

THE DETERMINANTS OF THE TRADE BALANCE IN KENYA: AN EMPIRICAL ANALYSIS (1970-2010).

BY

TOROITICH S. KIPKOSGEI

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SUPERVISORS

DR. MARY MBITHI

DR. DANIEL ABALA

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**A RESEARCH PAPER SUBMITTED TO THE SCHOOL OF ECONOMICS,
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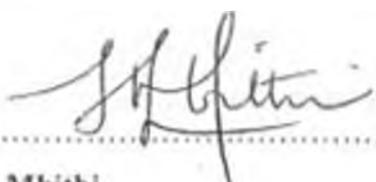
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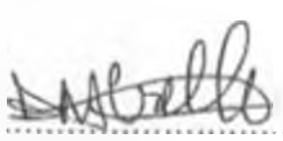
DECLARATION

This is my original work and has not been presented for any degree award in any other university.

Signed  Date: 24-9-2011
Toroitich S. Kipkosgei
Reg. No: X50/70866/08

This research paper has been submitted with our approval as university supervisors

Signed  Date: 27.09.2011
Dr. Mary Mbithi

Signed  Date: 27.09.2011
Dr. Daniel Abala

DEDICATION

I dedicate this research work to my Dad, Joshua Toroitich and Mum, Monica Toroitich, who made so much sacrifice to educate me despite the harsh economic times. Indeed, they inspired and gave me reasons to study. Further, I wish to appreciate the support of my wife, Lilian Jepkorir and my children Kimutai and Jebet

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ABSTRACT

The Kenya Economy has been characterized by persistent trade balance deficit over a long period of time despite the various initiatives that the Government has been undertaking to promote exports with the aim of arresting this situation. This study empirically investigated the determinants of Kenya's Trade Balance for the period 1970 to 2010 with specific objectives of estimating the factors that determine Kenya's Trade Balance and the nature and strengths of the relationship between Trade Balance and its determinants. Data was collected on Trade Balance, Real exchange Rate, Government Consumption Expenditure, Domestic Income, Income from the rest of the world, Foreign Direct Investment and Money supply

The Trade Balance model developed by Himmarios (1989), Bahmani-Oskooee (1989) and Buluswar *et al* (1996) and OLS model estimation using annual data on trade balance from 1970 to 2010 showed that Real Exchange Rate, Government Consumption Expenditure, domestic income and Money Supply are significant determinants of Kenya's Trade Balance for the period in question as opposed to foreign income was found to be statistically insignificant. The study recommends that, the Government must invest in productive sectors of the economy to increase exports and even add value to these exports so that they become competitive in international markets in line with the aspirations of the economic blue print, Kenya Vision 2030. Further, the Government should create conducive environment in the country by fighting corruption in order for it to attract FDI from abroad and even properly manage the exchange rate.

LIST OF ACRONYMS AND ABBREVIATIONS

AGOA- African Growth Opportunity Act

ARDL- Autoregressive Distributed Lag

BRM - Bickerdike-Robinson-Metzler Conditions

BOP- Balance of Payments

COMESA- Common Market of Eastern and Central Africa

EAC - East African Community

ECM- Error Correction Model

EU- European Union

FDI- Foreign Direct Investment

GDP- Gross Domestic Product

IS- Import Substitution Strategy

IMF- International Monetary Fund

ML- Marshall-Lerner conditions

NAFTA- North American Free Trade Agreement

RER- Real Rate of Exchange

SURE- Seemingly Unrelated Regression Equations

UNCTAD- United Nations Conference on Trade and Development

OECD- Organization for Economic Co-operation and Development

WTO- World Trade Organization

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CHAPTER ONE

1.0. INTRODUCTION

1.1. Background

The growth and development of African economies in general and of Kenya in particular have been influenced significantly by both the external trade environment and domestic policies geared towards using the opportunities of trade and responding to trade constraints. The domestic policies involved include exchange rates, tariff structures, export taxation, import control, foreign exchange allocation systems, and the adjustment of policies to meet or adhere to international obligations and commitments. The most important external factors are the prices of primary commodities, which for most economies have to be taken as givens. The application of trade policy instruments in Kenya has been guided by the need to stimulate domestic production, promote exports, safeguard domestic industry against dumping practices, and protect consumers. Kenya has been exercising its trade policy options in line with its international obligations.

Since independence in 1963, Kenya has pursued diverse economic policies culminating in major changes in trade policy with profound consequences for the expansion of trade and economic development. The trade regime in Kenya can be divided into five episodes. The first was in 1973 following the oil shock, a 398% increase in the price of oil leaving the country in a severe foreign exchange crunch, but was not sustainable - exchange controls had to be tightened to conserve foreign exchange, reversing the measures instituted. The second episode followed the coffee boom 1976-77; the higher earnings from coffee relaxed the foreign exchange constraint, permitting a relaxation of import restrictions.

The period between the first and second liberalization episodes was characterized by persistent balance of payments deficits, largely due to the massive increase in the cost of oil imports. By 1979, 120% of coffee export earnings were required to pay for oil imports, (GOK 1980). During the same period the plan to achieve an 8% increase in the growth of exports was not realizable, and there was a fall in the price of agricultural commodities in the international market. Furthermore, as a result of the break up of the East African Community (EAC) in 1977, Kenya lost the EAC market which was an important destination for her exports (Swamy, 1994).

The third liberalization episode was motivated by the need to correct macroeconomic imbalances, the aftermath of the expansionary fiscal policy, which followed the coffee boom.

Between the three liberalization episodes, the BOP deficit increased and each crisis would be addressed through ad hoc quantitative restrictions in addition to the existing tariffs. Export performance deteriorated and the need to remove the antiexport bias in the trade policy regime became the overriding concern which was addressed through the import substitution strategy.

The stated policies under the Import Substitution strategy (IS) were to contain the growth of imports to less than 2% on an annual basis, down from 7.3%; increase the growth of exports to 8% per annum and stimulate domestic production in substitution for imports and to support exports. Imports were to be constrained through higher taxes and quantitative restrictions, whilst an export subsidy of 10% on manufactured goods would promote exports (GOK, 1980). A foreign exchange allocation committee was constituted and an export-import licensing office to manage the controls aimed at increasing exports. A complex structure of protection emerged and the quantitative restrictions created a fertile environment for rent-seeking activities.

Though the controls reduced the volume and value of imports from 39% of GDP in 1980 to 28% in 1984 (GOK, 1985), reducing the deficit, trade performance deteriorated. Import controls constrained the growth of manufacturing and exports remained around 25% of GDP. When the IS strategy was adopted during the second half of 1980s, GDP growth ranged between 4-6% but the strategy was unsustainable. The growth of manufacturing was based on domestic demand and the scope for growth under IS was limited. Following the failure of IS strategy, Kenya started implementing a gradual liberalization programme in 1986, with specific focus of eliminating anti export bias. This therefore becomes the fourth episode.

The tariff rationalization programme started in 1986 with policy pronouncements in GOK (1986) and the National Development Plans. Trade policy reforms comprised of three components: rationalize the tariff code, reduce the average tariff rates and reduce the number of tariff bands (Pritchett and Sethi, 1994). Kenya has been undertaking trade reforms since the early 1990s, as part of World Bank conditionality and in preferential trade arrangements. Starting from 1990 there has been a gradual reduction in both tariff rates, especially on imported intermediate inputs, and tariff bands. The magnitude of reduction is constrained by revenue loss implications and the gradual pace allows for shifting to other sources of revenue.

Duty rates on imported raw materials and spare parts were targeted for reduction so as to reduce the anti-export bias and improve the country's competitiveness. Duty rates for this category of goods ranged between 10% and 100% in 1990 — the first steps in the liberalization process were to reduce tariffs on intermediate inputs by an average of 5%, while increasing duty on finished products by a maximum of 35%. Duty on capital equipment and parts has also been targeted for reduction in the liberalization process, and items taxed at 3% and 5% were zero rated from 2003. A similar reduction was applied to raw materials that are not produced locally. The other liberalization measure has been the reduction in the number of tariff bands. Starting from 1989, the number of tariff categories was reduced from 25 to 17; in 1990 another five categories were eliminated, reducing the bands to 12, and to 9 by 1993.

In the liberalization process, 1993 presented specific challenges, and there was a 25% temporary increase in duty rates. This was occasioned by the high inflationary pressure in the domestic markets and the mopping up exercise significantly increased domestic interest payments, additional revenues had to be mobilized through tariff revenue to cover the additional expenditure. With the exception of specific agricultural commodities, notably sugar, the tariff liberalization has resulted in a significant reduction in tariff barriers. However, there have been notable policy reversals; duty on fabrics was raised from 25% to 35%, to protect local producers, duty on locally available food stuffs was raised to 35% while the duty on sugar increased to 100%. The duty rates applied on wheat and sugar imports from COMESA caused a trade dispute with trading partners. The IMF rates the Kenyan trade regime at 6 on a scale of 1 to 10 (most restrictive), a moderately restrictive trade policy (IMF 2003), becoming the final leg (fifth) of full liberation that ensured the removal of foreign exchange controls and replacement of Quantitative Restrictions by tariffs and tariff rationalization. This ended with export compensation being reduced from 20% to 18 % between 1996 and 2000.

1.2. Evolution of Kenya's Trade Balance (1970-2010)

The Balance of Trade of a nation is the difference between values of its exports and imports (Sahu, 1992). When exports are greater than imports, the nation is said to have a balance of trade surplus. When imports are greater than exports, implies a balance of trade deficit. Exports and imports that figure in the balance of trade concept arise in the context of trade with other

countries. Since the balance of trade arises in the context of foreign trade, the balance of trade surplus is also called the foreign trade surplus and the balance of trade deficit is also called the foreign trade deficit. Also, since the balance of trade surplus or deficit is defined as the difference between exports and imports, it is also called net exports.

From Chart 1 on the trade balance, it is clear that large fluctuations have been experienced. In 1970 the trade deficit was Ksh.980M and this trend increased for two years. In 1973 the trade balance deficit reduced to Ksh. 981M. Then the trade deficit deteriorated to Ksh.3022M. This can be attributed to oil shock that lead to increase in oil prices by 398%(GoK, 1975).In response to these challenge the government intensified import-substitution policies; tariffs increased and import licensing became severe. Behind this protection Kenya's manufacturing sector boomed; annual growth in the sector averaged over 25 percent between 1971 and 1973.Throughout the decade import-substituting manufacturing continued to grow, and diversified to sectors including plastics, pharmaceuticals, and vehicles. There was a significant reduction in the trade deficit in the subsequent years of 1976-77, following the coffee boom that resulted in the country's economy growing by 8.3%(GoK,1978).The coffee boom also had a strong impact on the price of tea, another key Kenyan export. The net effect of the coffee boom was a 54 percent increase in Kenya's terms of trade by 1977, the peak year of the boom. This spike in the value of Kenya's commodity exports allowed the government to temporarily avert a foreign exchange shortage, and thus stayed on economic reform course in the short term.

In the 1980s, the economy continued experiencing trade deficits despite the introduction of Structural Adjustment Policies whose main thrust was to effect a shift from a highly protected domestic market to a more competitive environment that would facilitate increased use of local resources, outward oriented policies that would promote employment creation and export expansion. The implementation of the SAPs involved, among others, promotion of non-traditional exports, liberalization of market systems and reforms of international trade regulations. By this point Kenya's import substitution policy had essentially run its course: imports of consumer goods were low, which meant there was little room for future substitution and thus poor prospects for future growth. Additionally, the few trade links Kenya had-notably with Tanzania and Uganda as part of the East Africa Community (EAC)-were evaporating. The EAC, which had been an important source for Kenya manufactures, collapsed in 1977, as

Tanzania tightened its borders and import demand in Uganda waned due to internal instability (Gertz, 2007). With the already small export market shrinking, pressure for reform grew as the fault lines in the economy, which had been masked by the temporary influx of foreign exchange during the boom, began to reassert themselves resulting to further deteriorating the trade balance deficit.

In the first half of the 1980's, despite liberalization rhetoric, the government made only limited attempts to reform the economy. The share of imports not subjected to quota restrictions did increase from 24 percent in 1980 to 48 percent and average tariffs decreased by about 8%, but this had little impact of Kenya's trade (Swamy, 1994). The government only followed through on policy reforms when compelled by to do so by outside pressures, was quick to abandon liberalization in the face of other economic priorities: in an effort to counter foreign exchange crisis of 1982-984, Kenya uniformly raised all tariffs by a full 10 percent (Levin, 1999). During this period, the trade balance improved from Ksh. 6663M in 1982 to Ksh. 5765 M in 1984 (Chart 1).

From 1986 to 1990 the trade balance deteriorated further because the government shifted import restrictions schedules from quotas to tariffs and subsequently decreasing tariff levels. By this time, Kenyan exports had deteriorated tremendously. Merchandise export earnings as a percentage of GDP had for example declined from 19.6 percent in the 1970s to 16.97 percent over 1980-84 and to 13.6 percent over 1985-89 (Glenday and Ndii, 2000). In 1987, quantitative restrictions affected 40 percent of all importable items; by July 1991, import licenses were only issued for health or security reasons (Swamy, 1994). Imports climbed steadily during the late 1980s following the stronger implementation of liberalization programs, resulting in higher trade balance deficits. It is also worth noting that despite real exchange rate depreciating in the late 1980s, the balance of trade deficit was on the upward trend.

The outward orientation strategy started in Kenya in the 1990s was embodied in the Sixth Development Plan (1989-1993) which provided a policy framework for adoption of export strategy centred on creation of an enabling environment for export growth. This was to be achieved through institutional reform, reduction and restructuring of tariffs, abolition of export duties, introduction of export retention schemes, improvement of foreign exchange and insurance regulations and the establishment of the National Export Guarantee Corporation. This strategy

proposed incentives that aimed at encouraging industries to provide for exports. The main objectives of export led industrial reform programmes were to improve efficiency, stimulate private investment and increase the sector's foreign earnings. Therefore these reforms reduced the trade balance deficit from Ksh. 25269 M in 1989 to Ksh. 23209 M in 1993(Chart 1). The trend can also be attributed to recession that reduced imports and foreign exchange restrictions during the period. Further during this period Export Processing Zones (EPZs) were introduced. Kenya provided generous incentives to attract new firms manufacturing for export, including corporate tax holidays, waivers for import tariffs, and exemption from numerous business regulations.

The government established Export Promotion Council (EPC) in 1992 in order to enhance diversification of exports markets and products and to facilitate identification and removal of obstacles to rapid development of the export sector. EPC co-ordinates and harmonizes export development activities in the country so as to ensure higher and sustained growth of the economy. The council's activities have so far focused on consolidation and expansion of market share in traditional markets, diversification to emerging markets and promotion of non-traditional markets including promotion of non-traditional exports in order to diversify and expand the country's export base.

In 1993, the Ministry of Finance began another export promotion policy known as Export Promotion Programmes Office (EPPO), a duty drawback scheme which fully refunds import taxes paid on inputs used in the production of exports. Unlike under MIB and EPZ programs, firms do not need to be solely exporters to take advantage of the EPPO system: companies producing partially for the domestic market and partially for export can also reap the benefits. Largely attributed to this flexibility, the EPPO program was significantly more successful than other two export promotion platforms. Over two-thirds of eligible exports benefited from the EPPO scheme, representing 35 percent of total merchandise exports over the 1993-1998 period (Glenday and Ndi, 2002). Further, in 1993 devaluation of Kenya's exchange rate was undertaken. This could partly explain the improvement in the country's trade balance. From then the government adopted a flexible exchange rate. It is important to note that Kenya registered an increasing balance of trade deficit from 1993 to 2000 with an improvement in the balance of trade deficit between 2001 and 2002.

In 2003, a new government was formed under National Rainbow Coalition that the Economic Recovery Strategy for wealth and Employment Creation (ERS) covering the 2003 to 2007 period that was anchored on restoration of economic growth with the context of a stable macroeconomic environment. It identified growth of trade and industry among other sectors as critical towards this cause. Exports almost doubled since 2002 driven by strong growth in coffee, tea and horticultural exports. The improved exports, higher tourism receipts and remittances, and increased capital inflows resulted in more than doubling a doubling of international reserves held by the Central Bank since 2002, from US\$, 1.2 B in 2002 to US\$, 2.75 B in 2006. But still these did not result in the improvement of Kenya's trade balance deficit which continued to increase. Further, the Kenya Shilling exchange rate against the dollar appreciated due to strong balance of payments position, as well as a weakening of the U.S. dollar against major international currencies. This implies that the Kenya's exports became relatively expensive during this period therefore increasing the net exports deficit.

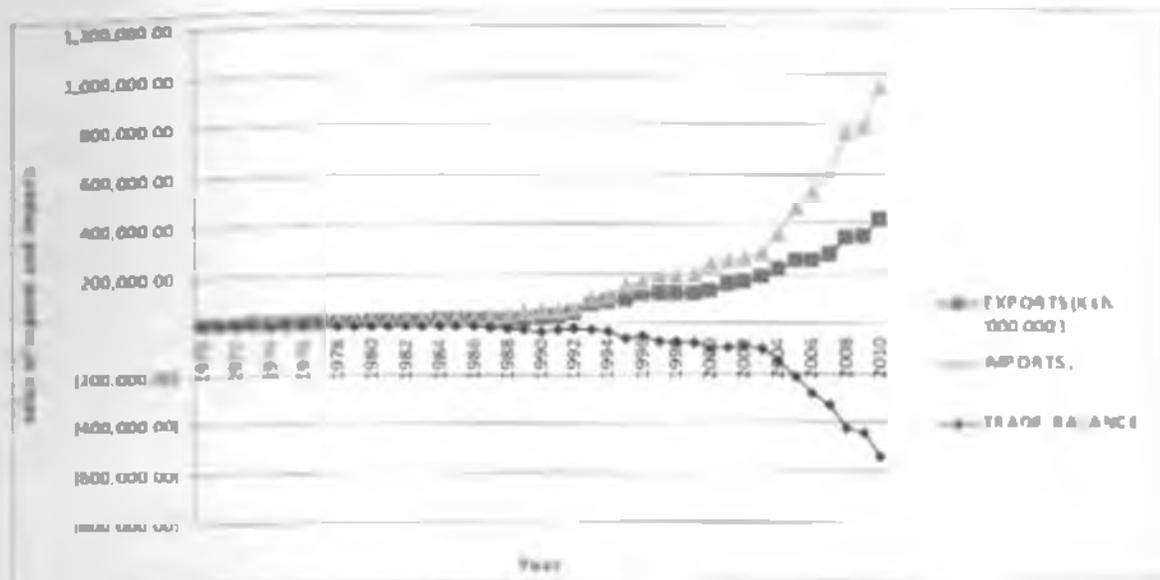
As the period covered by ERS came to an end in 2007, there was a general election that resulted in post election violence. This led to the further deterioration of Kenya's balance of trade deficit in 2008. The balance of trade continues to deteriorate amounting to Ksh. 537,588,30B in 2010.

The persistent trade balance deficit reflects Kenya's competitive weakness relative to her major trading partners. It is of great concern that such a rapid deterioration in the trade balance has taken place during the current decade and that deterioration is driven to some extent by necessary capital investment. Of equal concern is that this unfavourable position is as a result of trade with the most dominant trading partners. Given that the manufacturing sector has been the fastest growing in the recent decades and also the largest contributor to GDP from 25 percent in 1970 to 36 percent in 2008, imported capital goods will remain a major component of total imports and the trade balance may continue to deteriorate. In addition Kenya's export base remains relatively stagnant in recent years at around 13 percent of the GDP.

The historical trend of Kenya's external sector indicates that competitiveness relative to its trade partners is low. A major scenario for this is United Kingdom (UK), the second largest trading partner of Kenya after Uganda. Given the relative sizes of the two economies and Kenya's high level of dependence on UK, it is perhaps logical that such a trend should emerge. However, the apparent logic does not detract from the fact that chronic deficits, especially widening ones, are a

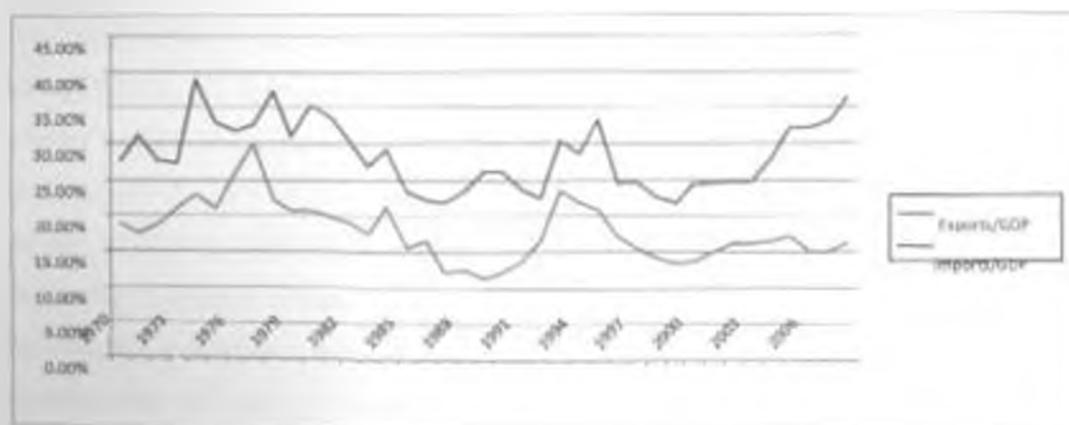
cause of concern for the policy makers of any country and require that ways to address them be explored

Chart 1 Kenya's Exports, Imports and Trade Balance (1970-2010)



International Monetary Fund (2010), International Financial Statistics, (CD ROM)

Chart 2 External Trade as % of GDP



International Monetary Fund (2010), International Financial Statistics, (CD ROM)

1.3. Statement of the Problem

The Kenya National Trade Policy (GOK, 2010) acknowledges the importance of foreign trade in the realization of the Kenya Vision 2030 by facilitating an efficient domestic market and export led globally competitive economy and eventually transforming Kenya's economy into a competitive export led economy, enhance regional integration and widen participation in both domestic and international trade. As such the Vision has identified tourism, agriculture, manufacturing, wholesale and retail trade, business process outsourcing (BPO) and financial services as the six priority sectors that promise to increase the country's GDP by 10 percent since these sectors make up 57 percent of the GDP. For these to be achieved, the Government has envisioned value addition, marketing and diversification in these priority sectors. Implying that in so doing the country's exports will increase and reduce the balance of trade deficit. It is imperative to note that the foreign trade as a percentage of GDP has increased overtime from 8.5% in 1970 to 20.20% in 2010.

For the period 1970 to 2010, Kenya has had a persistent balance of trade deficit. To mitigate the deficit, the Government has adopted measures like duty/VAT remission, Export Promotion Programmes Office, Export Processing Zones (EPZ), Manufacturing Under Bond (MUB) and even establishment of Export Promotion Council (EPC) and participation international trade arrangements. All these did not result in the improvement of the balance of trade since the country's imports are growing faster than exports from 18% as a percentage of exports to GDP, as compared to 27% as a percentage of imports to GDP in 1970, to 16% as a percentage of exports to GDP in 2008 while imports have grown to 37.5% in 2010 (IFS, 2010), implying that the country's balance of trade remains in deficit.

Equally, the extensive empirical work done focused more on the determinants of exports and imports with the aim of formulating policies that will reduce the balance of trade deficit. However, despite these efforts experience has indicated that most countries both developed and developing including Kenya have been experiencing trade imbalances with some instances of reversals and crises.

Therefore in the light of the efforts that the Government has been undertaking to promote the exports overtime, Kenya's balance of trade deficit is deteriorating hence it is important to know the factors that determine the balance of trade of Kenya.

The study therefore, aimed at providing an analysis of the empirical linkage between trade balance and a set of key macroeconomic variables proposed by both theoretical and empirical literature.

1.4. Objectives of the Study

The overall objective of this study was to establish the determinants of Kenya's trade balance from 1970 to 2010.

The specific objectives included:

- 1) Establish the factors affecting trade balance in Kenya.
- 2) Investigate the nature and strengths of the relationships between balance of trade and its determinants.
- 3) To recommend policies that improve Kenya's trade balance based on the study findings.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. INTRODUCTION

This section presented the literature reviews on determinants of trade balance and was divided into theoretical and empirical literature. Finally an overview of the literature was presented. We begin with theoretical followed by empirical literature.

2.2. Theoretical Literature.

There are a number of theoretically distinct approaches to predicting the outcome of policy changes on the balance of payments/trade. The elasticity approach describes the effects of changes in the exchange rate. This view is rooted in a static and partial equilibrium approach to the balance of payments that is well known as the elasticity approach (Bickerdike, 1920; Robinson, 1947; Metzler, 1948). It states that, starting from a balanced trade situation, devaluation will improve the balance of payments if the sum of the price elasticities (a measure of how much demand changes in response to a price change) of domestic and foreign demand for imports is larger than 1. Devaluation always improves the balance of payments if this condition is satisfied—although it is not a necessary condition of such improvement. The essence of this view is the substitution effects in consumption and production induced by the relative price (domestic versus foreign) changes caused by a devaluation. In particular, the Marshall Lerner condition states that, for a positive effect of devaluation on the trade balance, and implicitly for a stable exchange market, the absolute values of the sum of the demand elasticities for exports and imports must exceed unity. Assuming that the Marshall Lerner condition is met, when the exchange rate is above the equilibrium there is excess supply of foreign exchange and when the exchange rate is below the equilibrium there is excess demand for foreign exchange.

The absorption approach to the balance of payments emerged at the beginning of 1950s when Harberger (1950), Meade (1951), and Alexander (1952, 1959) shifted the focus of economic analysis to the balance of payments. This approach is in some respects an alternative to the elasticity approach. It states that a country's trade balance will improve if its output of goods and services increases by more than its absorption—the expenditure by domestic residents of foreign

goods and services. This approach takes a more macroeconomic view of the balance-of-payments question and looks at production and expenditure for the economy as a whole. It argues that currency devaluation will be successful only if the gap between domestic output and expenditure widens. The theory has been criticized, however, from a number of directions: first, for ignoring the inflationary effects of devaluation; second, for being inappropriate if the economy is at full employment, in which case output cannot increase; third, for completely ignoring monetary factors; and fourth, for dealing with the balance of trade without taking account of capital movements.

A different approach, the monetarist approach (Polak, 1957; Hahn, 1959; Pearce, 1961; Prais, 1961; Mundell, 1968, 1971) of the balance of payments emerged at the end of 1950s. This approach emphasizes the interaction between the demand and supply of money to determine the overall balance of payments position of the economy. Since, for any economy, the monetary base equals the sum of the domestic value of international reserves and the domestic asset holdings of monetary authorities, a change in international reserves is reflected in the change in the money supply. In very simple terms, if people demand more money than that being supplied by the central bank, then the excess demand for money will be satisfied by inflows of money from abroad. In this case, the trade balance will improve. On the other hand, if the central bank is supplying more money than is demanded, the excess supply of money is eliminated by outflows of money to other countries and this will worsen the trade balance.

The three different views presented above demonstrate that a country's balance of payments will be affected by changes in the domestic income level, money supply, and exchange rate. With regard to these different views, the study developed a model that incorporated simultaneously all three approaches and uses it to analyze Kenya's trade balance. The reason for incorporating all three approaches in a single equation model was to verify their empirical relevance and validity and minimize the residual unexplained variation in the trade balance model.

2.3. Empirical Literature

Using panel data, Falk (2008) investigated the determinants of the trade balance for 32 industrialized and emerging economies for the period 1990-2007. The results based on fixed

effects models and linear mixed models allowing for random slope coefficients, showed that the trade balance as a percentage of GDP is significantly positively related to real foreign GDP per capita of the trading partners. Further, real domestic GDP per capita has a negative effect on the trade balance. A real depreciation of the real exchange rate index leads to an improvement of the trade balance. However, in countries with a negative trade balance and/or a large positive net foreign direct investment position the trade balance is much less sensitive to movements in the real effective exchange rate index. This paper contributes to the literature in several ways. First, the country coverage is broader than those used in other literature. Second, the paper investigated the cross-country heterogeneity in the factors influencing the trade balance. Therefore it is possible to exploit time series and cross-sectional variation in the data which allows for dimension variability to exploit substantial additional variability. The main weakness of the study is that it did not establish causal-effect among trade balance and its variables. This study incorporated money supply and government expenditure variable in addition to real effective exchange rate, domestic and foreign income.

Akbostanci (2002) studied the existence of a J-curve in the Turkish economy in the period of 1987-2000, by using quarterly data. It is suggested and widely believed that a real depreciation initially worsens the trade balance, but through time trade balance improves, and thus the response of trade balance over time generates a tilted J shape, known as J-Curve. First an error correction model was estimated to differentiate between the long-run equilibrium and short-run dynamics. Then the response of trade balance to real exchange rate shocks investigated using the generalized impulse response methodology which investigates the impulse response function through time, which measures the time profile of the effect of a shock at a given point in time on the expected future values of the variables in a dynamical system. Even though the suggested long-run pattern, which is the improvement of the trade balance in response to a real depreciation, emerges, the results did not exactly support the J-curve hypothesis in the short-run. In this study it was found that the short-run behavior of the trade balance in response to real exchange rate shocks showed an S-pattern reminiscent of the Backus et al (1994) rather than the J-curve pattern. Backus, Kehoe and Kydland (1994) developed an international real business cycle model and found that the trade balance is counter cyclical and the cross correlation function of the trade balance and the terms of trade displays an S shape. The study is merited for

the use of generalized impulse response analysis which is unique, and brought further insight to the short-run dynamics of the trade balance in general. The problem with this approach is that impulse responses are not invariant to the ordering of the variables in the VAR. This problem can be dealt by imposing a priori restrictions so that covariance matrix is diagonal.

This study incorporated money supply, FDI and government expenditure variable in addition to real effective exchange rate, domestic and foreign income.

According to a study by Wang and Wan (2008) on the China's Trade imbalance with a focus on the role of inflow and outflow of foreign direct investment (FDI) in determining Chinese trade imbalance using aggregate, annual data from 1979 to 2007 and employing Seemingly Unrelated Regression Equations and Auto-Regressive Distributed Lag estimation models. It was found that although outflow FDI does not play an important role in determining Chinese trade flows and trade balance, inflow FDI contribute significantly to Chinese exports and thus its trade surplus with the rest of the world. Further, devaluation of the Chinese currency Yuan was found not to affect Chinese trade balance. Also both Chinese income and the income of the world play important roles in Chinese trade imbalance and that Chinese trade imbalance is stable (implying that China will still run a large amount of trade surplus for some time). The paper gave attention to the role of FDI inflow and outflow to China's trade balance model which other studies focused on real exchange rate and income as the determinants of China's trade imbalance.

The study included money supply and government expenditure as other determinants of trade balance

To examine the effects of real exchange rate depreciation and supply side shocks on exports and imports in Indonesia, Sugema (2005) used an Error Correction Model. The results suggested that trade balance will improve following devaluation through an increase in exports and a collapse in imports. Because the elasticity of imports with respect to the real exchange rate is greater than that of exports, improvement in trade balance would be mainly come from import compression. It was also found that export performance could have been far better if Indonesia did not suffer from banking problems and socio-political turbulence. The study can be merited for using ECM which permits separate estimation of long-run (steady state) relationships and short-run

dynamics. The main shortcoming of the study is the exclusion of money supply variable in view of banking crisis. This study therefore included money supply variable.

Gelashvili and Tsivadze (2008) examined the determinants of the trade balance using panel data for three Trans Caucasian republics – Armenia, Azerbaijan and Georgia for a decade using the theoretical model introduced by Goldstein and Khan, which was reviewed for the 40 industrialized countries. According to their findings, in the different countries different parameters matter. For Armenia it was average real GDP per capita of the 3 major trading partners, because it has such trading partners as Germany, Netherland and Russia. But one of the reason of trade deficit is high transportation costs because of its landlocked location. Trade turnover is small in comparison with Georgia and Azerbaijan. In spite of Georgia's good location, trade balance isn't positive. It is transit country. Local manufacturing is not developed and REER depreciation doesn't stimulate export. Therefore stimulating export won't improve economic situation, as nowadays import is cheaper.

The study used all the variables used in this paper except labour force productivity variable.

Zhuang *et al.* (2008) investigated the factors behind the growing U.S. trade deficit in consumer-oriented agricultural and food products by using panel data and an empirical trade model derived from international trade theory. The results indicate that per capita income in the United States appears to be the most important determinant for the growing U.S. trade deficit. Hence increases in per capita income and trade liberalization in foreign countries improves the U.S. trade balance. U.S. foreign direct investment abroad in food processing, a strong U.S. dollar, and NAFTA are found to have negative effects on the U.S. trade balance. The study adds knowledge to existing literature since is focused on trade balance on a sub-sector, consumer oriented agricultural and food products, unlike most studies that focus on trade balance of an economy as a whole. The use of panel data exposes the study to heteroskedasticity and serial correlation problems.

The current study added money supply and government expenditure variables in addition to real exchange rate, domestic and foreign income.

Rincón (1999) examined the role of exchange rates in determining the short-and-long-run trade balance behavior for Colombia.

Conventional wisdom says that a nominal devaluation improves the trade balance. This conjecture is rooted in a static and partial equilibrium approach to the balance of payments that has come to be known as the elasticity approach (Bickerdike, 1920; Robinson, 1947; Metzler, 1948).

The model, commonly known as the BRM model, has been recognized in the literature as providing a sufficient condition (the BRM condition) for a trade balance improvement when exchange rates devalue. The hypothesis that devaluation can improve the trade balance has also been rooted in a particular solution of the BRM condition, known as the Marshall-Lerner condition (Marshall, 1923; Lerner, 1944). This condition states that for a positive effect of devaluation on the trade balance, and implicitly for a stable exchange market, the absolute values of the sum of the demand elasticities for exports and imports must exceed unity. Accordingly, if the Marshall-Lerner condition holds, there is excess supply for foreign exchange when the exchange rate is above the equilibrium level and excess demand when it is below. The BRM and Marshall-Lerner (ML) conditions have become the underlying assumptions for those who support devaluation as a means to stabilize the foreign exchange market and/or to improve the trade balance.

Empirically, the evidence for both developed and developing countries has been inconsistent in either rejecting or supporting the BRM or ML conditions. The study tested these two conditions. It used a regression model formulation which included income and money so that the monetary and absorption approaches to the balance of payments are also examined. The econometric procedure used is the Johansen and Juselius' approach to estimation of multivariate cointegration systems. The main result is that exchange rates do play a role in determining the short-and-long-run behavior of the Colombian trade balance. Moreover, devaluation improves the trade balance, which is consistent with the BRM or ML conditions. The results showed also that the long-run effect of exchange rate devaluation on the trade balance is enhanced if accompanied by reduction in the money stock and/or an increase in income. The findings with respect to income and money variables did not uniformly reject or accept hypotheses from the absorption or monetary approaches either for the short run or the long run.

The literature has included income and money stock in the trade balance estimation model thus putting together the elasticity, absorption and monetary approaches to the balance of payments. Other variables used are RER and real GDP. This study included IPI and Government

expenditure variables in addition to RER, GDP and money supply variables as the determinants of trade balance.

The main weakness of the paper is use of Johansen and Juselius approach to conduct cointegration analysis because the approach requires that the variables are of the same order of integration. This requirement often causes difficulty to researchers when the system contains the variables with different orders of integration. To overcome this ARDL would have been used because it does not require classification of variables into $I(0)$ or $I(1)$.

Investigating the relationship between the real exchange rate and trade balance in Malaysia from year 1955 to 2006 using Unit Root Tests, Cointegration techniques, Engle-Granger test, Vector Error Correction Model (VECM), and impulse response analyses, Geoi-Mei (2008), found that there exists a long run relationship between trade balance and exchange rate. Other important variables that determine trade balance such as domestic income shows a long run positive relationship between trade balances, and foreign income shows a long run negative relationship and that the real exchange rate is an important variable to the trade balance, and devaluation will improve trade balance in the long run, thus consistent with Marshall-Lerner condition but the results indicate no J-curve effect in Malaysia case.

Mohammad (2010) investigated the long run as well as short run determinants of trade deficit with reference to Pakistan by using Johansen cointegration approach and Error correction model (ECM). The study found out that foreign income, foreign direct investment, domestic house hold consumption and real effective exchange rate significantly affect the trade deficit. To highlight the short run dynamics VECM (Vector Error correction model) was used.

The paper adds into existing literature for applying the maximum likelihood cointegration technique proposed by Johansen (1996) and Johansen and Juselius (1990), which captures the underlying time series properties of the data, provides estimates of all the cointegrating vectors that exist within a vector of variables and offers a test statistic for the number of cointegrating vectors without imposing a priori normalization on the dependent variable. However, it is necessary to mention that the maximum likelihood cointegration procedure of Johansen, while it establishes a long – run relationship among the variables of the VAR model, it is unable to

produce coefficient estimates with structural interpretation (Dickey, Jansen and Thornton, 1994; Alogoskoufis and Smith, 1991).

Gomez and Alvarez-Ude (2006) examined the determinants of trade balance for Argentina for the period 1962 to 2005. The investigation confirmed the existence of long-run relationships among trade balance, Real Exchange Rate (RER) and foreign and domestic incomes for Argentina between 1962 to 2005. Based on the estimations, the Marshall-Lerner condition is examined and, by means of impulse response functions, the effects of a one-time shock to the RER on the trade balance checking the J-curve pattern were traced. By using VAR-based cointegration tests and impulse response functions, it was shown that ML condition was fulfilled in the periods including fixed exchange rate regime policy but not in those periods when exchange rate has shown more flexible policies. This result holds even though there have been an episode of RER overvaluation with relatively flexible exchange rate periods in the Argentine economy as was shown Richaud et al. (2003). Besides the results coincides with those reported by Mahmud et al. (2004) for developed countries. In the short run, Argentine IB has not usually followed the J-curve pattern of adjustment. Only before the Convertibility Plan launching in 1991, the impact of RER is negative on the long-term and short-run IB showing that though the ML condition does not hold a J-curve-type phenomenon is observed.

The contributions of the paper are twofold. The first was to test ML and J-curve phenomenon for Argentina in different periods. The second is to provide new insights into the effects of fixed and flexible exchange rate regimes in the IB and, therefore, in the relationships between RER and long term economic growth.

The main weakness of the literature is the exclusion of money supply variable which is important in the light of the monetary approach of the balance of payment theory.

The current study incorporated money supply and government expenditure, in addition to domestic and foreign income, and RER variable, as determinants of balance of trade of Kenya.

What causes of the counter-cyclicity of the trade balance in the three major sectors of the U.S. economy: services, manufacturing, and agriculture? These results are compared with the results pertinent to the U.S. economy as a whole. At the macroscopic level, Sachs' hypothesis explained the counter-cyclicity of the trade balance, while results are mixed across individual sectors.

The services sector may be explained by Sachs' hypothesis, while results for the manufacturing sector are more consistent with the real business cycle hypothesis. The results for the agricultural sector, however, cannot be explained by either hypothesis, Miljkovic and Paul (2008)

The study adds into existing literature by looking at the impact that transitory or permanent income disturbances may have on sectoral trade balance in the United States. Further, the results of the study showed the difference in trade balance determinants at macroeconomic and the disaggregate level, an understanding of which policy makers can gain better understanding of the possible implications of their decisions on trade balance of different sectors of an economy in the era of globalization.

Garlick and Edwards (2005) reviewed the theoretical and empirical relationship between the exchange rate and trade flows in South Africa. Trade volumes were found to be sensitive to real exchange rate movements but nominal depreciations have a limited long-run impact on trade volumes and the trade balance, as real effects are offset by domestic inflation. Therefore policy should not focus on the exchange rate, but on the fundamental determinants of the profitability and competitiveness of domestic exporters and import competing industries: productivity enhancement, infrastructure, constraints to business operations and production costs, including labour costs.

The literature adds into existing literature by providing a more disaggregated research at sectoral level. However, the main shortcoming of the literature is the review of the three approaches of balance of payment theories without incorporating money supply variable in the study.

The literature has included tariff rates, RER and Volume of domestic production in the manufacturing trade balance estimation model. This study included domestic and foreign income, Money supply, FDI and Government expenditure variables in addition to RER variables as the determinants of trade balance in Kenya.

2.4. Overview of the Literature.

In examining the literature on the factors determining Kenya's trade balance, relevant empirical studies of related work and theoretical literature are reviewed to link this study with what has been documented. Empirical studies reveal how different methodologies and data sets in various environments have been used to yield the results that might be of great importance to this study. To understand the trade deficit and the causes of changes in the balance of trade, it is important to have a broader view of what has been done in related studies elsewhere.

Generally, many researchers agree (and have found empirically) that the variables in question (RER, Government expenditure, FDI, domestic and foreign income, and money supply) have an impact on a country's trade balance. The literature suggested that the internal and external factors that influence an economy's trade balance vary from country to country and from time to time. As a result, their influences on the trade balance also vary significantly. A full account of such factors required a detailed country analysis. It therefore was important to establish an empirical relationship between Kenya's trade balance and its determinants.

From the literature reviewed, real exchange rate was a central factor in the trade balance. Therefore, a depreciation of the real exchange rate leads to an improvement of the trade balance. Other factors that were found to influence trade balance are domestic income, foreign income and Foreign Direct investment. It is also evident that most studies were carried out for a period of at least ten years using different models ranging from Error Correction Model, to Vector Autocorrelation model. The studies used panel data or time series in their analysis of trade balance.

Further, from the literature reviewed, two theories, known as elasticity and absorption approaches, have dominated the explanation of trade balance and its central determinant, exchange rate. Therefore, monetary approach has been ignored. Towards this end, the study developed a model that incorporated simultaneously all three approaches and used it to analyze Kenya's trade balance. This was achieved by incorporating income and money supply variables in the model to examine monetary and absorption approaches, while the real exchange rate was used to evaluate the conventional approach to elasticities.

This study contributed to the existing literature on the determinants of trade balance because most studies have focused on EU, OECD and Asia-Pacific Rim countries with scanty focus on African countries. Therefore, this study contributed to existing literature on trade balance in Kenya and Africa at large.

CHAPTER THREE

3.0. METHODOLOGY

3.1. Introduction

This section presented the methodology used in carrying out this research, including discussion of the data types and sources, model specification, explanation of variables, and the hypotheses tested.

3.2. Theoretical Framework

To reiterate, the central theme of this paper was to examine the determinants of trade balance. Economic theory determines a number of key variables that have significant effect on imports and exports and hence trade balance. Now, let the trade balance of an economy be defined as export revenue X minus import expenditure M . This is represented as:

$$TB = X - M \quad (1)$$

Following Dornbush (1980) and Rose (1990), a simple relationship between trade balance and exchange rate by assuming that a domestic economy produces exportables and importables from which it consumes. Under such an assumption, the trade balance of Kenya, TB , defined in terms of domestic currency, can be expressed as follows:

$$TB = P_d X - e P^f M \quad (2)$$

Where X is the quantity of exports, P_d is the domestic price of exports, M is the quantity of imports, P^f is foreign price of imports in foreign currency, e is the nominal exchange rate expressed in domestic currency units per unit of foreign currency.

By dividing equation (2) by P_d , the domestic price of exports, we can obtain the real trade balance (TB) equation in terms of domestic goods as

$$TB = X - e P_d P^f M \quad (3)$$

Where $e P_d P^f = RER$ defines the real exchange rate.

Hence TB can be expressed as:

$$TB = X - RY_f - R_f Y_d \quad (4)$$

Consequently, if we express export and import demand equations as functions of real exchange rate and foreign and domestic real incomes respectively,

$$X = X(RER, Y_f) \\ \text{and} \quad M = M(RER, Y_d) \quad (5)$$

We obtain trade balance equation as follows:

$$TB = TB(RER, Y_f, Y_d) \quad (6)$$

Following Buliswar et al. (1996), "the monetary model of exchange rates is built on money market equilibrium", and is specified as

$$M_s / P = I(Y_d, RER) \quad (7)$$

Where M_s is the money supply, P is the domestic price level, I represents the demand for money, RER is the real exchange rate, and Y_d is domestic real income.

The expression in Equation (7) postulates that the money market is in equilibrium and this ensures that real money supply is determined by the demand for money and real exchange rate, in terms of the domestic economy. The original inspiration for this modeling can be found in Johnson (1972), Dornbush (1973, 1975) and Frenkel and Rodriguez (1975). From Equation (6), it can be deduced that a higher RER would reduce the purchasing power of the Kenya Shilling and this will increase the demand for money to maintain imports. An increase in M_s would create supply of money, causing domestic residents to spend their cash balances. In Kenya, this will result in a decrease in cash balances and consequently a worsening of trade balance. As pointed out by Buliswar et al. (1996), there is some ambiguity, however, of the effect of real balances, M_s/P , on trade balance. Higher M_s could raise P and lower the effective exchange rate and thereby raising trade balance in the long run. A higher price level P could also lower the real money supply, M_s/P , causing hoarding. A higher domestic income could also lead to excess money demand and hoarding (Dornbush, 1973).

3.3. Model Specification

The model therefore followed Himmarios (1989), Bahmani-Oskooee (1989) and Buluswar et al. (1996) that incorporates the basic variables that determine Trade Balance. Further, the modeling of the trade balance followed a study of determinants of balance of trade in Pakistan by Sumaiman (2009) but Money Supply (M_t) was incorporated so that the model follows Waliullah et al. (2006). Therefore a model incorporating the basic variables is specified below.

An empirical model for a country's trade balance can be specified in the following functional form:

$$TB = TB(RER, GE, Y_d, Y_f, FDI, Ms) \quad (8)$$

To run the regression analysis from the above function, we double-log all the variables in equation (8) above so that coefficients are interpreted as elasticities, therefore Kenya's trade balance model can be expressed as:

$$\text{Log}TB_t = a_0 + a_1 \text{Log}RER_t + a_2 \text{Log}GE_t + a_3 \text{Log}Y_d + a_4 \text{Log}Y_f + a_5 \text{Log}FDI + a_6 \text{Log}M_t + \varepsilon_t \quad (9)$$

where TB_t is the trade balance, taken as the ratio of import value (M) to export value (X). The ratio of M to X (i.e. M/X) or its inverse has been widely used in many empirical investigations of trade balance-exchange rate relationship, such as Bahmani-Oskooee and Brooks (1999), Gomez and Alvarez-Ude (2006), and Geni-Mei (2008). This ratio is preferable because it is not sensitive to the unit of measurement and can be interpreted as the nominal or real trade balance (Bahmani-Oskooee, 1991).

RER_t is the real exchange rate at time t , computed as e^* Wholesale price index/consumer price index ; GE_t is government expenditure at time t , in USD; FDI_t is foreign direct investment, net inflows in USD, at time t , in U.S. dollars; Y_d , domestic income of Kenya at time t , in USD ; Y_f is the average of aggregated foreign income, calculated on the basis of Kenya's three major trading partners (exports) that account for the largest shares of its trade (Uganda, United Kingdom, and the United States);, in USD M_t is Money Supply, broad money measured in USD, and ε_t is the error term capturing unexplained factors in the trade balance.

The study used OLS technique because of the time series properties of the data to obtain the estimates of the above variables that have been specified by equation (9).

3.4. Definition of Variables

Trade balance (TB) - is the difference between values of its exports and imports (Sahu, 1992). It measures the relationship between a country's exports to the rest of the world and its imports from the rest of the world.

Real Exchange rate (RER)-is defined as the real worth of foreign exchange in terms of a given domestic currency. A rise in the real exchange rate (RER) indicates a real depreciation of the Kenya Shilling. In such a situation, foreign goods become more expensive than domestic goods. This also will lead to an increase in competitiveness of Kenya's exports and a shift of resources from sectors that produce non-tradables to those producing tradable goods. This means that exports will rise relative to imports and hence trade balance will improve. A fall in RER (real appreciation) will lead to an increase in the cost of production, thereby depicting deterioration in the country's international competitiveness (that is, the country produces in a way that is less efficient than it used to be). These explanations lead us to expect that RER will affect the trade balance positively, but that depends on the ability of the country to manipulate the exchange rate, given the level of foreign reserves. It is expected to have a positive effect on trade balance.

Government Consumption expenditure (GE) -consists of expenditure incurred by government on both individual consumption goods and services and collective consumption(OECD,2001). The effect is that, if the government imports more than it exports—as always has been the case for developing countries— then the trade balance will widen. Government expenditures therefore is expected to have a negative impact on the trade balance.

Foreign Direct Investment (FDI) -is defined as an investment made to acquire lasting interest in enterprises operating outside the economy of the investor (IMF, 1993). Depending on the extent to which foreign direct investment (FDI) is concentrated in tradable sectors and on the import content of the associated domestic production, the impact of FDI on the trade balance may be positive or negative. For a developing nation like Kenya, most of the capital equipment and intermediate products are imported by transnational companies from overseas affiliates and they take out foreign exchange in the form of repatriated profits, salary, and interest on loans. The short-run net effect of FDI on the trade balance under such circumstances most likely will be

negative because of the production lag. In the long run, however, it is assumed that the net effect will be positive because export production from transnational corporations is expected to rise.

Domestic Income (Y_d)-is the GDP of Kenya which is the total market value of all final goods and services produced in a country in a given year. It is expected to have a negative relationship with trade balance.

Foreign Income (Y_f) -is the total market value of all final goods and services produced in countries that trade with Kenya in a given year. It has a positive impact on the trade balance of Kenya. The underlying assumption is that when the income of Kenya's trading partners' increases, they would "import" more from Kenya. It is expected to have positive effect with trade balance.

Money Supply (M_t) -is the total supply of money in circulation in a given country's economy at a given time. A fall in domestic money supply improves trade balance since foreigners send their money domestically for more goods and services. It is expected to have a negative effect on trade balance.

3.5. Hypotheses

Based on the stated problem, the study objective, and the literature review, the study tested the following hypothesis:

1. The real exchange rate has a significant positive effect on the trade balance.
2. Government expenditure has a significant negative effect on the trade balance.
3. Domestic Income has a significant negative effect on the trade balance
4. Foreign Income has a significant positive effect on the trade balance
5. FDI has a significant positive effect on the trade balance.
6. Money supply has a significant negative effect on the trade balance.

3.6. Stationarity, Cointegration and Diagnostic testing

For estimation purposes, time series data covering 1970 to 2010 was used. Non-stationarity of time series has often been regarded as a problem in empirical analysis. Working with non-stationary variables leads to spurious regression results from which further inference is meaningless. The conventional Augmented Dickey-Fuller tests will be used to test for Stationarity. If unit root is found in the data, it will be corrected by differencing the variables in

the first order, I (1), to make them stationary. This will make the variables useful for estimation purposes and therefore avoid the problem of results being spurious.

Differencing of variables to achieve Stationarity leads to loss of long-run properties. The concept of cointegration implies that there is a long-run relationship between two or more non-Stationarity variables, deviations from this long-run path are stationary. This is done by generating residuals from long-run equation of the non-stationary variables, which are tested for Stationarity using the ADF tests (Dickey and Fuller 1979). ADF is expressed in the form:

$$y = \beta_1 + \beta_2 + \alpha \sum_{i=1}^n y + \epsilon$$

Where y = is the variable of interest = {RIR, GI, Y_4 , Y_6 , FDI, Ms} and ϵ is the white noise residual of zero mean and constant variance

{ $\beta_1, \beta_2, \alpha, \dots, \alpha_m$ } is a set of parameters to be estimated.

Both of the null and alternative hypotheses in unit root tests are:

H0: $\delta = 0$ (y is non-stationary/a unit root process)

H1: $\delta \neq 0$ (y is stationary)

The unit root hypothesis of the Dickey-Fuller can be rejected if the t-test statistic from these tests is negatively less than the critical value tabulated. In other words, by the Augmented Dickey Fuller (ADF) test, a unit root exists in the series y (implies non-stationary) if the null hypothesis of δ equals zero is not rejected (Gujarati 1995).

For Cointegration and error correction model, trends whether stochastic or deterministic result into spurious regression results, un-interpretable student t-values and other statistics have too high goodness of fit which makes results difficult to evaluate. The remedy is to stationarise the data by differencing which leads to loss of long run properties. This can be remedied by measuring variables in the level form while maintaining Stationarity with short run (impact effect) and long run properties simultaneously incorporated by the use of the error correction model (ECM), or feedback mechanism in cointegration analysis. Cointegration solves the problem associated with the loss of information associated with detrending or by the attempts to

address the Stationarity through differencing. It rejects spurious results but at the same time accepts correlation between non-stationarity series where correlation is structural rather than spurious. This cointegration analysis was developed Granger (1986) and Granger and Engle (1987). Non-stationary variables are said to be cointegrated if they have a long run relationship amongst themselves in which deviations from their long run path are stationary that is two or more variables could be non-stationary but have their differences (or their linear combination) stationary. By definition, therefore variables are said to be cointegrated if a linear combination of these variables assumed lower order of cointegration. The variables are themselves non-stationary but must be of the same order of integration individually. It is their linear combination which is integrated of a lower order.

Where cointegration is rejected, then there is no long run relationship between the non-stationary series. Imposition of ECM will be rejected by the data and the solution will be to specify the model in another form which no long run relationship appears.

If $Y_t \sim I(a)$ and $X_t \sim I(b)$ and their linear combination.

$Z_t = Y_t - \alpha_1 X_t \sim I(a-b)$ then Y_t and X_t are cointegrated. This can be specified as:

$$Y_t = \alpha_1 X_t + \varepsilon_t \quad (10)$$

Where Y_t is the regress and X_t is the regressor, α_1 is the parameter to be estimated and ε_t is the mean zero error term.

If Y_t and X_t are non-stationary but their differences (ΔY_t and ΔX_t) are stationary, then only the short run effect will be captured by running a regression on the following equation:

$$\Delta Y_t = \alpha_1 \Delta X_t + \varepsilon_t \quad (11)$$

But if in equation (10), $Y_t - \alpha_1 X_t$ is stationary, then their lag ($Y_{t-1} - \alpha_1 X_{t-1}$) can be augmented into equation (11) as an explanatory variable such that we have an ECM, represented by:

$$\Delta Y_t = \alpha_1 \Delta X_t + \phi (Y_{t-1} - \alpha_1 X_{t-1}) + \varepsilon_t \quad (12)$$

Equation (12) simultaneously incorporates both the short run and long run solution and has an error correction mechanism when ϕ is negative

To ascertain the goodness of fit of the model, diagnostic tests are conducted. The diagnostic test examines the serial correlation, functional form, normality, and heteroskedasticity associated with the model.

3.7. Data, Sources and Types

This study used secondary time-series data concerning the trade balance (defined as the ratio of imports to exports), government expenditure, FDI, the real exchange rate, Money Supply, domestic income and income from the rest of the world. Secondary data was obtained from various sources. FDI data was taken from the 2010 report by the United Nations Conference on Trade and Development (UNCTAD) and World Development Indicators (World Bank). Data on government expenditure, Foreign Income (measured in USD), nominal exchange rates, and the consumer price index was derived from International Financial Statistics (IMF 2010) and from Kenya's Economic Survey (Republic of Kenya). Money Supply data was from the Central Bank of Kenya. Import and export data were derived from various issues of Kenya's Economic Survey.

CHAPTER FOUR

4.0 DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

This chapter presents the descriptive and empirical analysis of variables estimated in the model. The descriptive statistics gives the mean, the standard deviations and graphical analysis of the observed variables while the empirical analysis gives the regression results of the estimated model.

4.1.1 Standard Deviations and Means

In this section a summary of the main variables that have been used in estimation of the model are shown in the table 4.1 below.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Intb	41	0.495154	0.181786	0.0819914	0.8380484
Inrer	41	4.467334	1.342425	4.141011	4.813057
Inge	41	21.05677	0.740956	19.3788	22.35112
Inyd	41	22.82125	0.752905	21.19942	24.19827
Inyf	41	28.27831	0.815292	26.67291	29.16814
Infdi	41	17.27219	1.256267	12.8842	20.40726
Inms	41	20.48712	1.751179	17.49824	21.10297

Source: Author's computation

From Table 1, the mean value of the variables reflects their average values range from 0.495154 for trade balance to 28.27831 for the foreign income. The mean for Kenya's trade balance from 1970 to 2010 is 0.495154 with a standard deviation of 0.181786. For RER, the mean is 4.467334 with a standard deviation of 1.342425 as opposed to the Government Expenditure which has a mean of 21.056 with a standard deviation of 0.7410. The Domestic income has a mean of 22.82 with a standard deviation of 0.7530 compared to foreign income which has a mean of 28.28 with a standard deviation of 0.8153. Further, FDI has a mean of 17.27 with a standard deviation of 1.256 compared to Money Supply which has a mean of 20.49 with a standard deviation of 1.751.

The standard deviation shows how big the deviation of the dependent variable, trade balance, is from the regression line, the smaller the better which is between 0.1342425 for RER to 1.751179 for Money supply variable.

From the descriptive statistics all the variables have all the observations (41) indicating that there no missing observations in the primary variables.

4.2 Stationarity analysis

Recent studies have drawn attention to the fact that most time series data might be non-stationary which is likely to result in 'spurious regressions' and the concomitant incorrect statistical inferences. Though first differencing can be used to overcome this problem, potentially useful information about long-run equilibrium relationships between economic variables might be lost. The level information may be of significance particularly when a group of variables are cointegrated. The Augmented Dickey Fuller (ADF) test was utilized to test for the presence of unit roots. The test was performed in levels and in first difference including both a constant and a deterministic trend. The results are given in table 2.

Table 2: Unit root tests at Level

Variable	ADF Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Comments
LNIB	-2.471	-3.648	-2.958	-2.612	Non-Stationary
LNRRER	-2.337	-3.648	-2.958	-2.612	Non-Stationary
LNGE	-1.548	-3.648	-2.958	-2.612	Non-Stationary
LN _{YD}	-1.224	-3.648	-2.958	-2.612	Non-Stationary
LN _{YF}	-6.154	-3.648	-2.958	-2.612	Stationary
LNFDI	-5.386	-3.648	-2.958	-2.612	Stationary
LNMS	-0.595	-3.648	-2.958	-2.612	Non-Stationary

Source: Author's computation

The results indicate that variables LN_{YF} and LNFDI are stationary at level at 1 percent, 5 percent, and 10 percent levels. This means that LN_{YF} and LNFDI are integrated of order 0, that is, I(0). Other variables; LNIB, LNRRER, LN_{YD} and LNMS are non-stationary. This means that

there exists at least one unit root and it requires to be differenced to become stationary in order to eliminate the possibility of spurious regression results and erroneous inferences. Variables L.NTB, L.NRER, L.NGE, L.NYD and L.NMS are non-stationary at both 1 percent, 5 percent and 10 percent levels and thus they require differencing to become stationary; this is in order to eliminate the possibility of spurious regression results and erroneous inferences. First differencing results are presented in Table 3.

Table 3: Unit root tests at First Differencing

Variable	ADF Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Comments
L.NTB	-7.091	-3.655	-2.961	-2.613	Stationary
L.NRER	-7.383	-3.655	-2.961	-2.613	Stationary
L.NGE	-4.647	-3.655	-2.961	-2.613	Stationary
L.NY _t	-4.446	-3.655	-2.961	-2.613	Stationary
L.NMS	-5.406	-3.655	-2.961	-2.613	Stationary

Source: Author's computation.

The results in Table 3 indicate that after first differencing, L.NTB, L.NRER, L.NGE, L.NYD and L.NMS have become stationary and therefore are integrated of order 1, that is, $I(1)$. Therefore all the variables under consideration are stationary.

4.3. Cointegration Results

Cointegration is a method used to establish whether there exists a linear long-run economic relationship among the variables (Johansen, 1991). Cointegration also helps in pointing out whether there exists disequilibrium in various variables (Pesaran and Shin, 2001). Further, cointegration allows us to specify a process of dynamic adjustment among the co-integrated variables (Johansen, 1991). The first step is to estimate a long run equation using ordinary least

squares (OLS) with variables, which are integrated of order one, I(1) in their levels. The results of the OLS are shown in the Table 4.

Table 4: OLS Regression Results

Source	SS	df	MS	Number of obs	-	40
Model	.312733606	6	.052123268	F(6, 33)	-	3.13
Residual	.549529311	33	.016652404	Prob > F	-	0.0154
				R-squared	-	0.3627
				Adj R-squared	-	0.2468
Total	.862262936	39	.022109306	Root MSE	-	.12904

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dlnrb					
dlnrr	.9388193	.4233974	-2.21	0.034	-1.79822 .0754185
dlnge	.8161227	.4796787	1.70	0.098	-.159791 1.792036
dlnyd	-.7405904	.5787276	-1.28	0.210	-3.91802 .4368196
dlnyf	.0882819	.4875004	0.11	0.899	-1.310446 1.487034
dlnfdi	.0221328	.0133244	1.66	0.106	-.0049758 .0492435
dlnms	-.7244312	.2657269	-2.73	0.010	-1.265057 -.1838057
_cons	.1031402	.0584704	1.76	0.087	-.0158188 .2220991

The test on the residuals of the error term was done to test whether there was cointegration of the variables of order zero so as to utilize the ECT (Adam 1992).The results were as follows:

Table 5: Results on Augmented Dickey Fuller on Residual

Augmented Dickey Fuller test for unit root				Number of obs	-	38
Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value			
Z(t)	-4.896	-3.662	-2.964	2.614		
MacKinnon approximate p-value for Z(t) = 0.0000						

D.resid	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
resid					
L1.	-1.156729	.2362755	-4.90	0.000	-1.636394 -.6770642
L2.	.1088587	.1615751	0.67	0.504	-.2191562 .4368736
_cons	.0031581	.0193522	0.16	0.871	-.0361289 .0424451

Source: Author's computation.

As the results in Table 5 indicates, the unit root tests on the residual rejected the null hypothesis in favour of the alternative indicating an existence of cointegration since the residuals are stationary at 1 %, 5 % and 10 %. If the residuals are non-stationary they cannot become the Error

Correction Term (ECT) and consequently an error correction model is not adopted. The residuals were found to be stationary at 1%, 5% and 10% levels of significance by the ADF test. The Durbin Watson statistic of 2.17 shows that there is no serious serial correlation between the dependent variable and the residual of the estimated equations. Therefore the residual becomes the Error Correction Term (ECT). The residuals is therefore taken to be independent and identically distributed as $N(0, \delta)$.

The second step in the Engel Granger procedure is to estimate the corresponding error correction model (ECM), based on the long run cointegrating relationship to observe the short-run dynamics (Engel and Granger, 1987). The results of the error correction model in this case are represented in the Table 6.

Table 6: Results of the Error Correction Model

Source	SS	df	MS	Number of obs =	40
Model	321587377	7	.045941084	F(7, 32) =	2.72
Residual	.54067556	32	.016896111	Prob > F =	0.0248
Total	862262936	39	.022109106	R-squared =	0.1730
				Adj R-squared =	0.2358
				Root MSE =	.12999

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dlntr	-.8804031	.4335181	-2.01	0.051	[-1.763551 .0025444]
dlnge	.8428714	.4845869	1.74	0.092	[-.1441999 1.829943]
dlnyd	-.8165011	.592104	-1.38	0.178	[-2.022986 .1899824]
dlnyf	-.6120085	1.021642	-0.62	0.541	[-1.449008 2.713025]
dlnfdi	.0213224	.0134681	1.58	0.121	[-.0061113 .0487561]
dlnms	-.6831777	.2716065	-2.50	0.018	[-1.240696 -.1260594]
lagresid	.0019535	.0026986	0.72	0.474	[-.0035434 .0074503]
_cons	.0244789	.1235999	0.20	0.844	[-.2272858 .2762434]

4.4. Correlation of variables

Modeling using variables in the first difference to achieve stationary leads to loss of long-run information. The concept of correlation implies that if there is long-run relationship between two or more non-stationary variables, deviation from this long run-path are stationary.

Under specific assumptions as to the properties of the random error term ε , the OLS estimator has some useful properties. Specifically, the OLS is consistent and unbiased as an estimator of β if the following conditions hold: None of the dependent variables are perfectly correlated

(multicollinearity); ε is an independently distributed normal error with mean zero and with constant variance. ε is uncorrelated with any of the independent variables. The underlying model relating the dependent and independent variables is linear. If these conditions hold, the estimates are reliable and that hypothesis tests are informative.

Pearson correlation multivariate procedure was used to establish whether the variables are correlated in the long-run. According Gujarati (2004), multicollineality becomes a serious problem if the pairwise or zero-order correlation coefficient between two regressors is in excess of 0.8. The results given below in Table 7 were run to test both the existence of correlation between the variables at 5% level of significance for the variables. The results showed that most of the variables are not correlated, except domestic income and government expenditure. However, the correlation is not strong to result into serious endogeneity problem and unbiased estimates, hence no need to perform a two stage least square, which may not produce any better results than a simple OLS.

Table 7: Correlation of Variables

	dlnrb	dlnrer	dlnqe	dlnyd	dlnyf	dlnfdi	dlnms
dlnrb	1.0000						
dlnrer	0.1940	1.0000					
dlnqe	0.2778	0.6193	1.0000				
dlnyd	0.1528	-0.5991	0.5464	1.0000			
dlnyf	0.1391	0.1774	0.4272	0.4127	1.0000		
dlnfdi	0.1228	0.3080	-0.1240	-0.1224	-0.0172	1.0000	
dlnms	-0.1528	-0.7860	0.4833	0.5380	0.1487	-0.1357	1.0000

4.5. Regression Results

Log of Trade Balance was regressed against the logs of the independent variables and the results were as follows:

Table 8: The Results of the General Regression Model

Source	SS	df	MS	Number of obs =	40
Model	321587377	7	.045941054	F(7, 32) =	2.72
Residual	.54067556	32	.016896111	Prob > F	= 0.0248
				R-squared	= 0.3730
				Adj R-squared	= 0.2168
Total	862262936	39	.022109306	Root MSE	= .12999

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dlntrb						
dlnrer	-.8805033	.4335283	-2.03	0.053	-1.763551	.0025444
dlnge	.8428714	.4845869	1.74	0.092	-.1441999	1.829943
dlnyd	.8165013	.592304	1.38	0.178	-2.022985	.3899824
dlnyf	.6320085	1.021642	0.62	0.541	-1.449008	2.711025
dlnfdi	.0213224	.0174681	1.58	0.123	-.0061113	.0487561
dlnma	-.6833777	.2736065	-2.50	0.018	-1.240696	-.1260595
lagresid	.0019535	.0026986	0.72	0.474	-.0035434	.0074503
_cons	.0244789	.1235999	0.20	0.844	-.2272854	.2762436

Therefore the Model is represented as:

$$TB = 0.0244789 - 0.8805031RER + 0.8428714GE - 0.8165013Y_d + 0.6320085Y_t + 0.0213224FDI - 0.6833777Ms + 0.0019535resid \quad (11)$$

From Table 8, the coefficients of the real exchange rate, government consumption expenditure, domestic income, Foreign Direct Investment and money supply are statistically significant while foreign income is statistically insignificant.

The explanatory power of the estimated variables low as shown by the adjusted R^2 of 0.2358. This means that 23.48 per cent of the changes in Trade Balance (TB) are explained by the changes in variables capture by the model

The coefficients of some of the variables do not have the expected signs. The impact of the exchange rate on the trade balance is negative and statistically significant. The results are similar with a study by Shahbaz *et al* (2010) that a negative relationship between exchange rate and trade balance of Pakistan. It suggests that depreciation in real exchange rate is not an effective tool to improve trade balance in Kenya and that the Marshall-Lerner condition do not hold in the case of Kenya. The devaluation/depreciation of domestic currency by 1% on average worsens the trade balance by 0.8805 %. It indicates that the sum of elasticities of exports and imports do not exceed unity in the long run and that devaluation/depreciation worsens the trade balance.

The regression results indicate that there is a positive and statistically significant relationship between Government Consumption Expenditure and Trade Balance. A 1 percent increase in

government expenditure would lead to an improvement of the trade balance by 0.843 percent. This implies that difficulties in Kenya's Trade balance should be corrected through fiscal policy. According to Taylor (1993), this result simply means that there have been sensible government interventions, such as investment in productive sectors, undertaken to promote exports. The result supports government expenditure, but such expenses should really address the underlying challenges, such as infrastructure and human resource development. However, there is also a need to reduce government expenditure, especially in non- priority areas (cars and or military expenditures). It is important to note also that reducing government expenditure may not be a sensible solution if it entails reducing expenditures in such priority sectors as health care, education and agriculture.

The Domestic Income has shown a negative sign, as expected, and statistically significant at the 5 per cent level of significance. These results are aligned with those of Gomez and Alvarez-Ude (2006) that found a negative relationship between domestic income and trade balance. The negative sign of the coefficient of income variable supports the Keynesian view that income increases will encourage citizens to buy more imported goods and thus worsens the trade balance.

Foreign income has shown a positive sign, as expected, at the 5 percent level of Significance though statistically insignificant. A 1.00 percent increase in the foreign income will result in a 0.632 percent improvement in Kenya's trade balance. The results are consistent with a study by Sugema (2005) on the determinants of Trade Balance and Adjustment to the Crisis in Indonesia which found that foreign income variable is statistically insignificant and therefore does not add to the explanatory power of the regression over and above the other variables. The result is consistent with the hypothesis that exports from developing countries are supply, rather than demand determined (Athukorula and Riedel, 1996). This finding suggests that Kenya needs to improve productivity and efficiency so as to meet the standards of foreign demand. The impact of the change in foreign income on Kenya's trade balance, however, is insignificant at the 5 percent level. Going by the reality of the trade relationship between developed and least developed countries, this result is particularly true, as was revealed in the 2003 WTO meeting in Mexico. Developed countries have shown disinterest in the goods from developing countries and are helping their own local producers (particularly in the agriculture sector) through subsidies so that they out-compete agriculture products from least developed countries in terms of price and

probably quality. There was thus no equity in trade relations under the framework of the WTO because developed countries were too defensive and protective in their trade negotiations.

FDI has indicated a positive relationship, as hypothesized. The are similar to a study by Wang and Wan (2008) on the China's Trade imbalance with a focus on the role of inflow and outflow of foreign direct investment (FDI) in determining Chinese trade imbalance that found that although outflow FDI does not play an important role in determining Chinese trade flows and trade balance, inflow FDI contribute significantly to Chinese exports and thus its trade surplus with the rest of the world. A 1 per cent increase of FDI will result in 0.0213 percent improvement in the trade balance. The impact is significant could be because much of the so-called FDI currently in Kenya is engaged in production of export products.

Money Supply has a negative and statistically significant relationship with Trade Balance. The results are consistent with a study by Waliullah *et al* (2010) on the determinants of Pakistan's Trade Balance which found the role of money supply significant in initiating changes in the trade balance in the case of Pakistan. Therefore, the sign of the money supply variable is consistent with the monetary approach to trade balance. The theory indicates that a rise in domestic income increases the demand for money and will therefore increase exports and improve the trade balance. Also, a fall in domestic money supply improves the trade balance since foreigners send their money domestically for more goods and services. The fall in money supply resulted from tight monetary policy in Kenya which aimed at controlling inflation while providing adequate liquidity to stimulate economic growth. Monetary aggregates are controlled by the Central Bank through its influence over interest rates in banking sector, open market operations and occasionally, changes in reserve requirements.

The long run equilibrium effect of the independent variables on the trade balance as explained by the Error Correction Mechanism (ECM_t) was 0.0019535. The coefficient of -0.0019535 indicates the rate of convergence to equilibrium, which implies that deviation from the long-term equilibrium is corrected by 1.9535% over each year. The coefficient of ECM_t was significant at 5 percent level indicating that it was well defined.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1. Summary

The Kenya Economy has been characterized by persistent trade balance deficit over a long period of time despite the various initiatives that the Government has been undertaking to promote exports with the aim of arresting this situation. This study presented an empirical investigation on the determinants of Kenya's Trade Balance for the period 1970 to 2010 with specific objectives of estimate the factors that determine Kenya's Trade Balance and the nature and strengths of the relationship between Trade Balance and its determinants. Data was collected on Trade Balance, Real exchange Rate, Government Consumption Expenditure, Domestic Income, Income from the rest of the world, Foreign Direct Investment and Money supply.

The study used secondary data from various sources such as International Financial Statistics, World Development Indicators, Republic of Kenya statistical abstracts and Republic of Kenya Economic Surveys. Since time series data are candidates of trends and integration, tests were done to ascertain their levels of stationarity from where estimations were done instead of working with non stationary data which could have resulted in spurious regression results.

All the coefficients of factors in the final model had the right signs save Real Exchange Rate. Real Exchange Rate, Government Consumption Expenditure, domestic income and Money Supply were found to be statistically significant but foreign income was statistically insignificant.

Government Consumption Expenditure as expected improves Trade Balance implying that there have been sensible government interventions, such as investment in productive sectors, undertaken to promote exports. Also FDI as expected improves Trade Balance assuming that the FDI is channeled into production of goods for exports.

5.2. Conclusion

The results indicated that all the variables included in the equation had the expected signs except real exchange rate variable which showed a negative relationship with the trade balance instead of positive relationship. The study concluded that Real Exchange Rate, Government Consumption Expenditure, domestic income and Money Supply are significant determinants of Kenya's Trade Balance for the period in question as opposed to foreign income was found to be statistically insignificant implying that difficulties in Kenya's Trade Balance should be corrected through fiscal policies, and policies on income or growth and monetary policy. Therefore for Kenya to address the persistent trade balance deficit the Government must invest in productive sectors of the economy to increase exports and even add value to these exports so that they become competitive in international markets in line with the aspirations of the economic blue print, Kenya Vision 2030. For FDI, the Government should create conducive environment in the country by fighting corruption in order for it to attract FDI from abroad.

5.3 Policy Implications

A key question for Kenyan policy makers is 'why has substantive trade policy reform in Kenya produced to date a limited response in terms of the growth and diversification of exports against a background of increased imports growth that has led to persistent trade balance overtime?

Based on the findings of this study, given the relationship between real exchange rate and Trade Balance, it raises questions about the efficacy of depreciation in achieving the intended goal of correcting Trade Balance deficit in Kenya. Therefore an alternative policy to depreciation is the imposition of restrictions on less essential imports and foreign exchange movement. Nashashibi (1983) emphasizes that the success of such a policy depends on the ability of the government to encourage technological innovation, remove structural bottlenecks and rigidities, ensure that resource allocations is efficient, and encourage investment in labour-intensive techniques given that the such a policy biases production towards capital-intensive techniques. In terms of restricting foreign exchange movement, Nashashibi (1983) argues that such a policy could potentially encourage expansion of black market for foreign exchange, causing a divergence in private and public rates. The consequence being capital flight

Further, there is need to increase savings to finance domestic investment. To reduce the trade deficit, the country must increase the savings needed to finance domestic investment, which would then improve the industrial base. Different ways of doing that, however, would have greatly different effects on the economy. Reducing government spending would reduce the services and transfer payments for education and health care that are available to the citizens. An increase in personal taxes would reduce private consumption, saving, and investment. An increase in the tax on business investment would reduce the future growth of real wages and consumption. Therefore, Kenya should consider the opportunity cost forgone in the choice to be made among these measures.

Kenya should also design policies aimed at improving domestic production capacity. This study infers that most resources (human and material) used by foreign investors are imported, even if they are available locally. This occurs because of the low quality of the available resources and the country's poor infrastructure, so improving infrastructure and developing the country's human resources is needed to correct this situation. Doing so will enable foreign investors to import fewer resources (inputs), so the government will be able to take full advantage of the FDI.

Exchange rate stability is an important economic policy, as it does not only affect imports and exports but also FDI. Therefore there is need to properly manage the exchange rate. The intuition of most policy makers is that a rising trade deficit or current account deficit is bad, whereas surpluses are good. This intuition is a poor guide to policy. First, it ignores the distinction between a rising trade balance deficit associated with a stronger currency and rising investment opportunities in the country and a rising trade deficit accompanied by a depreciation of local currency. For strong economies like that of the United States, market forces can operate on their own and produce self-correcting forces that operate on the country's trade balance. For developing countries like Kenya, such self-correcting mechanisms cannot work. The most appropriate way to control the Kenyan trade balance is to combine liberalization with proper management of the exchange rate. Such management is considerably more important than import policy for successful exporting and sustained growth. A stable exchange rate would enable producers of tradables to make long-term investment plans. Proper management, however, will require having enough foreign reserves to hedge against exchange rate fluctuations.

Further, the relationship between trade balance and money supply, domestic income and exchange rate as determinants of trade balance has a policy implication that difficulties in Kenya's trade balance could be corrected through its policies on income or growth and money supply rather than exchange rate regime.

5.4. Suggestions for Further Research

The existing literature has revealed several variables that influence trade balances. The study has been able to capture some of them in the Kenyan context, but could not capture others. Variables like terms of trade and capacity to produce for export are very important in explaining the variability of the trade balance. Previous studies for a developing economy, for instance, have found a negative relationship between trade balance and terms of trade, but a lack of consistent and reliable data on terms of trade kept me from capturing its effect on trade balance. If enough reliable information can be obtained about these variables, integrating them with the other variables would be interesting work. Trade in services is another important area that needs further research because it is now the booming industry in the majority of least developed countries.

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