AID AND REAL EXCHANGE RATE DYNAMICS IN MALAWI

By

BANDA, HEADWICK NJOKA

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
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ABSTRACT

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By

Banda, Headwick Njoka

This study sought to determine the relationship between ODA and real effective exchange rate (REER) in Malawi by using time series data for the period 1980 to 2010. The Error Correction Mechanism was employed based on the time series properties of the data as well as the superiority of the technique in analyzing the dynamics during the transition from the short run to the long run. The regression results do not only support the Dutch Disease theoretical postulation that aid appreciates the REER in Malawi but also show that the observed REER overshoots its long run equilibrium level in the short run. In other words, a reduction in, or suspension of, ODA leads to a depreciation of Malawi's currency and the adjustment to this depreciated equilibrium level will be volatile in the short run.

The policy implication, therefore, is that both the donors and, most importantly, the Government of Malawi should moderate the REER volatility in the short and neutralize the aid-induced appreciation of the REER in the long run. To achieve this, Malawi may consider accumulating some reserves; improving the CAB by cutting on luxury imports and expanding exports; and offsetting the loss in competitiveness triggered by aid-induced appreciation of the REER by investing aid in areas that lower overhead cost of producing exports. On their part, donors ought to make ODA predictable through multi-year commitments while giving the government discretion on the sectors where to allocate the ODA to.

Key words: Cointegration, Impulse Response, One Standard Deviation of an Innovation, and REER appreciation

DEDICATION

To my late dad, Mika Matchipitsa

ACKNOWLEDGEMENTS

To God be the Glory for His Grace and Mercy has seen me this far. Indeed with You, Lord, "…the race is not to the swift, nor the battle to the strong … but time and chance happens to them all" as it has to me. Long live Prophet T. B. Joshua! Long live www.emmanuel.tv!

My profound gratitude goes to my wonderful supervisors, Professor Cho, Dongchul and Professor Kim, Taejong for their relentless support and guidance throughout my study. The same applies to all my Professors at KDI School for the knowledge and wisdom they have imparted on me. I will never be the same again as the adage goes, "a man's mind, once stretched by knowledge, never returns to its original size". Furthermore, I am deeply thankful to the Global Ambassador Scholarship Programme at KDI School of Public Policy and Management for enabling me to study in South Korea. A mention also be made of all my classmates from all corners of the Earth; you expanded my conception of the beauty of our mother Earth – keep smiling, guys! For my Korean friends, you made me feel at home, continue being warm-hearted. My family's role cannot be overemphasized. You kept patting me on the back all the way. My brother, Medson, thank you for the fatherly love.

May God Almighty Bless You All.

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LIST OF ACRONYMS

DAC	Development Assistance Committee
DEVPOL	Statement of Development Policies
GDP	Gross Domestic Product
GNI	Gross National Income
GoM	Government of Malawi
HIS	Integrated Household Survey
IMF	International Monetary Fund
MDGs	Millennium Development Goals
MGDS	Malawi Growth and Development Strategy
MPRS	Malawi Poverty Reduction Strategy
NSO	National Statistical Office
PAAP	Poverty Alleviation Programmes
OECD	Organisation of Economic Co-operation and Development
RBM	Reserve Bank of Malawi
REER	Real Effective Exchange Rate
SADC	Southern African Development Community
UNDP	United Nations Development Programme

CHAPTER ONE: INTRODUCTION

1.1 Overview

This paper assesses the impact of aid on REER in Malawi, a small low income country receiving aid worth 21 percent of its GDP in the last three decades. This aid is sometimes conditional on, and usually Malawi follows, exchange rate regimes recommended by the IMF. In 2010/11 financial year, Malawi lost donor support [1]. In December, 2012, IMF recommended at least 40 percent devaluation of the local currency after aid suspension. With change of government, the local currency was devalued by 49 percent and floated against other currencies on 7th May, 2012 in order to unlock the suspended aid[2].

By September, 2012, Malawi was leading the Southern African Development Community (SADC) region in headline inflation, at 28 percent (Malawi NSO 2012). Figure 1 below shows that inflation responded to the devaluation with no lag. The inflation lowered the real wages, leading to widespread industrial actions and strikes as workers demanded pay increases[3]. This could lead to more unemployment and induced rural-urban migration as Harris-Todaro migration model states (Todaro and Smith 2011).

Meanwhile, the combination of further downward pressure on the exchange rate and continued inflationary pressure[4] due to further weakening of the Kwacha following the

[1] Mainly due to concerns on governance and souring diplomatic relations with Britain (the Guardian, 2011).
[2] Reserve Bank of Malawi Press Release, 7th April, 2012 <http://www.rbm.mw/documents/press_releases/Press%20Release%20on%20Malawi%20Kwacha%20Devaluation.pdf>.
[3] Chiyembekeza Chikondi. 2012. Malawi's 2012 GDP to Slow Down. *Nation Newspaper.* Sept. 11.
[4] The high inflation rate is even creating expectations of further depreciation of the Kwacha based on the predictions of the PPP theory of exchange rate (Feenstra and Taylor 2008).

floating exchange rate regime[5] have sparked debate[6] in Malawi on the impact of aid on the exchange rate and what could be done about it. While some suspect that aid had been sustaining an overvalued local currency, others suspect lower export prices to be the cause. Still, others are just wondering whether the Reserve Bank of Malawi (RBM) was right in not only devaluing the local currency but also floating it[7]. Furthermore, it is not clear if the IMF and RBM devaluation figures (40 percent and 49 percent, respectively) could be explained by aid suspension alone or not. If aid suspension could account for all the devaluation level, then such a currency crisis[8] would be expected to lead to other financial crises like banking crisis, default crisis or even political crisis.

This paper sought to systematically assess if Malawi is having the symptoms of Dutch Disease by answering the following specific questions among others: does ODA affect REER in Malawi? How did IMF and RMB arrive at 40 and 49 percent devaluation values? Besides aid, are there other factors that can explain real exchange rate dynamics in Malawi? Finally, what can be done about aid utilisation and/or allocation in Malawi?

1.2 Historical Underpinnings of the Study

Dutch Disease is a term first used by *The Economist* to refer to a scenario where large foreign exchange earnings from the surge in North Sea oil exports from Holland appreciated

[5] NICO Asset Managers ,2012, and National Bank of Malawi, 2012.
[6] This debate is a continuation of prior debates on the role of aid in Malawi and whether government had to secure more aid at any cost or give up on it. The Government was first accused of not prioritizing economic growth and people's welfare when it lost aid due to failure to meet aid conditions. It was argued that aid suspension led to shortage of fuel, forex and medical supplies. However, after a change in leadership, the government softened up on its policies and devalued the local currency by 49 percent to meet the aid conditions set out by IMF (RBM 2012). But the government was again blamed for being a puppet of the donors instead of finding better means of securing economic growth because Malawi had already failed to grow after decades of aid. These two opposing arguments do not only pose a policy dilemma on the government but also shows underlying lack of consensus on the impact of aid in Malawi. Thus, understanding the impact of aid on REER would be one clue to the impact of aid in Malawi.
[7] Malawi voice, 2012
[8] Malawi is in a currency crisis by the definition of Feenstra and Taylor (2008) who define currency crisis as a 30 percent minimum loss in currency value in a year.

Holland's currency, thereby constricting the growth of her export sector due to lowered competitiveness. Overtime, scholars have argued that a surge in foreign exchange inflows, even in form of aid, will have similar impacts on the recipient economy. Thus, Dutch Disease now is debated more within the context of foreign aid.

Other authors tried to test for Dutch disease. For example, Elbadawi, Kaltani and Soto (2012), and Fielding and Gibson (2012) conducted cross country analyses for Dutch disease from aid in the Sub-Saharan Africa (where Malawi lies) and found evidence that aid contributes to real exchange rate misalignments in the region. Similarly, Issa and Ouattara (2008) found evidence of Dutch Disease in Syria, and Sackey (2001) found that aid depreciates real exchange rate in Ghana.

This study departs from the previous studies in that it is the first time series study for Malawi, at least to the current knowledge of the author. All previous studies were cross-country studies and so were their policy recommendations. To this effect, this study expects to find relevant and specific policy options for Malawi.

1.3 Statement of the Problem and Relevance of the Study

Malawi remains a low income country despite decades of aid. In the 2011/12 fiscal year, it was noted that aid suspension exerted immediate depreciation pressures on the exchange rate. Apparently, the aid was sustaining the exchange rate at some overvalued level, which was no longer sustainable in the absence of aid. If it is true that aid leads to appreciation of the REER, then one would think that reducing or removing aid would be a solution. However, the

immediate and negative impacts of the 2011/2012 aid suspension on the Malawi economy[9] suggest that Malawi still needs aid. Thus, policy makers need not avoid aid but mitigate its negative impacts so as to make aid compatible with the government's efforts "…to transform the country [Malawi] from being a predominantly importing and consuming economy to a predominantly manufacturing and exporting economy", as stipulated in Malawi's development blue print, the MGDS (2006, iii). This can be possible only if we establish the exact relationship between aid and macroeconomic fundamentals like exchange rate, hence, this study.

1.4 Objectives of the Study and Hypotheses to be tested.

Puzzled by the immediate and negative impacts of the aid suspension on the one hand and the currency devaluation and the exchange rate floatation on the other, this paper tests the impact of aid on REER. The ultimate goal is to provide policy recommendations on better allocation and utilisation of aid in Malawi.

Specific objectives of the study are as follows:

- To find out the relationship between aid and REER in Malawi.
- To explore other factors, apart from aid, which affect REER in Malawi.
- To investigate the proportion of the 2012 Malawi Kwacha devaluation that could be accounted for by aid suspension alone.

The study will, therefore, test the null hypotheses that aid, as well as each of the other variables, does not affect the REER both in the short run and the long run.

[9] The immediate economic hardships experienced since the aid suspension in 2011/12 financial year (2012/13 Malawi National Budget) may suggest aid dependence. They included shortage of forex, fuel and medical supplies.

1. 5 Organization of the Paper

This chapter has introduced the topic under study and the rest of the paper is organized as follows: Chapter two is the Literature Review subdivided into an overview of the Malawi economy[10], theoretical literature and the empirical literature. Chapter three presents the methodology used in the study while chapter four discusses the results of the regression equations, and it is followed by conclusion and policy recommendations in chapter five.

[10] For those with prior knowledge of the Malawi economy, this section is optional.

CHAPTER TWO: LITERATURE REVIEW

This chapter discusses the overview of the Malawi economy, the theoretical literature and some empirical studies on aid-induced exchange rate responses. In the theoretical literature, I revisit the genesis of the relationship between aid and REER (the Dutch Disease) while in the empirical literature, I summarize what other scholars have found elsewhere, and then show why it is still necessary to conduct this study in Malawi.

2.1 Context of the Study: The Malawi Economy

2.1.1 Overview

Malawi is a low income country (World Bank reported a GNI per capita of US$860 in 2010), whose economy is dominated by agriculture sector hitherto[11]. It is generally characterized by relatively low rates of GDP growth, high interest rates and volatile exchange rates except for the 2005-2010 period[12]. However, the economic gains of this period were immediately eroded by the suspension of donor support in 2011 which led to shortage of foreign exchange, and imported essential commodities like fuel, [medical supplies] and other intermediary goods[13]. Figure 1 shows that inflation rate responded with no time lag to the devaluation in May, 2012. Figure 2 suggests that the behaviour of ODA and per capita GDP are not strictly synchronized.

[11] It employs about 85% of the labour force, accounts for over 80% of the foreign exchange earnings. Tobacco alone contributes over 60% of the foreign exchange earnings (Mangani, 2011:7)
[12] Several Annual Economic Reports for Malawi.
[13] See African Economic Outlook <<http://www.africaneconomicoutlook.org/en/countries/southern-africa/malawi/>>.

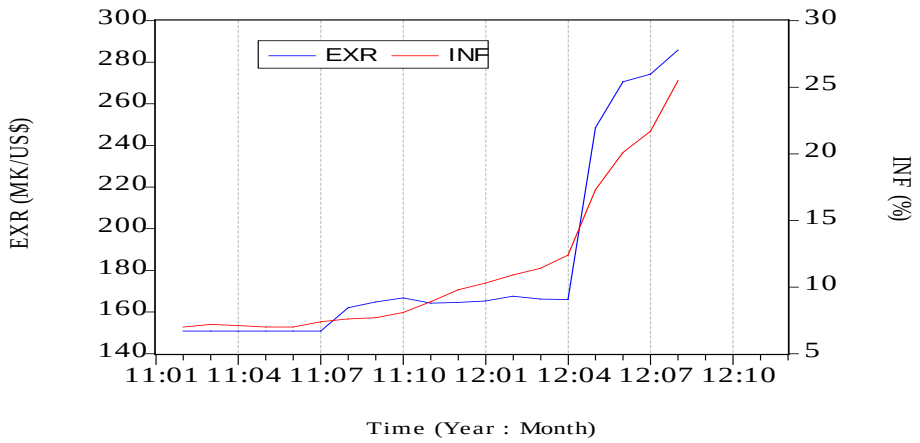


Figure 1: Inflation and Exchange Rate Before and After Devaluation

Source: Author using Malawi Central Bank and National Statistical Office data

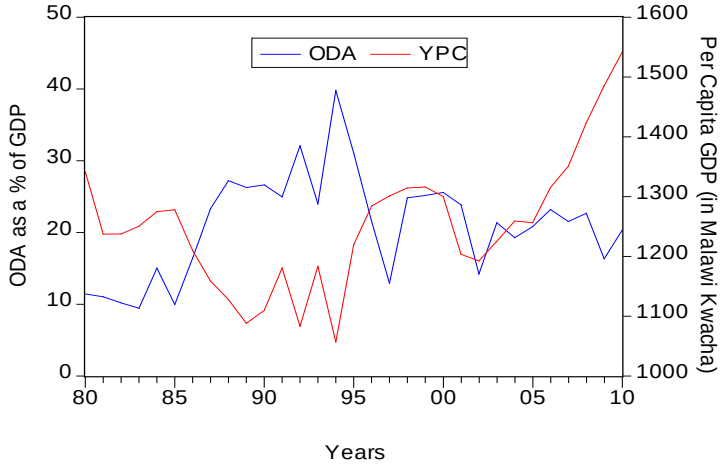


Figure 2: The Behaviour of ODA and per Capita GDP

Source: Author using World Bank data

That aside, the Government of Malawi (GoM) has been trying several economic growth policies and strategies, most of them with donor support, but to no avail. This prolonged lack of growth despite donor support cast doubt on the complementarities among aid, development strategies and economic growth in Malawi. Such thinking convinced the GoM to implement a balanced budget in 2011 after the aid suspension. However, the immediate

worsening of the economic situation during the implementation of Malawi's first ever zero-deficit budget has been a bad awakening that Malawi is not ready to graduate from aid. Thus, this study seeks to make suggestions on how best Malawi could utilize aid so that she can gradually graduate from it.

2.1.2 Development Planning in Malawi

Development planning in Malawi is done at three levels, namely: long term (through the Vision 2020); medium term (through the MGDS, which is also a localisation of the MDGs); and short term (through the national budget).

The history of the medium term development policies dates back to colonial era but this paper traces it from the independence year, 1964. In the 1960's through to 1980's, planning was achieved through 10 year Statement of Development Policies (DEVPOL's). These policies emphasised the role of public enterprises in development. From the 1980's to 2000 the public entities were viewed as draining government resources, hence, medium term planning changed to Structural Adjustments Programs (SAPs), with advice from the World Bank and IMF. The idea was to commercialise and/or privatise public entities in order to lessen the fiscal burden on the government, and liberalise markets. However, this led to job losses[14], more poverty (65.3 percent) and income inequality (Gini coefficient of 0.52) (IHS 1998 cited in MPRS 2002).

From 1994, Malawi adopted the Poverty Alleviation Programme (PAP), which sought to alleviate poverty by raising "national productivity through sustainable broad-based economic growth and socio-cultural development" but never met its objective (MPRS 2002, xi). Thus,

[14] (Clark 1991, Chipeta1993, Chinsinga 1995) cited in Chinsinga Blessings 2003,

from 2000 to 2005, medium term planning was guided by the Malawi Poverty Reduction Strategy Papers (MPRS).

It was later discovered that MPRS emphasised poverty reduction more than economic growth, such that the economy was registering negative growth (MGDS 2006, 4). Thus, the Malawi Economic Growth Strategy (MEGS) was formulated to go along with MPRS to stimulate economic growth. MPRS ex-post evaluation showed the need for an overarching development strategy that targets both poverty reduction and economic growth. Thus, the MGDS I (followed by MGDS II in 2011/12) were formulated for the 2006 until 2015 period, and the overall objective is "to reduce poverty through sustained economic growth and infrastructure development" (MGDS 2006, ii).

During the first years of MGDS, Malawi economy registered strong growth as can be seen in the Figure 2 below. However, Malawi lost donor support to the 2011/2012 budget and the economy slowed down from 5.8 percent growth in 2011 to a projected 4.3 percent growth due to shortages of foreign exchange, fuel medical supplies and other imported intermediate goods, yet inflation rate more than doubled after the local currency was devalued by 49 percent[15]. As a result, government has come up with an Economic Recovery Plan which is being implemented alongside the MGDS for the next 2-5 years (Malawi Economic Recovery Plan, 2012) in order to stimulate the economy in the short and medium run. Thus, the impact of aid suspension has been so immediate and gross that systematic quantification is urgent. This paper is one step towards the same.

[15] African Economic Outlook

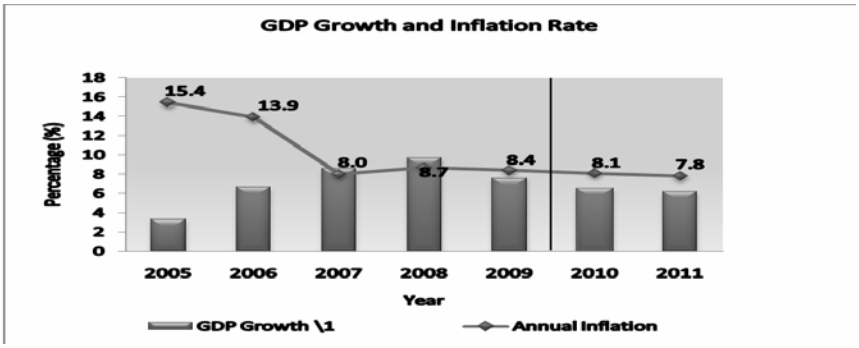


Figure 3: Malawi's Economic Performance During MGDS I

Source: Malawi Annual Economic Report, 2010

2.1.3 The Aid Story in Malawi.

Malawi has been receiving aid since 1960s (World Bank Indicators). Ironically, to date, there are no signs that she can graduate from aid as evidenced by the negative impacts of aid reductions or suspensions in 2001, 2004 and 2010/11. For example, acute shortage of forex which exerts depreciation pressure on the exchange rate, hence, nurturing parallel forex markets[16]. However, the aid has usually been conditional on Malawi implementing some policy reforms. For example, Malawi had to implement Structural Adjustment Programs (SAPs) in the 1980/90s to qualify for aid, and had to devalue the local currency by about 49 percent in 2012 in order to "unlock" or re-start suspended aid[17]. Whether these policy reforms are to the benefit of Malawi's economy remains an empirical matter.

2.1.4 Overview of Exchange Rate Determination History in Malawi.

Over the years, Malawi has practiced fixed, pegged, as well as floating exchange rate regimes, each having been necessitated by some economic goals as per prevailing circumstances. Table 1 presents a summary of the regimes. Overall, we note that the evolution of Malawi's

[16] www.guardian.co.uk/global-development/2011/jul/14/britain-suspends-aid-to-malawi.
[17] RMB Press release on the devaluation of the Kwacha states that the devaluation was a way of meeting the condition for aid.

exchange rate regimes has been a learning process, with each change learning from the shortfall of the preceding one.

Table 1: Exchange Rate Regimes in Malawi[18]

Period	Exchange Rate Regime
1965-1973	British Pound Sterling per Malawi Pound (MP) par value system: The MP (now MK) mimicked the British Pound Sterling in its fluctuations.
1973-1975	Peg to a basket of British Pound Sterling and the US Dollar.
1975-184	The peg to the IMF SDR: MK was pegged to IMF's Special Drawing Rights (SDR). The USD was used as the intervention currency based on SDR-US exchange rate.
1984-1994	Peg to the weighted basket of seven currencies: The MK was de-linked from the SDR (following crop failure and the disruption of the main sea-route to the ports of Beira and Nacala in Mozambique due to civil war).
1994-2004	Floatation of the MK against a basket of currencies: Supported by the IMF and World Bank under the SAPs.
2004-2012	Then Managed, now Floating regime

2.2 Theoretical Framework

Inspired by experiences surrounding the discovery of North Sea oil in Holland, macroeconomists have endeavored to draw some insights onto contemporary issues in international foreign exchange flows. This sets the theoretical link between aid flows and recipient's macroeconomic fundamentals and may cast doubt on earlier thinking that aid will automatically help the recipient countries grow (Rajan and Subramanian 2009).

2.2.1 The Dutch Disease

Dutch disease originally referred to the scenario whereby natural resources export earnings induce REER appreciation and a corresponding decline in the traded sector (Corden and Neary 1982). It originates from the discovery of North Sea oil in Holland[19] which led to a boom in natural resource exports (surge in foreign exchange inflow) in the 1960s. But this

[18] The Reserve Bank of Malawi provides the details of the Evolution of Exchange Determination in Malawi <<http://www.rbm.mw/documents/research_papers/EVOLUTION%20OF%20EXCHANGE%20RATE%20DETERMINATION%20IN%20MALAWI.pdf>>.

[19] Dutch Disease was also initially discussed with reference to "minerals in Australia, natural gas in the Netherlands, … [and] oil in the United Kingdom, Norway and some members of OPEC" (Corden and Neary 1982, 1).

appreciated her currency, and made manufactured exports less competitive relative to those of other countries.

Thus, the weakening of the natural gas industry in the 1970s made the Dutch economy suffer from high inflation, lower rates of growth, and high unemployment rates, hence, the name Dutch Disease coined by *The Economist* of 26th November, 1977 (Corden 1984). Overtime, scholars have debated Dutch disease in other countries[20], but most importantly, they have borrowed the concept onto the analysis of the impact of aid and FDI on the recipient countries. Mine is one of such studies.

In his explanations of the theory of Dutch disease, Van Wijnbergen (1985, 1986) argues that if the proportion of aid spent of non-tradable goods sector is higher than that spent on tradable sector (which is the likely case in Malawi because most aid allocated to social sectors by the donors) then the domestic prices will tend to rise resulting in a REER appreciation (if we define REER as the relative price of non-tradable goods to tradable goods). This constrains export growth. However, from the Neo-classical growth model, aid (if invested) can lead to faster growth through capital accumulation[21]. Thus, the ultimate impact of aid may not be known without conducting an empirical study (Torvik (2001), and Adam and Bevan (2003)).

2.2.2 Aid Categorisation

This paper distinguished aid from ODA, a definition once used by Moyo (2009) but well articulated by Lancaster (2007) who identifies two types of financial flows to developing

[20] Kayizzi-Mugerwa (1990) and Gillis, Perkins, Roemer and Snodgrass (1996) discusses it with respect to copper mining in Zambia and oil in Nigeria, respectively.
[21] Burnside, Craig and David Dollar (2000) "Aid, Policies, and Growth," *American Economic Review* 90(4) (September): pp. 847–68

countries: Private and Official. The official flows (aid) can be ODA or Other Official Flows (OOF). ODA refers all international financial flows from governments and their agencies to OECD/DAC designated developing countries, with the aim of promoting economic growth and development and people's welfare, and have an at least 25 percent grant element. Moyo (2009) categorised aid into three: humanitarian assistance or emergency aid; charity-based aid; and systematic aid. Whatever the definition of aid, it would be appealing to include all forms of aid in the analysis, but this paper only focuses on ODA for two reasons: Firstly, the other forms of aid, as Moyo (2009) also notes, are usually too small and/or short-lived to significantly affect the macroeconomy. Secondly, there is reasonable consensus on the importance of charity and humanitarian aid. In fact, donors tend to capitalise on this consensus to "…disguise the fundamental (yet erroneous) [reality] … that aid, whatever its form [or utilisation], is a good thing" (Moyo 2009: 8) *a priori*.

2.3 Empirical Literature

Several studies have been conducted on the impact of aid on economic growth and export promotion via REER responses in recipient countries. Their results are mixed. In Uganda, Adam and Bevan (2003) found that Dutch Disease effects were present in the short run, beyond which the relationships among aid, real exchange rates and welfare were less straightforward than usual models of aid would suggest. In Ghana, Sackey (2001) found out that aid depreciated the REER, a result which was later counter-argued by Opoku-Afari, Morrissey and Lloyd (2004) who used Vector Autoregressive (VAR techniques and found that aid appreciates the REER for Ghana in the long run. Also, White and Wignaraja, (1992) found evidence of appreciation from aid in Sri Lanka.. On the contrary, Ogun (1998) failed to find evidence of real exchange rate appreciation impact of aid in Nigeria, just as failed Nyoni (1998) in Tanzania and Ouattara and Strobl (2004) in CFA Franc Zone.

2.4 Chapter Summary

This chapter has presented the overview of the Malawi economy as a way of contextualizing the study. Thereafter, the theoretical literature highlighted the genesis of Dutch disease school of thought, and its evolution. It also summarized the categorization of aid. Finally, the empirical literature informed the reader that there is evidence of Dutch disease but not in all recipient countries. Thus, it is important to test for it in Malawi.

CHAPTER THREE: METHODOLOGY

3.1 Chapter Overview

This chapter discusses the study's model specification and estimation, the measurement of the variables and the expected signs of the parameter estimates of each variable. Thereafter, the chapter describes the data and its source. This is followed by a discussion of not only the time series properties and problems of the variables but also how they are dealt with. The last part of the chapter highlights the diagnostic tests conducted.

3.2 Specification and Estimation of the Model

This study regresses REER on ODA (as well as aid) and other explanatory variables using the Error Correction Mechanism in E-Views software. I adopt, with modifications, a model developed by Edwards (1989)[22] which assumes relatively perfect competition in a small, open economy in which the government consumes both tradable goods and non-tradable goods. Its spending is financed by tax revenue, borrowing and donations (aid) from abroad. Edwards (1989)'s discussion on real exchange rate is extended to REER to account for trade weights and prices variations overtime.

The model of Edwards (1989) is well suited for Malawi's real exchange rate system because the model is designed to identify the determinants of exchange in a fixed exchange rate regime, which has been the case with Malawi for some time as in Table 1 above. Besides,

[22] Its note worthy that Edwards (1989) was inspired by Corden and Neary (1982) whose work is considered novel in Dutch Disease theory. They assumed a two tradable goods and one non-tradable good small economy. One of their conclusions is that booms resulting from external shocks to a small open economy (of which ODA is one for Malawi) may lead to appreciation (sometimes depreciation) of the local currency. His model was also inspired the writings of Mathinsen (2003).

Malawi is a relatively open economy, and a net importer of both investment and consumption[23]. Thus, I adopt the following functional relationship:

$$REER = f(ODA_t, CAB_t, TOT_t, FDI_t \ldots) \ldots\ldots(1)$$

where REER is real effective exchange rate; ODA is Official Development Assistance as a percent of GDP; CAB is current account balance, proxied by trade balance; TOT for Terms of Trade is the ratio of the export price to the import price, and FDI is net inflows of Foreign Direct Investment as a percent of GDP.

Since all variables had unit roots, and they were cointegrated, error correction mechanism was used. Thus, the functional relationship in (1) above becomes the error correction models in (2), (3) and (4) below, with changes in the composition of regressors:

$$D(LN(REER))_t = \delta[LN(REER)_{t-1} - \beta_0 - \beta_1(ODA)_{t-1} - \beta_2(CAB)_{t-1} - \beta_3 LN(TOT)_{t-1} - \beta_4 FDI_t] + \alpha_0 + \alpha_1 \Delta LN(REER)_{t-1} + \alpha_2 \Delta ODA_{t-1} + \alpha_3 \Delta FDI_{t-1} + \alpha_4 \Delta CAB_{t-1} + \alpha_5 \Delta LN(TOT)_{t-1} + \varepsilon_t \quad \ldots.(2)$$

$$D(LN(REER))_t = \delta[LN(REER)_{t-1} - \beta_0 - \beta_1(ODA)_{t-1} - \beta_2(CAB)_{t-1} - \beta_3 LN(TOT)_{t-1}] + \alpha_0 + \alpha_1 \Delta LN(REER)_{t-1} + \alpha_2 \Delta ODA_{t-1} + \alpha_3 \Delta CAB_{t-1} + \alpha_4 \Delta LN(TOT)_{t-1} + \varepsilon_t \quad \ldots.(3)$$

$$D(LN(REER))_t = \delta[LN(REER)_{t-1} - \beta_0 - \beta_1(AID)_{t-1} - \beta_2(CAB)_{t-1} - \beta_3 LN(TOT)_{t-1}] + \alpha_0 + \alpha_1 \Delta LN(REER)_{t-1} + \alpha_2 \Delta AID_{t-1} + \alpha_3 \Delta CAB_{t-1} + \alpha_4 \Delta LN(TOT)_{t-1} + \varepsilon_t \quad \ldots(4)$$

where δ is the error correction coefficient and it is expected to have a negative sign[24]; and ε_t is the white noise error term.

[23] Degngol-Mathisen (2003) discusses these issues in detail.
[24] When the observed REER is below its long run level, then it will be expected to rise to its long run equilibrium level in the next period. The opposite is also true.

3.3 Measurement of Variables and Expected Signs

3.3.1 Real Effective Exchange Rate (REER)

The REER refers to the exchange rate that accounts for relative prices and relative trade weights between the home country and its trading partners (Cho 1996). This is the dependent variable for this paper, measured as basket(s) of foreign goods per basket of Malawian goods. Thus, an increase in REER means appreciation, and vice versa.[25]

3.3.2 Aid and ODA

This paper uses the aid categorisation and definition by Lancaster (2007) and splits aid into ODA and OOF as stated in Section 2.2.3 above. In Malawi's case, ODA alone accounts for about 80 percent of the total aid, hence, it could be used as proxy of all aid. However, in order to understand the difference between the level of currency devaluation that IMF recommended to Malawi (40 percent) and the actual level of devaluation (49 percent), the paper also uses aid instead on ODA in one of the regressions. Both ODA and aid are expressed as a percent of GDP. We expect a positive coefficient because, from a theoretical perspective, an increase in ODA implies an increase in the supply foreign currency relative to local currency thereby making local currency expensive in terms of foreign currency which we call appreciation of the local currency.

3.3.3 Current Account Balance (CAB)

CAB is proxied by the Trade Balance as a percent of GDP because it is the most significant component in Malawi's CAB. An increase in exports means that the CAB is improving and more of foreign currency is being supplied. Thus, appreciation of the Malawi Kwacha is

[25] This is based on IMF definition, which is also used by the World Bank, the source of the data used in this study. See *IMF Country Report* No. 10/87, Pp 8.

expected (assuming at least a less than proportionate increase in Malawi's money supply). This implies that we expect a positive sign for the coefficient estimate for CAB.

3.3.4 Terms of Trade (TOT)

TOT refers to the ratio of the export price to the import price, usually, expressed as a percent. Thus, 100 percent means one for one TOT, if a country's TOT is more than 100 percent, then there is net inflow of foreign exchange which would appreciate the local currency and vice versa. Thus, a positive sign for the coefficient estimate is also expected.

However, other authors had previously argued that the sign is indeterminate *a priori.* For example, Opoku-Afari, Morrissey and Lloyd (2004) assert that TOT reflects the interaction of the forces of supply and demand in the tradable goods sector. In their view, improvements in the TOT encourage producers to allocate more resources to export production sector, and vice versa, as predicted in the Dutch Disease theory. This change in factor allocations leads to income and substitution effects. Thus, the impact of the Terms of Trade on the REER may be indeterminate because it is a product of the relative strengths of income and substitution effects. If the income effect associated with TOT deterioration is stronger than the substitution effect, a depreciation of the *REER* will occur and vice versa.

3.3.5 Foreign Direct Investment.

The theoretical expectation is that an increase in FDI will lead to an appreciation in the REER because there is an increase in the supply of foreign currency. Thus, we expect a positive coefficient estimate for this variable.

3.4 The Data and Data Sources

The study used annual time series data for Malawi from 1974 to 2010, sourced from the World Bank database. Some variables were re-calculated to suit the variable definitions adopted in this paper. The choice of the sample period was based on data availability.

3.5 Time Series Properties of the Variables

3.5.1 Stationarity and Unit roots

The OLS estimation and hypothesis testing technique assumes that the means, variances and auto-covariances of a time series are constant and/or time independent (Wooldridge 2009). If these assumptions hold, then the time series is a stationary stochastic process and the mean, variance and other statistics based on a small realization (sample) are relevant for a larger realization (population) and may be considered good approximations of statistics for the rest of the stochastic process. On the contrary the mean, variance and other statistics based on a small realization of a non-stationary stochastic process cannot be used to make inferences about the entire realization. In that case, the relationship among the variables is termed as *spurious regression* and such statistics as *t*, R-Squared or F statistic may give misleading results, hence, are inapplicable (Granger and Newbold 1974 cited in Wooldridge 2009). This study tests the variables for unit roots.

3.5.2 The Dickey-Fuller Test for Unit Roots

Dickey and Fuller (1979)[26] came up with a procedure for formally testing for nonstationarity. The test is equivalent to testing for the presence of a unit root and is

expressed as;

$$X_t = \alpha X_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

[26] Cited in Gujarati (2003)

Where ε_t is a white noise error term and an α that is statistically equal to one implies the presence of a unit root and, thus, the time series is nonstationary. In terms of differencing, (2) may be re-written and simplified as in (3) - (5) below.

$$X_t - X_{t-1} = \alpha X_{t-1} - X_{t-1} + \varepsilon_t \quad (6)$$

$$\Delta X_{t-1} = (\alpha - 1) X_{t-1} + \varepsilon_t \quad (7)$$

$$\Delta X = \lambda X_{t-1} + \varepsilon_t \quad (8)$$

$$\text{where } \lambda = (\alpha - 1) \quad (9)$$

Unlike equation (5), the null hypothesis in equation (8) tests if λ is statistically the same as zero. Failure to reject the null hypothesis implies that α is statistically the same as 1, hence, shows the existence of a unit root. Similarly, rejection of the null hypothesis implies absence of unit root and, therefore, the stationarity of the series.

However, with the null hypothesis that $\lambda = 0$, the *t*-value of the estimated coefficient of X_{t-1} does not follow the *t* distribution even in large samples. Dickey and Fuller (1979) have shown that under such cases, the estimated *t* value of the coefficient of X_{t-1} follows a *tau* statistic. It is this *tau* statistic that is usually referred to as the Dickey-Fuller (DF) test in econometrics literature in honor of the two authors. Its critical values are calculated of the basis on the Monte Carlo simulations (Gujarati 2003).

3.5.3 The Augmented Dickey-Fuller Test for Unit Roots

The Dickey-Fuller test assumes that the error terms are uncorrelated. If the error terms are correlated, the two authors developed the so-called Augmented Dickey-Fuller test which still

tests whether $\lambda = 0$ and uses the same critical values as the DF test but it *augments* the DF equation by adding lagged values of the dependent variable (where the number of lagged values to be included in empirically established at the point where the error term becomes serially uncorrelated) (Gujarati 2010). To avoid the problem of non-stationarity, this study employed the Augmented Dickey Fuller (ADF) test for unit roots to establish whether the variables are stationary or not before conducting a regression analysis. All variables had unit roots, but were made stationary after being differenced once. I.e. they were all I(1) processes.

3.5.4 Co-integration Test

If variables are found to be nonstationary (contain a unit root) but the error term (μ_t) obtained from running a regression from such variables is found to be stationary, then the linear combination of such variables may be stationary. In such a case, the regression is termed a cointegrating regression and the variables are said to be cointegrated. Thus, irrespective of the nonstationarity in the variables, there is a long-term (equilibrium) relationship between them. Also, the orthodox regression techniques (like the *t* and F tests) become applicable to that data despite the nonstationarity. This is tested by using the Augmented Engle–Granger test for stationarity. Alternatively, one can directly test for the presence of cointegrating equation(s) by conducting the Johansen cointegration test where the null hypothesis' rejection implies the presence of cointegrating equation among the variables. i.e that the original nonstationary variables are cointegrated. Presence of cointegrating equation is a prerequisite for running ECM. This paper used the Johansen cointegration test.

3.5.5 Error Correction Mechanism

When you have spurious regression, one remedial measure is to make the variables stationary by applying the differencing technique so as to get correct reliable parameter estimates from

the model. But, such an equation only gives the short run relationship among the variables. Besides, even if the nonstationary time series is cointegrated and that a long term (equilibrium) relationship exists among them, the short run may still be characterized by disequilibrium. So, the error term found from a cointegrating regression may be called an equilibrium error and it can be used to peg the short term deviations in the variables to their long term realizations. In other words the short run relationship between cointegrated variables can be expressed as Error Correction Mechanism (ECM) by simply running a regression of the differenced variables and including a lagged value of the equilibrium error as an additional regressor. Alternatively, statistical packages automatically do these processes and gives the results of the long-run relation after correcting for the short-run disequilibria. This study uses the statistical software.

3.6 Diagnostic Tests

In order to figure out the reliability of the results of the regression, it is necessary to conduct diagnostic tests. Since the data in my study met the required conditions for using Error Correction Mechanism, the main diagnostic test remaining was the test for multicollinearity. One of the assumptions of the Classical Linear Regression Model (CLRM), the first one of which is that there is no linear relationship among all or some of the regressors. If such a linear relationship is present, it is called multicollinearity. Among other things, multicollinearity results in large variances which make the t-ratios of the coefficient to be statistically insignificant (Gujarati 2003). This study used the zero-order correlation matrix to check for multicollinearity.

3.5 Chapter Summary

This chapter started by highlighting the estimation and specification of the model for this study. Thereafter, it went on to explain the variable measurements and the expected signs of the coefficient estimates. This was followed by description of the type of data and data sources used in the study. The chapter then turned onto the time series properties of the variables and elaborated on how each one is taken care of in this paper. The last section discussed diagnostic tests carried out in the study.

CHAPTER FOUR: EMPIRICAL FINDINGS

This chapter presents the analysis of the empirical results of the regression models estimated in chapter three and their economic and statistical interpretations.

4.1 Tests for Unit Roots

This study conducted the Augmented Dickey-Fuller (ADF) test for unit root in each of the variables. From the results presented in Table 2 below, we note that all the variables were stochastic processes integrated of the first order, I(1) processes, at 1 percent significance level. Thus, OLS estimation may not be used. However, Error Correction

Table 2: Results of Unit Root Tests.

	ADF Statistic in			
Variable	Levels	1st Difference	Level of Significance	Order of Integration
Log (REER)	-1.246	-6.383	1%	I (1)
ODA	-2.276	-4.332	1%	I(1)
CAB	-2.096	-5.010	1%	I (1)
Log(TOT)	-1.544	-3.865	1%	I(1)
FDI	-2.334	-5.199	1%	I(1)

Note: The 1 percent Critical ADF Statistics in levels,and in first differences are -3.675, and -3.685, respectively.

Mechanism may be used if the variables are cointegrated. Therefore, I tested for the presence of at least one cointegrating equation among the variables. . The results of the Johansen Cointegration test revealed that there at least one cointegrating equation among the variables at 5 percent in all the three models as can be seen in Table 3 below. Thus, there is a long term relationship among the I(1) processes. This implies that it is technically justifiable to run an

Error Correction Model (ECM) to peg the long term and short term behavior of the variables together.

Table 3: Results of Johansen Cointegration Tests

Model (2)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.84	95.56	68.52	76.07	None **
0.58	42.51	47.21	54.46	At most 1

**(**) denotes rejection of the hypothesis at 5%(1%) significance level*
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Model (3)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.82	67.51	47.21	54.46	None **
0.26	17.51	29.68	35.65	At most 1

**(**) denotes rejection of the hypothesis at 5%(1%) significance level*
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Model (4)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.84	67.14	47.21	54.46	None **
0.25	14.70	29.68	35.65	At most 1

**(**) denotes rejection of the hypothesis at 5%(1%) significance level*
L.R. test indicates 1 cointegrating equation(s) at 5% significance level *4.2 Results of Diagnostic Tests*

Prior to obtaining these results, the study conducted the test for multicollinearity among the regressors variables. Appendix 2 presents the zero–order correlation matrix and we note that the absolute value of the largest correlation coefficient among the regressors does not exceed

0.8, implying that the degree of multicollinearity is tolerable (Kuotsoyiannis, 1977). Using both the Alkaike Information Criterion (AIC) and the Scharz Information Criterion (SIC), Model (3) is preferred since it produces the smallest value (see Table 4). This is also the model of main interest in this study because it uses ODA, the main variable of interest in this study. The Akaike Information Criterion (AIC) suggested a maximum lag length of two. However, given that this annual data has a relatively shorter series, I use lag of one to save on the degrees of freedom.

4.3 Estimation Results of the Error Correction Model

4.3.1 Interpretation of Long Run Results

Table 4 presents the regression results of Models (2), (3) and (4). The Adjusted R-Squared for all models shows that that each one fits the data well as it explains between 59 percent (in Model 2) and 79 percent of variations in the REER (in Model 4). The rest of the long run results will be interpreted variable by variable.

4.3.1.1 ODA

In Table 4 below, the coefficient estimate for ODA is positive and statistically significant at 1 percent in Model 2. This implies that, ceteris paribus, a one percentage point increase(decrease) in ODA exerts about 1.7 percent appreciation(depreciation) pressure

Table 4: Estimation Results of the Error Correction Model
The Dependent Variable is D(LN(REER))

Regressors	Model 2	Model 3	Model 4
LN(REER(-1))	1.0000	1.0000	1.0000
ODA(-1)	0.0167***	0.0173***	—
	(0.002)	(0.002)	
AID(-1)	—	—	0.0188***
			(0.002)

FDI(-1)	-0.004	—	—
	(0.012)		
CAB(-1)	0.015***	0.015***	0.009**
	(0.002)	(0.002)	(0.002)
LOG(TOT(-1))	0.874***	0.885***	1.138***
	(0.057)	(0.043)	(0.058)
Constant	0.687	0.623	0.784
Adj. R-Squared	0.59	0.61	0.79
F-Statistic	7.65	9.79	22.50
AIC	12.5	8.6	8.9
SIC	14.3	9.9	10.2
Error Correction	-1.068***	-1.054***	-1.015***
Coefficient	(0.194)	0.185)	(0.110)
D(LOG(REER(-1)))	0.124	0.124	0.146
	(0.167)	(0.162)	(0.143)
D(ODA(-1))	-0.008	-0.008	—
	(0.005)	(0.005)	
D(FDI(-1))	0.003	—	—
	(0.011)		
D(AID(-1)	—	—	-0.01**
			(0.003)
D(CAB(-1))	-0.008**	-0.008**	-0.004**
	(003)	(0.003)	(0.002)
D(LOG(TOT(-1)))	-0.022	-0.036	-0.5**
	(0.248)	(0.241)	(0.193)
Constant	-0.022	-0.022	-0.029**
	(0.018)	(0.017)	(0.013)

*Notes: (1) Standard errors in parentheses; (2) *, **, and *** denote statistical significance at 10%, 5% and 1%, respectively.*

on Malawi's REER, irrespective of whether we control for FDI (Model 2) or not (Model 3). Thus, a suspension of all the 21.04 percent ODA [27] would lead to about 36 percent depreciation of Malawi's currency. This is not far from the 40 percent devaluation recommended by IMF missions to Malawi in December, 2011[28], and March, 2012[29].

[27] This is mean value of Malawi's ODA for the sampled period. See Descriptive Statistics in Appendix 3.
[28] http://thinkafricapress.com/malawi/hell-you-mutharika-tells-donors-leave-him-alone.
[29] http://www.malawivoice.com/2012/04/02/imf-still-want-kwacha-devaluation-24779/.

However, this does not explain the difference between IMF devaluation recommendation (40 percent) and the actual devaluation (49 percent). Therefore, I went a step further by adding Other Official Flows (which were part of the suspension) to ODA (so that now I have AID in Model 4 instead of ODA in Models 2 and 3). I found that the currency ought to be devalued by 48.5 percent[30], which is close to the Reserve Bank of Malawi (RBM)'s 49 percent devaluation in May, 2012. These findings suggest that the currency devaluation in Malawi could almost fully be explained by the aid suspension and that the RBM must have been right in devaluing the currency in the absence of aid.

4.3.1.2 CAB

The coefficient has a positive sign as expected and it was also statistically significant at 1 percent. Thus, a 1 percentage point increase(decrease) in the CAB leads to a 1.5 percent appreciation(depreciation) in the REER. As Appendix 1 shows, Malawi's current account is in perpetual deficit implying that Malawi is a net-importer. Since aid suspension has led to depreciation of the REER, increasing the trade balance by cutting on luxury imports would help prevent further depreciation of the currency even in the short run.

4.3.1.3 Terms of Trade

The coefficient estimate had a positive sign just as expected and it was statistically significant at 1 percent. Thus, a 1 percentage point increase in the TOT will lead to a 0.87 percent appreciation in the REER. Malawi's main exports are primary agricultural products, whose

[30] By replacing ODA by AID, where AID = ODA + Other Official Flows (as a proxy for all other aid than ODA), I ran the same regression and found a coefficient estimate of 0.018771 which was also statistically significant. The mean of AID was 25.842. By similar manipulations, a total suspension in aid to Malawi calls for a 48.5 (i.e. 0.018771*25.842) percent depreciation of Malawi's local currency, which is not far from the 49 percent devaluation Malawi's Central Bank effected on 7th May,2012 after both multilateral and bilateral donors had withdrawn their aid. Thus, the results are similar to those of IMF missions to Malawi and those of Malawi's Central Bank.

terms of trade are volatile and deteriorate over time[31]. Thus, she ought to shift from raw exports to manufactured goods by, for example, exporting cigarettes instead of raw tobacco. Investing ODA in such manufacturing industries would be beneficial in this regard. However, policy makers need to be conscious because one (especially small) country has little or no influence on the terms of trade.

4.3.1.4 Foreign Direct Investment

The finding in FDI is rather unusual. The coefficient estimate is negative, though statistically not significant because Malawi does not receive a lot of FDI. However, the negative sign implies that during the sampled period, FDI led to depreciation of the local currency. This is, seemingly, a puzzle to economic theory and it is worth explaining and resolving. Most of Malawi's investment goods are imported. Thus, most FDI to Malawi is spent abroad in the importation of investment goods. Thus, it is mainly the FDI flowing out of Malawi (which involves the selling of Malawi's currency for foreign currency) that may have the direct effect on exchange rate. With such transactions (where Malawi's currency is being sold rather than being bought) it will be expected that Malawi's currency will depreciate, hence, the negative sign. Thus, the puzzle is resolved.

4.3.2 Short Run Results

As already alluded to in Section 3.5.5, Error Correction Mechanism (ECM) helps to show the short run dynamics as the REER adjusts to its long run level. In the short run, several adjustments are going on among the variables. However, the error correction coefficient and the impulse response functions give meaningful summary of all the short run dynamics within the ECM environment.

[31] The Prebisch-Singer Hypothesis which states that the TOT of countries exporting primary goods are volatile and deteriorate overtime (Todaro and Smith 2011).

4.3.2.1 The Error Correction Coefficient

The Error Correction Coefficient (ECC) shows how the short run REER adjusts to its long run equilibrium level by "correcting" the difference between them. As expected, the ECC has a negative sign (with an absolute value of greater than 1) and it is statistically significant at 1 percent for all the three Models. Both the negative sign and the absolute value have special meanings. The negative sign implies that when the observed REER is below(above) its long run equilibrium level in period *t-1*, it will increase(decrease) in period *t*, towards its long run level. An absolute value of more than 1 implies that during the adjustment towards the long run equilibrium level, the observed REER will overshoot its long run level in the short run. That is, when the observed REER is below its long run equilibrium level in period *t-1*, it will increase beyond the long run equilibrium in period *t*. Thus, in period *t*, the observed REER will be above the long run equilibrium, and will decline towards its long run equilibrium in period *t+1*, which it also overshoots. Thus, in period *t+2*, the cycle begins again.

For Model 2, 3 and 4, respectively, the results show that 107 percent, 105 percent and 101 percent of the difference between the long run equilibrium REER and the observed REER will be adjusted in one period. This means that the short run REER overshoots its long run level by about 7, 5 and 1 percentage points in models 2, 3 and 4, respectively. The economic meaning of this overshooting is that the currency value will be unstable in the short run in response to, say, change in ODA. Using impulse response functions helps to visually see how the observed REER overshoots its long run equilibrium level.

4.3.2.2 The Impulse Response Functions

The impulse response functions (see Figure 4) below show how the short run REER behaves as it adjusts to its long run equilibrium after one standard deviation ODA innovations. It is now clear that the REER keeps overshooting its long run equilibrium level in the first eight years (Model 2) to twelve years (Model 4). That is, ODA innovation first leads to the appreciation of the REER beyond its long run value. Thereafter, the REER depreciates to a level lower than the long run value, leading to appreciation in the next period, thereby re-starting the cycle up until 8^{th} year (Models 2 and 3) or the 12^{th} year (Model 4). However, the equilibrium REER is still an appreciated one (for ODA increase) or a depreciated one (for ODA decrease) relative to the initial one.

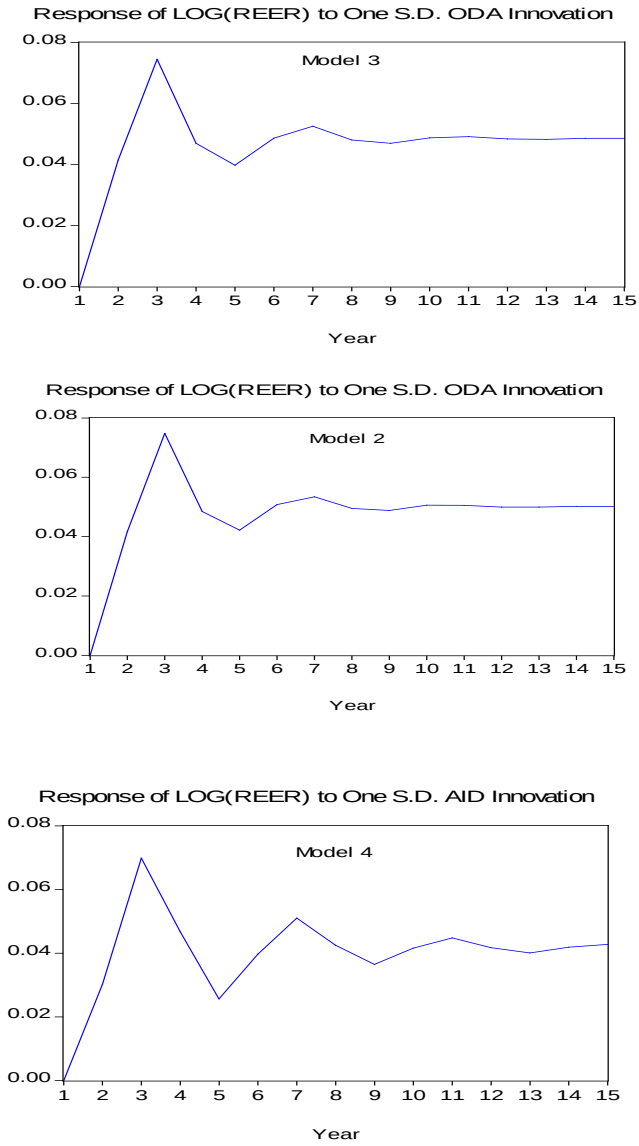


Figure 4: Impulse Response Functions

This implies that LOG(REER) increases by about 0.07 points in the first two years and by about 0.04 points in the long run in response to a one standard deviation shock to the innovations of the regressors. From Appendix 3, I found that that one standard deviation ODA innovation is was about 5.39 percentage point (or 25.63 percent) of ODA. Thus, if ODA increases by 10 percentage points, the LN(REER) increases by 0.38 (or 0.07*5.39) points in the short run and 0.22 (or 0.04*5.39) in the long run. Overall, it is evident that REER is volatile in the short run which is also the prediction by the overshooting theory of

exchange rate (Feenstra and Taylor 2008). Such volatilities are not preferable in an economy, hence, may call for stabilization policies.

4.4. Chapter Summary

In a nutshell, the regression results discussed in this chapter have shown that ODA appreciates REER in the long run. Besides, shocks to ODA will make the REER volatile in the short run. Either volatile or appreciated REER, or both, may be detrimental to long run economic growth. As such, policy actions are necessary in order to do away with these problems. This is the main theme of Chapter 5.

CHAPTER FIVE: CONCLUSION

5.1 Summary of the Study

The overall objective of this study was to analyse the relationship between ODA and REER in Malawi. It was divided into five main chapters. The first one was the introduction of the study, and its relevance. The second chapter reviewed some related literature and provided the context of the study. The third chapter discussed the methodology of the study. Chapter four discussed the results of the Error Correction Model in Eviews software, using annual time series data for 1980-2010 from World Bank. This last chapter summarises the study and provides policy recommendations.

The study met its overall objective of testing if ODA determines Malawi's REER while controlling for the effects of CAB, TOT and FDI. Having found a positive and significant relationship between Malawi's REER and ODA, I assert that ODA(AID) appreciates REER in Malawi in the long run. The other side of this assertion, which is more important for Malawi's current situation[32], is that ODA(AID) suspension will lead to devaluation of Malawi's currency, holding everything else constant. In the short run, shocks to ODA may increase the volatility of the REER.

5.2 Policy Recommendations

From the above summary of results, I note that not only does ODA appreciate REER in the long run but also makes it volatile in the short run. Both of these are undesirable impacts of

[32] Malawi's currency is currently undergoing further depreciation despite the 49 percent devaluation in May, 2012. This is the exact prediction of my paper and we would expect this further depreciation to stop in mid-2013, which is the second year since the aid suspension. However, if the aid inflow resume significantly, then, mid-2013 may be too far before the depreciation trend changes.

ODA. Therefore, my general recommendation is that policy makers should stabilize the exchange rate in the short run and mitigate its appreciation in the long run. This calls for actions by both the Government of Malawi and the donors.

5.2.1 The Government of Malawi

Firstly, in order to cushion the REER volatilities, in the short run, there is need for the central bank to find Malawi's optimal reserve ratio and maintain it as much as possible. Secondly, there is need for cutting on luxury imports. To understand this point, please recall that my study endogenously identifies TOT or the CAB as areas of policy intervention in order to influence the REER. But, Malawi has little or no power to influence the TOT because she is a small economy. Thus, improve the CAB by cutting of luxury imports in the short run is one sure way prevent a currency crisis when the exchange rate is already experiencing depreciation pressures from ODA suspension.

In the long run, investing either the ODA or money from other sources in export promotion would help improve the CAB thereby preparing the economy to automatically offset depreciation pressures of any future aid suspension. When there is a surge in ODA, REER will be appreciated, thereby reducing the competitiveness of the export sector. However, the government can offset this lost competitiveness by investing ODA in areas that reduce overhead production costs of the exporters. For example, investments in roads or ports construction may reduce overhead costs for exporters.

5.2.2 The Donors

Firstly, the results suggest that changes in ODA make the REER volatile. Thus, donors need to make aid more predictable overtime. This means that they should not only match

commitments and actual disbursements but also make multi-year commitments. This may help Malawi's policy makers in setting long term targets. Secondly, the results suggest that Malawi government ought to improve the CAB by investing in export promotion. Thus, donors need not allocate their ODA directly to social sectors because this takes away the discretion of the Government of Malawi to choose the sectors requiring more financial resources.

5.3 Suggested Areas for Further Study

Due to data limitations, the study suffers some limitations which may be supplemented by further studies. For example, this study asserts that ODA will appreciate the REER. However, there is need to further study how each sector of Malawi's economy responds to REER dynamics so that we can be better informed on exact sectors requiring deliberate policy interventions, and the nature of those interventions.

APPENDICES

Appendix A: Data Used in the Study

YEAR	REER	ODA	CAB	TOT	FDI
1980	207.31	11.41	-13.96	163.33	0.77
1981	211.34	11.04	-5.83	195.24	0.09
1982	204.27	10.19	-6.35	200	0.51
1983	208.34	9.44	-7.57	185.96	0.21
1984	221.48	15.01	1.94	191.07	2.26
1985	211.94	9.94	-5.71	167.35	0.055
1986	188.47	16.43	-2.14	144.83	-0.25
1987	170.38	23.32	-2.36	137.31	0.01
1988	184.72	27.22	-9.22	129.33	1.26
1989	191.68	26.24	-15.74	138.16	0.58
1990	190.40	26.60	-9.64	148.24	1.24
1991	202.24	24.94	-6.04	157.47	-1.30
1992	185.3	32.07	-19.25	127.78	-0.39
1993	189.56	23.97	-16.09	114.12	0.39
1994	134.76	39.78	-32.11	89.32	2.11
1995	118.00	31.07	-17.72	105.79	0.40
1996	170.37	21.55	-9.05	112.51	0.69
1997	177.22	12.917	-12.23	117.284	0.56
1998	131.72	24.82	-5.33	103.22	0.69
1999	133.33	25.15	-15.27	106.25	3.30
2000	137.82	25.59	-9.73	100	1.49
2001	148.10	23.85	-11.14	101.306	1.12
2002	161.87	14.197	-13.35	92.50	0.22
2003	112.91	21.37	-13.90	86.65	3.38
2004	99.13	19.26	-18.23	83.10	4.88
2005	100	20.81	-28.14	82.643	1.33
2006	97.38	23.19	-24.49	86.765	2.92
2007	95.15	21.51	-12.59	84.91	1.48
2008	98.18	22.67	-21.75	79.70	4.79
2009	107.55	16.32	-15.89	97.95	2.01
2010	101.13	20.33	-16.61	87.72	2.77

Appendix B: Correlation Matrix

	LOG(REER)	CAB	ODA	LOG(TOT)
LOG(REER)	1.000	0.623	-0.312	0.899
CAB	0.623	1.000	-0.488	0.688
ODA	-0.312	-0.488	1.000	-0.461
LOG(TOT)	0.898	0.688	-0.461	1.00

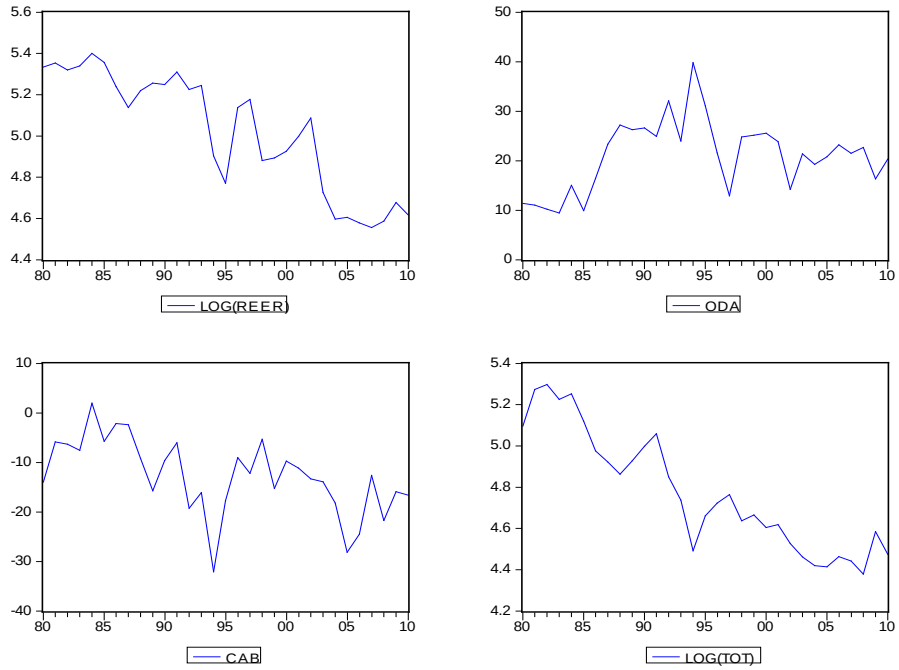
Appendix C: Residual Covariance Matrix

	LOG(REER)	ODA	CAB	LOG(TOT)
LOG(REER)	0.006	-0.312	0.286	0.005
ODA	-0.312	29.08	-13.51	-0.245
CAB	0.286	-13.51	40.79	0.287
LOG(TOT)	0.005	-0.245	0.287	0.008

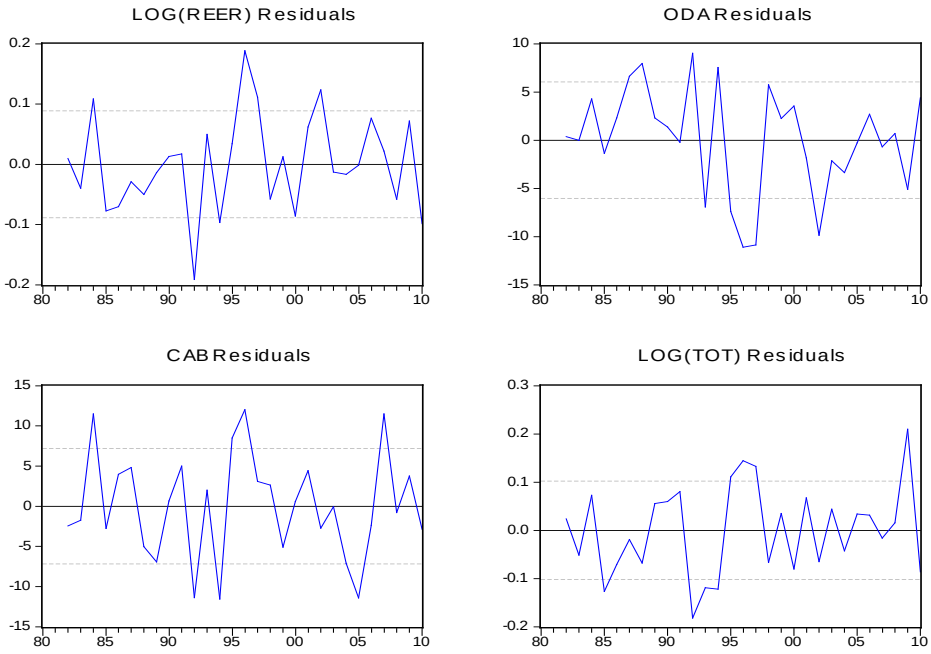
Appendix D: Summary of Descriptive Statistics

	LOG(REER)	ODA	CAB	AID	LOG(TOT)	FDI
Mean	5.02	21.04	-12.76	25.84	4.77	1.28
Median	5.14	21.55	-12.59	28.07	4.72	0.77
Maximum	5.40	39.78	1.94	48.49	5.30	4.88
Minimum	4.56	9.44	-32.11	10.13	4.38	-1.30
Std. Dev.	0.29	7.14	7.60	9.31	0.29	1.46
Skewness	-0.38	0.23	-0.50	0.12	0.39	0.89
Kurtosis	1.62	3.01	3.20	2.74	1.90	3.36
Jarque-Bera	3.20	0.27	1.36	0.17	2.36	4.22
Probability	0.20	0.87	0.51	0.92	0.31	0.12
Observations	31	31	31	31	31	31

Appendix E: Graphs of the Variables Used in the Study



Appendix F: Graphs of the Innovations



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