EXCHANGE RATE AND TRADE BALANCE IN UGANDA (1975-2015)

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1165-05136-10338

A RESEARCH THESIS SUBMITTED TO THE COLLEGE OF ECONOMICS AND MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS DEGREE OF ECONOMIC POLICY AND PLANNING OF KAMPALA INTERNATIONAL UNIVERSITY

APRIL, 2019

DECLARATION

This Thesis is my original work and has not been presented for a Master's Degree or any academic award in any University or Institution of Learning.

Mohamed Hussein Yousuf

Signature _____ Date: 25 - April - 2019

APPROVAL

I confirm that the work reported in this thesis was carried out by the candidate under my supervision.

Supervisor's Name

Dr. John Mutenyo

Signature _____ Date: 26/04/2019

DEDICATION

I dedicate this thesis to my family whose resources I used in my studies.

ACKNOWLEDGEMENT

I first of all thank ALLAH who has been ever there for me in all hard time and who have helped me to go through this piece of work.

I appreciate my guardians who have made sure that all my tuition fees are paid up and all the necessary required at school are cleared in time. Without her, things would not have been easy for me.

I also acknowledge my lecturers in the College of Economics and Management especially my supervisor Dr. John Mutenyo for his great work done towards the completion of my thesis.

Lastly, I appreciate all my friends who have helped me with advice and academically.

May ALLAH help you all!

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LIST OF ABREVIATIONS

ARDL.....Autoregressive Distributed Lag

BOP.....Balance Of Payment

FDI.....Foreign Direct Investment

IFR.....Impulse Response Function

KGDP.....Ugandan Gross Domestic Product

LDCs.....Least Developing Countries

US.....United States

USA.....United States of America

USD.....United States Dollars

UGDP.....Ugandan Gross Domestic Product

UK.....United Kingdom

TB.....Trade Balance

RER.....Real Exchange Rate

VECM.....Vector Error Correction Model

ABSTRACT

This study examines the relationship of Exchange Rate changes and trade balances in Uganda for the period 1975 to 2015. Uganda needs to strengthen the capacity of firms to improve on the quality of products so that the government does not have to import almost everything especially during construction of big projects. The objectives of the study were; i) to examine the long run relationship between exchange rates and trade balance in Uganda, ii) to assess the short run relationship between exchange rates and trade balance in Uganda. To avoid spurious regression problems, the data were tested for stationarity and Cointegration. Augmented Dick -Fuller (ADF) tests show that the series were non stationary at Level but all of them are stationary at their first difference. The Engle granger Cointegration Test shows that there are long and short run relationship between exchange rate and trade balance in Uganda. The findings of the study were; The test for stationarity using Augmented Dickey-Fuller (ADF) test proved that the variables used in this study are stationary, though not in levels, but in their first differences. The next step involved test for cointegration using the Engle granger Cointegration approach which proved the existence of cointegration. Under such circumstances, we employed the error correction model (ECM), since it offers more and better information compared to other data generation processes. The results point to a close long-term effects of exchange rate and trade balance. The recommendations were; monetary policy management should emphasize price stability and minimisation of volatility in interest rates and exchange rates of the shillings, and from what has been observed from the study that exchange rates can have an impact on the country's external trade balance, exchange rates could be used as a tool to reduce the country's external imbalances. The contribution to the study was that; the study indicated that when the international exchange rate falls, the local currency in relation to world currencies appreciates, imports become cheaper, exports become expensive thus leading to more imports and less exports. On the other hand, when the international exchange rate rises, the local currency in relation to world currencies depreciates, imports become more expensive, exports become cheaper and the country exports more and imports less. From this deduction, it is noted that foreign exchange rate movements affect international prices both negatively and positively leading to either a decline or boost in trade.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter brings forth the introduction to the research paper as it tackles the background of the study, the statement of the problem, purpose of the study, study objectives, research questions, the scope of the study in terms of geography, content/variables and time, hypothesis, and the significance of the study.

1.1 Background to the Study

The background of the study will be presented in relation to historical perspective, theoretical perspective, conceptual perspective and contextual perspective.

1.1.1 Historical Perspective

Since the mid-1980s the United States has had a growing deficit in tradable goods, especially with Asian nations (China and Japan) which now hold large sums of U.S debt that has in part funded the consumption. The U.S. has a trade surplus with nations such as Australia. The issue of trade deficits can be complex. Trade deficits generated in tradeable goods such as manufactured goods or software may impact domestic employment to different degrees than do trade deficits in raw materials. Economies which have savings surpluses, such as Japan and Germany, typically run trade surpluses. China, a high-growth economy, has tended to run trade surpluses. A higher savings rate generally corresponds to a trade surplus. Correspondingly, the U.S. with its lower savings rate has tended to run high trade deficits, especially with Asian nations (Resnick, 2013).

Kimbugwe and Perdikis (2009), assert that the evolution of the trade balance and exchange rate policy in Uganda can be traced back to the 1975s, when the official exchange rate with the US dollar was held close to the original rate at which the East African shilling had been fixed, which the Uganda shilling inherited in 1966 after the

dissolution of the East African Currency Board. Economic mismanagement of the 1975s and 1980s led to the emergence of a parallel foreign exchange market (Gligorić, 2015). Sangeeta, (2009) contends that by 1981, the price of foreign currency in the parallel market was over 10 times higher than the official exchange rate which limited export trade within the country, thus inhibiting negative balance of trade and thus this led to an adjustment program to correct the prevailing exchange rate distortion hence a massive devaluation of the shilling in July 1982. This is because the policy objective was to eliminate the overvaluation of the Uganda Shilling and to establish a unified market based rate that would provide a uniform price, which would promote efficiency in allocation of resources, growth and development (Moses, 2017).

In October 1989, a crawling peg was introduced and as a result, the nominal exchange rate was adjusted on a monthly basis. Legalization of the parallel market by licensing foreign exchange bureaux was implemented in 1990 where bureaux were permitted to conduct spot transactions at freely determined exchange rates and to satisfy most private sector demand for foreign exchange to finance visible and invisible payments Gligorić, (2015). This was in a bid to address popular concern about capital flight hence creation of a market based foreign exchange system which aimed at increasing the efficiency of the foreign exchange allocation processes and at the encouragement of foreign capital flows through an open and competitive exchange rate payments system (Muhwezi, 2013). Whereas exchange rates were market determined, the foreign exchange market remained segmented. In order to eliminate the segmented nature of the foreign exchange market and to bring about convergence of the exchange rates, an inter-bank foreign exchange market system was introduced in November 1993 (Anguyo, 2007). Previously , Uganda recorded a trade deficit of 225.60 USD Million in May of 2011 and Balance of Trade averaged to about 146.92 USD Million from 1993 until 2018, reaching an all-time high of 14.60 USD Million in April of 1996 and a record low of 431.20 USD Million in December of 2015 (Lubinga, 2016).

Uganda is a net exporter of agricultural products such as coffee and cotton and its main trading partner is Uganda with 15% of imports and 10% of exports. Additionally, the country's exports have increased at a slower pace hence off-setting the imports expenditure bill (Mugabe, 2013).Uganda's balance of trade gap is continuing to widen because of imported raw materials and it has observed an increase in the volumes of exports but the value of imports has more than doubled and while working with the private sector, government has created the Uganda National Commodities Exchange to work towards national food security and commodity price stabilization to help in the medium term. Therefore since 1985 the expenditure on imports has been increasing, standing at $ 500m (Shs1.7 trillion) in 2001; $3b (Shs10.7) in 2014 and $6b (Shs21.5 trillion) in 2015 (Kimbugwe, 2009).

The balance of payments recorded a surplus of USD 167.1million in the first seven months of 2016/17. This was an improvement compared to the deficit of USD 66.5million recorded in the corresponding period of 2015/16. This improvement is partly due to the decline in imports, reflecting subdued economic activity. During the same period, the current account balance improved to a deficit of USD 551.9 million from a deficit of USD 984.7 million, mainly driven by a lower trade deficit which significantly declined to USD 1,047.8million in the seven months to January 2017, from USD 1,666.5million in the same period of 2015/16.

Improvement in the goods account was mainly supported by higher export earnings coupled with a general decline in all imports, reflecting subdued domestic demand and reduced government expenditure on development projects for the period. During the first seven months of 2016/17, inflows through the financial account increased by 7.4 per cent to USD 591.3million from USD 550.7million in the corresponding period of the previous financial year. On quarterly basis, the external sector recorded a surplus overall balance for the quarter ended January 2017, on account of an improvement in the current account balance. The current account balance improved by US$262.7

million to a deficit of US$92.70 million during the quarter ended January 2017, from a deficit of US$355.39 million in the preceding quarter. The improvement in the current account balance was largely on account of an improvement in the goods account (Muhwezi, 2013).

The widening of unfavorable trade balance has been majorly on account of continued exportation of unprocessed agricultural products which form the bulk of Uganda's exports, while the deteriorating trade balance in Uganda has affected economic growth, employment and price stability hence justifying the case for considering trade balance equilibrium an important objective of economic policy and therefore Uganda has a systemic trade deficit as a result of the country's dependence on fuel imports (Perdikis, 2009).

According to Kyatusiimire (2017), Uganda's negative balance of trade, with imports outweighing exports, is unlikely to improve soon until its economic infrastructure is more fully developed. For more than a decade now, the country's exports are on average half the value of its imports. Today much of the materials used in building new dams, roads and bridges are imported due to lack of local capacity to produce industrial inputs that are of the international standards and quality. Near the top of the imports list are petroleum products, pharmaceuticals, vehicles and spares, crude vegetable oil and wheat. "We need to strengthen the capacity of our firms to improve their capacity to improve on the quality of their products so that the government does not have to import almost everything especially during construction of big projects (Othieno, 2011).

However according to Bank of Uganda, the current account deficit for 2015/16 improved slightly from a deficit of $1.9 billion to $1.4 billion, largely driven by a decline in the private sector import bill, reflecting a combination of low global crude oil prices and subdued domestic demand (Mbabazi, 2002). Therefore, much as the government is pushing for efforts to promote exports and create a trade balance between exports and imports, there is a great limitation on the capacity of Uganda to produce materials that

can replace the expensive imported items especially construction materials and new technology. During 2016, the government's direct imports increased by 120% from $2.2billion in 2015 to $4.9 billion while the private sector reduced its imports by 17% from $4.6 billion to $3.8 billion (Lubinga, 2016).

Uganda's balance of payments has deteriorated since the onset of the global financial crisis. Uganda has always run fairly large trade deficits but these have been funded with foreign savings from a variety of sources; workers' remittances, foreign aid and net capital inflow (Perdikis, 2009). However because of the slowdown in global growth and the economic recession in some of our most important export markets, include Europe, our exports have grown very slowly over the last three years, by only 4 percent per annum on average in US dollar terms. In contrast, our import bill has grown much faster, by about 10 percent per annum on average, because the buoyancy of the Ugandan economy has raised incomes and thus demand for imports. The consequence of this divergence in the growth rates of exports and imports is that the trade deficit has widened. In the last fiscal year the trade deficit in goods and services was 20 percent of GDP, compared to only 13 percent of GDP in 2007/08 (Talemwa, 2017).

1.1.2 Theoretical Perspective

Balance of Payments Theory by Letiche (1959)

The study will also be guided by the Balance of Payments Theory developed by Letiche (1959), the theory stresses that the rate exchange basically relates to the position of balance of payments of the country concerned. A favourable balance of payments leads to an appreciation in the external value of the currency of the country. Unfavourable balance of payments causes a depreciation of the external value. The balance of payments theory of exchange rate holds that the price of foreign money in terms of domestic money is determined by the free forces of demand and supply in the foreign exchange market. It follows that the external value of a country's currency will depend upon the demand for and supply of the currency (Balassa, 2004).

The theory states that the forces of demand and supply are determined by various items in the balance of payments of a country. According to the theory, a deficit in the balance of payments leads of a fall or depreciation in the rate of exchange, while a surplus in the balance of payments strengthens the exchange reserves, causing an appreciation in the price of home currency in terms of foreign currency. A deficit balance of payments of a country implies that demand for foreign exchange exceeds its supply. As a result, the price of foreign money in terms of domestic currency must rise, i.e., the exchange rate of domestic currency must fall (Gligorić, 2015).

On the other hand, a surplus in the balance of payments of a country implies a greater demand for home currency in a foreign country than the available supply. As a result, the price of home currency in terms of foreign money rises, i.e., the rate of exchange improves. The balance of payments theory of exchange rate maintains that rate of exchange of the currency of one country with the other is determined by the factors which are autonomous of internal price level and money supply. It emphasizes that the rate of exchange is influenced, in a significant way, by the balance of payments position of a country. A deficit in the balance of payments of a country signifies a situation in which the demand for foreign exchange (currency) exceeds the supply of it at a given rate of exchange. The demand for foreign exchange arises from the demand for foreign goods and services. The supply of foreign exchange, on the contrary, arises from the supply of goods and services by the home country to the foreign country (Cavallo, 2016).

J-curve effect describes that in the short-run export volumes and import volumes do not change much so that the country receives less export revenue and spends more on imports leading to deterioration in the current account balance (Solderstein, 1995).
However there is a time lag before the trade balance improves following a real depreciation. The short and long run effects of depreciation on the trade balance are different. Theoretically, the trade balance deteriorates initially after depreciation and

sometime along the way it starts to improve until it reaches its long-run equilibrium. The time path through which the trade balance follows generates a J-curve. The time lag comes about as an impact of several lags such as recognition, decision, delivery, replacement, and production (Junz and Rhomberg, 1973).

Marshall-Lerner condition is the condition that an exchange rate devaluation or depreciation will only cause a balance of trade improvement if the absolute sum of the long-term export and import demand elasticities is greater than unity. The best choice thereof, leads to favorable economic repercussions (Davidson, 2009).

1.1.3 Conceptual Perspective

According to Mendy (2012), trade balance refers to the value of exported goods minus the value of imported goods. A positive trade balance signifies a trade surplus, while a negative value signifies a trade deficit. In 2017, Uganda's trade deficit amounted to around 2.65 billion U.S. dollars. In other words, it is the difference between the country's exports and imports for a given period of time usually a year from one country to another. The Balance of trade will be measured and expressed in Dollar. It is also referred to as the difference in value over a period of time between a country's imports and exports of goods and services, usually expressed in the unit of currency of a particular country or economic union (e.g., dollars for the United States, pounds sterling for the United Kingdom, or euros for the European Union). The balance of trade is part of a larger economic unit, the balance of payments (the sum total of all economic transactions between one country and its trading partners around the world), which includes capital movements (money flowing to a country paying high exchange rate s of return), loan repayment, expenditures by tourists, freight and insurance charges, and other payments

The exchange rate; this is the price of a unit of foreign currency in terms of the domestic currency Cavallo (2016). Exchange rate serves as the basic link between the local and the overseas market for various goods, services and financial assets. Using

the exchange rate, one is able to compare prices of goods, services, and assets quoted in different currencies. Exchange rate volatility can affect actual inflation as well as expectations about future price volatility (Baharumshah, 2001). Changes in the exchange rate tend to directly affect domestic prices of imported goods and services. Exchange rate volatility can affect the country's external sector through its impact on foreign trade. The exchange rate affects the cost of servicing on the country's foreign debt. Under the system of freely floating exchange rates, the value of the foreign currency in terms of the local currency, like any commodity or service being sold in the market, is determined by the forces of supply and demand Korinek (2011). Under a fixed exchange rate system, a par value rate is set between the local currency and the foreign currency by the central bank. The par value may be adjusted from time to time Arize (1994).

1.1.4 Contextual Perspective

Uganda's foreign exchange rate has been under so much pressure because foreign savings have increased slightly in US dollar terms, but as a share of our GDP foreign savings have been virtually flat over the last four years, at about 18 percent of GDP (Mugabe, 2013). Whereas foreign savings were more than sufficient to fund our trade deficits prior to the global financial crisis, allowing Uganda to run BOP surpluses and accumulate foreign exchange reserves, this is no longer the case. Our trade deficits are becoming unsustainably large. Additionally, the current account deficit has also widened since the mid-2000s whereby the capital and financial account surpluses, have not increased to match the widening current account deficits. Unfortunately, the problems in the global economy mean that it has become much harder to mobilize foreign savings to fund our wide trade deficits (Mbabazi, 2002).

Lubinga (2013) contend that the economy may recover to above 5% in 2017/18 and to 6% in 2018/19, if weather conditions improve, Foreign Direct Investment (FDI) inflows accelerate, the banking system stabilizes, and budgeted, capital spending is executed

without delays. Meanwhile, low business confidence, the ongoing strife in South Sudan and its subduing of segments of exports, and high credit costs all continue to weigh on private domestic investment. At the same time, private foreign investment in the oil sector could help support the recovery of growth, following the issuance of exploration permits. The most critical risk to this outlook is regional instability, particularly in South Sudan and any election-related disturbances that take place in Uganda. Reliance on rain-fed agriculture remains a downside risk to real GDP growth, the poor's income, as well as export earnings. The latter could be impacted by a flaring up of conflict in South Sudan, and any renewed refugee inflows that would add to the estimated 1 million South Sudanese already in the country. Meanwhile, further delays in the completion of a public investment program would prevent the productivity that could be gained from enhanced infrastructure, while acceleration in domestic arrears would have an adverse impact on private investment and worsen the credit challenge.

1.2 Statement of the Problem

Policies implemented to manage exchange rates are very crucial and important in achieving and sustaining long-term economic growth within economies. This had led to a lot of discussions about what optimal exchange rate policy is best to enable and sustain long-term economic growth. Although Uganda implemented the SAP and a lot of economic reforms and also adopted several exchange rate policies, it still continues to experience high trade deficits and balance of payment deficits. The success of growth in some economies in Southeastern Asia is attributed to implementing correct exchange rate policies and the volatility of exchange rates has been a major defining obstacle to economic growth in most Latin American and African economies (Krugman, 2016).

Balance payment deficits have become serious issues for governments in recent times. Uganda is not an exception because the country has been recording deficits over the years and this has greatly impacted the growth and development of the country adversely. It is highly possible that exchange rate is very crucial in determining the

Ugandan trade balance; a component of the balance of payment account. Hence, it is very prudent to investigate the impact of exchange rates on trade balance in Uganda, so as to identify appropriate policies that could improve upon the trade balance in the economy.

1.3 Purpose of the Study

The purpose of the study was to examine the impact of Exchange Rate on Trade Balances in Uganda.

1.4 Objectives of the Study

i) To examine the long run relationship between exchange rates and trade balance in Uganda

ii) To assess the short run relationship between exchange rates and trade balance in Uganda

1.5 Research questions

i) What is the long run relationship between exchange rates and trade balance in Uganda?

ii) What is the short run relationship between exchange rates and trade balance in Uganda?

1.6 Hypotheses of the Study

H_{O1}: There is a long run relationship between exchange rates and trade balance in Uganda.

H_{O2}: There is a short run relationship between exchange rates and trade balance in Uganda

1.7 Significance of the Study

Exchange rates management has been crucial to the growth of many economies. The best choice thereof, leads to favorable economic repercussions. This piece of study seeks to contribute to the knowledge gap where empirical study on the effects of exchange rate on the Ugandan trade balance does not include the validity of a Marshall-Lerner condition and the existence of a J-Curve phenomenon. This study will inform policy makers in Uganda as to which exchange rate regimes to adopt in order to ensure optimal economic growth. Also, it will inform them on whether a devaluation of the Ugandan shilling will help Uganda's trade position or not.

1.8 Scope and limitations of the study

This study employs secondary data for its analysis. The study will be limited to the effect of exchange rate fluctuations on Uganda's trade balance from 1975 – 2015; thus 40 observations. All data would be gathered from the World Bank's World Development Indicators. The main limitation of the study was choosing the optimal measurement for the trade balance. This study was only limited to Uganda, taking exchange rate and GDPs for Uganda since1975-2015 to represent domestic income and world GDPs especially Uganda.

1.9 Organization of the Study

The study is structured into five chapters. Chapter one takes a look at the introduction of the topic, which takes into account the background of the study, the problem statement of the research work, the objectives of the study, the justification behind conducting this study among others. Chapter two reviews relevant empirical and theoretical literature. Chapter three focuses on the research methodology that is used in analyzing the various data collected. Chapter four analyzes the results of the relevant econometric models used in the study. Chapter is devoted to summarizing the results of the study, recommendations for policy adaption and conclusions drawn from the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the literatures which are in relation to this study. It starts by explaining theories pertaining this study, and then empirical studies already done, it then shows how the theories have been supported by empirical studies done and lastly it gives the summary of the reviews presented.

2.1 Theoretical Review

Balance of Payments Theory by Letiche (1959)

The study will also be guided by the Balance of Payments Theory developed by Letiche (1959). The theory stresses that the rate exchange basically relates to the position of balance of payments of the country concerned. A favourable balance of payments leads to an appreciation in the external value of the currency of the country. Unfavourable balance of payments causes a depreciation of the external value. The balance of payments theory of exchange rate holds that the price of foreign money in terms of domestic money is determined by the free forces of demand and supply in the foreign exchange market. It follows that the external value of a country's currency will depend upon the demand for and supply of the currency (Balassa, 2004).

The theory indicates that the forces of demand and supply are determined by various items in the balance of payments of a country. According to the theory, a deficit in the balance of payments leads of a fall or depreciation in the rate of exchange, while a surplus in the balance of payments strengthens the exchange reserves, causing an appreciation in the price of home currency in terms of foreign currency. A deficit balance of payments of a country implies that demand for foreign exchange exceeds its supply. As a result, the price of foreign money in terms of domestic currency must rise, i.e., the exchange rate of domestic currency must fall (Gligorić, 2010).

The theory emphasises that the rate of exchange is influenced, in a significant way, by the balance of payments position of a country. A deficit in the balance of payments of a

country signifies a situation in which the demand for foreign exchange (currency) exceeds the supply of it at a given rate of exchange. The demand for foreign exchange arises from the demand for foreign goods and services. The supply of foreign exchange, on the contrary, arises from the supply of goods and services by the home country to the foreign country. A balance of payments surplus signifies an excess of the supply of foreign currency over the demand for it. In such a situation, there is a depreciation of foreign currency but an appreciation of the currency of the home country. The equilibrium rate of exchange is determined, when there is neither a BOP deficit nor a surplus. In other words, the equilibrium rate of exchange corresponds with the BOP equilibrium of a country (Cavallo, 2016).

2.1.1 J-curve

J-curve effect describes that in the short-run export volumes and import volumes do not change much so that the country receives less export revenue and spends more on imports leading to deterioration in the current account balance (Solderstein, 1995). However, after a time lag, export volumes start to increase and import volume starts to decline, this leads to the improvement in the trade balance.

"Most economists and policy makers believe that currency devaluations bring about competitive advantage in International trade, when a country devalues its currency, domestic export goods become cheaper relative to its trading partners resulting in an increase in quantity demand. Devaluation as a policy prescription is mainly aimed at improving the Trade balance. However there is a time lag before the trade balance improves following a real depreciation. The short and long run effects of depreciation on the trade balance are different. Theoretically, the trade balance deteriorates initially after depreciation and sometime along the way it starts to improve until it reaches its long-run equilibrium. The time path through which the trade balance follows generates a J-curve. The time lag comes about as an impact of several lags such as recognition, decision, delivery, replacement, and production (Junz and Rhomberg, 1973).

One explanation for the J-curve phenomenon is that the prices of import rise soon after real depreciation but quantities take time to adjust downward because current imports and exports are based on orders placed some time back (Yarbough and Yarbrough, 2002). On other hand, domestic exports become more attractive to foreign markets but quantities do not adjust immediately for the same reason. An increase in value of the imports against a constant or a small change in the value of exports results in a trade deficit in the short run. As time pass-by importers have enough time to adjust their import quantities with respect to the rise in prices while quantity demand for exports increases and this result in an improvement in the Trade balance (Kamoto, 2006).

2.1.2 The Elasticity Approach

The Marshall –Lerner condition states that the sum of the elasticities of demand for a country's exports and of its demand for imports (in absolute value) has to be greater than unity for a devaluation to have a positive effect on a county's trade balance. If the sum is less than unity, a country can instead improve its balance of trade by revaluation (Solderstein, 1995). In other words we can say that the condition for depreciation to improve the Trade balance, for the exchange market to be stable and for international barter exchange to be stable, the sum of import and export (in absolute value) of a given country must exceed one.

As a devaluation of the exchange rate means a reduction in the price of exports quantity demanded will increase. At the same time, price of imports will rise and their quantity demanded will diminish. The net effect on the trade balance will depend on price elasticities. If goods exported are elastic to price, their quantity demanded will increase proportionally more than the decrease in price and total export revenue will increase, similarly if goods imported are elastic, total import expenditure will decrease. Both will improve the Trade balance. Empirically, it has been found that goods tend to be inelastic in short term, as it takes time consuming patterns to adjust to new prices (Bahmani-Oskoee and Ratha 2004). Thus, the Marshall-Lerner condition is not met, and

devaluation is likely to worsen the trade balance initially. In the long term, consumers will adjust to the new prices and the trade balance will improve. This effect is called J-curve effect.

2.2 Empirical Literature Review

This section uses empirical evidence from the research works, experiences and observations of researchers that have researched on the topic of the effects of exchange rate fluctuations on trade balance.

Anning et al (2015) in their study, "Exchange Rate and Trade Balance in Uganda-Testing the Validity of the Marshall Lerner Condition" used co-integration analysis and VECM to analyze effects of exchange rate on the Ugandan trade balance. They used annual data from 1980 – 2013 on macroeconomic determinants like exchange rate and GDP to explain the correlation between trade balance and exchange rates. They discovered that trade balance declines in the short run after a currency devaluation. This was due to terms of trade agreements that the country had with most of their trading partners. The Marshall-Lerner condition was not met even though a devaluation of the currency could improve the trade balance. They recommended that Uganda should devalue their currency in order to experience favorable trade balances since currency devaluation can lead to favorable trade balances in the long run. Also, Ugandans should switch from importing goods for consumption and rather focus on consuming domestic goods.

Mduduzi Biyase (2014) in his work "An export-led growth (ELG) paradigm on Africa: A Panel Data Approach", he investigated linkages between exports and economic growth in African economies. Panel data on 30 African countries from 1990 – 2005 was used to achieve this objective. He used variables like export, labor force, inflation, government expenditure and gross domestic investment in his regression and modeling. In the study, he observed that a 1% increase in exports brings about a resulting 0.056% in

economic growth. He noted that this finding has been congruent with studies conducted by Krueger (1978), Tyler (1981) and Chenery (1979). He recommended that since export-led trades bring about economic growth, policy-makers must implement policies that will promote the expansion of exports.

Maehle et al (2013), in their work "Exchange Rate Liberalization in Selected Sub-Saharan African Countries. Successes, Failures, and Lessons" researched on economic reforms policies that were implemented by Sub-Saharan Africa economies. They discovered that economic reforms implemented by countries in the region were successful. The periods during which these reforms were implemented marked the end of decades of economic crises and decline. When these reforms were sustained, the countries started experiencing strong and sustained economic expansions. A fundamental element to the success of the reform effort by these nations was exchange rate liberation. Reduced fiscal deficits, monetary expansions, external assistance and structural reforms were also important in achieving the economic expansion. They noted however that fixing the exchange rates in the face of exogenous shocks without supporting it with prudent monetary and fiscal policies resulted in severe pressure on the balance of payment and an overvaluation of the exchange rates. Also, attempts by government and monetary policy authorities to implement price controls and import licenses, reduced revenue, depressed the economy and also shifted the external trade to the informal sector.

Colton Christensen (2011) assessed the impact of the Dollar/Peso exchange rates and the GDPs of US and Mexico on trade balance between US and Mexico. He used quarterly data from 1994 – 2010. The independent variables in the regression were domestic GDP, foreign GDP and real exchange rates. He discovered that a rise in the GDP of Mexico causes a trade surplus with a smaller impact than the GDP of USA. The US Dollar has a positive effect on its trade balance in the period in which it depreciates. This phenomenon is likely to reduce the US trade deficit with Mexico.

Thorbecke, (2011) in his work "The Effect of Exchange Rate Changes on Trade in East Asia", noticed that changes in bilateral exchange rate bring about a decline in exports of capital and intermediate goods from developed countries in Asia to developing countries in the same region. He employed panel data on 30 countries from 1982 – 2003, thus 21 observations. He examined that there is a substantial decline in the exports of finished products from developing economies in Asia to the world. Appreciations in the economies of Thailand, Malaysia and Indonesia relative to economies in the region would also cause a significant decline in exports. He concluded that the current exchange rate regimes would interfere with the relationship that exists between developing and developed economies in Asia, if the market forces exert pressure on currencies in that region to appreciate.

In their research work "Exchange Rate and Trade Balance: J-Curve Effect" (2010), Petrović and Gligorić explored the correlation between trade balance and currency depreciation in Serbia. The objective of the study was to find whether currency depreciation improves on the trade balance or an appreciation of it will worsen it.

They employed both the Johansen's co-integration analysis and the Auto Distributive Regression Line (ADRL) lag approach in approximating the long run effects of currency depreciation on trade balance. A time series data at a monthly frequency on macroeconomic variables like GDP from 2002 - 2007 were used in estimating this relationship. They discovered a positive effect of currency depreciation on Serbia trade balance in the long-run. Although in the short run trade balance declines initially, it improves later in the long run. Estimates from the error correction model used showed short run movement of the trade balance thus proving the J-Curve effect.

Armah & Bhattarai, (2005) in their work "The effects of exchange rate on the trade balance in Uganda: Evidence from co-integration analysis" noticed that Uganda's trade balance will not be favorable in the short run except if it implements policies in the currency market. The adoption of policy rules however may have negative

consequences if such policy adjustments are done without proper care and supervision in the long run. The econometric models they used show that the Marshall-Lerner Robinson condition necessary for a devaluation would not be enough to neutralize the trade deficit in the short run. A devaluation of the Cedi may increase exports and reduces imports but this policy may have a negative consequence on the welfare of Ugandans by increasing the cost of living due to the reduction of the Cedi in the international market.

Hsing (2005) found that Japan's aggregate trade provided evidence of the J-Curve phenomenon while Korea and Taiwan did not show any presence of the phenomenon. He argues that this may be attributed to a small open economy effect. In small open economies like Korea and Taiwan, both imports and exports are invoiced in foreign currency and as a result, the short run effect of real devaluation is hedged and the trade balance remains unaffected.

Stucka (2004) found evidence of the J-Curve effect on trade balance in Croatia. His study employed a reduced form model to estimate the impact of a permanent shock on the merchandise trade balance. It was found that 1 percent depreciation in the exchange rate improves the equilibrium trade balance by the range of 0.94 to 1.3 percent and it took 2.5 years for equilibrium to be established

In their research work "Exchange Rate Policy and Macroeconomic Performance in Uganda", Jebuni et al. (1994), investigated the relationship between exchange rates policies and macroeconomic aggregates in Uganda. They estimated the link between the GDP and exchange rate. They discovered that real devaluation had an expansionary effect on GDP. Real devaluation had a positive effect on both imports and exports. Uganda being an import-dependent economy, the inflow of external resources will be expected to have a positive relationship between imports and devaluation. Accompanying capital inflow led to the growth in imports and the growth of GDP was

positively influenced by the imports. They however, opined that depending on the level of increase, the trade balance could worsen.

Kocy and Rosenweig (1990) studied the dynamics between the dollar and components of the U.S. trade. They employed time series specification tests and Granger tests of casual priority to identify the J-Curve phenomenon. Two of the four components portrayed dynamic relationships that are weaker and more delayed than the standard J-Curve.

Orden, (1986) in his research "Exchange Rate effects on Agricultural Trade" observed impact of exchange rate on agricultural trade. He realized exchange rate movements determine the gap between prices of traded goods in the domestic and foreign markets. He noted it performs an equilibrating role when there is the need for a methodical movement in the relative prices of tradables and non tradables. Movements in exchange rate, he maintained, depends on inflow of capital and that factors that determine the capital inflows include monetary policy. He asserted that monetary policies have biased effects, which justifies the lack of consistency in prices of agricultural products. Macroeconomic conditions are key in determining domestic policies implemented on agriculture hence they is competition in the world market and tension in trade relations among trading partners.

Bahmani-Oskooee (1985) was a pioneer in introducing a method that tested the J-Curve. In his research paper "Devaluation and the J-Curve: Some Evidence from LDCs" he tested for the J-Curve by directly linking the trade balance to exchange rate and other variables of four developing countries (Greece, Korea, Thailand and India), using quarterly data on these relevant variables from 1973 – 1980. He noticed that there was a J-Curve phenomenon with all the countries he selected except Thailand. Also, he discovered that the effect of devaluation in the long run is the same as its short-run effects. Trade balance in the short run and the long run after a devaluation declines.

Stephen Magee (1973) was among the first people to observe and study the J-Curve phenomenon. In his research work "Currency Contracts, Pass-Through, and Devaluation", observed that although the US Dollar was devalued in 1971, its trade balance still deteriorated in 1972. He postulated that trade balance deteriorates initially due to some adjustment lags but after some time, it begins to improve. He characterized this phenomenon with the fact that a quick increase in domestic activity (measured by real income) relative to activity abroad may overwhelm any positive effects the devaluation might have generated. This has caused researchers to pose a question as to how long it will take trade balance to experience an improvement after devaluation.

Bahmani-Oskooee and Ratha in their work "The Bilateral J-Curve: Sweden versus her 17 Major Trading Partners", assessed the effect of real depreciation on the Swedish Krona on their bilateral trade balances. The VAR estimation technique was employed in this study. Data was gathered quarterly from 1980 – 2005. They discovered that there was an existence of the J-Curve phenomenon after devaluation for some trading partners (United Kingdom, Netherlands, Italy, Austria and
Denmark).

Uganda's current account deficit widened in 2014/15 by an estimated $700 million, to almost $2.9billion. This was mainly because of our exports of goods and services fell in the last fiscal year, as a result of lower global commodity prices, problems in regional markets such as that of South Sudan, and a drop in tourism arrivals. Despite the fall in the price of oil, which enabled Uganda to reduce its fuel import bill, imports of goods and services increased, partly because of higher Government spending on imports related to infrastructure projects but also because of stronger demand from the private se ctor for non-oil imports. As a result of these adverse trends in our imports and exports, our trade deficit in goods and services was larger by $582million in 2014/15 (Thomas, 2015)

As a percentage of GDP, our trade deficit was estimated at 12.1 percent in 2014/15 compared to 10.2 percent in the previous fiscal year. This means that, for every 100 Shillings of goods and services produced in Uganda, we actually absorbed 112 Shillings in consumption and investment spending. In addition to the larger trade deficit, dividend payments by foreign owned companies were higher by almost $250 million, which reflects a recovery in corporate profits in 2014/15, and this also contributed to the widening of the current account deficit (Abuka and Ddamulira, 2009). Our current account deficits have to be financed by surpluses on the financial account (this is what used to be referred to, in the terminology of the balance of payments, as the capital account). However, while the current account deficit widened in 2014/ 15, the surplus on the financial account failed to keep pace. This was mainly because of a fall of almost $240 million, or about 20 percent, in inflows of foreign direct investment (FDI), which is the single largest component of the financial account (Edward, 2013).

2.3 Summary of gaps identified in literature

Several scholars and researcher have reviewed the subject of exchange rate volatility and the levels of macroeconomics in Uganda. Ambunya (2012) studied the relationship between exchange rate movement and stock market returns volatility at the Kampala Securities Exchange and concluded that that there is a strong relationship between exchange rate movement and stock market returns volatility. Mwanza (2012) reviewed the relationship between monetary policy and the performance of the NSE and established that the monetary policies including exchange rates greatly affected the stock returns at the NSE following the high level of foreign investors and the high fluctuations in the change rates. But however Ambunya (2012) and Mwanza (2012) did not show how both foreign and domestic currencies affect trade balance in Uganda.

Mungami (2012) examined the effects of exchange rate liberalization on the balance of payments of a developing country using a case of. Mungami (2012) recommends development of forward, futures and options markets to enable the companies to certainly forecast the expected exchange rates in the future hence facilitate planning. From the above discussion, it is evident that limited research has been conducted on the relationship between exchange rate movement and balance of payments in Uganda. But however Mungami (2012) did not show how exchange rates affect trade balance in Uganda.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter presents the methodology that was used in the study, sources of data, variables that was used, scope, technique for data analysis and various tests that will be carried out and the procedures for the interpretation of results.

3.1 Theoretical Frame Work

The balance of trade is usually measured by the difference between exports and imports. In this study proved more convenient to work with the ratio of exports to imports, since in a logarithmic model this gives the Marshall-Lerner condition exactly rather than as an approximation. The results can be transformed back to the difference if required. The ratio of nominal exports to nominal imports, B, is given by the ratio of the volume of exports, X, multiplied by domestic prices, P, to the volume of imports M, and multiplied by foreign prices, P^*, and the nominal spot exchange rate S:

$$B_t = (P_t X_t)/(P_t^* S_t M_t)$$

Or using lower case letters for logarithms:

$$tb_t = x_t - m_t - (s_t - p_t + p_t^*) = x_t - m_t - e_t \qquad (1)$$

Where $e_t = (s_t - p_t + p_t^*)$ is the real exchange rate. Notice that this is defined in terms of the real exchange rate (using general price indices) rather than the terms of trade (using import and export price indices).

X is the volume of exports,

M is the volume of imports,

P is domestic prices,

$P^*$is foreign prices,

S is the nominal spot exchange rate

B is the ratio of nominal exports to nominal imports the ratio of the volume of exports, X, multiplied by domestic prices, P, to the volume of imports M, and multiplied by foreign prices, P^*, and the nominal spot exchange rate S:

Long run import and export demand are given by:

$$x_t = \alpha_x + \beta^* y_t^* + \eta_x e_t + \lambda_x t \quad (2a)$$

$$m_t = \alpha_m + \beta y_t + \eta_m e_t + \lambda_m t \quad (2b)$$

The trends capture terms of trade effects (e.g. for primary product producers), unmeasured quality improvements or policy measures such as trend liberalization. The long run balance of trade

$$b_t = (\alpha_x - \alpha_m) + \beta^* y_t^* - \beta y_t + (\eta_x + \eta_m - 1)e_t + (\gamma_x - \gamma_m)t \quad (3)$$

The coefficient on e_t gives the familiar Marshall-Lerner condition for a devaluation (increase in e) to improve the balance of payments.

3.2 Model Specification

The analysis of data was to examine the relationships between Trade balance (dependent variable) and real exchange rate, GDP, domestic real income and world real income (which are regressor). The study follows Shao (2008), Herve *et al* (2009) and Bhattarai and Armah (2005) by estimating a single equation model treating real exchange rate, GDP (domestic real income) and real world income as independent variables and Trade balance as dependant variable. The model is modified to include dummies in order to account for structural changes such as major policy changes such as trade liberalization which led to a shift to more flexible exchange rates from 1986 onwards. Therefore the model is expressed as follows;

TB = f(RER, UGDP,KGDP, SAP)

$$TB = \beta_0 + \beta_1 RER + \beta_2 UGDP + \beta_3 KGDP + \beta_4 SAP + \xi \quad (4)$$

Where ξ represents error term which is independently distributed random variable with mean zero and constant variance. RER represents real exchange rate, UGDP represents the Ugandan GDP (domestic income), KGDP represents Uganda real income, SAP represents the structural adjustment dummy, with the value of 1 from 1986 onwards and 0 otherwise. TB represents the dependant variable (Trade balance). β_0, β_1, β_2, β_3 and β_4 are parameters to be estimated.

Taking Logs on both sides we obtained the log-linear transformation equation which will now estimate the β's as elasticities.

$$\ln TB_t = \alpha_0 + \alpha_1 \ln RER_t + \alpha_2 \ln UGDP_t + \alpha_3 \ln KGDP_t + \alpha_4 SAP_t + \emptyset_t \quad (5)$$

Where ln represents the natural log operation and Ø is assumed to be a Gaussian white noise.

According to economic theory, a positive relationship exists between real foreign incomes and Trade balances, and therefore α_1 is expected to be positive. Also, real exchange rate depreciation implies an increase in country competitiveness in the world market making exports cheaper to foreigners' hence increasing demand for domestic exports and improving Trade balance. Therefore, α_3 is expected to be positive. Nevertheless α_2 and α_4 are expected to be positive.

3.3 Measurement of Variables

This section discusses the measurement of real exchange rate and trade balance and other variables used by this study.

It is indicated that exchange rate influences trade balance in relation to foreign currency and domestic currency. If a country exports a greater value than it imports, it has a trade surplus or positive balance, and conversely, if a country imports a greater value than it exports, it has a trade deficit or negative balance. The notion that bilateral

trade deficits are bad in and of themselves is overwhelmingly rejected by trade experts and economists.

3.3.1 Real Exchange Rate Measurement

The estimation of real exchange rate is based on purchasing power parity theory. According to this theory the real exchange rate is represented algebraically as;

$$e = E\frac{P^*}{P} \qquad (6)$$

Where e the real is exchange rate, E represents the nominal exchange rate, P^* stand for foreign price level, and P denotes the domestic price level. The study uses the domestic consumer price index and the foreign consumer price index as proxies for domestic and foreign prices respectively.

3.3.2 Measurement of Trade Balance

Trade balance is defined as the difference between the value of exports and the value imports (Colander 2004), this study following Baharumshah (2001) measured trade balance as the ratio of imports to exports. The use of this ratio has several advantages first, it is invariant to units measuring for exports and imports, and second the regression equation can be expressed in log-linear form or constant elasticity form.

3.4 Estimation and Econometric techniques

The first step involved preliminary analysis to study the behavior of variables using the descriptive statistics. The second step involved **unit root tests,** that is, pre-testing each variable to determine the order of integration. The standard Augmented Dickey-Fuller (ADF) suggested by Dickey and Fuller (1979) and the Philip Peron (PP) confirmatory unit root test were conducted for each of the series to examine the stationary properties. The Augmented Dickey-Fuller (Dickey and Fuller, 1979) test is based on the following equations:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad (7)$$

Where: t denotes the time trend and acceptance of the null hypothesis of non-stationary ε is the white noise error term, Δ is the first difference operator, Y is the times series, α_0 is the intercept and k is the optimum number of lags of the dependent variable. The variable is said to be stationary if the value of the coefficient α_1 is less than the critical values from ADF table.

The PP (see Phillips &Perron, 1988) unit root test equation is given as follows:

$$\Delta Y_t = \alpha + \rho^* Y_{t-1} + \varepsilon_t \quad (8)$$

The PP test is also based on t-statistics that is associated with estimated coefficients of ρ^*.In the literature, some conflicting evidence is available against the ADF and PP unit root tests.

The Johansen Co-integration test is conducted under the null hypothesis that there is no long run relationship among the variables. This system approach sets up a non-stationary time series as a Vector Autoregressive (VAR) process of order ρ in a re-parameterized form as given in equation (3.7)

$$y_t = \mu + A_1 y_{t-1} + \ldots + A_\rho y_{t-\rho} + \varepsilon_t \quad (9)$$

Where: Y_t is an nx1 vector of endogenous variables that are integrated of order one commonly denoted I (1) and ε_t is an nx1 vector of innovations. This VAR can be re-written as:

$$\Delta y_t = \mu + \Pi y_{t-1} + \sum_{i=1}^{\rho-1} \Gamma_i \Delta y_{t-1} + \varepsilon_t \quad (10)$$

Where

$$\Pi = \sum_{i=1}^{\rho} A_i - 1 \qquad (11)$$

$$\Gamma_t = -\sum_{j=i+1}^{\rho} A_j \qquad (12)$$

If the coefficient matrix pie (Π) has reduced rank r <n, then there exist nxr matrices α and β each with rank r such that Π = α β, and β′ yt, is stationary. r is the number of cointegrating relationships, the elements of α are known as the adjustment parameters in the vector error correction model and each column of β is a cointegrating vector. It can be shown that for a given r, the maximum likelihood estimator of β defines the combination of y_{t-1} that yields the r largest canonical correlations of yt with Δ yt−1 after correcting for lagged differences and deterministic variables when present. The trace test and maximum eigenvalue test, shown in equations (13) and (12) respectively.

$$\Delta X_t = \alpha_2 + p_2 e_{i-1} + \sum \beta_i Y_{t-i} + \sum \delta_i \Delta X_{t-i} + \sum \gamma_i Z_{-}$$

CHAPTER FOUR

RESULTS AND INTERPRETATION

4.0 Introduction

This chapter presents and discusses the empirical findings and analysis of the study. The chapter is divided into five sections. Section 4.1 presents the descriptive statistics analysis of the variables in the model while section 4.2 explains the unit root test. Section 4.3 describes Cointegration equation and error correction model (ECM). Section 4.4 presents ordinary least square results and diagnostic test, Section 4.5 presents discussion of results and Section 4.6 presents comparison with other studies.

4.1 Analyses Descriptive Statistics

The Trade balance has been increasing at average rate of 0.463870 while real exchange rate at average rate 430.1249 for the whole period under consideration. The range of all variables is from 0.220384 to 629955.4. The minimum growth rate is 0.463870 and the maximum growth rate is 427239.0. The median which is the data at the centre ranges from 0.451427 to 474679.8. All variables are positively skewed except World GDP. This implies that most of the values are on the right of the mean and few of them on the left. The normality of the variables can be observed by using Jarque-Bera and Probability values, which are insignificant (all probabilities are greater than 0.05)

4.2 Stationarity Tests (Unit Root Test)

Most of the time series data are non-stationary at levels thus before applying the Cointegration procedure all variables must be tested to check if the series are stationary or non-stationary and their order of Integration.

Table 4.1: Summary of the Descriptive Statistics of the Data

	TB	RER	UGDP	KGDP
Mean	0.463870	430.1249	6983.609	427239.0
Median	0.451427	195.0600	6220.380	474679.8
Maximum	0.802185	1432.300	16258.62	629955.4
Minimum	0.220384	7.020000	3117.080	185268.2
Std. Dev.	0.142821	482.6178	3497.965	144421.6
Skewness	0.685999	0.691866	1.151771	-0.254981
Kurtosis	3.031749	1.969887	3.388646	1.629176
Jarque-Bera	3.217450	5.083737	9.322979	3.654501
Probability	0.200143	0.078719	0.009452	0.160855
Sum	19.01868	17635.12	286328.0	17516800
Sum Sq. Dev.	0.815918	9316797.	4.89×10^{8}	8.34×10^{11}
Observations	41	41	41	41

Source: Eviews Estimations

The Augmented Dickey Fuller (ADF) unit root tests were carried out on the economic variables as required in the equations in order to determine whether the variables are stationary or not. ADF also ensures that the problem of serial correlation is reduced (Dickey and Fuller, 1979), and it takes into account higher-order auto regressive lags. The results reported in Table 4.2 shows that none of the variables were stationary in their log levels, implying that the variables are integrated of higher order other than $I(0)$. The ADF test statistics for each of the variables are greater than the critical values at the conventional levels (1%, 5%, and 10%) which imply that the data have unit root.

Table 4.2: Unit Root Test Results

	At Levels	At First Difference	
Variable	t-Statistic	t-Statistic	Order of Integration
LogTB	-2.638(0.0853)	-6.779*(0.0001)	I(1)
LogRER	-2.442(0.1302)	-7.205*(0.0000)	I(1)
LogUGDP	-3.574(1.0000)	-6.990*(0.0000)	I(1)
LogKGDP	-3.617(0.6054)	-4.639*(0.0001)	I(1)

NOTE: The null hypothesis is that the series are non-stationary and the critical values at 1%, 5% and 10% are -3.648, -2.958 and -2.612 respectively. The asterisks (***), (**) and (*) indicate rejection of the null hypothesis of non-stationary at 1%, 5% and 10% levels of significance at all levels of significance, respectively. The numbers in brackets are the probability values.

The presence of unit root requires the variables to be differenced, after differencing once all variables became stationary, implying that the variables were integrated of order one $I(1)$. The critical value for each of the variables turned out to be less than the computed t-value thus concluding the time series data be stationary after differencing once. This result is consistent with other empirical work in macroeconomic literature.

4.3 Johansen Cointegration Test

Table 4.3: Trace Test

Hypothesized No. of CE(s)	Trace Eigenvalue	Statistic	0.05 Critical Value	Prob. **
None *	0.84626	139.809	95.7537	0.0000
At most 1 *	0.65221	74.2714	69.8189	0.0211
At most 2	0.45007	37.3063	47.8561	0.3332
At most 3	0.28561	16.3776	29.7971	0.6855
At most 4	0.12215	4.60635	15.4947	0.8491
At most 5	0.00133	0.0467	3.84147	0.8289

* denotes significance at 5%: **Source:** E-views Econometric Software

Table 4.4: Maximum Eigenvalue Test

Hypothesized No. of CE(s)	Trace Eigenvalue	Statistic	0.05 Critical Value	Prob. **
None *	0.84626	65.5377	40.0776	0
At most 1 *	0.65221	36.9651	33.8769	0.0207
At most 2	0.45007	20.9287	27.5843	0.2806
At most 3	0.28561	11.7712	21.1316	0.5704
At most 4	0.12215	4.55965	14.2646	0.7961
At most 5	0.00133	0.0467	3.84147	0.8289

* denotes significance at 5%

Source: Computation using Eviews Econometric Software

From Table 4.3 and Table 4.4 there exist at most 2 cointegration equations. The Trace and Maximum Eigenvalue tests have probability values lesser than 5% at none and at most 1. Although this is true, the statistics for both tests are bigger than their

respective critical values at none and at most 1. This validates the test results and proves cointegration between the variables. The test results show that there is a long run association between the variables as confirmed by positions of Nyarko F. (2016) and Anning et al (2015).

Table 4.5: Error Correction Model Results for Trade Balance the Dependent Variable $\Delta Log(TB)_t$

Variables	**Coefficient**	**Std. Error**	**T-Statistic**	**Prob.**
Constant	0.081	0.033	2.420	0.013
$\Delta Log(RER)_t$	0.325	0.036	8.99	0.000
$\Delta Log(UGDP)_t$	0.634	0.089	7.160	0.000
$\Delta Log(KGDP)_t$	0.034	0.008	4.24	0.000
ECM_{t-1}	-0.350	0.128	-2.730	0.010
SAP	0.293	0.073	4.040	0.000
R-square = 0.7833, Adjusted R- square = 0.69 F-statistic=23.13(0.0000)				

4.4 Regression Diagnostic Results

The results of the diagnostic tests show that all models are correctly specified and the parameters are correctly estimated. The tests do not fail the serial correlation, the heteroscedasticity, and normality checks (see Table 4.7, Table 4.8 and Table 4.9). The graph of cointegration, which shows the stationarity of the cointegration equations, maintains a stable pattern hence they are within the 95% confidence interval. Moreover, the remaining eigenvalues do not appear close to the unit circle (see Figure 1). The test results also indicate that the model specified is equally distributed. They all exhibit probability values greater than the significant level of 5%.

Table 4.6: Autocorrelation Test

Diagnostic	Statistic	P-Value	Conclusion
Serial Correlation: VEC Residual Heteroscedasticity Tests: No Cross Terms	LM Stat: 46.68222	0.0553	No serial correlation
Normality: Jarque-Berra	0.761938	0.6832	Errors are normally distributed
Heteroscedasticity: VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)	Chi Square : 327.4279	0.5297	No heteroscedasticity

VEC Residual Serial Correlation LM Tests

Null Hypothesis: no serial correlation at lag order h

Date: 23/04/19 Time: 19:54

Sample: 1975 2015

Included observations: 41

Table 4.7: Heteroskedasticity Test

Lags	LM-Stat	Prob
1	46.68222	0.0553
2	35.37681	0.0816

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Date: 23/04/19 Time: 19:58

Sample: 1975 2015

Included observations: 41

Joint test:

Chi-sq	df	Prob.
327.4279	330	0.5297

Table 4.8: Normality Test (Cholesky (Lutkepohl)

VEC Residual Normality Tests

Orthogonalization: Cholesky (Lutkepohl)

Null Hypothesis: residuals are multivariate normal

Date: 23/04/19 Time: 21:25

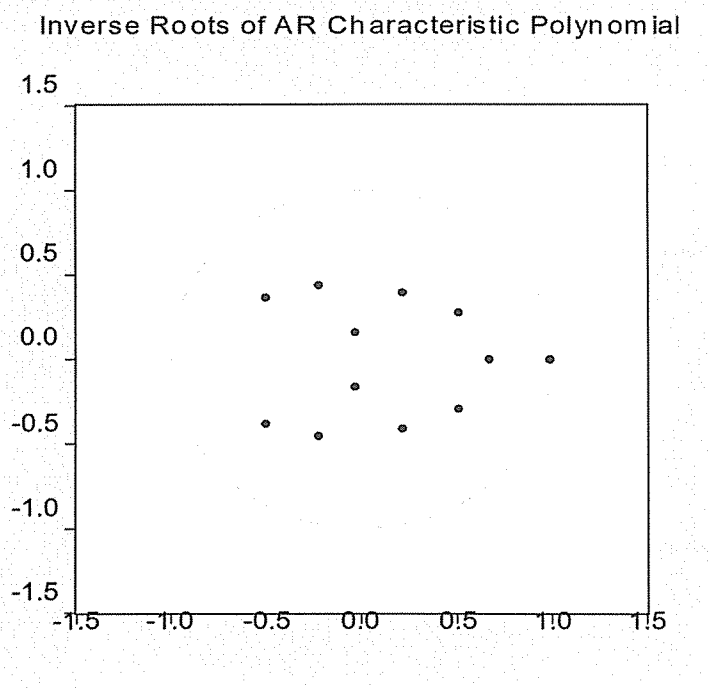
Sample: 1975 2015

Included observations: 41

Component	Kurtosis	Chi-sq	Df	Prob.
1	0.826145	3.867586	1	0.0492
2	1.031222	6.026036	1	0.0141
3	-0.446759	1.131029	1	0.2876
4	0.127356	0.09191	1	0.7618
5	0.192913	0.210887	1	0.6461
Joint		11.32745	5	0.0453
Component	**Kurtosis**	**Chi-sq**	**df**	**Prob.**
1	5.237065	7.089651	1	0.0078
2	5.635033	9.836479	1	0.0017
3	3.332914	0.157011	1	0.6919
4	1.770515	2.141482	1	0.1434
5	3.62368	0.55105	1	0.4579
Joint		19.77567	5	0.0014

Component	Jarque-Bera	Df	Prob.
1	10.95724	2	0.0042
2	15.86251	2	0.0004
3	1.288041	2	0.5252
4	2.233392	2	0.3274
5	0.761938	2	0.6832
Joint	31.10312	10	0.0006

Figure4.1: AR Roots Graph



4.5 Interpretation of Results

The results reveal that all variables have the expected signs. The real exchange rate coefficient indicated a positive effect on trade balance and was significant at 1 percent level. The coefficient of real exchange rate is 0.325which implies that a 10 percent depreciation of real exchange rate causes 3.2 percent improvement in trade balance. The results are consistent with economic theory which suggests that depreciation of

exchange rate will increase country competitiveness in the world market which will eventually lead to improvement in trade balance.

The Uganda GDP coefficient is 0.034 and is statistically significant at 1 percent level. This implies that a one percent increase in world GDP will lead to 3.4 percent improvement in the trade balance. Furthermore the Ugandan GDP coefficient is 0.634, implies that a percentage increase in domestic income will bring about a 63 percent improvement in trade balance.

The estimated error correction coefficient of the cointegration vector is -0.3502 and significant at 1%. The coefficient confirms that the variables are cointegrated and the error correction mechanism is stable, which implies that any departure from the equilibrium in the short-run will eventually converge to long run equilibrium state. It also implies that 35% of adjustment occurs annually. The SAP dummy was incorporated to capture the structural adjustments. The coefficient was 0.2937 and was significant at 1%. This implies that the structural adjustments reforms brought about 29% improvements in the Ugandan trade balance.

4.6 Discussion of findings

Various studies have been done to investigate effects of exchange rate and trade balance, from which different results have been obtained. The aims of investigation are see the way how exchange rate can be used as a tool to affect the trade balance in a certain direction. However after a century of research in the field we still do not have a sharp theory about depreciation and appreciation on trade balance (Qiao, 2005). The empirical findings in this direction are also mixed (Koray and McMillan, 1998). The results showed exchange rate to be positively or negatively related to trade balance and in some cases, it was found to be insignificant. Here we provide few of them which resemble this study.

Miles (1979) examined the effects of devaluation and trade and balance of payments during the 1960s for a group of 14 developed countries, the balance of payments improved after devaluation. There was no support for the hypothesis that devaluation improves the trade of balance. He concluded that the adjustment to devaluate is essentially monetary in nature involving only portfolio stock adjustments.

Brada*et al* (1993) examined the response of the trade balance of China to the real exchange rate using quarterly data for 1980:I to 1980:IV. Cointegration technique was applied in this study, he found that both in the short-run and long-run devaluation serves to improve the balance of trade, though showed the bulk of the response to devaluation occurs over one year period with no J- curve effect. Marwah and Klein(1996) find evidence of S-curve for both Canada and US utilizing disaggregated data in IV and OLS regression for the period 1977 to 1992, According to their results the trade balance initially declines after depreciation followed by trade balance improvement.

Studies by Waane (2000) on real exchange rate and trade balance in Uganda from 1967 to 1997 showed that exchange rate is positively related to trade balance and foreign balance is related to trade balance. This means that an increase in real prices of foreign exchange improves trade balance. Baharumshah (2001) employs an unrestricted VAR model for bilateral trade of Thailand and Malaysia with the US and Japan for period 1980 to 1996 he finds support for a stable and positive long-run effects of trade balance and the exchange rate.

Fisher and Huh (2001) studying Exchange rates, trade balances and nominal shocks in G-7 they found that a nominal shock causes a real exchange to depreciate and the trade balance to improve in long run, which is Lane's model when the income effect of a nominal shock dominates the substitution effect. They further showed that a positive aggregate supply shock causes output to increase and the real exchange rate to depreciate in each of the G-7 countries, both in short run and long run. Both effects

where statistically significant tended to work in opposite directions on the trade balance over both the short and long run. Hacker and Hatermi (2002) looked at disaggregated bilateral data between the Czech Republic, Poland and Hungary with respect to Germany. They found evidence of a positive long-run effects of the trade balance and the exchange rate for all three countries. The Czech Republic and Poland seem to possess characteristics that lead to the J-curve.

4.8 Summary

This chapter explored the descriptive analysis and unit root characteristics of the data used in the analysis. The unit root characteristics of the data were examined out using ADF test unit root tests. It is found that the data are stationary in first difference. The analysis was followed by cointegration tests and an error correction model (ECM). The results obtained showed the existence of long-run effects of the variables.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter consists of four sections. Section 1.1 presents the summary of the study; section 5.2 discusses the finding of the study; section 5.3 presents policy implications and section 5.4 presents limitations of the study and areas for further research.

5.1 Summary of the Study

The purpose of the study was to investigate the impact of exchange rate on Trade balance for the period 1975 to 2015. The trade deficit which can be expressed as a ratio of export to import motivated the study. It has been observed that over years, there were depreciations but trade balance expressed as a ratio of export to import has never even reached a unity. We wanted to know whether depreciation has negative effect or positive effect on trade balance.

5.2 Findings of the Study

This study attempts to offer evidence on the long- term effects of exchange rate and Trade balance in Uganda for the period 1975 to 2015. The test for stationarity using Augmented Dickey-Fuller (ADF) test proved that the variables used in this study are stationary, though not in levels, but in their first differences. The next step involved test for cointegration using the Engle granger Cointegration approach which proved the existence of cointegration. Under such circumstances, we employed the error correction model (ECM), since it offers more and better information compared to other data generation processes. The results point to a close long-term effects of exchange rate and trade balance. We found that Exchange rate, world GDP, Domestic GDP and structural adjustments reforms have a positive relationship with a trade balance. The depreciation of exchange rate leads to improvement in trade balance.

5.3 Recommendations

Monetary policy management should emphasize price stability and minimization of volatility in interest rates and exchange rates of the shillings.

From what has been observed from the study that exchange rates can have an impact on the country's external trade balance, exchange rates could be used as a tool to reduce the country's external imbalances.

According to the findings of this study, the real exchange rate is positively related to the trade balance for the period 1975 to 2015 which mean depreciation improves the trade balance. Therefore depreciation is recommended, but policy makers and implementers should put in consideration of other effect of depreciation for instance, although depreciation improves the trade balance it accelerates the domestic price levels thus leading to inflation.

5.4 Limitations of the Study

In this study we used GDPs of some countries as World GDP by considering that they were major trading partners with Uganda, the model might have imperfections if a major trading partner is excluded, which might be the case as trading activities of Uganda and its neighboring countries is increasing. Furthermore, the real exchange rate was against USA dollar, we did not put in consideration currencies of other countries, as Ugandan shilling can be depreciating against one currency at the same time appreciating against another. Also can impair the model.

Another limitation can be due to inconsistence of the data used in the study, since we used secondary data covering the period 1975 to 2015, the consistence and reliability of data vary from one source to another. This is a problem facing all developing countries whereby the quality of data is normally low.

5.5 Contribution to knowledge

The study indicated that when the international exchange rate falls, the local currency in relation to world currencies appreciates, imports become cheaper, exports become expensive thus leading to more imports and less exports. On the other hand, when the international exchange rate rises, the local currency in relation to world currencies depreciates, imports become more expensive, exports become cheaper and the country exports more and imports less. From this deduction, it is noted that foreign exchange rate movements affect international prices both negatively and positively leading to either a decline or boost in trade.

5.6 Area for Further Studies

The following Areas need further investigation on how they can improve Trade balance; Import duty and subsidies on some goods imported as they may have significant effect on Trade Balance.

The link between International marketing and Trade balance, this may put Uganda's products on exposure, Human capital development on how to increase production, this may increase production and growth, Cost of production on both exports and imports and how they can affect Trade balance, Effect of Price on goods manufactured at home on Trade balance and How Uganda should have high imports substitution to improve Trade balance by reducing import effects.

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APPENDICES

Appendix 1: Data Used in the Study

YEAR	Trade balance	Exchange rate	UGDP	KGDP
1975	0.790325418	7.14	3117.08	185268.22
1976	0.701797506	7.14	3247.37	193223.78
1977	0.802185224	7.14	3465.73	208670.68
1978	0.741908594	7.02	3571.66	225034.98
1979	0.535261298	7.13	3660.95	222483.69
1980	0.484063047	7.37	3869.17	229568.44
1981	0.68846729	8.38	4124.87	238581.63
1982	0.681334199	8.29	4141.44	249174.71
1983	0.417037963	7.71	4229.65	262364.27
1984	0.451427312	8.22	4352.73	275887.58
1985	0.406625922	8.2	4494.91	301583.05
1986	0.483191293	8.28	4549.41	314179.74
1987	0.394675683	9.28	4551.92	324556.94
1988	0.466114678	11.14	4511.68	334941.03
1989	0.454573708	15.29	4532.64	336044.42
1990	0.285112641	17.47	4712.91	372014.35
1991	0.369068254	32.7	4977.86	382901.03
1992	0.311964948	64.26	5288.08	398668.18
1993	0.334549908	99.29	5599.98	427083.39
1994	0.350792407	143.38	5811.17	450006.34
1995	0.242762723	195.06	6220.38	474679.76
1996	0.220384082	219.16	6349.26	490037.14
1997	0.275798701	297.71	6386.33	495074.08
1998	0.294074579	405.27	6463.37	497205.86

1999	0.346293929	509.63	6564.65	503005.19
2000	0.402904295	574.76	6799.04	513850.03
2001	0.565897964	579.98	7108.02	528660.89
2002	0.561313443	612.12	7358.6	538541.7
2003	0.405142284	664.7	7631.49	530464.26
2004	0.354785513	744.8	7900.88	531950.35
2005	0.43551477	800.4	8290.69	548161.15
2006	0.452792789	876.4	8787.95	550702.91
2007	0.544452475	966.6	9417.48	553999.26
2008	0.531516654	1,038.90	10065.99	564003.72
2009	0.538987328	1,089.10	10853.99	581489.74
2010	0.509049677	1,129.20	11653.91	595832.01
2011	0.408032868	1,253.90	12474.63	611564.05
2012	0.416657537	1,244.10	13341.54	629955.41
2013	0.415308529	1,196.30	14315.13	626976.12
2014	0.455980525	1,319.90	15274.82	595542.63
2015	0.4905522	1,432.30	16258.62	622866.81

Appendix 2: Tables

Table 2.1: Appendix Showing Ramsey RESET test

F- Statistic	Probability
0.097682	0.759994

Table 2.2: Appendix Showing White Heteroskedasticity Test:

F-statistic	2.883789	Probability	0.013470
Obs*R-squared	18.68378	Probability	0.21973

Table 2.3: Appendix Showing Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.136606	Probability	0.011065
Obs*R-squared	9.303552	Probability	0.209545