

**EFFECTS OF FISCAL DEFICITS ON THE EXCHANGE RATE FOR MALAWI:
EVIDENCE FROM 1981-2021**

MASTERS OF ARTS (ECONOMICS) THESIS

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**THE EFFECT OF FISCAL DEFICIT ON THE EXCHANGE RATE FOR
MALAWI**

M.A (ECONOMICS) THESIS

By

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DECLARATION

This thesis is my original work and it has not been submitted to any other institution for similar purposes. Acknowledgements have been duly made where other people's works have been used. I bear responsibility for the contents of this paper.

Full Legal Name

Signature

Date

CERTIFICATION OF APPROVAL

The undersigned certifies that this thesis represents the student's work and effort and has been submitted with my approval.

Signature: _____ Date: _____

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Supervisor

DEDICATION

I dedicate this work to my Parents, Brothers, and Sisters, my lovely wife (Lesa Phiri), and my two lovely Sons (Ethan & Eliezer). Thank you and God bless you abundantly.

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First, I thank the almighty God, for his grace has been sufficient for me. To him be the glory and honour.

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ABSTRACT

Understanding the effect of fiscal deficit on the exchange rate is important in Malawi, given the increased fiscal deficits and unstable exchange rate movements. This study investigated the effect of fiscal deficit on the exchange rate for Malawi from 1981 to 2021. The study tested the existence of the two main channels on the effect of fiscal deficit on the exchange rate for Malawi. The study examined the current account and inflation channels. Data for the study were obtained from the and Economic Affairs of Malawi, the Ministry of Trade, the Reserve Bank of Malawi, and the National Planning Commission. The study employed the Structural Vector Autoregressive (SVAR) Model. The dickey-Fuller test was used to determine on stationarity of the variables. The results indicated that the variables used in this study were stationary at level and first difference form. The study found that fiscal deficit has a significant effect on the exchange rate for Malawi. The study also revealed that the current account balance and inflation channels exist in Malawi. The study recommends that government should put measures aimed at reducing the unhealthy borrowing for consumption which suffocates investments and focus on increasing the production of exportable goods to generate more foreign reserves.

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ABBREVIATIONS

ADB	Authorized Dealer Banks
ARDL	Autoregressive Distributed Lag
ADF	Augmented Dickey-Fuller
BOP	Balance of Payment
CAD	Current Account Deficit
CIRP	Covered Interest Rate Parity
DOM	Dornbusch Overshooting Model
DIR	Domestic Interest Rate
EXCH	Exchange Rate
FDI	Foreign Direct Investment
FIR	Foreign Interest Rate
GBP	Great Britain Pound
GDP	Gross Domestic Product
GOM	Government of Malawi
GBP	Great Britain Pound
HIPC	Heavily Indebted Poor Countries
IMF	International Monetary Fund
IRF	Impulse Response Function
IS	Investment and Savings
LM	Liquidity Market.
MoFEA	Ministry of Finance and Economic Affairs
OECD	Organisation for Economic Co-operation and Development
REH	Ricardian Equivalence Hypothesis
RBM	Reserve Bank of Malawi
RER	Real Exchange Rate
SVAR	Structural Vector Autoregressive
SVAR	Structural Vector Autoregressive
SAPs	Structural Adjustment Programmes
VAR	Vector Autoregressive
USA	United States of America

US\$	United States of America Dollar
ZAR	Southern African Rand

CHAPTER ONE

INTRODUCTION

1.1 Background

Fiscal deficits have become an integral part of the economic process in developing and developed nations that affect productivity growth and economic development (Abanikanda et al., 2023). In the context of Sub-Saharan Africa (SSA), fiscal deficits are promoted by government involvement in economic activity (Abanikanda et al., 2023). Fiscal deficits in SSA have deteriorated despite that the SSA nations benefited greatly from the Highly Indebted Poor Country (HIPC) relief initiative from 2006, which lessened the debt burden on many countries. The HIPC helped to bring drastic information on debts for SSA from 2008 to 2009 (Kawai & Morgan, 2013).

Fiscal deficits have gained a lot of interest from economists and policymakers owing to their prodigious growth, particularly in developing countries. From standard economic theory, fiscal deficits may boost a sluggish economy since a budget deficit may increase government spending and/or lower taxes, this may increase disposable income, and raise the volume of investment and gross Domestic Product (GDP), (Kurantini, 2017). However, long-term deficits have proven to be detrimental to the economy, (Kurantini, 2017). The main concern about the growing budget deficits is that they are associated with high interest rates, higher inflation, depressed private investment, increased indebtedness, poor economic growth, and reduced foreign exchange reserves (Njoroge, 2014).

According to (Mangani, 2021), Malawi has undergone increased fiscal deficits for a long time. For example, according to the (Ministry of Finance and Economic Affairs, 2021),

indicated that the ratio of budget deficits to nominal GDP between 2012 to 2021 increased from 1.5% to 11%. Malawi continues to experience rising levels of expenditure and fiscal deficits and this has resulted in increased public debt to cover the deficit). According to the World Bank (2020), the Malawi government deficit averaged 4.7 percent of GDP during 1970 - 2017 and recorded a high amount of 10.2 percent of GDP in 1981. Over 30 percent of the budget is donor-funded (Mangani, 2021), and disruptions in the flow of such funding instigate recourse to domestic borrowing and or reductions in the delivery of the already inadequate public goods and services.

According to (Ministry of Finance and Economic Affairs, 2021), a big chunk of public debt has been towards consumption compared to productive investment. However, meeting Malawi 2063 which aims to transform Malawi into a self-reliant and wealthy industrialized country requires the inclusion of higher expenditures on productive investments (National Planning Commission, 2020). It has been a common problem for developing countries to fund these budget deficits such that they may end up acting as a catalyst for unstable macroeconomic variables such as exchange rates (Burney & Akjitar, 1992). The predictability of the effects of fiscal deficits on the exchange rate is important in the formulation of policies and economic performance particularly in developing countries cannot be underrated since it influences the allocation of resources, levels of production, and the balance of payment (BOP

Resend (2007), in his paper on cross-country estimates of the degree of fiscal dominance and the central bank, found that the empirical validity of the fiscal dominance proposition may depend on the state of development of a country's financial sector; the degree of central bank independence; the country's inflation pattern; and the operating exchange rate regime within a global system of historically unequal development.

According to Woodford (2001), monetary authorities trade in short-term debt instruments in domestic capital markets which may influence economic conditions for advanced and developing economies. Despite trading in debt instruments, differences across these economies arise in how fiscal deficits are financed. According to

(Woodford, 2001), deficit spending in developed nations involves the issuance of long-term public debt in the form of government bonds compared to developing nations where such markets are not developed. Woodford (2001), indicated that where central bank independence is limited and where monetary authorities are the financial agents of the government, recourse to seigniorage may only be constrained by the degree of fiscal discipline.

Fiscal deficit may affect the exchange rate through several channels such as the inflation, current account, and interest rate channels ((Frenkel & Razin, 1996). According to (Blanchard, 2008), the Keynesian view states that through the inflation channel, fiscal deficits may lead to higher inflation, especially if the economy is near full capacity and the domestic currency may depreciate. Additionally, (Krugman, 2015) states that through the Twin Deficits Hypothesis, there may be a direct link between fiscal deficits and current account deficits which may raise aggregate demand and may lead to higher imports as consumption rises and this may depreciate the domestic currency.

Furthermore, Adekunle (2023), investigated the impact of fiscal deficits on the exchange rate in Nigeria, the study found that fiscal deficits contributed to exchange rate depreciation due to increased money and inflationary pressures, common in emerging economies with high fiscal deficits and limited monetary policy independence. Additionally, Ndikumana et al (2022), investigated the effect of fiscal deficits on the exchange rate, the study found that fiscal deficits tend to depreciate the exchange rate by increasing inflationary pressures, particularly in less developed financial systems with fixed exchange regimes.

Notwithstanding the above, Sachs & Wyplosz (1984) in their paper postulated that the effect of fiscal deficit on the exchange rate is ambiguous i.e., it may lead to depreciation, appreciation, or indeed a zero change for the exchange rates. For example, (Saysombath, & Kyophilavong, 2013; Su & Su, 2003) found that the effect of fiscal deficit on the exchange rate is zero in Asian and European nations, and in the Lao People's Democratic Republic respectively. Apergis (1998), found that the effect of fiscal deficit on the

exchange rate in different nations was either an appreciation or a depreciation. According to (Sachs & Wyplosz, 1984), fiscal deficits affect exchange rates either directly or implicitly and the effects are determined by different macroeconomic statuses of a given economy.

1.2 Problem statement

The exchange rate plays a significant role in an economy with its volatility causing significant effects on an economy (Sarno et al., 2003). The exchange rate for Malawi has shown mixed movement patterns from 1981 to 2021. According to (Ministry of Finance and Economic Affairs, 2021), the share of fiscal deficits to nominal GDP for Malawi increased by an average of 279% between 1981 to 2021. The increased fiscal deficits may have led to increased external debt service, and this may put pressure on the foreign reserves since payment of these debts may deplete existing reserves (Ministry of Finance and Economic Affairs, 2021).

The increased budget deficits may increase the demand for money by the government and this may lead to an increase in interest rates (Adekunle, 2023). When the interest rate increases, investors earn more returns and they may start selling relatively low-yielding foreign securities for domestic and high-yielding facilities and this may appreciate the domestic currency (Mungendi & Ricy, 2023). On the contrary, budget deficits may also lead to a reduction in the private sector's demand for funds and this may lead to a reduction in the interest rates which may lead to exchange rate depreciation (Mungendi & Ricy, 2023).

According to (Simwaka, 2012), Malawi's exchange rate is significantly influenced by inflation and trade imbalances, he stipulated that the persistent inflationary pressures may lead to depreciation for Malawi and this may reduce Malawi's competitiveness. According to (Simwaka, 2012), the current account deficit for Malawi may be one of the significant drivers of exchange rate volatility, particularly when financed through short-term foreign capital.

The two channels that are discussed above may demonstrate the existence of some of the channels on the effect of fiscal deficit on the exchange rate and may be one of the factors for the presence of the unstable exchange rate over the study period.

From theory, the link between fiscal deficit and the exchange rate is not clear in that widening deficits would cause the exchange rate to depreciate or appreciate depending on how it affects the demand for money (Su & Su, 2003). For instance, Korsu (2009) argued that a fiscal deficit increase may appreciate the currency. In contrast, Kim & Roubini (2008) demonstrated that a fiscal deficit increase may depreciate the exchange rate. Furthermore, Kyophilavong (2013) established that there is no link between exchange rates and fiscal deficits.

1.3 Research Objectives

The study seeks to investigate the following objectives:

1.3.1 Main Objective

To investigate the effect of fiscal deficit on the exchange rate for Malawi.

1.3.2 Specific Objectives

- a) To examine the effect of fiscal deficit on the exchange rate through the current account balance channel in Malawi.
- b) To examine the effect of fiscal deficit on the exchange rate through the inflation channel in Malawi.

1.4 Study Hypotheses

- a) Fiscal deficit does not affect the exchange rate through the current account channel Malawi.
- b) Fiscal deficit does not affect the exchange rate through the inflation channel in Malawi.

1.5 Significance of the Study

Malawi envisions a manageable budget balance (Government of Malawi, 2012a). To apprise this target, the study's findings will relay relevant information on how changes in fiscal deficit on the exchange rate for Malawi as well as what aspects of these changes are of high relevance. The study will also fill the literature gap on the topic for Malawi since to the best of my knowledge no academic work has been done on the topic. The study is important in that it would help in offering direction in policy formulation for budget management for Malawi.

1.6 Organization of Study

This paper has been structured as follows; the first chapter provides the introduction, which includes the background, the problem statement, objectives, and the study's justification. The second chapter presents the context of the paper by discussing the overview of the fiscal deficit and exchange rate for Malawi. The theoretical and empirical literature reviews are undertaken in the third chapter. The fourth chapter presents the method employed in the study. Chapter five presents the empirical findings of the study and a discussion of the results. Lastly, chapter six summarizes the study, and suggests policy implications, limitations, and the conclusion of the study.

CHAPTER TWO

OVERVIEW OF FISCAL DEFICIT AND EXCHANGE RATE FOR MALAWI

2.1 Introduction

This chapter outlines the overview of the study. Section 2.2 provides a relationship between fiscal deficits and exchange movements for Malawi. Section 2.3 provides the history of the foreign exchange rate movement in Malawi. Section 2.4 provides the literature on the relationship between current accounts, trade deficits, and exchange rates.

2.2 Fiscal Deficit and Nominal Exchange Rate Movement for Malawi

Malawi's economy is heavily characterized by more government expenditures compared to its total revenues and periodic episodes of macroeconomic volatility since independence (Ministry of Finance and Economic Affairs, 2021). External shocks, poor policy implementations, inadequate fiscal discipline, and severe weather shocks are among the factors that contributed to the country's uncertain macroeconomic environment and low growth (International Monetary Fund, 2024). In addition, economic instability caused by poor spending management has resulted in increased fiscal deficits, causing the government to borrow a lot on the domestic market, crowding out the private sector in the process putting pressure on interest rates, inflation, and exchange rates.

The fiscal deficits may increase the depletion of foreign reserves through the payments of debts (Adekunle, 2023). The government may be required to pay the debts using foreign reserve denominations for the creditor nations. As a result of foreign reserve payments, the country may fail to have enough foreign reserves to be used in the importation of goods and services.

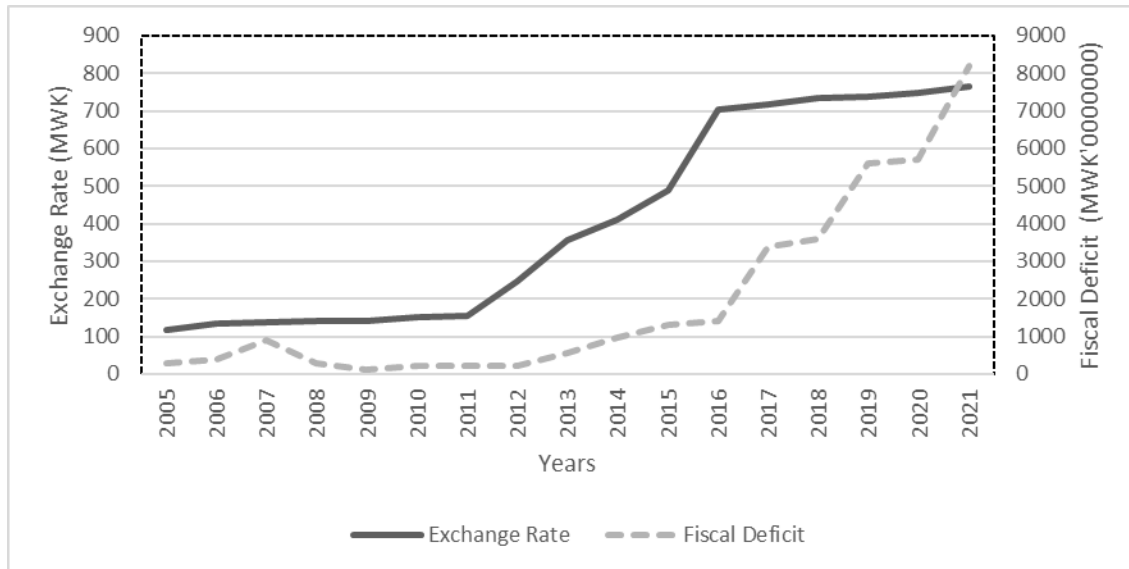


Figure 1: Fiscal Deficit Versus Exchange Rate Movement for Malawi.

Source: Author's Computation

As can be seen from the above graph, on average, the fiscal deficit for Malawi has been increasing since 1981. The nominal fiscal deficit has increased from MWK5.595 billion to MWK824 billion representing a 14,627% percent change between 2000 to 2022. The largest contributing factor to the increased budget deficit between 2013-2014 may be the Cashgate Scandal (International Monetary Fund, 2014). According to the International Monetary Fund (2014), Cashgate involved the siphoning of money from the public through fraudulent transactions affected the government's financial position, and may have led to a lack of trust from donors, who supported a large portion of the budget.

As can be seen from Figure 1 above, the nominal exchange rate movement for Malawi has on average been depreciating from 1981 to 2021. For example, the nominal exchange rate moved from MWK59 to MWK763 between 1999 to 2022 translating to 1193% on that period.

From Figure 1, the relationship between fiscal deficit and to exchange rate between 2005 to 2021 is not linearly related. This implies that there are variations for variations in fiscal deficits and nominal exchange rate figures. When deficits occur, governments may borrow to finance the fiscal deficit. According to the World Bank (2002), Malawi has

financed its budget deficit primarily with transfers from abroad and through debt. The debts may result in an increase in money supply which may in turn increase demand for forex thereby causing forex shortage and adverse movement in the exchange rate (World Bank, 2002). The costs of servicing the loans take away the funds that would have been used in the economy to generate more income.

According to the (Ministry of Finance and Economic Affairs, 2021), the current debt service cost, amounts to MWK900 billion of the MWK3.8 trillion national budget and that was reflected in the underfunding of some ministries such as the Ministry of Health. The continuous borrowing and the public debts cause the economy to fail to produce goods and services which would generate foreign currency for the nation.

2.3 History of Exchange Rate Movements in Malawi

From independence in 1964 to January 1971, Malawi operated within the Sterling zone with the Malawi Pound pegged at par with the British pound Sterling. However, due to heavy fluctuations of the two currencies, the Kwacha was pegged to the Special Drawing Rights (SDR) in June 1975.

Various exchange rate regimes have been pursued in Malawi during its history (Mangani, 2021). The kwacha was pegged to the British pound sterling (GBP) at one-to-one from 1964 to 1967 and at MK2.00 per GBP between 1967 and 1973. Following the collapse of the fixed exchange rate system, the kwacha was pegged to a trade-weighted average of the pound sterling and the United States dollar from November 1973 to June 1975, and to the Special Drawing Rights (SDR) at almost one-to-one between July 1975 and January 1984 (Mangani, 2021).

In response to an expansion in Malawi's trade volume and trading partners, the kwacha was eventually pegged to a trade-weighted basket of seven currencies (US\$, GBP, German Deutschmark, South African rand [ZAR], French franc, Japanese yen, and Dutch guilder). This period was characterized by frequent devaluations of the kwacha, implemented in the context of SAPs, in an attempt to improve the country's export

competitiveness and BOP position. Devaluations of 10%, 20%, 7%, 15%, and 22% against the US\$ were affected between February 1986 and August 1992. In February 1994 the kwacha was finally floated, and an inter-bank foreign exchange market was introduced to determine the exchange rate through market forces. Consequently, the current account was liberalized, although the capital account remained un-liberalized and some exchange controls.

2.4 Relationship between Current Account, Trade Deficits, and Exchange Rate

A current account (CA) is a sub-component of the balance of payments account and it experiences deficits when a nation's imports are worth more than its exports (Thompson, 2017). Typically, the net income from foreign investments in the form of interest dividends, and transfers are also included in the current account, notwithstanding that they make a very small part of the current account. Current account deficits can be detrimental to an economy because current account deficits raise a country's liabilities (Devadas & Loayza 2018). Sustained current account deficits are a major problem faced by developing countries because they result in mushrooming external debt, currency crises, and depletion of foreign exchange reserves (Thompson, 2017).

Depending on the amount of an economy's foreign debt and whether or not this debt is used to fund investments with higher marginal productivity than the interest rate on the repayment of such debt, the country can decide whether or not it should operate a current. These current account deficits could result from budget deficits. Since national saving falls in the presence of a fiscal deficit raising interest rates, results in exchange rate appreciation.

As the interest rate rises, the imports become relatively cheaper compared to the exports, raising the demand for imports vis-a-vis the demand for exports, which in turn raises the overall earnings from imports about that of exports, deteriorating the trade balance, which further results in a current account deficit (Abbassi, 2015). With a current account deficit, the demand for imports is relatively higher than the demand for exports and since these imports are purchased using foreign currency, it raises the foreign currency demand. This

increased demand further appreciates the exchange rate. Therefore, the movements in the exchange rate can be influenced by current account imbalances.

Malawi's current account has been in a deficit since the 1970's and below over the years the current account deficit has continued to widen, currently standing at USD 1.07E+ 14, for the FY 2020/21 (National Planning Commission Data Bank, 2024).

The widening of Malawi's current account deficit may be attributed to the increasing external debt, appreciation of the exchange rate, poor economic growth, high reliance on foreign aid, and the continual growth of imports versus the depressed growth of exports, which is associated with the continued increase in oil prices raising the value of imports despite the increased receipts from transport and tourism and growth of remittances from abroad.

CHAPTER THREE

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

3.1 Introduction

This chapter provides the literature review as the study's main foundation. This chapter covers the conceptual framework, and theoretical and empirical literature relevant to the study.

3.2 Conceptual Framework

The theory suggests that fiscal deficit may have effects on the exchange rate through both direct and indirect channels (Blanchard, 2008). The direct channel involves the overall estimation of the effect of fiscal deficit on the exchange rate whereas the indirect channel involves the estimation of the effect of fiscal deficit on the exchange rate through some intermediary variables. The intermediary variables that pass the effect of fiscal deficit to exchange rate forms channels and these include the current account, interest rate, inflation, etc.

3.3 The Concept of Fiscal Deficit

A fiscal deficit occurs on how the government adjusts its spending and revenue (Stupak, 2019). The revenue portfolio consists of components like tax revenue, trade surplus, and foreign aid, while the expenditure portfolio consists of recurrent and capital expenditures. By adjusting its level of spending and tax revenue, the government can affect the economy by either increasing or decreasing economic activity in the short term. For example, when the government runs a budget deficit, it is said to be engaging in fiscal stimulus, spurring economic activity, and when the government runs a budget surplus, it is said to be engaging in a fiscal contraction, slowing economic activity (Stupak, 2019).

According to (Tanzi & Zee, 1997), there are three cardinal indicators of fiscal policy namely, government expenditure, taxes, and deficits.

Higher government expenditure finance with borrowing may or may not contribute to the overall performance of the economy. For instance, if the government increases borrowing to finance its expenditure, it crowds out the private sector, thus reducing private investment or it may spend the substantive amount on servicing its existing liabilities that can otherwise, be used for investment. Furthermore, in a bid to score cheap popularity and ensure that they continue to remain in power, politicians and government officials sometimes increase expenditure and investment in unproductive projects or in goods that the private sector can produce more efficiently. Thus, government activity sometimes produces misallocation of resources and impedes the growth of national output.

3.4 The Concept of Nominal Exchange Rate

The nominal exchange rate is the price of one country's currency in terms of another currency. It determines how much of one currency can be exchanged for a unit of another currency and plays a crucial role in international trade and finance (Sarno et al., 2003). The exchange rate is an important economic variable. Movements in the exchange rate influence the decisions of individuals, businesses, and the government. Collectively, this affects economic activity, inflation, and the balance of payments (Hamilton, 2018).

3.5 Theoretical Review

This section covers major theoretical arguments on how the exchange rate is determined as well as how budget deficits affect the exchange rate. These arguments are based on the Interest Rate Parity theory, the Equivalent Hypothesis, the Dornbusch Overshooting Model, the Portfolio Balance Model, the Ricardian paradigm, the neoclassical paradigm, the Keynesian paradigm, etc. Mainstream macroeconomic models used by policymakers suggest that the high budget deficit and the method of financing it, affect many macroeconomic variables.

3.5.1 Twin Deficits Hypothesis

The twin Deficit hypothesis is based on the Keynesian traditional school of economics and postulates that the current account deficit has a positive relationship with the budget deficit. It states that an increase in budget deficit leads to a current account deficit and a budget surplus leads to a positive impact on the current account deficit. The increase in the budget deficit will lead to domestic absorption (Banday & Aneja, 2019).

3.5.2 The Ricardian Equivalence Hypothesis

The equivalent hypothesis shows that the method of financing the budget deficit through domestic borrowing does not affect the value of the local currency in relation to the foreign currency because the increase in government borrowing is the result of a lack of government saving, which will be compensated by an increase in private saving (Barro, R, 1989).

3.5.3 The Fiscal Approach of Budget Deficit on Exchange Rate

The fiscal approach focuses on the impact of government borrowing to finance deficits on interest rates. Higher deficits mean increased government borrowing, which in turn leads to higher demand for loans. This increased demand for loans can push up interest rates. Higher interests can attract foreign investors seeking better returns.

Conversely, If the deficit is perceived as unsustainable, it can lead to expectations of future inflation, causing the currency to depreciate.

3.5.4 Portfolio Balance Model

The Portfolio Balance Model stipulates that investors tend to hold three different kinds of assets: domestic bonds, foreign bonds, and domestic money. Assuming that the economy has no influence over the world interest rate and takes it as a given, investors would be forced to take the prices as given, the rate of return elsewhere will be unaffected by the return on domestic currency-denominated assets and the supply of assets equals the demand for those assets. With supply equal to demand, the asset market equilibrium can be defined by:

$$M = m(r, r^*) W \quad (3.1)$$

$$B = b(r, r^*) W \quad (3.2)$$

$$sF = f(r, r^*) W \quad (3.3)$$

Where M = money stock, B = domestic currency-denominated assets, and sF = foreign currency-denominated assets, held by the home country residents. Both the domestic interest rates and the foreign interest rates are negatively correlated with money stock. Domestic currency-denominated assets are positively correlated with domestic interest rates and negatively correlated the foreign interest rates. Finally, foreign currency-denominated assets have a positive relationship with foreign interest rates and a negative relationship with domestic interest rates. These, therefore give rise to the wealth constraint, characterized as:

$$W = B + M + sF \quad (3.4)$$

Monetary policies, budget deficits, and exchange rate market operations influence the stock of money and bonds (Dooley & Isard, 1979). For instance, budget deficits lower interest rates, raising the demand for foreign bonds.

The increased demand for foreign bonds raises the price of domestic bonds and lowers their return, which implies that foreign bonds become relatively more attractive. This results in capital outflow, which in turn appreciates the exchange (Min & McDonald, 1993). In addition, the demand for domestic bonds will increase as the supply of domestic bonds reduces if the domestic and foreign bonds are deemed as complements in response to lower interest rates. As a consequence, the lower demand for money raises the exchange.

Conversely, the transaction demand for money expands as the value of the debt stock in the home country increases. A higher transaction demand for money raises the interest rate, assuming that the transaction demand for money is influenced by individuals' wealth. Due to the higher interest rate, investors may choose to shift their portfolios from foreign to domestic bonds to capitalize on the higher interest rates, which in turn stimulates capital inflow, and as a result, the exchange will depreciate. Therefore, the

particular effect of financial assets on the exchange rate is unknown due to the disparate effects that arise from holding different financial assets as well as from the behavior of investors. For instance, if domestic bonds rather than foreign bonds are offered for sale to individuals, then their effect on interest rates would be much higher because open market operations expand the portfolio share. The expanded portfolio share would be due to a lower exchange and an expansion in the nominal bond stock in the home country.

Furthermore, a current account deficit will reduce the domestic holding of foreign bonds in that domestic investors tend to hold more domestic bonds and fewer foreign bonds in their portfolio at a particular interest rate. Therefore, if a country is experiencing a current account deficit, investors will sell the foreign bonds that were initially held to purchase more of the domestic bonds. These bonds are bought using domestic currency, which raises the demand for local currency, forcing the exchange to appreciate.

In a nutshell, the demand for assets fluctuates as asset stocks are adjusted, these changes in demand affect the exchange (Kojen & Yogo, 2020). Since both the current account and the rate of foreign asset accumulation are affected by the terms of trade and the initial amount of foreign bonds simultaneously, the accumulation of foreign assets affects the exchange. Consequently, the exchange rate influences net exports through the terms of trade and the initial quantity of foreign bonds held by the nation's residents. Therefore, provides the basis for the introduction of the current account deficit, terms of trade, and budget deficit to the model that will be used in this study.

This theory emphasizes the role of portfolio diversification by investors. A budget deficit can affect exchange rates indirectly through its impact on interest rates. If a government runs a deficit and borrows heavily, it increases the supply of government bonds in the market. This can lead to a decrease in bond prices and an increase in bond yields (interest rates). Foreign investors may find these higher yields attractive, leading to increased demand for the domestic currency to invest in these bonds. This increased demand for the currency can cause it to appreciate.

3.5.5 Expectations Theory

Exchange rates are also influenced by market expectations about future economic conditions. If investors believe that a persistent budget deficit will lead to future inflation or economic instability, they may sell off the currency, leading to depreciation. Conversely, if the investors believe that a deficit will be temporary or that government policies will effectively address it, the impact on exchange rates may be less pronounced or even positive.

3.5.6 Market Sentiment and Speculation

Sometimes, exchange rate movements are driven more by market sentiment and speculation rather than fundamental economic factors. In such cases, perceptions of a country's fiscal policy can heavily influence exchange rates. A large budget deficit may raise concerns about a country's ability to manage its finances, leading to negative sentiment and currency depreciation, even if the deficit itself does not directly cause it.

3.5.7 Sachs and Wyplosz Theory of Fiscal Deficit on Exchange Rate

Sachs & Wyplosz (1984) developed a framework for analyzing the effect of fiscal deficit on the exchange rate. From their results, the short-run impact of various types of fiscal measures are considered as well as the dynamics of adjustment to long-run steady states. Their results show that the effects of fiscal deficits on the real exchange rate can vary widely and will depend closely on several structural features. Sachs & Wyplosz (1984) observed that the composition of government spending is an important factor along with the degree of asset substitutability, the initial size of the public debt, and the net external position responsible for the effect of fiscal deficit change on the real exchange rate.

3.5.8 The Dornbusch Overshooting Model

The Dornbusch Overshooting Model (DOM) is not only a model for understanding the Exchange rate, but it also provides a framework for understanding monetary policy. It further anticipates that the exchange rate is positively related to the Interest Rate Difference (IRD). (Dornbusch, 1976) stipulates that an increase in the amount of money supplied will either drive up prices or result in exchange rate depreciation. Bearing that

in mind, increased money supply bids down the interest rate. The relatively lower interest rate raises exchange rate depreciation expectations, as exchange rate depreciation expectations rise there are no immediate price increases. Compared to the assets market, the model assumes that the goods market adjusts rather slowly to the changes in money supply (Wang, 2020).

3.5.9 Neoclassical Paradigm

By transferring taxes to future generations, rational and farsighted individuals with access to the ideal capital markets plan their lifetime consumption, this will raise their total lifetime consumption, which therefore means that budget deficits will stimulate consumption. With full employment of resources, reduced savings will stem from increased consumption (Ribaj & Mexhuani, 2021). The shrunken savings will in turn raise the interest rates, with higher interest rates individuals will be reluctant to hold the initial amount of domestic financial assets and physical capital.

The interest rates continue to rise until balance is achieved in the capital market, depressing private investment (Bernheim, 1989). The depressed private investment further depresses capital accumulation. For a small open economy, budget deficits bid up interest rates, the higher interest rates intend to draw foreign lenders. These lenders seek to capitalize on the higher return on interest rates, increasing capital inflow. The increased capital inflow increases the supply of foreign currency, which leads to appreciation.

3.5.10 Keynesian Paradigm

The Keynesian paradigm stipulates that the budget deficit increases disposable income. This is because individuals are considered to be liquidity-constrained and the changes in aggregate consumer demand accompany changes in disposable income. The increased disposable income and increased consumer demand increase aggregate demand, income, and employment (Orji et al, 2015). For a small open economy, an increase in the aggregate demand indicates that individuals will demand more products including imports and the increased income implies that individuals will have more income to

spend on these products (Abbassi, et al., 2015). This will increase the value of imports vis-a-vis exports, widening the current account deficits. The widening current account deficits increase the demand for foreign currency, which leads to appreciation.

3.6 Empirical Review

This chapter research examines research on the effect of fiscal deficit and exchange rate. Section 3.5.1 provides empirical investigations for developed nations. Section 3.5.2 concentrates on research which was conducted in African countries.

3.6.1 Developed Nations Empirical Review

Several studies have conducted investigations on the effect of fiscal deficit on the exchange rate, utilizing various methodologies. For instance, Khan (2002) investigated the relationship between the exchange rate and budgetary deficit in Pakistan for the period 1982-1998.

Khan (2002) used the ordinary least squares method in their analysis and their result showed that budget deficit has both direct and indirect effects on the real exchange rate. In the United States of America, Bernheim (1989) analyzed the effects of government expenditure increase on the US economy's output, consumption, net exports, investments, inflation, debt, and exchange rate using data from a quarterly time series spanning 1983:1 to 2007:4. To establish the transmission mechanism of government shocks, the study employed structured VAR and estimated the baseline VAR tracing their effects in the economy. Further, to calculate the impulse responses, the VAR model was re-estimated with the addition of a variable, Ramey's shock measure.

The findings indicated that a government expenditure increase appreciates the real exchange rate on impact followed by real exchange rate depreciation over time, the real exchange depreciation proved to be highly significant, and net exports dropped briefly and quickly started to rise. In addition, the study also revealed that the exchange rate response to government expenditure varies systematically with the exchange regime. For instance, countries with floating regimes i.e. Australia, the USA, and the UK registered

exchange rate depreciation after a government expenditure increase while other countries in the euro area with fixed regimes recorded RER appreciation.

Furthermore, Su & Su (2003) re-examined the relationship between budget deficits and exchange rates by Applying the (Hakkio, 1996) model to seven Asian countries and eight Euro-currency countries over the years from 1951 to 2001. The empirical results also present evidence supporting the Ricardian Equivalence Proposition that there is no direct effect of budget deficits on exchange rates. Similarly, Korsu (2009) examined how Sierra Leone's external sector was affected by the fiscal deficit. The findings revealed that budget deficit contraction reduces money supply and prices, which depreciates the real exchange rate and improves the balance of payment.

Saysombath & Kyophilavong (2013) examined the link between deficits and the RER in Lao PDR using annual time series data from 1980 to 2010 and the ARDL bounds test in conjunction with a VAR-based Granger causality test together with the SVAR framework to establish the long-term and short-term dynamics of the budget deficit and the real exchange rate. The findings demonstrated that there was no granger causality between deficits and the RER in Laos. Bajo & Berke (2014), examined the connection between fiscal deficits in the exchange rate in Spain relative to the euro area, using quarterly time series data from 1995 to 2011 and the fully modified OLS method. The study further established that for a narrower fiscal deficit, the government has to reduce its expenditure, the composition of government expenditure matters about its effects on the real exchange rate, and how the real exchange rate is defined also plays a significant role.

Apergis (1998), investigated the relationship between budget deficits and exchange rates in eight OECD countries over the period 1980-1995 by using quarterly data and the methodologies of cointegration, long-run causality, and granger (or short-run) causality tests. The empirical findings provide evidence in favor of the association between exchange rates and budget deficits with the impact of these deficits on the exchange rate, however, not being uniform. In certain cases, budget deficits seem to have led to a currency depreciation, while in others to a currency appreciation. In Spain, De Castro &

Fernandez (2011) analyzed the impact of fiscal deficits on the Spanish effective exchange rate over the period 1981-2008 using a standard structural VAR framework. The results indicated that government spending brings about positive output responses, jointly with real appreciation. The real appreciation is explained by persistent nominal appreciation and higher relative prices.

3.6.2 Studies on African Economies

Expanding the scope to other African Countries, Gakuru (2017), assessed the effect of budget deficit on the current account deficit and subsequently the exchange rate in Kenya using time series data spanning 1980 to 2015 and the autoregressive distributed lag (ARDL) bounds test to cointegration.

The findings demonstrated a positive correlation between the current account deficit (CAD) and deficits. The results also indicated a negative correlation between the current account deficit and the real exchange rate. The study recommended a controlled budget that can be financed solely through taxation and domestic debt. The study further recommended that policymakers should ensure proper exchange rate (EXR) management to ascertain that exports become globally competitive thereby eliminating the current account deficit.

Furthermore, Eldepcy (2022), examined the dynamic relationship between Egypt's budget deficit and real exchange rate, indicating the deficit's sources either implicitly or explicitly using annual time series from 1975 to 2020 using the structural vector autoregressive model. The findings indicated a budget deficit increase depreciates the real exchange rate. On decomposing the budget deficit into domestic bank financing, foreign financing, and domestic non-bank financing. It was revealed that a domestic non-bank financing shock brought about real exchange rate depreciation, a domestic bank financing shock gave rise to real exchange rate appreciation and a foreign financing shock resulted in real exchange rate appreciation. The results indicated that the government's reliance on domestic financing sources was immense, especially on

domestic banks. The study recommended budget deficit reduction as crucial to the achievement of stability in the exchange rate.

3.7 Transmission Mechanisms on the Effect of Fiscal Deficit on Exchange Rate

A transmission mechanism refers to the process through which economic policies or external shocks impact some economic variables, such as output, inflation, and employment (Obstfeld & Rogoff, 1995). Accordingly, they refer to the pathways through which budget deficits affect the exchange rate. The exchange rate is influenced by many factors including fiscal deficits (Obstfeld & Rogoff, 1995).

Several theoretical frameworks and empirical studies explain the link between fiscal deficits to exchange rates. These frameworks give the transmission effect on how shocks on fiscal deficits are transmitted across some channels and present the effects on the exchange rate movements. Each channel provides a specific perspective on how fiscal deficits influence exchange rates based on the historical and economic context for the variables.

3.7.1 The Interest Rate Channel

This refers to the pathway through which interest rate influences the effect of fiscal deficits on the exchange rate (Blanchard & Fischer, 1989). Under this channel, the government borrows to finance a fiscal deficit and it borrows from the domestic market, increasing the demand for funds. The increased borrowing increases demand to borrow and this leads to higher domestic interest rates as the government competes with the private sector for available funds.

When an economy experiences high interest rates, it attracts foreign investors seeking better returns, leading to capital inflows and potential appreciation of the domestic currency. Conversely, when the government is exercising prudent fiscal discipline, it may run a budget surplus, which may reduce government borrowing or not borrowing at all, which reduces the demand for funds. The decreased borrowing leads to lower domestic interest rates as the government does not compete with the private sector for

available funds. When an economy experiences low interest rates, it does not attract foreign investors seeking better returns, and this will lead to capital outflows and potential depreciation of the domestic currency.

3.7.2 The Inflation Channel

The Inflation Channel refers to the pathway through which the budget deficit of a country is financed by printing money and that influences the value of the currency (Dornbusch, R, 1976).

The increased money supply is aimed at covering for the increased aggregate demand which is created from the increase in expenditure. This leads to inflationary pressures that erode the currency value, causing depreciation.

The inflation channel assumes that the fiscal deficit is financed by printing money which leads to an increase in the money supply (Dornbusch, R., 1976). When the money supply in an economy increases, the country will experience inflation which increases with more money supply. The channel stipulates that the higher inflation erodes the purchasing power of the domestic currency, leading to depreciation. When this happens, investors start to demand higher returns to compensate for inflation risk, impacting interest rates and capital flows.

3.7.3 The Capital Flow Channel

The channel assumes that fiscal deficits can influence investor sentiment about a country's economic stability and fiscal sustainability (Calvo & Reinhart, 2002). In this regard, if investors perceive a high risk of fiscal irresponsibility or unsustainable debt levels, the channel assumes that they may withdraw their investments, leading to currency depreciation. Conversely, if fiscal deficits are viewed as sustainable, they attract foreign investment, leading to currency appreciation. In this channel, the short-term capital inflows due to higher interest rates may support the currency, but long-term sustainability concerns can lead to capital flight and depreciation. In the same vein, if investors perceive a country has fiscal discipline, the channel assumes that investors may

not withdraw their investments, leading to currency appreciation. Furthermore, long-term prudent fiscal discipline can lead to capital inflow and appreciation.

3.7.4 Current Account Balance Channel

This channel posits that fiscal deficit leads to higher government spending, which can boost overall domestic demand, including imports (Frenkel & Razin, 1996).

In this channel, it is assumed that the increased government spending will lead to more money in the economy and this will enable people to have more money which can be used in the purchase of goods and services domestically and abroad.

Nevertheless, the increased imports relative to exports can worsen the current account balance. With the larger current deficit, there is a need for higher foreign currency to pay for imports, hence depreciating the exchange rate. Conversely, when government expenditure is low, there is less money in the economy and this will lead to less demand for both domestic and foreign goods (Frenkel & Razin , 1996). When imports decrease, the country may experience a reduction in the current account deficit.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter outlines the methodology adopted for the study. Section 4.2 provides the model specification of the study. Section 4.3 discusses the variable used in the study. Section 4.4 discusses the description and measurement of the variables used in the study. Section 4.5 provides the sources of data used in the study.

4.2 Model Specification

The study adopted a structural var (SVAR) approach used by Castro & Fernandez (2011) in the study on the effects of fiscal shocks on the exchange rate in Spain from 1981-2008. The SVAR model is an improved model and it overcomes the limitation of the traditional identification problem which is common in the standard VAR (Sims, 1980). SVAR includes restrictions to identify exogenous or structural shocks.

The short-run restrictions are placed on the matrices A and B (Sims, 1980). The model is chosen for the study because it is a flexible tool, especially for the analysis of policy actions. In the current study, the model estimated the contemporaneous effect of fiscal deficit on the nominal exchange rate. Ideally, an A P-th order structural autoregressive SVAR(P) model is specified as follows:

$$Y_t = V + \sum_{i=1}^p A_i Y_{t-i} + B X_t + \alpha T + U_t \quad (4.1)$$

In the model above model, Y_t represents all the endogenous variables at time (t); X_t is a vector of exogenous variables at time (t); V represents the constant term; T represents the

trend term at time (t); U represents the error term at time (t). The model takes the form $X_t = \begin{bmatrix} r_t \\ y_t \end{bmatrix}$. Accordingly, the system is written as:

$$r_t + a_{12} = B_{10} + B_{11} r_{t-1} + B_{12} Y_{t-1} + u_{rt} \quad (4.2).$$

$$a_{21} r_t + y_t = B_{20} + B_{21} r_{t-1} + B_{22} Y_{t-1} + u_{yt} \quad (4.3).$$

In matrix form, it is written as:

$$\begin{bmatrix} 1 & a_{12} \\ a_{21} & 1 \end{bmatrix} \begin{bmatrix} r_t \\ y_t \end{bmatrix} + \begin{bmatrix} B_{10} \\ B_{20} \end{bmatrix} + \begin{bmatrix} B_{11} & B_{12} \\ B_{21} & B_{22} \end{bmatrix} \begin{bmatrix} r_{t-1} \\ y_{t-1} \end{bmatrix} + \begin{bmatrix} u_{rt} \\ u_{yt} \end{bmatrix}$$

In the above matrix, coefficients a_{12} and a_{21} , are elements of matrix A; they represent a contemporaneous relation between the endogenous variables, i.e., fiscal deficit, and nominal exchange rate. The restrictions are based on economic concepts and theories are imposed on the contemporaneous relation among endogenous variables of the model (Stock & Watson, 2001).

In the current study, Matrix A is multiplied with the VAR estimation model, the SVAR model is produced. The SVAR isolates exogenous shocks and measures the impact of these shocks on the variables included in the model (Sims, 1980). Further, on the SVAR model by the inverse of A, to get the reduced form of VAR,

$$\text{i.e., } A^{-1}AX_t = A^{-1}B_0 + A^{-1}B_1X_{t-1} + A^{-1}\mu_t \quad (4.4).$$

The above equation is also expressed as $X_t = G_0 + G_1X_{t-1} + e_t$ where matrix A relates with forecast errors of the reduced form VAR, e_t and structural shocks, μ_t , thus $e_t = A^{-1}\mu_t$. In this model, the forecast errors are linear combinations of structural shocks. These shocks can be identified directly from reduced form residual (e_t) with matrix B; such as,

$$e_t = B\mu_t.$$

The more general way of relating errors and shocks in structural VARs is by combining these two matrices. Thus, $e_t = A^{-1}B\mu_t$. Restrictions imposed on matrix A, such that:

$$A = \begin{pmatrix} 1 & 0 & \dots & 0 \\ a_{21} & 1 & \dots & 0 \\ \dots & . & \dots & 0 \\ a_{k1} & a_{k2} & \dots & 1 \end{pmatrix}$$

Restrictions in matrix A are imposed on the off-diagonal terms based on economic concepts (Sims, 1980). The diagonal terms indicate the unit change effect of the variable on itself that should be one; while off-diagonal terms indicate contemporaneous relation among the variables that are given restrictions according to economic theories. The matrix is always square, thus for two variables model 2X2 matrixes, for three variables model 3X3 matrices, and so on are used. The number of restrictions is identified as $K(K-1)/2$, where K is the number of variables included in the model.

$$A = \begin{pmatrix} r \mapsto r & y \mapsto r \\ r \mapsto y & y \mapsto y \end{pmatrix}$$

In the study there are two variables, hence, it is a 2X2 matrix and the number of restrictions is one. The diagonal terms indicate the relation of variables i.e. percentage change of fiscal deficits to exchange rate, which is positive and equal to unity, since it indicates its effect. The off-diagonal term in the second row and first column indicates the covariance coefficient for the effect of fiscal deficit and nominal exchange rate, while the term in the first row and the second column indicates the covariance coefficient for nominal exchange rate and fiscal deficit.

The SVAR model assumes structural shocks orthogonal; which means the innovations or shocks (μ_{rt}, μ_{yt}) are not correlated (Sims, 1980). Therefore, structural shocks are identified with the help of matrix B which is a variance-covariance matrix in which covariance is restricted to zero. B matrix places restrictions on error structure which is not changed usually given as;

$$B = \begin{pmatrix} \cdot & 0 \\ 0 & \cdot \end{pmatrix}$$

4.3 Variable Selection

4.3.1 Endogenous Variables

To investigate the main objective, the endogenous variables are fiscal deficits and the nominal exchange rates. Furthermore, current account balance, inflation rate, fiscal deficits, and the exchange rate are used as endogenous variables in examining the specific objectives.

4.3.2 Control Variables

To ensure that the analysis accounts for other factors that may influence the exchange rate; GDP, inflation, trade balance, current account deficits, and balance of payments deficits will be included in the model. According to (Gujarati, 2012), control variables are those that the study acknowledges that affect the dependent variable (explanatory variable, in this case, exchange rate).

These variables are essential to this study to provide a more comprehensive and accurate picture of the economic environment in which exchange rates operate. The inclusion of these variables in this study is crucial since would help to mitigate the effects of confounding variables and enhances the validity of the study's findings.

4.4 Description and Measurement of Variables in the Study

4.4.1 Fiscal Deficit

In this study, fiscal deficit refers to the net values of government total revenues (including grants) and government expenditure (including payment of arrears and loan interests) (Blanchard & Fischer, 1989). The deficit represents the extent to which the government needs to borrow to cover its spending. The fiscal deficit is a critical indicator of a government's financial health and its fiscal policy stance (Blanchard & Fischer, 1989).

4.4.2 Nominal Exchange Rate

In this study, nominal exchange rate is the rate at which the currency of one country can be exchanged for that of another country (Frankel & Rose, 1996). This variable represents a measure of the responsiveness of a policy shock.

4.4.3 Trade Balance

In this study, trade balance refers to the difference between the value of the goods that a country exports and imports (Frankel & Rose, 1996). It represents a key component of a country's balance of payments. This is an important indicator of a country's economic health and its international economic relations.

4.4.4 Exchange Rate Regimes

Exchange rate regimes show the relationship between the domestic currency about other currencies and the foreign exchange market (Frankel & Rose, 1996). These regimes can range from flexible (or floating) systems, where the market determines the exchange rate, to fully fixed (or pegged) systems, where the government maintains a set exchange rate (Frankel & Rose, 1996). In this study, this variable is presented as a dummy variable, where each year with a flexible exchange regime was coded 1, and the years with fixed exchange rate regimes are coded 0.

4.4.5 Inflation rate

The inflation rate measures the percentage change in the average price level of goods and services in an economy over a specific period (Blanchard & Fischer, 1989). It shows how much the cost of living has increased over time and reflects the purchasing power of money.

4.4.6 Nominal Gross Domestic Product (GDP)

Nominal Gross Domestic Product (GDP) refers to the total monetary value of all goods and services produced within a country's borders at a specific time (Barro, 1988). GDP serves as a comprehensive measure of a country's economic activity.

4.4.7 Current Account Deficits

The current account reflects the difference between a country's savings and investment. It includes trade in goods and services, net income from abroad, and net current transfers. A current account deficit indicates that a country is importing more than it is exporting (Gakuru, 2017).

4.4.8 Balance of Payments Deficits

A balance of payments (BoP) deficit occurs when a country's total international payments exceed its total international receipts over a specific period (Clarida, 2007).

4.5 Time Series Properties

4.5.1 Lag Selection Criteria

The Final Prediction Error, Akaike Information Criteria, and Hannan Quinn Information criteria were used to select the optimal lag length. In the main and specific objectives, models with minimum values were chosen since these models achieve a balance between model complexity and goodness of fit (Gujarati, 2012).

4.5.2 Impulse Response Functions

The impulse response function (IRF) is a concept used in time series analysis, particularly in the context of vector autoregression (VAR) models (Amisano & Giannini, 1997). It describes the dynamic response of a variable in a VAR model to a one-time shock, or impulse, in another variable, while holding all other variables constant. The impulse response function is often graphically represented, with time on the horizontal axis and the response of each variable on the vertical axis (Amisano & Giannini, 1997). Each line in the graph represents the response of one variable to the impulse in another variable, showing the pattern of movements over time (Sims, 1980). This study used the Impulse response functions to investigate the effects of fiscal deficit on the nominal exchange rate. Ideally, IRFs do not directly address the estimation method used to estimate VAR models and Ordinary Least Square Methods (Stock & Watson, 2001). IRFs provide a powerful tool for analyzing dynamic interactions among variables and assessing the response to shocks, which help mitigate some of the limitations associated with traditional OLS estimation (Sims, 1980).

The effect of a shock on one of the endogenous variables to another is determined by a zero line for the confidence interval of the variables for the Impulse Response Functions (IFRS) (Sims, 1980). If the zero line is within the confidence interval, it entails that a positive shock in one of the endogenous variables has no statistically significant effect on the other variable (Sims, 1980). If the zero line is above the confidence interval and is increasing then the effect of one of the endogenous variables on another is positive (Sims, 1980).

If the zero line is above the confidence interval and is decreasing then the effect of one of the endogenous variables on another is negative (in the context of the study, it means a positive shock to the fiscal deficit leads to appreciation (gain in value) of the Malawi kwacha. If the zero line is below the confidence interval and is increasing, then the relationship between the endogenous variables is positive. In the study, it means that a positive shock to fiscal deficit leads to depreciation (loss) of the Malawi kwacha. If the zero line is below the confidence interval and is decreasing, then the relationship between the endogenous variables is negative.

4.6 Diagnostic tests

Several diagnostic tests are conducted to guarantee the regression model's reliability (Gujarati, 2012). These include tests for autocorrelation, multicollinearity, and heteroskedasticity, each addressing a specific potential issue in regression analysis. Ordinarily, diagnostic tests are context-specific, and only tests relevant to a particular model are supposed to be applied.

4.6.1 Unit Root Tests

In regression analysis involving time series data, a critical assumption is that the time series under consideration is stationary (Gujarati, 2012). The mean and variance of a stationary time series do not change over time. A unit root is a special case of non-stationary, where the time series has a trend. According to Gujarati (2012), a non-stationary time series can only be studied for a period under consideration. Still, it is not possible to generalize to other periods, and can lead to spurious regression. For the series to be said it is integrated of order zero i.e. $I(0)$, the series has to be stationary in levels. However, if the series demonstrates non-stationarity but becomes stationary when differentiated once, then it is to be integrated of order one denoted as $I(1)$. In general, a time series is predicted to have a unit root integrated of d , denoted $I(d)$. The null hypothesis for the test is that there is a unit root which means that it is nonstationary and so when the test statistic is greater than the critical value in absolute terms, we reject the null hypothesis.

4.6.2 Multicollinearity test

Multicollinearity indicates the perfect relationship between the variables under study. Usually, when estimating a regression it is assumed there is no linear relationship among all or some of the independent variables (Gujarati, 2012). In this study, the Structural vector autoregressive model (SVAR) is used in estimating the effects of the shocks between the variables, in this model, multicollinearity is not a problem because the Impulse Response Functions (IRFs) take control of it.

4.6.3 Heteroscedasticity test

The classical linear regression model (CLRM) assumes that the error term in the regression model has equal variance across observations. However, when the variance of the error terms changes across observations it is known as heteroscedasticity (Gujarati, 2012).

This study used time series data and it does not worry about heteroscedasticity since it is a general problem in cross section data analysis where there are different observations and this study uses Impulse Response Functions to control for heteroscedasticity.

4.6.4 Normality test

The normality distribution is a direct consequence of the Central Limit Theorem (Engle, 1982). As such, the normality of the error is one of the basic premises in regression analysis. It is assumed that a normal distribution of error terms emerges whenever the sample size is large enough. In this study the sample size is 40, evoking the Central Limit Theory, the distribution of the values in the variables becomes normal since the sample size is more than thirty.

4.7 Data Sources

In the study, secondary annual time series data from 1981-2021 was used (see Appendix 3). Data for fiscal deficits and nominal exchange rates was obtained from the Ministry of Finance and Economic Affairs of Malawi. Data on Trade Balance was obtained from the National Planning Commission of Malawi. Data on Gross Domestic Product was obtained from the Ministry of Trade and Industry of Malawi. Data on inflation was

retrieved from the Reserve Bank of Malawi website. Data for the current account and balance of payments were obtained from the National Planning Commission of Malawi.

4.8 Methods of Analysis

Descriptives were used to present summaries of the data sample. In terms of econometric approaches, the research used the Augmented Dickey-Fuller unit root test to check the presence of unit roots.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1 Introduction

The chapter discusses the main and specific objectives of the study. Results for the other model forms of the main are presented in the Appendix (1.1 to 1.6). The chapter gives descriptive statistics for the variables and the results from the SVAR model. Furthermore, the chapter provides the statistical implications of the findings.

5.2 Descriptive statistics

Table 1: Summary Descriptive Statistics for Variables

Variable	Observation	Mean	Std. deviation	Minimum	Maximum
Fiscal Deficit	41	7.98+10	1.84E+11	2.75E+07	8.24E+11
Exchange Rate	41	181.883	257.452	0.93	763.58
Trade Balance	41	6.07e+08	6.17e+08	1.53E+07	2.04e+09
Gross Domestic Product	41	1.20e+12	1.95e+12	1.90e+09	7.00e+12
Inflation	41	18.99	14.01	7.40	83
Current account deficit	41	1.57e+13	2.90e+13	7.11e+09	1.70e+14
Balance of payment Deficit	41	5.20e+08	5.50e+08	4375905	1.92e+09

Table 1 above provides an overview of the descriptive analysis of the study. Where the summary tables postulate an outline of the central tendency, variability, and range of the variables concerned in this study. The period under consideration in this study is 1980-2021.

From Table 1, the main endogenous variables are Fiscal Deficit and Exchange Rate.

The above table indicates the description of variables in the estimation. The table shows that the maximum nominal fiscal deficit occurred in the year 2021 and its value was MWK824,000,000,000, whereas the minimum nominal fiscal deficit occurred in 1983 and its value was MWK27,500,000.

In the study period, the maximum value for the nominal exchange rate is MWK763.58/\$ and it occurred in 2021 while the minimum value for the nominal exchange rate is MWK181.883/\$ and it occurred in 1981.

5.3 Results for Stationarity Tests

Data analysis was conducted using Stata 17. The Augmented Dickey-Fuller (ADF) test was used to test for the stationarity of the time series and determine the order of integration of the variables.

Table 2: Stationarity Tests Results for the Variables

Variable	t-statistic	t-critical	Decision
Fiscal Deficit	-4.435	-3.655	I (1) **
Exchange Rate	-3.825	-2.961	I (1) **
Trade Deficit	-3.683	-2.958	I (0) *
Inflation	-3.562	-3.562	I (1) **
Gross Domestic Product	-5.268	-2.961	I (1) **
Current Account Deficit	-4.721	-2.961	I (1) **
Balance of Payments Deficit	-8.561	-2.961	I (1) **
Source: Author's compilation.			
Note: H ₀ : the series is non-stationary. *, ** means the variable is stationary at the level form and first difference respectively.			

The null hypothesis (H0) of the test is that the variable has a unit root (not stationary) and follows a Random Walk without drift, represented as $d=0$ (Granger & Newbold, 1974). The results are interpreted by comparing the test statistics against the critical values obtained at a 5% confidence level (Enders, 2015). As can be seen from Table 2 above, the trade deficit was stationary at level I (0) and the absolute value for t-statistic was more than the absolute value for t-critical, therefore, the null hypothesis (H0) that there was a unit root was rejected.

Additionally, Fiscal Deficit, Exchange Rate, Inflation, Gross Domestic Product, Current Account Deficit, and Balance of Payment were stationary after first differencing and at that level, their t-statistics were more than t-critical values at a 5% significant level, therefore the null hypothesis (H0) that there was a unit root is rejected.

5.4 Results for Lag Length Selection

The Akaike Information Criteria, Hannan Quinn Information, and the Schwarz Bayesian Information Criteria at the lag of 4 were used since at that lag level they have the lowest values.

Table 3: Results for the Lag Length Criteria

Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	-2997.86				7.7e+67	167.659	167.966	168.539
1	-2968.33	59.048	16	0.0	3.8e+67	166.907	167.46	168.491
2	-2874.63	187.41	16	0.0	5.5e+65	162.59	163.389	164.878
3	-2834.97	79.31	16	0.0	1.8e+65	161.27	162.32	164.267
4	-2791.19	87.575*	16	0.0	5.4e+64*	161.02*	161.022*	163.427*

5.5 Results of Objectives

The study achieved the main objective by investigating the two channels, namely: the current account balance and the inflation channels due to the availability of data.

5.6 Current Account Balance Channel

To achieve this specific objective, two graphs are simultaneously analyzed. The first graph investigated the significant effect of a shock to the fiscal deficit on the current account balance. The second graph gives the effect of a shock to the current account balance on the exchange rate. Overall, the two graphs give the results for the main objective.

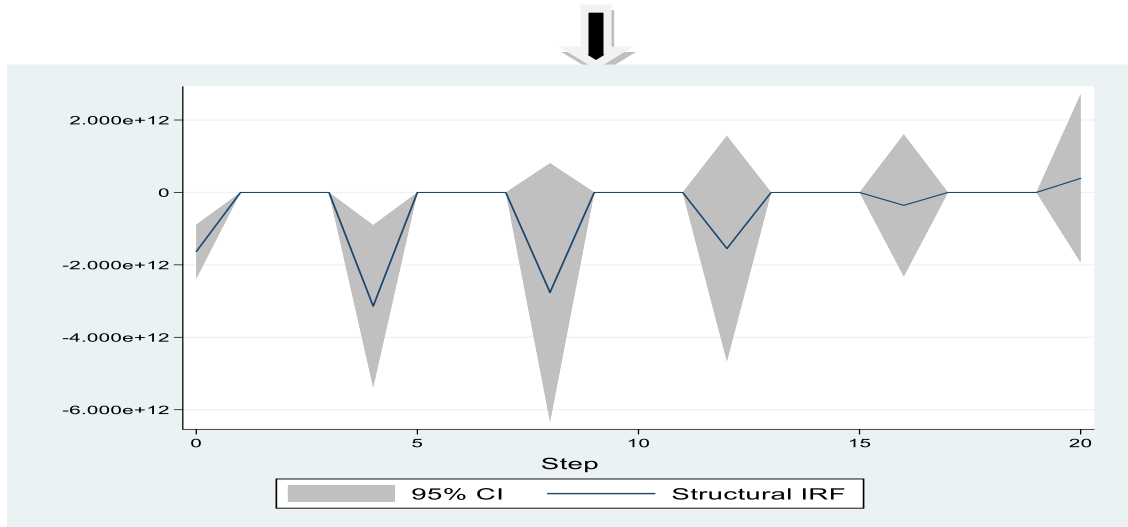


Figure 2: IRF on the Effect of Fiscal Deficit to Current Account Balance

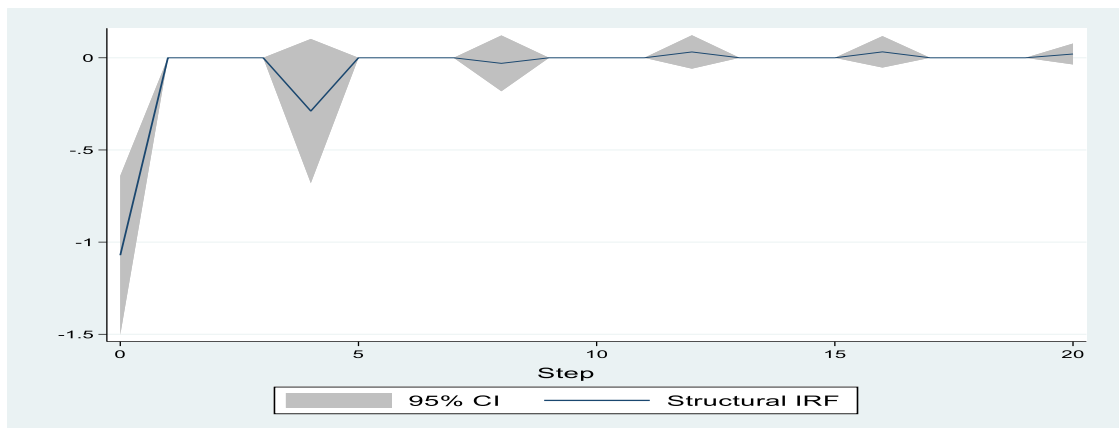


Figure 3: IRF on the Effect of Current Account Balance to Exchange Rate

Interpretation

As can be seen from the first graph, a shock in fiscal deficit leads to an increase in the current account deficit within the first two years. In the second graph, a shock in the current account balance leads to a depreciation for the first two years. This result, confirms the main result which shows that fiscal deficit has a significant effect on the exchange rate for Malawi. This result means that the current account balance channel exists in Malawi.

5.7 Inflation Channel

To achieve this specific objective, two graphs are simultaneously tested, the first graph investigated the significance of a shock to fiscal deficits on inflation. The second graph investigated the effect of inflation on the exchange rate. The overall result gives the effect of fiscal deficit on the exchange rate.

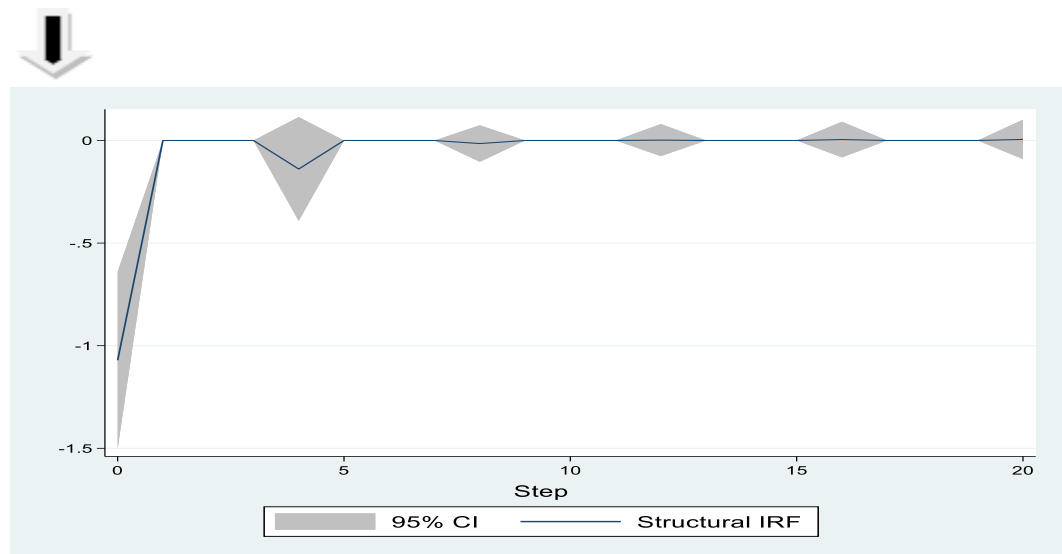


Figure 4: IRF on the Effect of Fiscal Deficit to Inflation

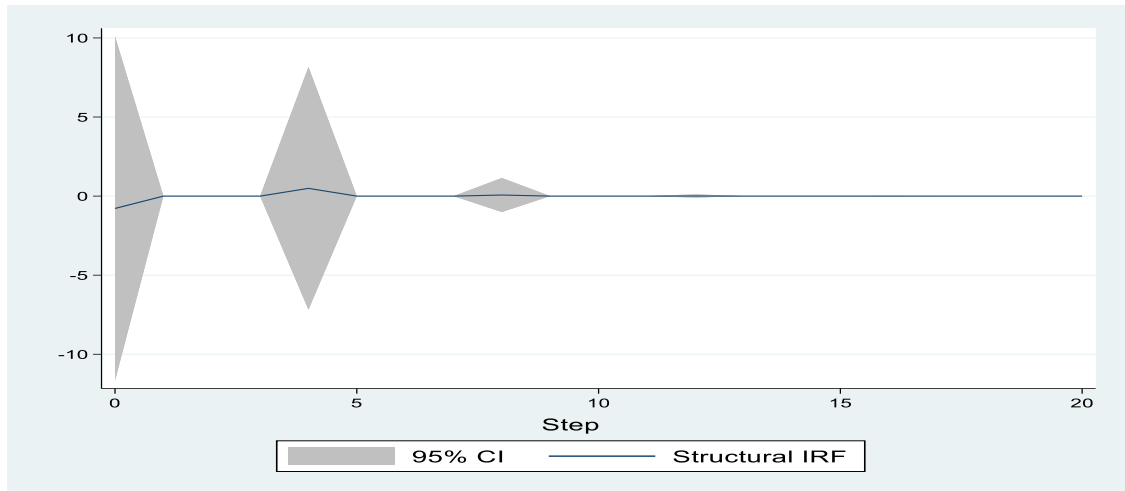


Figure 5: IRF on the Effect of Inflation on Exchange Rate

5.7.1 Interpretation

As can be seen from the first graph, a shock in fiscal deficit leads to an increase in inflation in the first two years. In the second graph, a shock to the inflation leads to a depreciation for the first two years. This result, confirms the main result which shows that fiscal deficit has a significant effect on the exchange rate for Malawi. This result means that the inflation channel exists in Malawi.

5.8 Discussion of Results

The study adds to the existing literature on the effect of fiscal deficit on the exchange rate. To the best of my knowledge, this is the first paper to assess the effects of fiscal deficit on the exchange rate in Malawi using nationally representative data. Using the SVAR model, the study found that there is statistically significant result on the effect of fiscal deficit on the exchange rate for Malawi in the study period.

These results were robust to a series of estimation methods. The above findings are consistent with other studies such as by (Apergis, 1998), and Eldepcy (2022), who found that indeed fiscal deficit has a significant effect on exchange rate by either leading to depreciation or appreciation to different countries and depreciation respectively. The above results disagree with the Ricardian Equivalence Hypothesis, (Su & Su, 2003),

(Saysombath & Kyophilavong, 2013) found that there is no effect of fiscal deficit on the exchange rate for Asian and European Countries and in the Lao People's Democratic Republic.

CHAPTER SIX

CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Introduction

This chapter provides the conclusions and policy implications. Section 6.2 gives the study's recommendations, while section 6.3 gives the study's limitations and areas for further research.

6.2 Conclusion and Recommendations

Based on the empirical findings, the study concluded that budget deficit directly influences the movements in the exchange rate. The study used fiscal deficit and nominal exchange rate to investigate the effect of fiscal deficit on exchange rate. The study found that fiscal deficit depreciates the Malawi Kwacha. This result is in line with the theoretical background that stipulates that the increased budget deficits may propel the government to spend more money and raise the demand for money which in turn increases interest rates leading to the depreciation of the domestic currency.

Therefore, there is a need to keep the widening budget deficit in Malawi in check. This can be accomplished through the formulation of policies to reduce government expenditure and/or increase taxes. However, it is important to exercise caution when raising taxes because too much taxation could inhibit economic growth. Alternatively, the rising budget deficit could be reduced by stimulating economic growth which can also increase tax revenue. Furthermore, the composition of government expenditure is a critical determinant of economic growth. The above result shows that there is a need for prudent budget management because it promotes fiscal discipline. Fiscal deficit is necessary for debt reduction, which is critical to the elimination of persistent budget deficits. The study recommends the establishment of a regulatory framework tailored

towards budget deficit reduction and debt sustainability. In addition, clear lines of accountability must be established to boost budget management. Furthermore, policymakers should develop policies to enhance fiscal forecasting and expenditure analysis and strengthen budget management.

6.3 Study Limitations and Areas for Further Research

In light of the empirical findings, the widening budget deficits have significant effects on the exchange rate in Malawi, which implies that the continued growth of budget deficits continues to depreciate the Malawi Kwacha. The study investigated the effect of fiscal deficit on the exchange rate for Malawi. Specifically, the study examined the existence of the current account and inflation channel on the effect of fiscal deficit on the exchange rate. This study did not investigate the effect of fiscal deficit on exchange rate using other channels such as the interest rate channel due to data unavailability. The study failed to incorporate some variables such as inflation, and interest rate differentials between Malawi and foreign nations such United States of America due to data unavailability in its analysis, and further studies can look at that aspect if data can be available.

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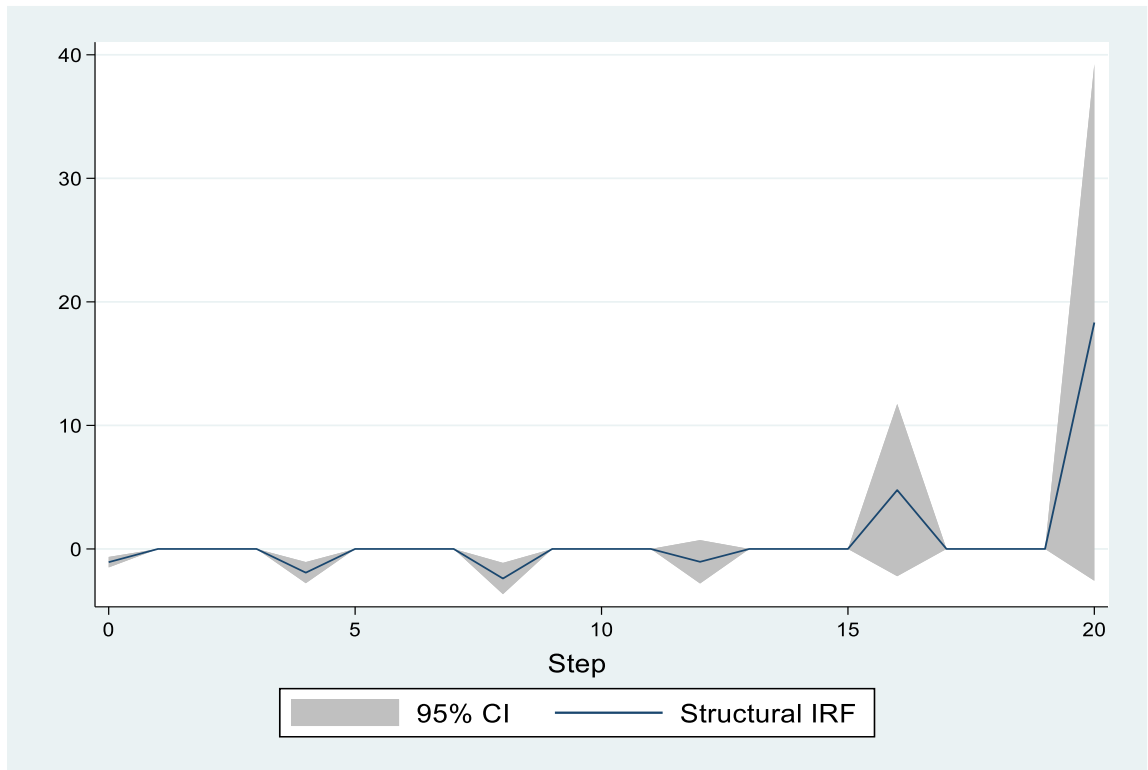
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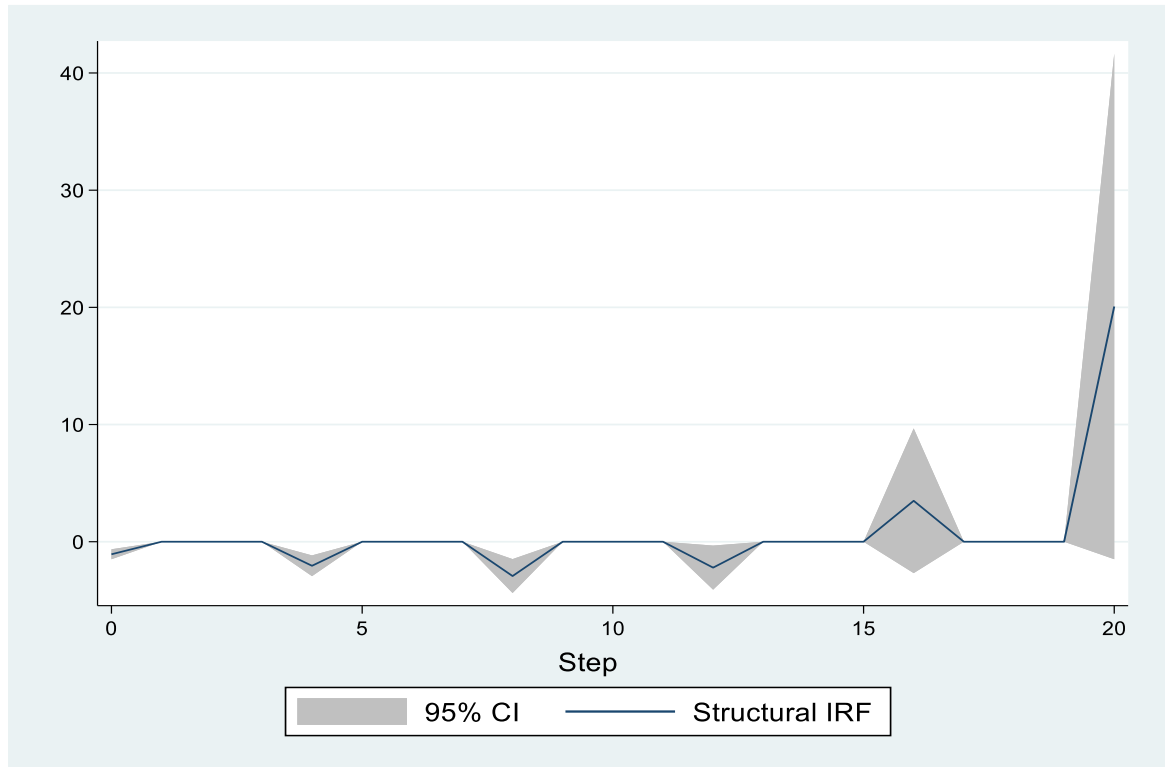
APPENDIX

Appendix 1: IRF on the effect of fiscal deficit on the nominal exchange rate in level form. The model has no exogenous variables



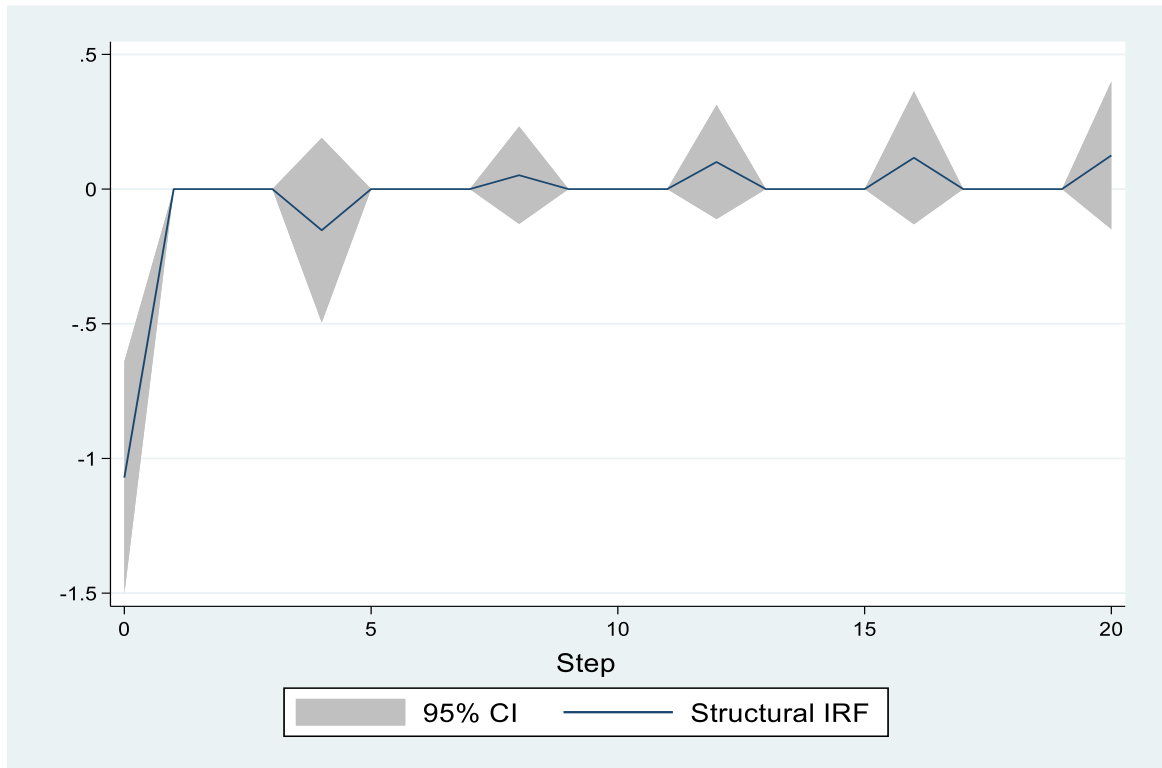
Interpretation: The upward increase of the curve towards zero means that a positive shock to the fiscal deficit has a statistically significant effect on the exchange rate. Ideally, in the short- run, there is a significant rise in the exchange rate for about 2 years. This is because the curve increases upwards at the beginning of the curve.

Appendix 2: IRF on the effect of fiscal deficit on the nominal exchange rate. A non-constant model with no exogenous variables. Variables are in level form



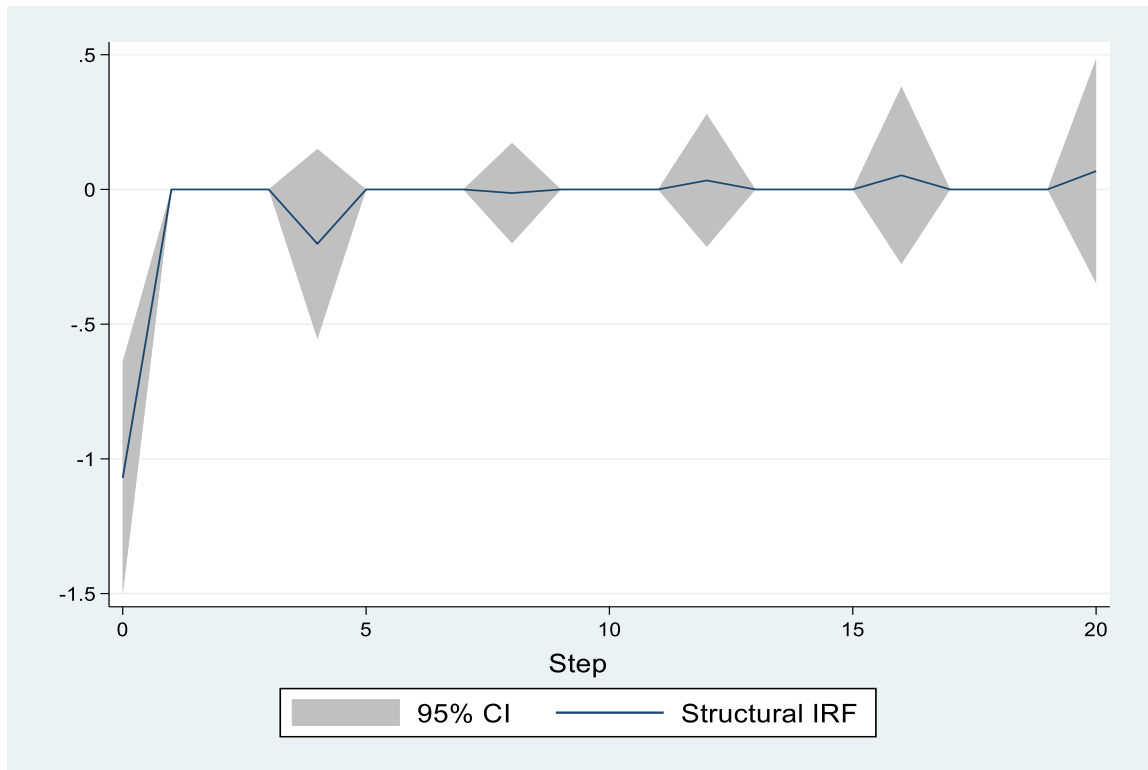
Interpretation: The upward increase of the curve means that a positive shock to the fiscal deficit has a statistically significant effect on the exchange rate. Ideally, there is a significant rise in the exchange rate for a period of about 2 years in the shortest term.

Appendix 3: IRF on the effect of fiscal deficit on the exchange rate. A non-constant model with exogenous variables. All Variables are in level form.



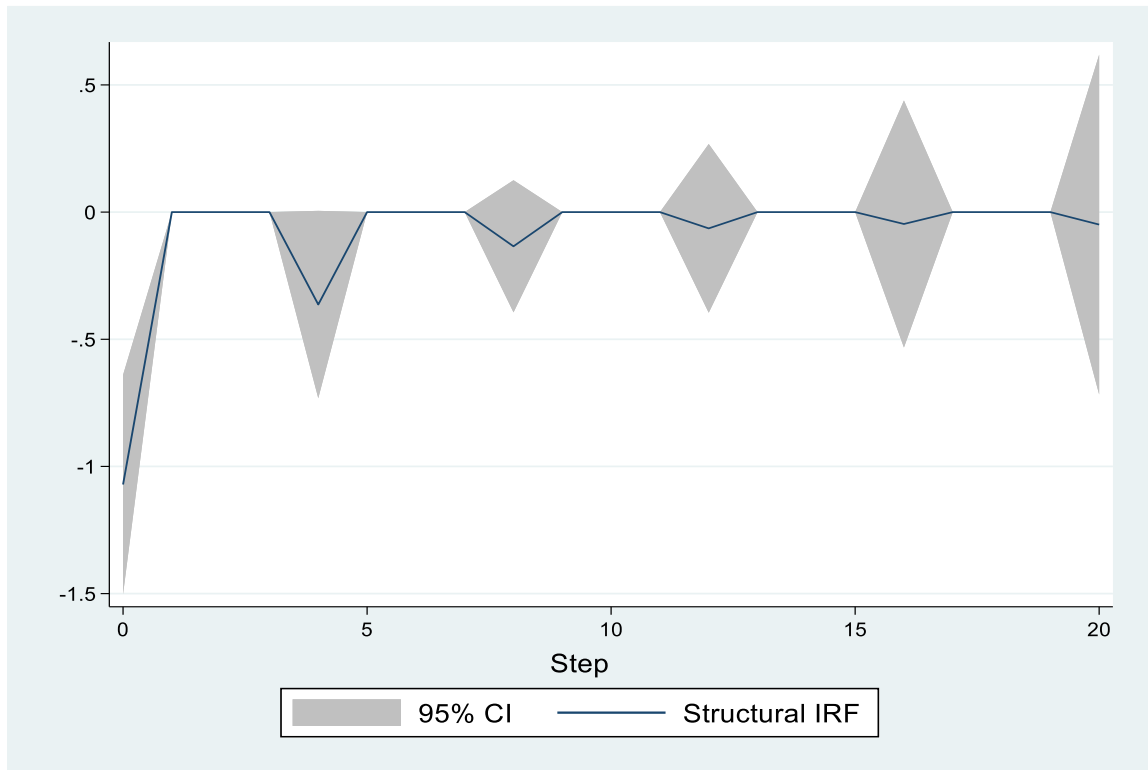
Interpretation: As the curve moves from -1 to 0, the upward increase of the curve means that a positive shock to the fiscal deficit will have a statistically significant effect on the exchange rate. Ideally, there is a significant rise in the exchange rate for a period of about 2 years in the shortest term.

Appendix 4: IRF on the effect of fiscal deficit on the nominal exchange rate in difference form.



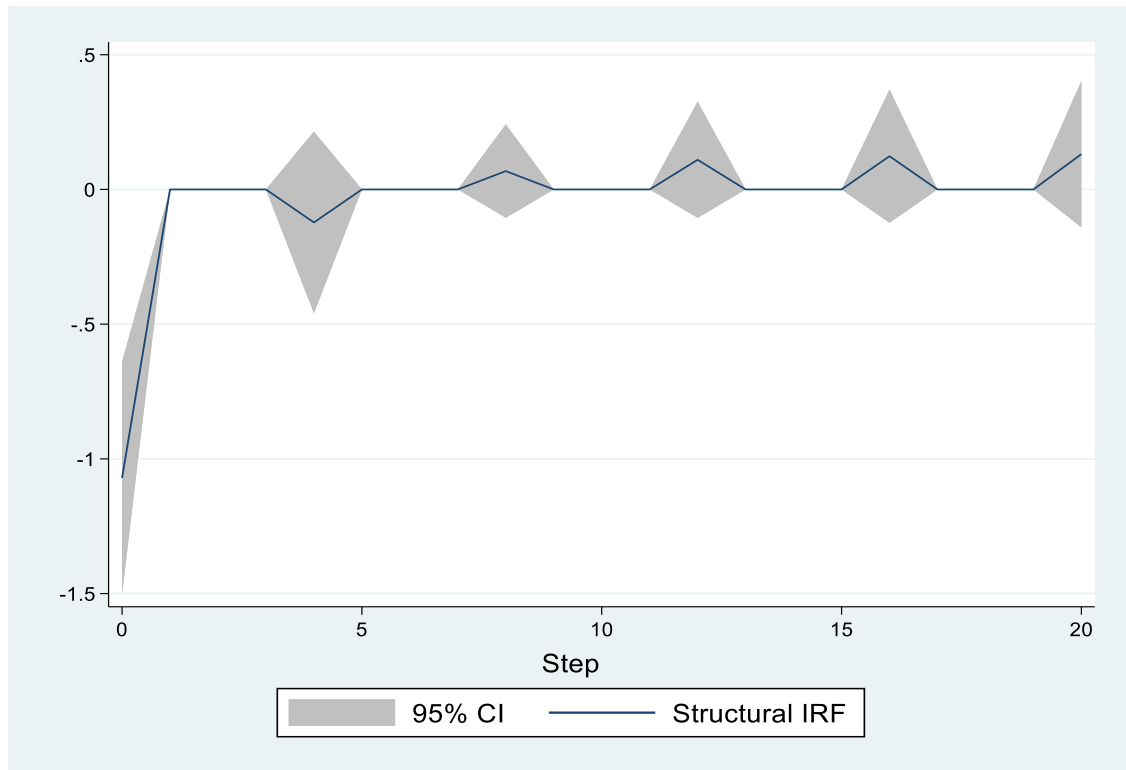
Interpretation: The upward increase of the curve from -1 to 0 means that a positive shock to the fiscal deficit will have a statistically significant effect on the exchange rate. Ideally, there is a significant rise in the exchange rate for a period of about 2 years in the short run.

Appendix 5: IRF on the effect of fiscal deficit on the nominal exchange rate in difference form with no exogenous variables. A non-constant model.



Interpretation: The upward increase of the curve means that a positive shock to the fiscal deficit will have a statistically significant effect on the exchange rate. Ideally, there is a significant rise in the exchange rate for a period of about 2 years in the short run.

Appendix 6: IRF on the effect of fiscal deficit on the exchange rate in difference form with exogenous variables. A non-constant model.



Interpretation: The upward increase of the curve means that a positive shock to the fiscal deficit has a statistically significant effect on the exchange rate. Ideally, there will be a significant rise in the exchange rate for a period of about 2 years in the short run.

Appendix 7: Data used in the study.

	Fiscal			Trade	Exchange		Balance of	Current
time	deficit	exch	GDP	balance	rate	Inflation	payments	account
					regimes		deficits	deficits
1981	5.20E+07	0.93	1.90E+09	7.50E+07	0	12	145667806	8.01
1982	3.40E+07	1.07	2.20E+09	6.90E+07	0	9.524	111697296	6.503
1983	2.70E+07	1.26	2.50E+09	6.90E+07	0	13.768	130833217	7.349
1984	6.40E+07	1.52	3.00E+09	3.50E+07	0	19.745	41746255	2.374
1985	7.30E+07	1.7	3.40E+09	4.90E+07	0	10.638	126394341	7.67
1986	7.10E+07	1.86	3.80E+09	1.60E+07	0	14.183	84855744	4.92
1987	1.50E+08	2.2	4.40E+09	1.50E+07	0	25.053	60603036	3.51
1988	1.00E+08	2.56	5.90E+09	1.20E+08	0	33.838	86858722	4.32
1989	1.10E+08	2.75	7.30E+09	1.40E+08	0	12.453	51238143	2.21
1990	1.60E+08	2.72	8.20E+09	1.10E+08	0	11.857	86189153	3.14
1991	1.80E+08	2.76	1.10E+10	2.60E+08	0	8.227	227694914	7.1
1992	1.90E+08	3.59	1.10E+10	3.30E+08	0	23.236	284907447	10.87
1993	7.50E+08	4.38	1.60E+10	2.50E+08	0	22.775	165554553	5.49
1994	1.10E+09	8.76	1.80E+10	2.80E+09	1	34.659	180682328	10.5
1995	2.40E+09	15.21	3.70E+10	1.90E+08	1	83.148	78039051	3.83
1996	2.50E+09	15.2	6.10E+10	2.30E+08	1	37.733	147425934	4.44
1997	8.50E+09	16.5	7.60E+10	3.40E+08	1	9.137	276209986	7.12
1998	1.00E+09	30.92	9.40E+10	9.10E+07	1	29.779	4375905	0.17
1999	1.60E+09	43.87	1.40E+11	2.60E+08	1	44.759	157545476	6.09
2000	5.60E+09	59.25	1.80E+11	1.90E+08	1	29.597	73496265	2.89
2001	1.20E+10	71.84	2.10E+11	1.70E+08	1	22.7	59950909	2.31
2002	1.40E+10	76.29	2.70E+11	3.20E+08	1	14.751	200692464	3.94
2003	1.10E+10	96.96	3.10E+11	2.90E+08	1	9.588	248981345	5.33
2004	8.80E+09	108.36	3.80E+11	4.80E+08	1	11.471	378990003	7.49
2005	2.70E+09	117.83	4.30E+11	7.00E+08	1	15.407	506710118	9.52
2006	4.00E+09	135.34	5.40E+11	5.40E+08	1	13.904	306571775	5.26
2007	8.90E+09	139.3	6.20E+11	6.60E+08	1	7.961	418027622	6.48

2008	2.70E+10	139.82	7.50E+11	9.80E+08	0	8.716	693385937	8.95
2009	1.20E+10	140.46	8.70E+11	8.90E+08	0	8.416	543633386	6.03
2010	2.20E+10	149.74	1.00E+12	1.40E+09	0	7.409	969288544	9.57
2011	2.10E+10	155.42	1.30E+12	1.30E+09	0	7.621	1136709793	9.76
2012	2.30E+10	246.62	1.50E+12	1.20E+09	0	21.296	744667770	8.49
2013	5.50E+10	355.41	2.00E+12	1.60E+09	1	28.279	1236186788	15.39
2014	9.80E+10	410.48	2.60E+12	1.40E+09	1	23.775	1128536960	12.82
2015	1.30E+11	490.52	3.20E+12	1.20E+09	1	21.83	1064422990	11.54
2016	1.40E+11	704.9	3.90E+12	1.20E+09	1	21.75	1005613300	12.71
2017	3.40E+11	716.56	4.50E+12	1.70E+09	1	11.58	1558043206	17.42
2018	3.60E+11	733.315	5.10E+12	1.80E+09	1	9.166	1705025812	17.25
2019	5.60E+11	737.61	5.70E+12	1.80E+09	1	9.33	1321052063	11.92
2020	5.70E+11	747.85	6.30E+12	1.90E+07	1	8.5	1638679484	13.6
2021	8.20E+11	763.58	7.00E+12	2.00E+09	1	9.25	1917650722	15.24