



**Bradford Centre for International
Development (BCID)**

**School of Social and International
Studies**

**DOES FOREIGN AID PROMOTE GROWTH?
EVIDENCE FROM MALAWI**

By

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Declaration

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I declare that this dissertation is substantially my own original work and has not been submitted in any form for an award at any other academic institution. Where material has been drawn from other sources, this has been fully acknowledged.

Signature.....

Date.....

Dedication

Lovingly dedicated to my late mother, may God bless her soul.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
ADF	Augmented Dickey Fuller
AEG	Augmented Engle-Granger
BOP	Balance of Payment
DAC	Development Assistance Committee
DSP	Difference Stationery Process
ECM	Error Correlation Mechanism
EERP	European Economic Recovery Plan
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GLS	Generalized Least Square
GMM	Generalized Method of Moments
GNI	Gross National Income
GNP	Gross National Product
ICOR	Incremental Capital Output Ratio
IDA	International Development Association
IMF	International Monetary Fund
LDC	Less Developed Countries
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
NGO	Non-Governmental Organizations
NSO	National Statistical Office
ODA	Overseas Development Assistance

OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
OOF	Other Official Flows
PRGF	Poverty Reduction Facility Programme
PWT	Penn World Table
RER	Real Exchange Rate
SAPs	Structural Adjustment Programmes
SSA	Sub-Saharan Africa
SWAP	Sector Wide Approach
TOL	Tolerance
TSP	Trend Stationery Process
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
USA	United States of America
USD	United States Dollar
VIF	Variance Inflation Factor
WC	Washington Consensus
WB	World Bank
WDI	World Development Indicators
WHO	World Health Organization

ABSTRACT

This dissertation aims at investigating the longstanding argument on whether foreign aid promotes economic growth. Precisely, the study's empirical investigation focuses on OLS time-series analysis for Malawi from 1960s to 2012. Overall, results suggest that aid exerts a negative and highly significant impact on growth. Importantly, the study distinguishes itself from the rest by testing this hypothesis on three distinct models to confirm whether model choice matters. Albeit, all models confirm the same by hinting that aid possibly increases government-consumption rather than investments. The findings corroborate previous-studies that tend to associate aid with Dutch disease effects in African-countries. Furthermore, the study indicates that aid-effectiveness is circumstantial, conditional on countries having supportive governance-structures, sound-policies and strong-political will. Hence, the study recommends that appropriate policy response to aid-influx is to channel aid towards investments to offset adverse economic effects of aid. Additionally, Malawi ought to diversify its economy to reduce aid overdependence.

Key words: Foreign Aid, Economic Growth, Dutch Disease, Development
Economics, Developing countries, OLS Time-Series

CHAPTER 1: INTRODUCTION AND BACKGROUND

“If you give a man a fish he will eat today but if you teach him to fish he will eat for a lifetime” -Chinese Proverb

1.1 Introduction

One of the most important and longstanding arguments in development literature is whether foreign aid promotes economic growth in recipient countries. Indeed, this debate has evolved for over five decades now. Yet, there is no consensus on how aid achieves its primary goals of promoting growth and poverty-reduction (Hudson, 2015). Mixed results continue to emerge from aid-growth studies indicating positive, negative, or even insignificant relationships. Earlier studies suggested that aid promotes growth via savings and investments (Papanek, 1973). However, this hypothesis is controversial considering that aid may finance consumption rather than investments (Boone, 1996). Recently, aid-growth debate heightened when an influential study by Burnside et al. (2000) suggested that aid only works in good-policy countries. Yet, using the same data Easterly et al. (2004) reported negative results whereas Hansen et al. (2001) suggested positive results, interestingly even in bad-policy countries. Indeed, despite voluminous studies little is known regarding aid-growth nexus.

Aid-growth linkage deserves critical attention considering that aid involves substantial volumes of public-funds. So far, about \$4 trillion has been disbursed since 1960s with Sub-Saharan Africa (SSA) receiving the highest share (OECD, 2015; Phillips, 2013), see table 1 and figure 1. Yet, Africa’s economic performance

has largely been erratic characterized by widespread poverty (Riddell, 2009). Moreover, the region is unlikely to meet its Millennium Development Goals (MDGs) targets (World Bank, 2014). No wonder, the debate on aid and growth has progressively become more contentious among scholars and policy makers owing to Africa's underperformance. Indeed, evidence reveals that economic divergence between the richest and the poorest countries has drastically escalated over the last century (Pritchett, 1997, Rodrik, 2011, Easterly, 2014).

Briefly, leading aid critics like Milton Friedman (1958), Peter Bauer (1971), Boone (1996), and more recently Easterly (2003) and Moyo (2009) oftentimes cite the above contradictory performance of Africa as basis for their strong arguments against aid. Specifically, they posit that aid only enlarges unnecessary government spending rather than supporting investments hence, it perpetuates dependence and long-term poverty. It mostly enriches the few elite of poor countries (Easterly, 2014). Simply put, Peter Bauer (1971, p.115) likens aid to, 'a process by which poor people (tax-payers) of the rich countries help rich people (elites) of the poor countries'.

Contrary, aid proponents like Rosenstein-Roden (1961), Papanek (1973), Collier (2007) and Sachs (2007) hypothesize that most poor countries face various development bottlenecks or traps including extreme poverty, conflicts and fatal diseases, which deter their growth. Hence, aid acts as a 'big push' to help them take off in development, without which their economic performance would be more

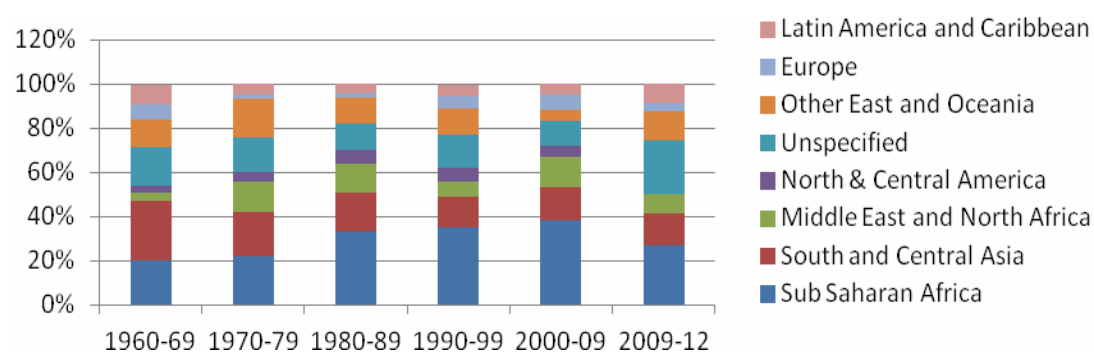
catastrophic (Sachs, 2005; 2007). They oftentimes cite the successful Green Revolution in Asia, exceptional economic progress in aid recipient countries like Taiwan, Korea, Botswana and most recently Mozambique (Radelet et al., 2004). Additionally, they also single out reduction and elimination of lethal diseases like polio, among others (Sachs, 2007). Still, another group including Mosley (1987), Rajan et al. (2008), Roodman (2007; 2011), take a neutral-position suggesting that aid's impact on growth is insignificant (immaterial) as opposed to other growth determinants like trade and more recently remittances (Hudson,2015).

Table 1: Trends in ODA since 1960s-focusing on Africa (Constant, 2007 US\$ millions)

Category	1960s	1970s	1980s	1990s	2000- 2012	Total	As %
All Developing Countries Total	414,711	481,688	676,552	744,565	1,063,670	3,381,186	100%
Multilateral Donors	54,691	137,669	214,153	230,818	311,463	948,794	28%
Bilateral Donors	360,020	344,018	462,399	513,747	752,208	2,432,392	72%
Grants-ODA	249,060	230,104	359,042	466,130	763,490	2,067,825	84%
Loans-ODA	109,932	113,915	103,357	47,617	11,282	386,103	16%
Sub- Saharan Africa Total	80,715	111,350	215,028	229,681	347,988	984,762	100%
Multilateral	10,290	32,964	67,695	86,917	116,942	314,807	32%
Bilateral	70,425	78,387	147,334	142,763	231,046	669,955	68%
Grants-ODA	52,999	58,708	112,714	134,933	235,139	594,494	85%
Loans-ODA	21,817	20,111	30,325	22,612	12,159	107,023	15%

Source: Constructed using OECD's 2015 data

Figure 1: Aid by Region (1960-2012)



Source: Constructed using OECD 2015 data

Sour

Lastly, some recent scholars postulate that aid works but with diminishing returns and that timing (lagged-effect) of aid matters (Hadjimicheal et al., 1995; Hansen et al., 2001). Notwithstanding, others propose that the type and purpose of aid matter, thus its impact on growth rests on whether aid is designed for early-impact or long-impact development (Moreira, 2005; Clemens et al., 2012). Finally, some economists hypothesize that aid only works at micro-level (projects) as opposed to macro (growth) level, the so called 'micro-macro paradox' discovered by Mosley (1987). Lastly, a new-strand quashes current measuring-apparatus arguing that the choice of tools and models by researchers determines whether aid-growth nexus turns positive, negative or insignificant (Rajan et al., 2007; Hansen et al., 2007; Roodman, 2007).

1.2 Rationale and Scope of the Study

Most studies examining aid-growth linkage employ cross-country or panel-data approaches where countries are lumped together irrespective of their differences. Against this backdrop, this study attempts to incorporate a case study for Malawi based on time-series data (1960-2012). Unlike generic studies, a case-study is advantageous as it reduces problems of overgeneralization biases (Yin, 2014). Hence, policy-recommendations drawn become more apt and contextual. Notably, Malawi was selected based on its outstanding features. For example, firstly, Malawi is among world's most aid-dependent countries accounting over 40% of its budget and over 30% of GDP (World Bank, 2014). Secondly, aid misappropriation is considerably high leading to persistent donor-withdrawals (Anders, 2015). Thirdly, despite increased aid-inflows, poverty levels are escalating while GDP

growth has dropped from over 5% in the 1970s to -0.1 by 2012, see figure 10 (World-Bank Data, 2014).

It is important to mention that this study is not the first to examine aid effectiveness in Malawi. However, most previous studies did not specifically focus on aid and GDP growth as they instead linked aid to other proxy indicators of human development. Moreover, unlike most studies this study attempts to examine aid-growth nexus by testing three distinct models to verify if indeed model choice by researchers matters as premised by Roodman et al. (2007). Additionally, recognizing profound role of good governance in aid-growth nexus, the study has incorporated role of policies including dummies on regime types to determine their impact on aid effectiveness. Hence, the study adds profound knowledge to aid-growth literature to help policy makers develop concrete decisions regarding aid's impact on growth and overall macroeconomic management in Malawi.

1.2.1 Research Question

This dissertation is guided by the following research question.

'To what extent has foreign aid contributed to economic growth in Malawi?

1.2.2 Main Objective

The main objective of the study is to assess whether foreign aid has contributed to the economic growth in the developing countries, in particular, Malawi as a case study.

1.2.3 Specific Objectives

The specific objectives are:

- To determine the level of aid dependence and its possible effects on major macroeconomic variables including investments, savings, trade; inflation, and Gross Domestic Product (GDP) growth.
- To examine possible dynamic linkage between aid, economic growth and country's policies (governance systems).
- To understand whether the researcher's choice of a particular econometric model matters in aid-growth studies.

1.2.4 Methodology and Data Collection

The study has used a combination of both qualitative and quantitative approaches.

This technique is valuable since weaknesses of one approach are neutralized by strengths of the other (Carvalho et al., 1997). Quantitative data is exclusively secondary data. Unlike primary data, secondary data is deemed more accurate, credible, and saves researcher's time and resources (Hakim, 1982). Furthermore, the study has employed Ordinary Least Square (OLS) regression analysis to construe its findings. Although statistical data is a challenge for Malawi, still only reliable data-sources like World Bank, IMF, OECD and PENN World have been used recognizing that "...the results of research are only as good as the quality of the data" (Gujarati and Porter, 2009).

1.3 Aid at a Glance: Definition of Key Concepts and Types of Aid

It is important to define some key concepts used in this study. Generally, there are two main categories of aid; *non-development aid* and *development aid* (Reddy and Minoiu, 2009). Non-development aid includes humanitarian (emergencies and charities) and military assistance (Riddell, 2007). However, this dissertation borders around development aid as other types of aid are generally less questionable, although Moyo (2009) hints that even humanitarian aid is equally prone to mismanagement. Notably, development aid refers to Overseas Development Assistance (ODA); being funds transferred from developed countries, particularly, Development Assistance Committee (DAC) country-members to poor-countries primarily to promote economic development and welfare improvement (OECD, 2015).

Still, it is imperative to note that in reality other ulterior donor-motives override the above stated altruistic objectives of aid (Alesina and Dollar, 2000). Generally, ODA is made directly to governments either through government-to-government, *bilateral aid*, or via institutions like the World Bank, *multilateral aid* (OECD, 2015). It includes grants and concessional loans (loans with no or very low interest rates below the market price) (Riddell, 2007; Hudson, 2015). The bulk of ODA, 70% is bilateral while over 90% constitutes grants refer to graphs 2 and 3. Table 2 gives a summary of different modalities of aid and their perceived effects on recipient countries.

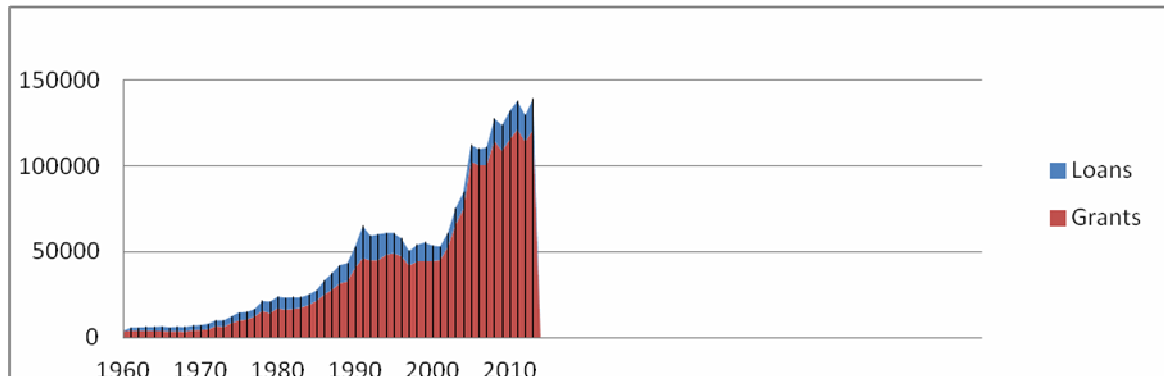
Alternatively, economic-growth which is the primary goal ODA, refers to an increase in overall national income estimated as real Gross National Product (GDP) or sometimes as per-capita income (Graham Bannock et al., 2003). However, it ought to be acknowledged that GDP's usefulness in measuring development is equally questionable (Sen, 1999). For instance, GDP excludes income-distribution (Ravallion and Datt, 2002) and informal-sector, e.g. black-market activities, which account over 30% of Africa's income (Hudson, 2015). Regardless, GDP remains today the most credible indicator for growth studies (Bergh, 2009), hence its adoption in this study.

Table 2: Summary of Effects of Different Aid Modalities

Types of Aid	Rationale	Major Macroeconomic Benefits	Possible Adverse Macroeconomic Consequences
Project Aid	Investment or rehabilitation	Higher output; improved social sectors	White elephant projects; deformable spending patterns; tie up recurrent resources
Import Support	Raise capacity utilisation	Higher output, increased goods availability	Easily fungible to non-priority imports
Debt Relief	Relax foreign exchange constraint; remove debt overhang	Increased imports and investment	Policy deterrent effects, highly fungible
Food Aid	Food Security and support to agricultural development	Increased labour efficiency	Disincentive effects
Technical Assistance	Filling skills gap; human capital development	Greater efficiency	Labour market distortions; encourage brain drain and hinder human capital development
Budget Aid	Relax government recurrent constraint	Higher public spending and lower inflation	Distort government spending
Counterpart Funds	Relax Budget constraint	Reduce needs for deficit financing; redirect government spending to priority areas	Inflation

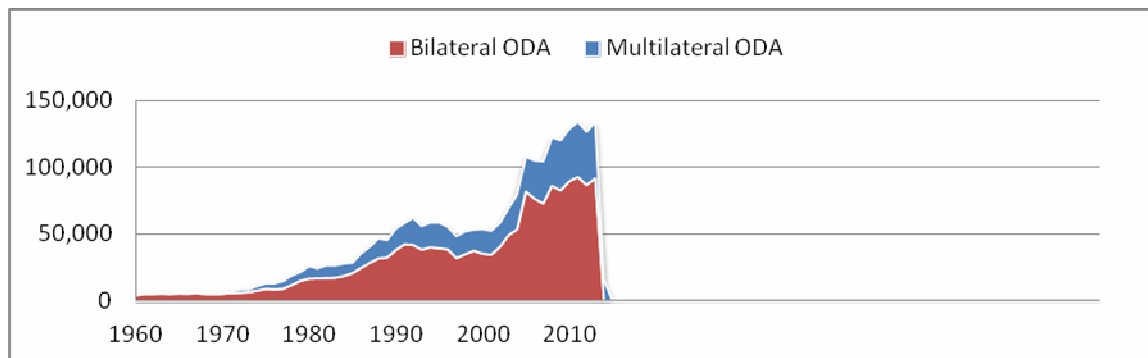
Adapted from White (1998, p.88)

Figure 2: Trends in Grants versus Loans (in US\$ millions)



Constructed using OECD 2015 data

Figure 3: Trends in Bilateral versus Multilateral ODA (in USD\$ millions)



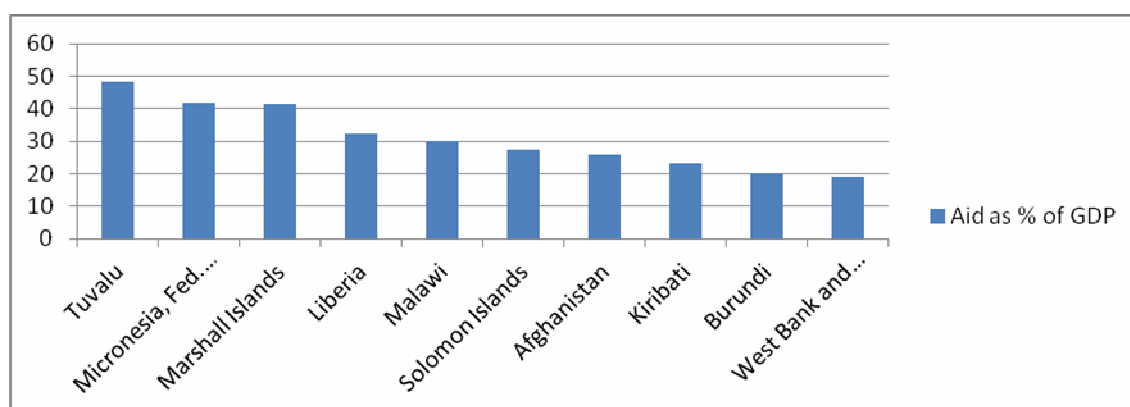
Constructed using OECD 2015 data

1.4 Country Background: A Snapshot of Malawi

Malawi is among the poorest countries with per capita GDP of \$226 (WDI, 2013) and equally ranks badly on human-development at 174th out of 187 countries (UNDP, 2014). Furthermore, Malawi is the fifth most heavily aid-dependent country in the world (World Bank, 2013), see figure 7. Moreover, aid covers over 40% of national-budget and about 90% in other critical programmes, e.g. health (Mueller et al., 2011). Despite receiving more aid-inflows than most African countries, growth has been inconsistent while economic-forecasts look unpromising (IMF,

2014). There are few previous studies specific to Malawi on this topic although they still provide mixed results. Notably, Roberts et al. (2013) argue that in Malawi aid is ineffective because aid allocation is highly fungible and dependent on political and ethnic targeting. Contrary, Fagernäs et al. (2004) claim that aid has largely achieved its social-goals. This indeed hints that little is known about aid-growth nexus in Malawi. Chapter 3 gives a further detailed analysis for Malawi.

Figure 4: Malawi and other World's Top Ten Dependent Countries (2013)



Constructed using OECD/World Bank 2013 data

1.5 Organization of the study

The study contains five chapters. Chapter 1 comprises the introductory aspects: the background to the study, definitions, study's rationale, aims, and methodologies followed by a snapshot of case study, Malawi. Chapter 2 critically examines literature from both theoretical and empirical studies. Thereafter, Chapter 3 presents a critical review on Malawi regarding foreign aid and macroeconomic performance. Furthermore, chapter 4 provides data analysis, findings and discussions. Finally, chapter 5 concludes the study and further provides key recommendations.

1.6 Chapter Summary

The chapter has highlighted key issues regarding aid-growth debate followed by the rationale, objectives and limitations of the dissertation. Furthermore, the section hints that aid-growth nexus is controversial judging from mixed findings from both theoretical and empirical literature. Importantly, the chapter provides some key arguments for and against aid. Finally, an overview of the case study Malawi equally indicates that little is known regarding aid-growth nexus in Malawi.

CHAPTER TWO: AID-GROWTH REVIEW

“Foreign Assistance is not an end in itself. The purpose of aid must be to create the conditions where it is no longer needed.”- President Barack Obama, 2009

2.1 Introduction

As mentioned, aid-growth linkage has been a subject of intense debate from both theoretical and empirical grounds since 1960s. Still, no single theory or evidence appears to offer a straightforward answer (Clemens et al., 2012). This chapter reviews aid-growth literature. The first section attempts to understand historical trends of modern aid. Next sections critically review prevailing theories and empirics. The last sections provide a scrutiny of key criticisms against aid and a brief analysis of aid allocation and endogeneity.

2.2 A Snapshot of Origins of Modern Aid: 1940s onwards

Most scholars trace modern aid to the *1948 Marshal Plan* or European Recovery Program (ERP) where United States of America (USA) financed Europe's reconstruction after World War II (Tarp and Hjertholm, 2000). Still, historically nations have been known to assist each other for various motives (Bowen, 1998). For instance, by 1929 Britain introduced the Colonial Development Act to support its colonies although critics argue that its ulterior motive was to boost Britain's ailing economy (Phillips, 2013). Similarly, it is argued that the Marshal Plan's concealed motive was to spread capitalism over socialism (Easterly, 2014). Arguably, by 1940s Europe had all the necessary institutions and human capital to

make ERP succeed unlike Africa today (Moyo, 2009). Nonetheless, the Marshall-Plan remains a classical example that aid may support growth given the right environment.

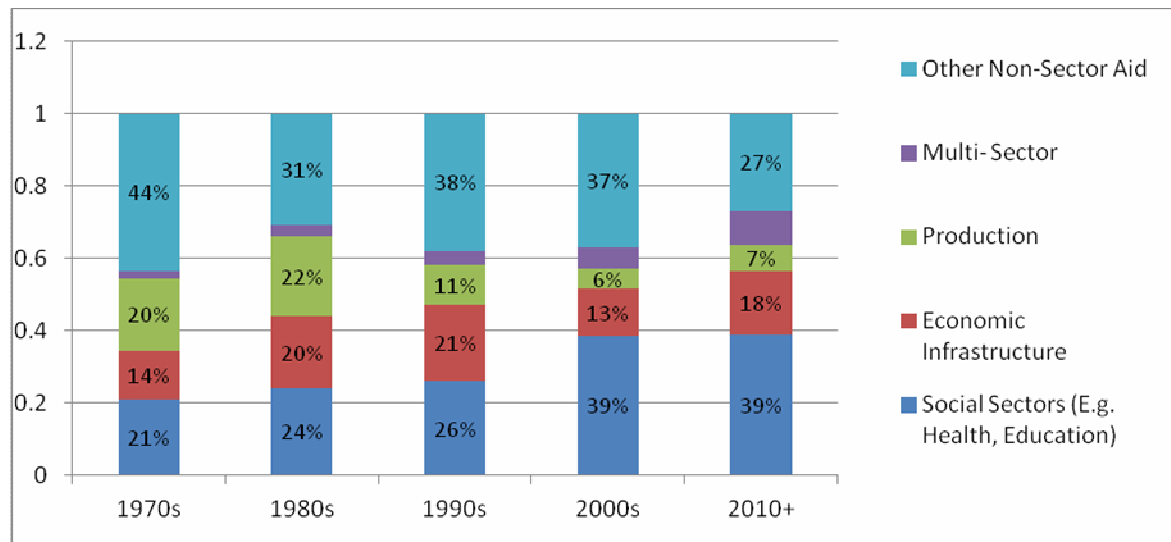
Aid paradigm has been evolving since 1960s although more at the discretion of donors than recipient countries (Hjertholm et al., 2000). Arguably, growth was not the focus of ODA in its formative years, instead donor-ideologies like combating communism and instituting structural reforms such as Washington Consensus (WC), dominated the aid landscape, see table 3. Hence, Stiglitz (2003), a fierce critic to structural reforms, contends that aid disbursement during Structural Adjustment Programmes (SAPs) period at the behest of World Bank and International Monetary Fund (IMF), only increased 'debt overhang' and poverty especially in SSA. Gradually, aid focus has been shifting from economic sectors towards human-development (Hudson, 2015), see table 3. To illustrate, over 40% of aid today supports education and health (figure 5). Consequently, some aid proponents argue that aid is mistakenly misjudged by critics because it is now mostly in 'hard to measure sectors' (Roodman, 2007a). Nevertheless, despite increased volumes of aid, most donor-countries are failing to reach the 0.7% aid/GNI target agreed under the 1968 Pearson Commission. Ironically, the largest donor US, ranks poorly contributing less than 0.2% of its GNI (OECD-Data, 2015), see figures 6 and 7.

Table 3: Ideological Trends in ODA from 1940s to date

Decade	Donor Ideology	Donor Focus
1940s	Planning and promotion of aid	Reconstruction of war-torn Europe
1950s	Communism versus Anti-communism	Community Development
1960s	Communism versus Anti-communism	Infrastructural and productive sector development
1970s	State engagement	Social development and poverty alleviation
1980s	Structural involvement	Macroeconomic Reform, e.g. Structural Adjustment Programmes (SAPs)
1990s	State involvement	Human rights, governance and poverty reforms
2000s to date	State involvement	Governance and human development reforms

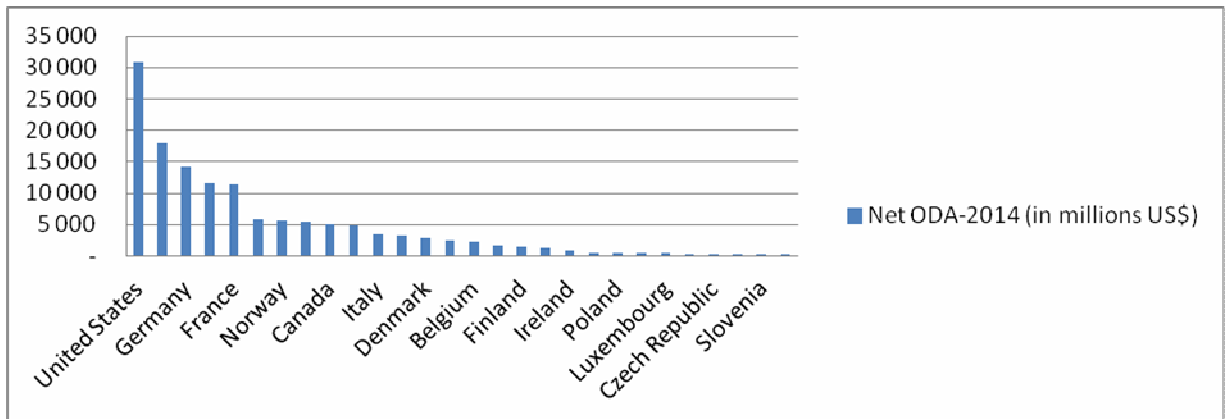
Source: Adopted from Hjertholm et al. (2000, p.81)

Figure 5: Changing Emphasis on Aid since 1960s



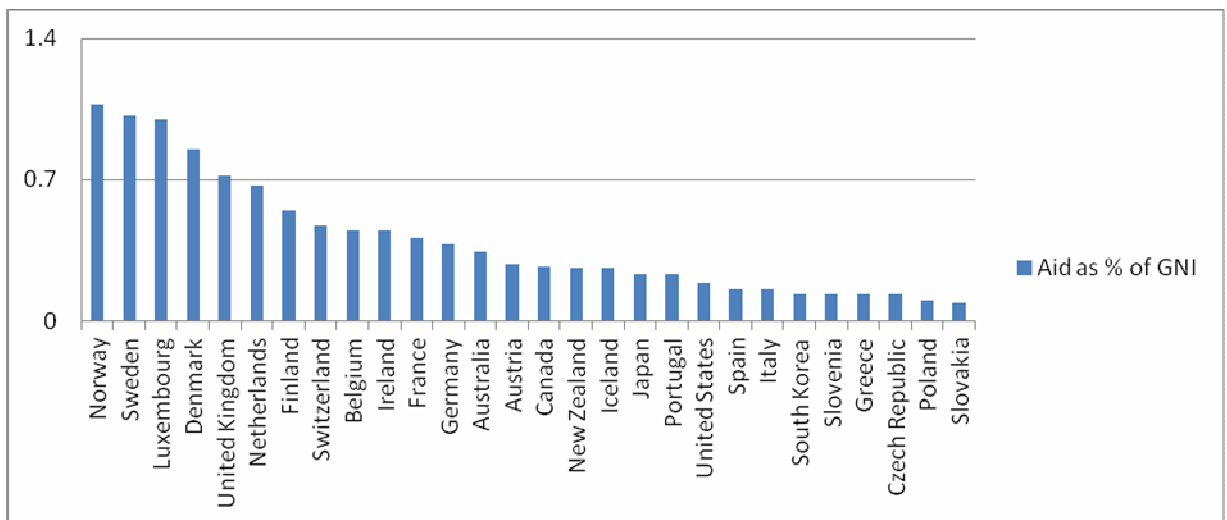
Constructed using OECD 2015 data

Figure 6: Net ODA in Absolute Volumes-2014



Source: Constructed using OECD 2015 data

Figure 7: ODA as a Percentage of GNI (2014)



Source: Constructed using OECD 2015 data

2.3 Aid-Growth Theories

As mentioned, numerous theories have emerged since 1960s to explain aid-growth linkage. Still no theory seems to offer a concrete answer to the discourse (Clemens et al., 2012). This section, therefore, discusses notable theories attempting to address this contentious linkage. For clarity, the section classifies these theories in three generational groups following similar categorization by influential scholars like Hansen et al. (2000) and Moreira (2005).

2.3.1 First Generation Theories: Aid, Savings, Growth

The bulk of earliest theories on aid-growth nexus from 1940s to mid-1970s primarily relied on the Harrod-Domar model (Arvin, 1999). The underlying premise was that foreign capital, say aid, increases savings which ultimately boast investments and economic-growth (Papanek, 1973). Indeed, theorists like Rosenstein- Roden (1961) proposed that each additional dollar of foreign reserves (aid) would result in an equal increase in total savings. However, this preposition is unconvincing since in reality aid is fungible (movable) as it may finance other avenues like consumption rather than savings (Boone, 1996). Nevertheless, fungibility was not allowed for in early aid-growth models (Moreira, 2005).

Briefly, the Harrod-Domar model which is regarded as a theoretical workhorse of the popular gap theories, assumed that poor countries fail to climb the economic ladder because of extensive gaps in savings-investments rates ($S-I$), hence foreign-capital or aid is indispensable (Bowen, 1998). The popularity of this model heightened due to success of the Marshal Plan. Hence, Arvin (1999) states that

most first national development-plans were modeled around Harrod-Domar at the behest of the World Bank. Still, the Harrod-Domar model was too simplistic hence Chenery and Strout (1966) introduced a more comprehensive Two Gap model by incorporating trade balance (X-M) or foreign exchange. Notwithstanding, Bacha (1990) motivated by the 1980s debt crisis, proposed the Three Gap model with fiscal deficit (T-G) as the third gap

A simple version of the Two Gap model used by many scholars, in particular, the World Bank, resembles the following equations:

$$g_t = dY_t/Y_t = (I_t/Y_t)/\mu \quad (1.1)$$

$$I_t/Y_t = A_t/Y_t + S_t/Y_t, \quad (1.2)$$

Here, I_t is required investment with respect to time t , Y_t is output, g or dY_t/Y_t is targeted GDP growth, A is aid or given as F_t , foreign capital as in equation 1.3, and S is domestic saving. Parameter μ represents incremental capital-output ratio (ICOR), often ranging between 2 and 5, where high ICOR indicates poor quality of investment. The final model after combining equations 1.1 and 1.2 becomes:

$$g = (S_t/Y_t + F_t/Y_t)/\mu \quad (1.3)$$

Briefly, growth, g , results from growth in savings ratio, s and foreign reserve ratio (aid), f , given μ as ICOR-level. Rajan et al. (2008, p.663) provides a detailed version of this model.

Other notable theories from this generation include the Big Push theory by Rosenstein-Rodan (1961), Hirschman's Backward and Forward Linkages Theory, and Rostov's Stages of Development theory. Importantly, the Big Push theory is still the overriding argument used by influential aid-proponents such as Sachs (2005) and Collier (2007a) including celebrities to proselytize the need for aid (Moyo, 2009). Nevertheless, leading aid critics such as Bauer (1972) and recently Easterly (2014) criticize the Big Push model on several grounds, particularly, that it undermines critical role of market forces.

To summarize, earliest theories though inconclusive largely assumed a positive role of aid on growth via savings (Moreira, 2005). Although early-models receive credit for initiating theoretical underpinnings of aid-growth nexus, still they are often criticized for being too simplistic and static in their formulations (Hansen and Tarp, 2001). Furthermore, they seemed to ignore active-role of recipient countries by taking a paternalistic approach to development (Easterly, 2003).

2.3.2 Second Generation Studies: Aid, Investments, Growth

By mid 1970s to early 1990s, it was clear that the aid-savings-growth pendulum set by the early economists was no longer agreeable (Hansen and Tarp, 2001). For example, Griffin et al. (1970) argued that in a long-run aid reduced domestic savings by acting as a substitute to savings. They further reconfirmed that the bulk of aid only increased government spending rather than investments, a condition which Griffin (1970) called 'fungibility of aid' (Rajan, 2005a). However, an aid-proponent, the first to develop a multivariate regression model, Papanek (1973),

criticized Griffin's view and further quashed previous (aid-savings-growth linkage) models. Instead, he hypothesized that foreign inflows (aid, foreign private investment, and other foreign inflows) and savings are autonomous variables that directly explain investments or growth.

Noticeably, two strands emerged from Papanek's works; the first strand proposed that aid influences growth directly through investments and not necessarily savings (Moreira, 2005). However, the second and more recent strand also influenced by Augmented Solow model, proposed that aid has a direct impact on incomes via economic multiplier-effects (McGillivray, 2000). The flexibility of this strand hiked its popularity although poor data availability at the time hampered its applicability (Tarp and Hjertholm, 2000). The two related models resemble the following:

$$I_{i,t} = \alpha + \beta Aid_{i,t} + F_{i,t} \eta + \varepsilon_{i,t} \quad (2.2)$$

$$G_{i,t} = \alpha + \beta Aid_{i,t} + X_{i,t} \eta + \varepsilon_{i,t} \quad (2.2)$$

Here, $I_{i,t}$ is rate of investment for country i at time t , $Aid_{i,t}$ = net disbursements of aid, $F_{i,t}$ = other types of capital inflows, e.g. FDI, η is a vector of other capital inflows. $g_{i,t}$ = growth per capita in country i at time t , $X_{i,t}$ = vector of country characteristics and $\varepsilon_{i,t}$ is white noise. The test was on whether parameter for aid, β , was positive, negative, and significant. Generally, this generation posted mixed results. However, the most influential preposition came from Boone (1996) who reconfirmed controversial claims by Bauer (1971) and Griffin (1970) that aid

financed government consumption rather than savings. Although increasing consumption seems desirable as argued by Collier (2007), overwhelming evidence still suggests that growth resulting from investment is more meaningful than that from consumption (Rajan and Subramanian, 2008).

2.3.3 Third Generation Theories: Aid, Conditions (Policies) and Growth

The third generation theories span from late 1990s to date. According to Clemens et al. (2012), these models may generally be viewed as reactions to Boone's controversial hypothesis that aid supports consumption rather than investments. The current generation argues that the absorption rate of aid is conditional on domestic factors such as, human capital, infrastructure, governance, institutional, and policy capacities (McGillivray and Morrissey, 2000). However, the most dominant hypothesis from this generation originates from works of Burnside and Dollar (1996; 2000) that aid-effectiveness is dependent on policy environment (monetary, trade, and fiscal policies). More recently, new strands have emerged in reaction to this hypothesis. Now, there are models advancing for diminishing-returns role of aid (Hansen and Tarp, 2001); distinguishing aid by timing (lagged effect) (Moreira, 2005); and disaggregating aid by type or purpose (Clemens et al., 2012, Rajan, 2005b). Finally, there is the 'null' hypothesis or 'unconditional' strand reconfirming Boone's (1996) view that aid has null effect on growth irrespective of any policies or conditions (Rajan et. al., 2008). The following are the most notable of the new theoretical models.

Conditional and Policy Strands

The following multivariate regression models may represent the conditional and the policy strands adopted from Burnside et al. (2000), respectively:

$$G_{i,t} = \alpha + \beta_1 Aid_{i,t} + X_{i,t} \eta + \beta_2 Z_{i,t} + \beta_3 (Aid_{i,t} * Z_{i,t}) + \varepsilon_{i,t} \quad (3.1)$$

$$G_{i,t} = \alpha + \beta_1 Aid_{i,t} + X_{i,t} \eta + \beta_2 Policy_{i,t} + \beta_3 (Aid_{i,t} * Policy_{i,t}) + \varepsilon_{i,t} \quad (3.2)$$

Here, $cZ_{i,t}$ are country's conditions, $(Aid_{i,t} * Z_{i,t})$ is an interactive term of aid and conditional factors. Particularly, in equation 3.2, an interactive term $Aid_{i,t} * Policy_{i,t}$ measures impact of aid subject to policies. Here, test is on parameter β_1 and β_3 for conditional (policy) effect of aid on growth. Still, results from these models have been contentious. Although the policy model commands overwhelming support now, some economists including Clemens et al. (2012) argue that there is no consensus regarding definition of 'good policy-environment'. Indeed, this assertion is a reminder to researchers to handle policy indices with caution when conducting aid-growth studies.

Other Recent Models

Another outstanding recent hypothesis is the diminishing returns or non-linear role of aid on growth. Thus, as aid rises its impact on growth diminishes, particularly, when aid reaches 15%-20% of a country's GDP (Clemens et al., 2012). Understandably, the law of diminishing returns is traditionally a well-known hypothesis in economic theory (Weil, 2013). The multivariate model of this group adopted from Clemens et al. (2012) resembles the following:

$$G_{i,t} = c + \beta_1 Aid_{i,t} + \beta_2 Policy_{i,t} + \beta_3 (Aid_{i,t})^2 + \varepsilon_{i,t} \quad (4)$$

Here, the interactive term of aid-squared $(Aid_{i,t})^2$ measures impact of aid on growth in presence of diminishing returns. Notably, most studies using this model tend to find very modest positive results. For instance, Clemens et al. (2012) proposes that on average 15% of aid/GDP only leads to less than 1% of GDP growth.

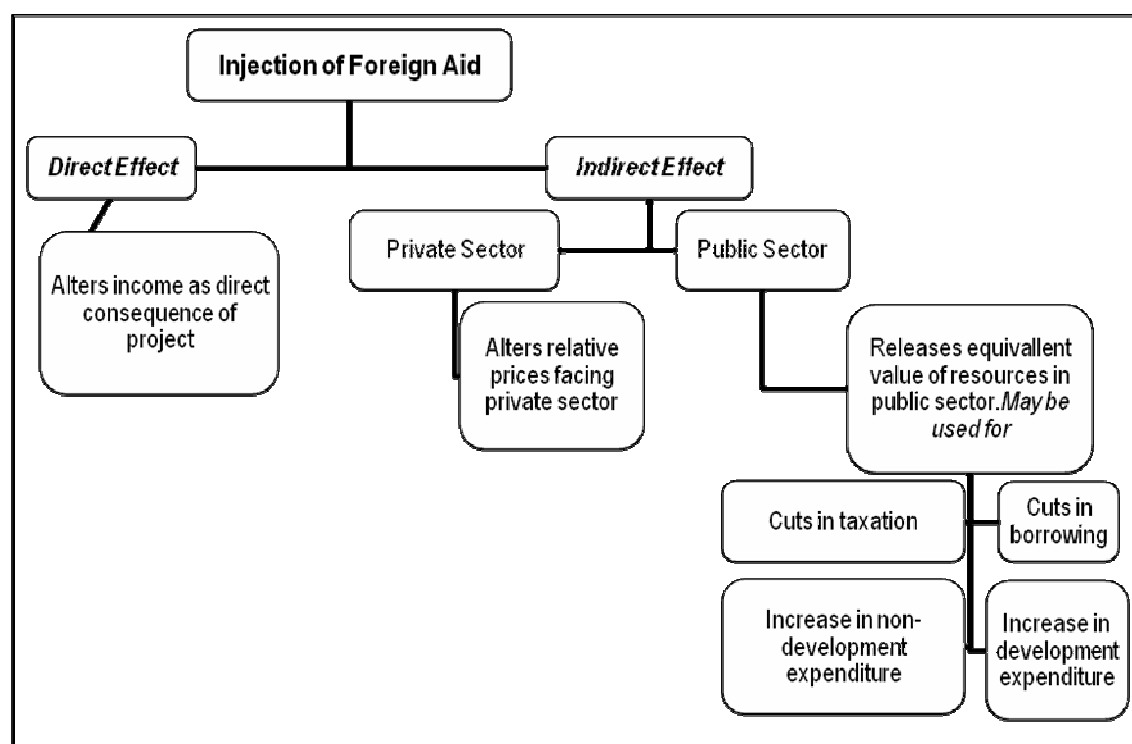
More recently, a more inclusive model by Collier et al. (2002 , p.1478) attempts to capture the conditional variables, policy environment, and the diminishing returns of aid, resembling the following:

$$G_{i,t} = c + \beta_1 X_{i,t} + \beta_2 Pol_{i,t} + \beta_3 Aid_{i,t} + \beta_4 Aid_{i,t}^2 + \beta_5 Aid_{i,t} * Pol_{i,t} + \varepsilon_{i,t} \quad (5)$$

Here, the test is on coefficients β_3 , β_4 , and β_5 , for aid impact, diminishing returns and policy effect, respectively. However, the weakness of this model is that it did not incorporate timing-effect of aid. Hence, others like Moreira (2005) modified it to include aid lags to capture the timing effect although use of aid lag is equally contentious. Succeeding subsections discuss this issue in depth. To conclude, the third generation models tend to use more improved and sophisticated techniques than the previous models. Although results are mixed, most of these models suggest a weak or insignificant aid-growth linkage (Roodman, 2007a).

To encapsulate, first-generation theories assumed aid to promote growth via savings although their findings were highly inconclusive due to poor data and study techniques (Roodman, 2007a). Contrary, the second-generation theories, shifted attention to investments, nevertheless, the results were still mixed with a prominent paper by Boone (1996) challenging the aid-investment hypothesis. Finally, the third-generation or current models employ improved OLS techniques and attempt to link aid directly to growth via various economic effects. Still results are mixed and mostly indicating insignificant relationships (Clemens et al., 2012). Chart 1 summarizes the conceptual effects of aid on growth as hypothesized by aid-growth theorists particularly Mosley (1987).

Chart 1: Conceptual Channel of Aid on Economic Growth



Adapted from Mosley (1987, p.120)

2.2 Evidence from Empirical Studies

Just like theories, there also seems to be no consensus from empirical studies regarding the relationship between aid and growth (Riddell, 2007). Specifically, this section, critically evaluates aid-growth empirics since 1960s.

2.2.1 First Generation Empirics: Post Second World War to 1970s

Likewise, the first empirical studies on aid and growth were premised around the Harrod-Domar's savings model. The underlying test was on whether aid increased savings. Notable studies during this period include Rosenstein-Roden (1961), Chenery et al. (1962; 1966) and Rahan (1967), who reported positive correlation. Contrary, Griffin et al. (1970), Nurse (1952; 1953) and Weisskopf (1972), suggested negative correlation. Notably, Chenery et al. (1966) were among the first to produce a more comprehensive study of 31 developing-countries using their Two Gap model. Importantly, the duo assumed that aid was a temporary measure needed until a country reached its self-reliance. However, their assumption seems unrealistic considering that today fifty decades later most aid recipient-countries are still not self-reliant (Easterly, 2006).

Contrary, Griffin et al. (1970) conducted the first known study to use a bivariate regression model of aid and savings covering 27 countries and reported a negative correlation. They further suggested that aid reduced domestic savings by promoting consumption. Equally, Rahman (1972) conducted an ordinary least square (OLS) regression using Chenery and Strout data and reconfirmed that aid acted as a disincentive to savings (Bowen, 1998). Understandably, most early

studies were inconclusive due to poor data and weak study techniques (Hansen and Tarp, 2001).

2.2.2 Second-Generation Studies: Mid 1970s to early 1990s

The second crop of studies shifted focus from investigating aid, savings, and growth relationship to aid, investment and growth. Notable studies include Papanek (1972, 1973), Gulati (1978), Gupta and Islam (1983), Mosley (1986), Barro (1990), and Boone (1995; 1996). Papanek (1972; 1973) who was the first to introduce a multivariate regression in this group suggested a positive relationship between aid and growth. He claimed that the first generation studies like Griffin (1970) failed to register positive results because aid might affect growth directly through investments even where savings stagnate. Again, by increasing consumption, aid still promotes growth through economic multiplier-effect (Papanek, 1973). Similarly, Gulati (1978) conducted a multivariate study on aid and growth for 51 countries and suggested positive results. Nevertheless, as earlier argued, by promoting consumption rather than investments aid becomes less meaningful in a long run.

Unlike their peers, who mostly focused on testing correlation, Mosley (1975; 1987) and Over (1975), first attempted to test causality between aid and growth. Their results indicated a negative causal linkage between aid and investments. However, it ought to be noted that even today testing for causality in aid-growth linkage is contentious and likely unfeasible considering aid-fungibility problems and that aid is mostly given for different motives apart from growth (Clemens et al. 2012). Still,

Barro (1990) demonstrated that aid promotes growth through reducing fiscal deficit and tax burden, the so-called Three-Gap Theory. However, the most influential study from this generation was conducted by Boone (1996) covering 91 countries (1971-1990). Boone (1996) quashed the aid, investments, and growth hypothesis suggesting that aid only increased recipient's government expenditure. Nevertheless, apart from Boone, the majority of studies during this period assumed a positive relationship between aid, investments and growth.

2.2.3 Third Generation Studies: Mid 1990s to date

The current period beginning from 1990s is the most controversial period regarding aid-growth debate due to increasing but contrasting number of theories and study techniques (Roodman, 2007a). Equally, results from this group are mixed. For example, Hansen and Tarp (2000), Burnside and Dollar (2000), Gomanee, et al. (2003), Dalgaard et al. (2004), McGillivray et al. (2000) Karras (2006) and Collier (2007a), demonstrate positive relationship. Contrary, Jensen and Paldam (2003), Easterly (2001;2003;2008), Ekanayake et al. (2010) and Moyo (2009), suggest negative relationships. Finally, Doucouliagos and Paldam (2009), Rajan (2005b), Clemens et al. (2007; 2012), find insignificant (non-existent) effect. Notable strands from this group include following.

Aid, Policies and Growth

The most influential study of this group is aforementioned Burnside and Dollar (2000) paper, which underscored the importance of good policy environment. Indeed, the study had huge policy implications that Easterly (2003) points out that

consequently donors including USA and World Bank, increased their aid but with sterner conditions. A good example is US' Millennium Challenge Account (MCA), which others criticize for subjecting poor countries to unrealistic post and ex ante conditions (Moyo, 2009). Nevertheless, the aid-policy study attracted several mixed reactions notably from Levin et al. (2004), Easterly et al. (2004), Rajan et al. (2007), Hansen et al. (2001), among others. Ironically, using Burnside and Dollar data, Easterly et al. (2004) and later Rajan et al. (2008) found negative correlation while Hansen et al. (2001) suggested positive relationship even in poor-policy countries. Still, a time series study by McGillivray (2005) for African countries (1968-1999) showed positive impact of aid under good-policies. Indeed, overwhelming evidence suggests that policies matter in aid effectiveness although this issue is still contentious as economists fail to agree on definition of good policies (Levine and Roodman, 2004; Dollar and Levin, 2006).

Diminishing Returns of Aid

Another group spearheaded by Hadjimicheal et al. (1995) and later Hansen et al. (2001) and Clemens et al. (2012) argue that aid works, although its effectiveness is non-linear and hence subject to the law of diminishing returns. Thus, aid reaches a point where its additional increase results in reduced returns. Understandably, the law of diminishing returns has dominated mainstream economics for decades. Still, it is worth mentioning that its major drawback is treating recipient-countries as having equal conditions (Radelet, 2006). Nevertheless, Hadjimicheal et al. (1995) conducted a generalized least of square (GLS) cross section study of 31 African countries (1986-1992) and reported robust positive results but with diminishing

returns. Again, a study by Lensink et al. (2000) covering 111 countries (1975-1992) also confirms diminishing returns of aid. Although still debatable, the notion of diminishing role of aid now seems to be an accepted wisdom in aid-growth literature (Feeny and McGillivray, 2011).

Micro-Macro Paradox and Choice of Aid-Growth Models

Interesting observations continue to emerge where studies at micro-level (aid projects), mainly using cost-benefit analysis approaches (CBAs) depict a positive effect of aid as opposed to macro-level (growth) studies (Howes et al., 2011, Roodman, 2007a). Mosley (1986) was the first to report this contradiction which he called “micro-macro paradox”. Notable studies reporting ‘macro-micro paradox’ include Arndt et al. (2006) time-series study for Mozambique, and Picciotto (2009) time-series for 55 countries. Indeed, numerous studies like OECD (1997) synthesis study demonstrate that over 80%-90% of NGOs’ aid projects successfully achieve their objectives (Riddell, 2007), although challenges like poor-coordination are evident (Mueller et al., 2011). Nonetheless, Hansen et al. (2000), and later Moreira (2005) quash the idea of macro-micro paradox arguing that overall aid works and seemingly fails at macro level due to flaws in econometric instruments and methodologies.

Specifically, Hansen et al. (2001) argue that aid’s impact is highly sensitive to the choice of estimator and set of control variables. For instance, Hansen et al. (2001, p.547) state that, *‘When investment and human capital are controlled for, no positive effect of aid is found. Yet, aid continues to impact on growth via*

investment'. Additionally, Roodman (2008) posit that choice of models and techniques used by researchers determines whether results turn positive, negative or negative. Arguably, if true this phenomenon may influence researchers to select a model that fits their interests hence as mentioned previously the study also attempts to examine this premise.

Timing (Lagged) Effect and Type of Aid

Another important recent discovery hypothesizes that the timing and type of aid matters in examining aid effectiveness (Temple, 1999; Clement et al., 2012). The argument is that aid may depict either long or short time effect depending on its type. For example, investments in health may influence growth decades later (Roodman, 2007a). Specifically, a prominent study by Clemens et al. (2012) suggests that once aid is distinguished by type and a time-lag, negative results from key past studies turn positive although not robust. However, Roodman (2007) warns against trusting aid lags, as their coefficients often mistakenly turn positive due to reverse causation particularly in cases where poor growth performance attracted additional aid-inflows.

Additionally, Rajan et al. (2008) demonstrate that multilateral aid is more effective than bilateral aid. This is not surprising considering that unlike multilaterals; bilateral-donors are possibly more interested in other strategic motives rather than promoting growth (Alesina and Dollar, 2000). Furthermore, others contend that grants are more effective than loans since interests from loans might increase debt-burden (Odedokun, 2004). Among bilateral donors, Scandinavian aid whose

countries score highly in terms of donor practices is arguably more effective than the rest (Rajan et al., 2008). Nevertheless, this finding is still contentious as others claim that source of funds has little impact on its effectiveness (Easterly, 2009). Table 4 provides a summary of major studies in aid-growth literature.

Table 4: Summary of Some Major Studies on Aid and Growth (1960- to date)

Study name	Study Type	Study Tools	Key Finding
Chenery et al. (1966)	Panel Data Study for 31 developing countries (1957 to 1965)	Economic Analysis :Two-Gap Model	Positive Impact through savings
Griffin et al. (1970)	Cross Country study for 27 developing countries	First Bivariate Regression Analysis	Negative Impact-reduced savings
Bauer (1971)	Desk Review	Descriptive Analysis	Negative Impact
Papanek (1973)	Cross Country for 27 developing countries	First Multivariate Regression Analysis	Positive Impact through investments
Gulati (1976;1978)	Cross country for 51 developing countries	Multivariate Regression Analysis	Positive Impact through investments
Mosley(1980;1987)	Panel Data for various countries	Multivariate Regression Analysis	Negative Impact-reduced savings
Barro (1990)	Cross country various developing countries	Endogenous Growth Model Analysis :Three-Gap Model	Positive impact reduces fiscal gaps
Boone (1996)	Cross country for 91 developing countries	Multivariate Regression Analysis	Insignificant/Negative Impact supported consumption
Burnside et al.(2000)	Panel data of 56 countries (1970-1993)	Multivariate Regression Analysis	Positive impact only in countries with good policies
Easterly (2003)	Panel data of 56 countries (1970-1997)	Multivariate Regression Analysis	Negative/Insignificant impact
Roodman (2007)	Panel data for various developing countries	OLS regression Analysis	Not robust Mode choice matters/macro-micro paradox
Rajan et al. (2008)	Panel data various countries (1960-2000)	OLS regression Analysis	Insignificant/ non-robust even in good policy countries
Picciotto (2009)	Time Series for in 55 different countries	OLS regression Analysis	Insignificant/ modest depending on country's conditions
Clemens et al. (2012)	Panel Data from key previous studies	OLS regression Analysis	Not robust impact varies across countries

Source: Constructed by author

2.4 Criticisms of Aid as a Growth Mechanism

In order to provide a thorough analysis on the role of aid and growth, it is important to examine some of key arguments leveled against aid. Understandably, the majority of the arguments emanate from dependence theories pioneered by Raul Prebisch in the 1950s (Easterly, 2014). The following are some notable criticisms against aid.

2.4.1 Aid and the Dutch Disease

Among the most cited economic criticism against aid is the ‘Dutch Disease’ or ‘resource curse’. The term originates from a shocking experience of decreasing terms of trade in the Netherlands’ during 1970s due to discovery of gas-fields (Nyoni et al., 1997). Similarly, in aid-growth context, the Dutch disease occurs when aid-influx in non-productive sectors raises recipient country’s real-exchange rate and inflation thereby worsening the price of goods. Consequently, this harms the overall economy (Rajan and Subramanian, 2011; Arhenful, 2013). Indeed, studies in SSA by Fielding et al.(2012) and Rajan et al. (2011) support this claim. However, it is worth mentioning that this impact becomes less problematic where countries sterilize aid into other productive-sectors. Unfortunately, the bulk of ODA over 40% targets non-productive areas; refer figure 5. This ultimately makes sterilization of aid a challenge.

2.4.2 Aid, Rent Seeking and Corruption

Generally, evidence indicates that rent seeking behavior and corruption hamper economic growth (Svensson, 2000, Easterly, 2003). Particularly, Svensson et al.

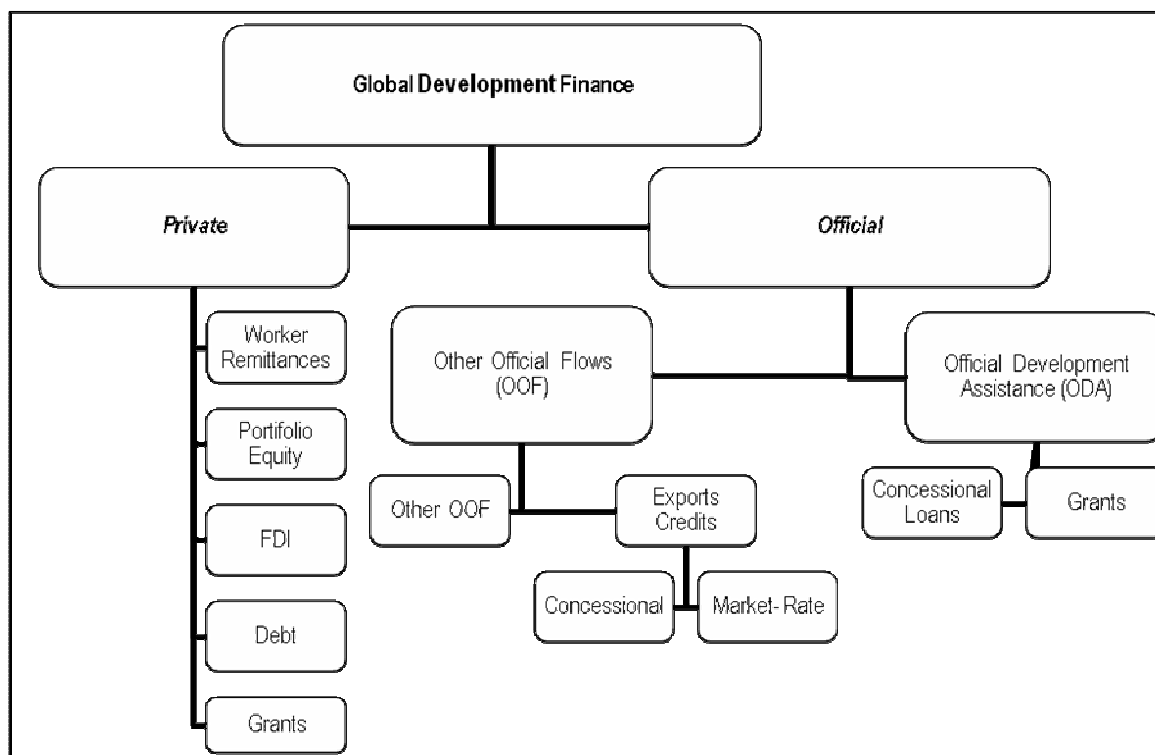
(2000) suggest that aid promotes rent-seeking behavior and corruption in SSA. Furthermore, Moyo (2009) argues that aid makes political leaders more dictatorial as they become more responsive to donors rather than their citizens. Still, others argue that aid promotes 'kleptocracies' - by definition governments of thieves where those in power abuse national resources like Mobutu Sese Seko in Zaire, (Easterly, 2013). Nevertheless, such claims ought to be noted with caution considering that correlation does not necessarily imply causation (Collier, 2007). Moreover, other scholars like Collier (2007) contend that aid enhances good governance through its conditionality although there is little evidence to support this claim.

2.4.3 Aid for trade

Critics argue that trade is an important source of income for poor countries and has higher-returns than aid (Thorp et al., 1971; Stiglitz and Charlton, 2006). Indeed, recent economic growth in Asia is more highly linked to trade than aid (Rajan and Subramanian, 2008). As cited in 2002 Monterrey Consensus, aid for trade entails using aid to support trade-inducing policies, institutions and infrastructure (Hudson, 2015). Much as this sounds logical, it is still important to note that developing countries are at different stages of development with diverse needs and capacities (World Bank, 2014). Consequently, the benefits from aid for trade might still vary significantly amongst countries. Nevertheless, more recently, aid for trade, FDI and migrant remittances are considerably increasing (OECD, 2014). Precisely, migrant remittances and even FDI have surpassed ODA as major sources of development finance, see figure 8 where aid for trade is given as Other

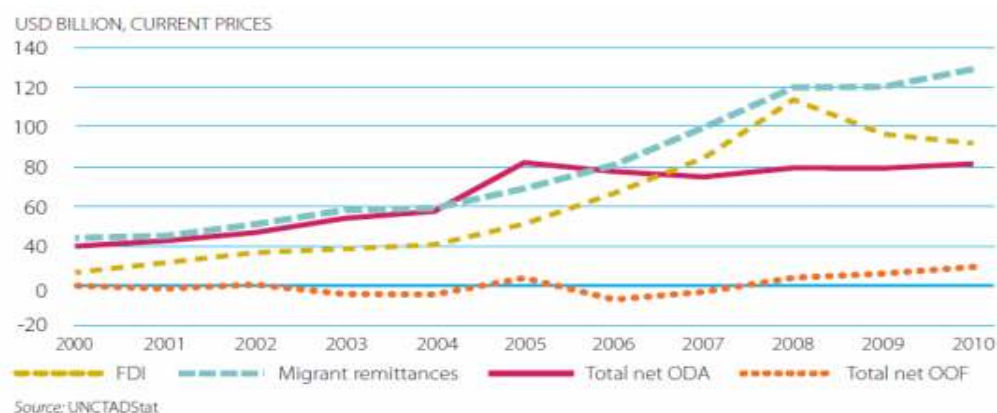
Official Flows (OOF). Chart 2 illustrates the linkage between aid and other forms of development finance discussed above.

Chart 2: ODA and Other Sources of Development Finance



Adapted from Bräutigam (2011, p. 204)

Figure 8: Recent Trends in Aid for Trade and other sources of Development Finance

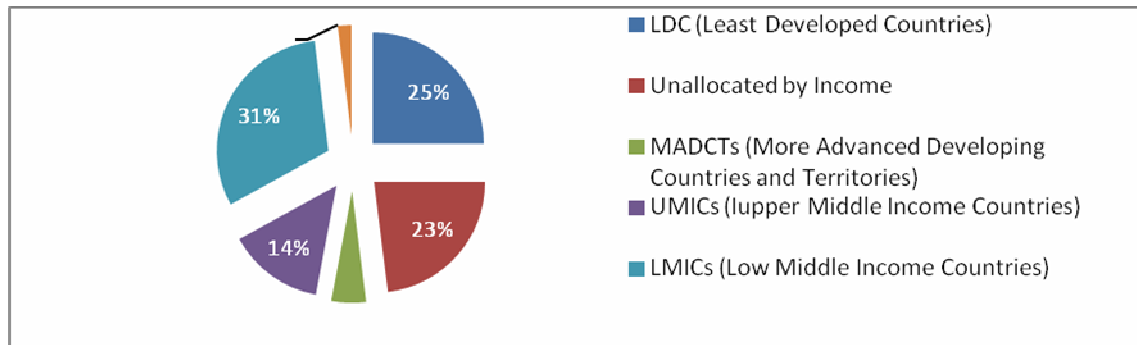


Additionally, some notable criticisms include: supporting wars or coups (Collier, 2007b); fungibility-aid is easily moved to non-priorities (Bauer and Onslow, 1998); it is easily abused by donors-funding own citizens and multinationals, e.g. technical assistance aid (Moyo, 2009); and may increase debt overhang e.g. SAPs loans in the 1980s (Tchereni et al., 2013). Furthermore, there is lately an increasing significance of non-DAC donors led by China. Although non-DAC donors are being commended for operating a 'no-strings' aid policy, evidence against the largest non-DAC donor, China equally indicates presence of ulterior motives like natural-resource exploitation (Dreher et al., 2011) and market expansion (Chaponniere, 2009), among others.

2.5 Aid Allocation and Donor Motives

Another important area of interest in aid studies is aid allocation. Optimal allocation of resources is essential for economic-growth (Weil, 2013). Evidence, however, suggests that donors barely allocate aid on need-basis as other interests like geo-politics, security, commerce, cultural influence, and colonial ties surpass altruism (Alesina and Dollar, 2000). Indeed, since 1960s only 25% of ODA supported LDCs while the rest went to relatively rich countries (OECD, 2015), See Figure 9.

Figure 9: Aid Allocation by Income Groups (1960-2012)



Source: Constructed using World Bank and OECD 2015 Data

For instance, the largest-donor USA mostly finances its strategic-interests in relatively rich-countries like Israel and Egypt (Dreher et al., 2011). Alternatively, Britain and France target their former colonies plus spreading their cultural influences (Alesina and Dollar, 2000). Moreover, Hudson (2015) notes that the bulk of Britain's aid goes to relatively rich India, which also now doubles as a new donor. Hence, it is crucial for researchers to understand that not all aid is primarily for growth, as other factors also matter (McGillivray, 2004).

2.6 Endogeneity and Fungibility of Aid

Another critical observation related to aid-growth nexus is the endogeneity problem. This refers to a scenario where aid and growth may share a simultaneous causal linkage between them (Arndt et al., 2015). For example, donors may strategically give aid to countries that are particularly doing badly or those performing brilliantly (Roodman, 2007a). Under such conditions, researchers may wrongly confuse correlation with causation (Hansen et al., 2007). Indeed, Clemens et al. (2012, p.15.) warn that in aid-growth nexus, 'it is naturally possible for non-causal mechanisms to produce Granger causality'. Furthermore, aid is also

highly fungible-easily moved by politicians and bureaucrats to non-priority areas (Jones, 2005), this is particularly common in countries with poor governance structures (Moyo, 2009). This underscores the need to note that in reality aid-growth nexus is complex.

2.7 Chapter Summary

The chapter first outlined a historical trend of modern aid from 1948 Marshal Plan to date. Thereafter, the section analyzed notable theories and empirical evidence relating to aid-growth nexus. Overall, both theoretical and empirical studies hint that there is no straightforward answer on how aid affects growth. Specifically early studies linked aid to growth via savings and investments while new studies assume a more direct linkage between aid and growth. However, major criticisms suggested against aid include the 'Dutch disease effect, corruption and debt overhang. Additionally, the section argues that although new donors are less stringent with rules, they still harbor non-altruistic ambitions. Finally, the section argues that globally aid allocation has not been optimal as donor-motives supersede altruism (Alesina et al., 2000). Moreover, aid-growth nexus is very complex and often susceptible to endogeneity and fungibility problems (Arndt et al., 2015) .

CHAPTER 3: OVERVIEW OF AID, MACROECONOMIC STABILIZATION AND GROWTH IN MALAWI

“Malawi has been conflict-free for its entire Post-independence history, yet it still has not developed”-Paul Collier, The Bottom Billion, 2007

3.1 Introduction

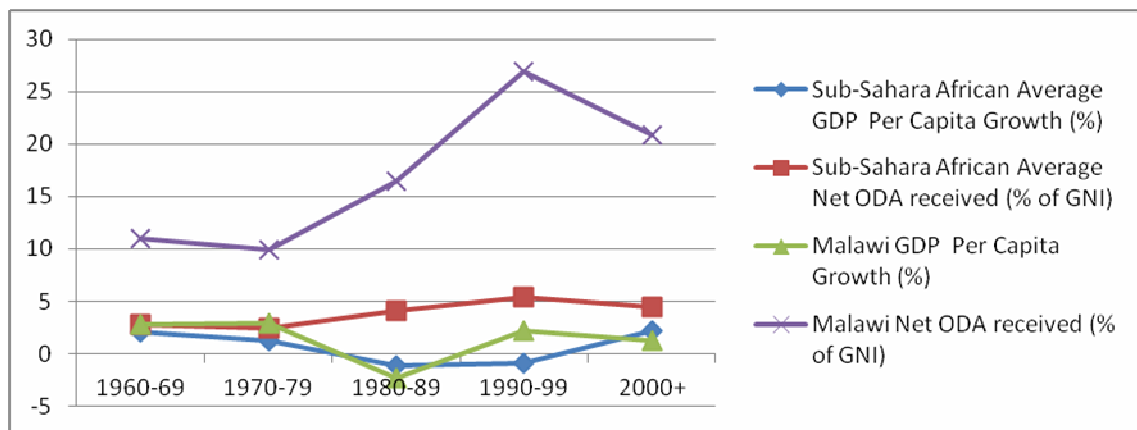
Currently, critical interest in aid-growth studies is being placed on the interaction between aid-inflows, growth and macroeconomic environment of a recipient country (Rajan et al., 2008). This chapter, therefore, examines the aid-growth nexus with respect to prevailing policies and other key macroeconomic variables including foreign exchange, government expenditure, trade, and investment-savings in Malawi. Importantly, the section also examines the aforementioned Dutch disease effect in the context of Malawi. Furthermore, the section examines aid allocation and its management in the post-independence era.

3.2 An Overview of Macroeconomic Environment for Aid in Malawi

As mentioned in the introductory chapter, Malawi is amongst the world's most aid dependent countries. However, despite increasing aid-inflows economic performance has been erratic since 1960s characterized by exorbitant inflation, high interest rates, huge debts and high budget deficits (Fagernäs and Schurich, 2004). However, soon after independence until 1970s Malawi achieved remarkable growth averaging 7% owing to excellent fiscal-policies plus good management of aid-inflows that hiked from 3% of GDP in 1960s to 15% by 1970 (OECD, 2015) see

figure 10. Nevertheless, economic-performance stalled towards the end of 1970s to early 1980s due to global oil-crisis, severe drought and repressive policies (Fagernäs and Schurich, 2004).

Figure 10: Aid and Growth: Malawi versus African Region (1960-2012)



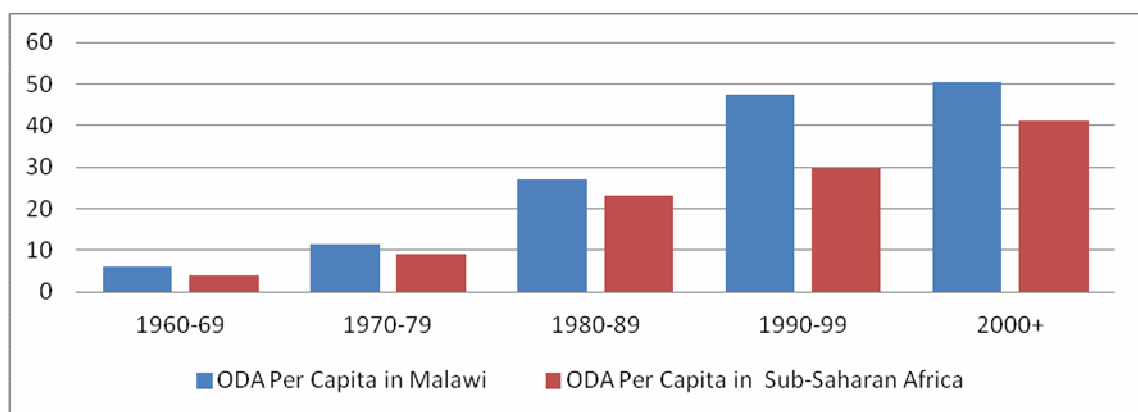
Constructed using WB and OECD 2015 data

Furthermore, by 1990s ODA extremely increased averaging US\$ 470 million from \$64 million in 1970s (IMF, 2001). However, this increase was less pronounced in per-capita terms due to rapid population-growth. Again, it is important to mention that during this period much of ODA was earmarked for Structural Adjustment Programmes (SAPs) reforms rather than growth (De and Becker, 2014). Contrary, Malawi like most African countries responded poorly to SAPs reforms particularly massive devaluation-policy and privatization of state-enterprises (Chiumia and Simwaka, 2012). Hence, critics contend that instead of bringing growth, SAPs loans increased debt overhang and poverty (Mapulanga, 2012). Indeed, the

period was a crisis hence by 1989 Malawi recorded its lowest per-capita growth of -4% see figure 10.

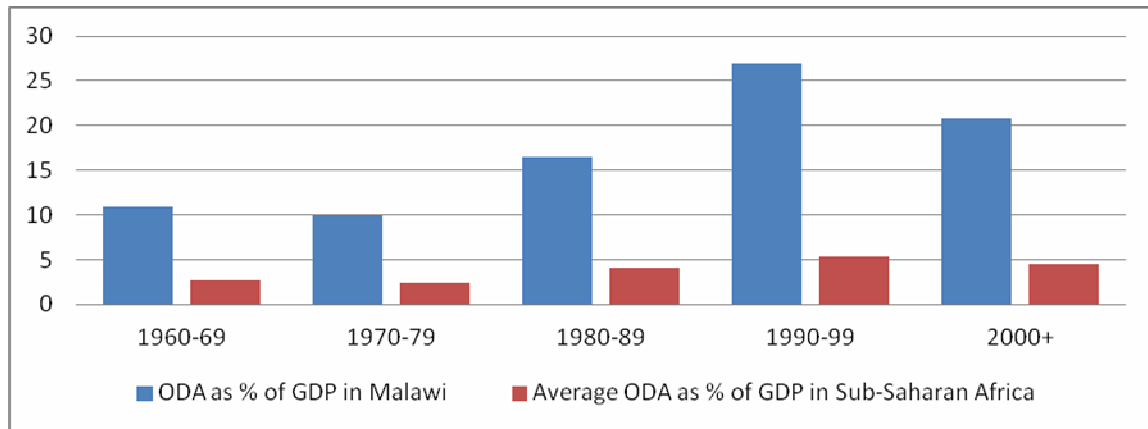
Since 1990s, ODA is gradually shifting towards supporting human-development through the Malawi Growth Development Strategy (MGDS), a local version of the MDGs, see figure 13. Nonetheless, around 1993 donors allegedly used aid conditionalities to pressurize government to adopt democracy (Morton, 2010). No wonder critics argue that donors have often used aid to subject Malawi to donor-interests with little focus on attaining growth (Wroe, 2012). Lately, per capita aid sharply increased, still economic-growth deteriorated except for a short stint between 2000 and 2009 owing to fiscal discipline and high agricultural yield (Masina, 2009). To encapsulate, Malawi's economic-performance has been below SSA's average as per-capita growth has fallen from 5% in the 1970s to -1% by 2012, see figure 11 (OECD, 2015; World Bank, 2015).

Figure 11: Trend in Per Capita ODA- Malawi and Sub Saharan Average



Constructed using WB and OECD 2015 data

Figure 12: Aid Dependence-Malawi and Sub-Saharan African Average



Constructed using WB and OECD 2015 data

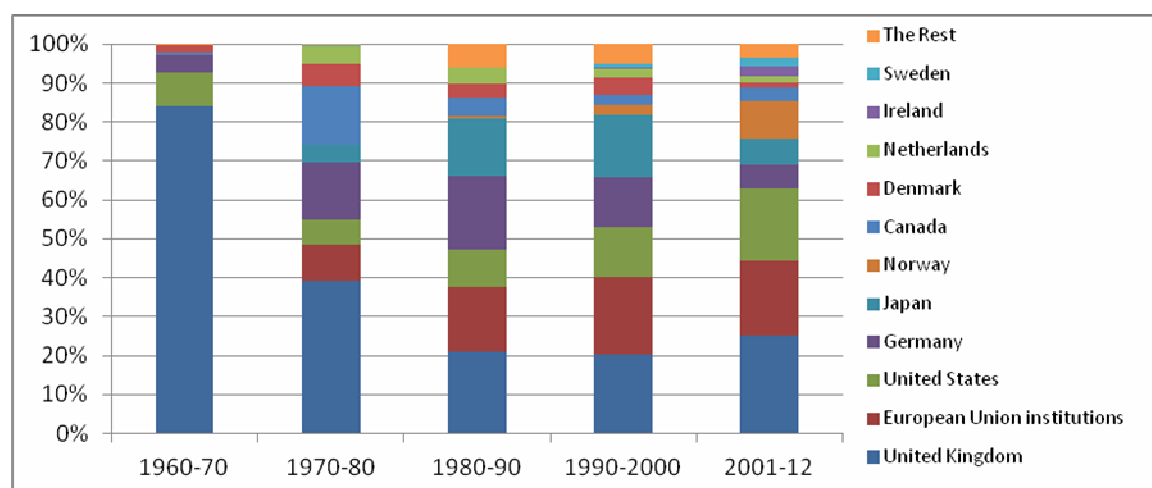
3.3 Aid and Macroeconomic Management Since 1960s

Furthermore, it is important to indicate that traditionally Britain is the largest donor confirming claims made by Alesina et al. (2000) that colonial-ties matter. Other key donors are as shown in (figure 13). Currently, ODA mostly supports social-sectors with health accounting over 38% (figure 14). Therefore, some progress has been registered in social outcomes particularly health and education (De and Becker, 2014), whereas productive-sectors like manufacturing deteriorated (Chiumia and Simwaka, 2012), see figure 17. Furthermore, Malawi's relationship with donors has been unstable in the post democratic era due to alleged aid mismanagement; the latest being the famous 'Cash-gate scandal' involving millions of donor-funds (Blas, 2013).

Notwithstanding, studies have also documented donor-related challenges attributable to non-adherence to both Paris and Accra Agreements on aid (Winters,

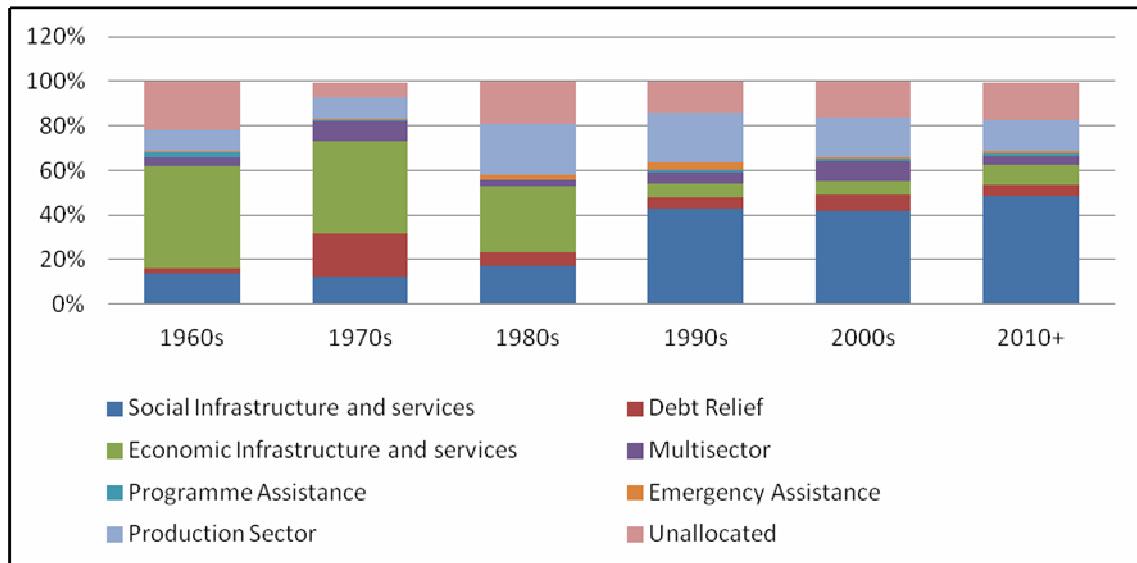
2012). Admittedly, poor aid management may compromise aid's roles in attaining growth and reducing poverty (Moyo, 2009). Comparatively, economic performance and aid effectiveness have been more disappointing in the democratic era as opposed to the autocratic era (Blas, 2013). Indeed, Brown (2012) contends that corruption and misappropriation of public funds including aid have escalated during the democratic era due to laxity in governance structures.

Figure 13: Major Donors in Malawi (1960-2012)



Source: Constructed using OECD 2015 data

Figure 14: Aid by Sector in Malawi (1960-2012)



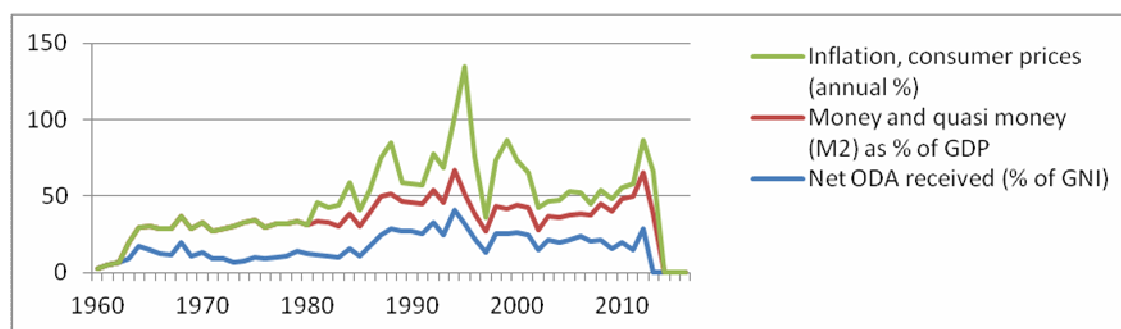
Constructed using OECD and DFID data

3.4 Foreign Aid and the Dutch Disease Effects

One of the pertinent questions in aid-growth studies is whether foreign aid causes aforementioned Dutch disease in recipient-countries. Indeed, studies by Chiumia et al. (2012) and Shields (2001) suggest presence of Dutch Disease effects in Malawi. Specifically, Shields (2001) who reported a negative-effect of aid on growth argues that aid-influx simply increases government spending and hence leads to undesirable inflationary effects because Malawi fails to sterilize aid into productive-sectors. Indeed, figures 15 and 16 illustrate that money supply, inflation and government spending seem to correlate strongly with ODA. Contrary, Chiumia et al. (2012) suggest that the main adverse effect of aid in Malawi is reduction in tax-efforts as government becomes more complacent with aid. They further argue that although useful, aid has less impact on growth than domestic tax-revenue as a 1%-increase in tax-revenue raises growth by 0.8% whilst a 10%

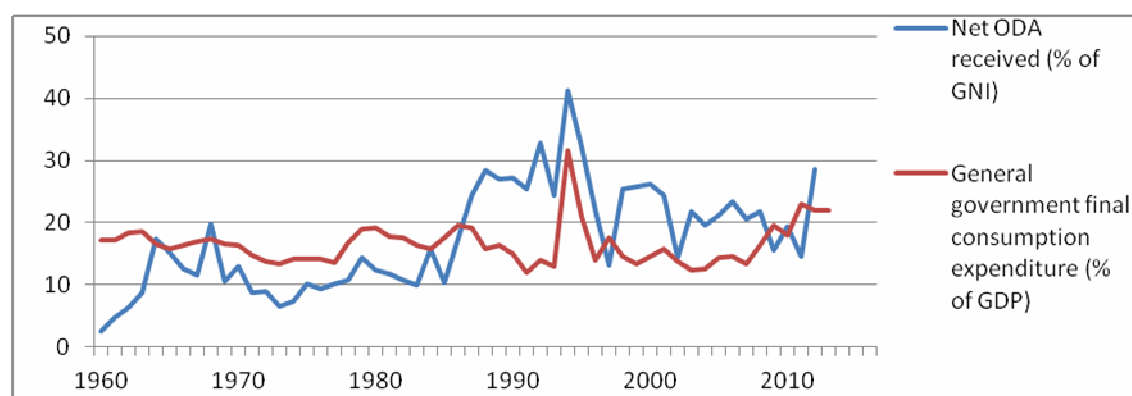
increase in aid only raises growth by 0.3%. Nevertheless, data seems to agree with Shields (2001) that there is a close correlation between aid-influx and inflationary-effects as opposed to reducing tax-revenue, see figures 16 and 17.

Figure 15: Growth in ODA, Reserve Money and Inflation (1960-2012)



Source: Constructed using World Bank and OECD 2015 Data

Figure 16: Trend in ODA and Government Spending (1960-2012)



Source: Constructed using World Bank and OECD 2015 Data

3.4.1 Aid, investments and savings

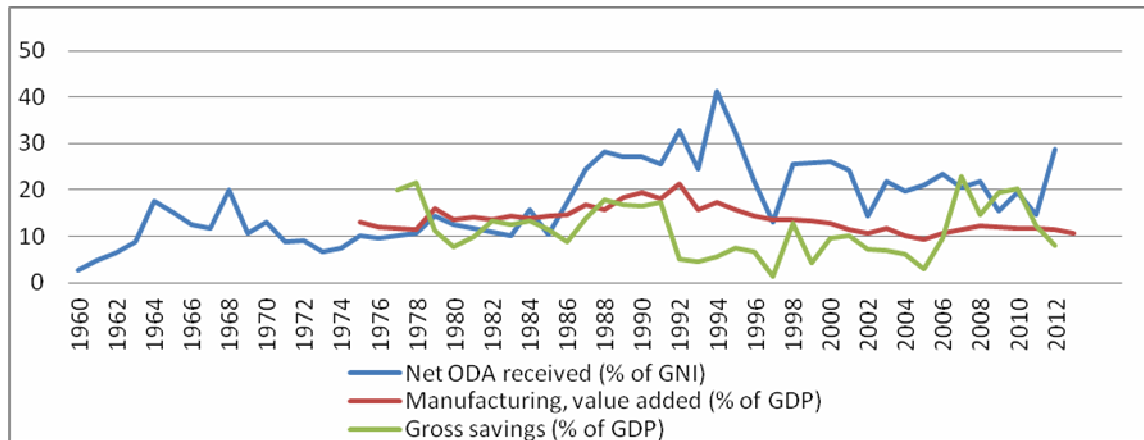
This subsection analyzes the relationship between aid, savings and investments in Malawi as theoretically aid affects growth via this channel. According to World Bank (2014), Malawi's savings and investment rates are among the lowest in Africa. Already, Tchereni et al. (2013) and Shields (2001) suggest that aid-inflows

in Malawi discourage both savings and investments mainly due to Dutch disease effects. Contrary, Fagernäs et al. (2004) counter-argue that through budget-support aid has helped reduce both foreign and domestic borrowing thereby promoting savings and investments in a long-run. Outstandingly, Morton (2010) argues that it is impractical to conclude that aid promoted or deterred savings and investments in Malawi considering that other factors like institutions, policies, demographics, citizens' culture and population-growth also affect savings and investments.

3.4.2 Aid, Manufacturing and Trade

Aid-inflows can profoundly affect manufacturing and trade in a recipient country either positively or negatively (Rajan and Subramanian, 2011). To begin with, Mapulanga (2012) suggests that aid-influx coupled with SAPs reforms e.g. massive devaluation hampered Malawi's manufacturing and exports sectors. However, influential aid-proponents, Sachs (2005) and Collier (2007) argue that Malawi derails in trade mainly because of its landlockedness, overreliance on tobacco for exports and globalization effects. Specifically, Collier (2007) argues that the emergence of China and India has hugely affected trade competitiveness of small economies. Evidently, manufacturing and trade have deteriorated while aid increased see figure 17. Still, it is possibly unrealistic to accuse aid of entirely deterring trade since other factors also affect trade competitiveness.

Figure 17: Declining Trend in Manufacturing and Savings Volatility (1960-2012)



Source: Constructed using World Bank and OECD 2015 Data

3.5 Aid and Policies

The critical role of economic policies in aid-growth studies continue to garner more support (Dollar and Levin, 2006). Similarly, Shields and IMF (2001) examined impact of economic policies on aid effectiveness in Malawi using a special time-series policy-index resembling the one by Burnside et al. (2000). The policy index specific to Malawi used by the IMF and World Bank is as follows:

$$\text{Policy} = 1.26 + 8.4 \times \text{Budget surplus} - 1.4 \times \text{Inflation} + 2.2 \times \text{Openness} \quad (7)$$

Consequently, Shields and IMF (2001) reported that poor economic policies contributed to failure of aid in Malawi. Moreover, aid-influx worsened the policy index through the Dutch Disease effects. Nevertheless, Collier (2007) counter-argues that comparatively Malawi has failed to grow mainly because of other disadvantages like its landlockedness and not bad-policies. Put simply, Collier

(2007, p.64) argues that ‘even the best governance and policies are not going to turn Malawi into a rich country-it just doesn’t have the (right) opportunities’. Hence, good governance and policies possibly matter in aid effectiveness and growth but subject to availability of other enhancing opportunities (Hudson, 2013).

3.6 Aid Allocation, Diversion and Fungibility

As stated, aid allocation is crucial in aid effectiveness studies. It is, therefore, imperative to analyze whether aid was optimally allocated both at national and sub-national levels. Notably, Roberts et al. (2013) analyzed aid distribution in 28 districts in Malawi and they suggest that locally aid-allocation is highly fungible and sensitive to political and ethnic targeting. In short, a district with same political or ethnic belonging to a serving president was likely to receive a bigger chunk of aid (Roberts et al., 2013). Conversely, De et al.(2014) argue that aid distribution has been effective in Malawi particularly in the social-sector citing some improvement in human development indicators. Albeit, poor aid allocation is a recipe for aid’s failure to achieve growth (Easterly, 2009).

Furthermore, Moyo (2009) argues that foreign aid is treated as ‘free money’; consequently, some African leaders have ably diverted aid projects to non-prioritized regions thereby creating ‘white elephant’ projects. For instance, in Malawi a former leader allegedly relocated a university project worthy US\$79 million of Chinese grant miles from its planned location to his home district at his private-farm (Nkhoma Synod, 2012), see figure 18. Easterly (2014) contends that such tendencies contribute to aid’s failure on growth in most African countries.

3.7 Emergence of New donors in Malawi

Although the study focuses on DAC-aid, it is important to mention that Chinese aid is increasingly gaining momentum in Africa moving from \$100 million few years ago to over \$39 billion by 2009 (Bräutigam, 2011). Unlike traditional (DAC) donors, China claims a 'win-win' relationship while focusing largely on infrastructure development (Rotberg, 2008). In Malawi alone, China is implementing major infrastructure projects amounting to over US\$ 287 million comprising US\$ 80 million grants and US\$ 175 million as concessional loans (Banik, 2013). However, as earlier argued, China is equally motivated by other ulterior motives apart from growth.

Figure 18: Chinese funded public university relocated at former president's private farm



Picture courtesy of timesmediamw

3.8 Chapter Summary

To recap, the macroeconomic environment in which aid evolved in Malawi has been turbulent and highly volatile hence it has been difficult for aid to contribute effectively to growth. Furthermore, the section hints that in the democratic era, aid (public funds) management has been more disappointing (Brown, 2012). Additionally, previous studies reported mixed results although the majority suggested that aid has not promoted growth. Notable studies revealed that aid causes the Dutch disease, which affects macroeconomic variables (Shields, 2001). However, this is still contentious since correlation does not necessarily imply causation (Clemens et al. 2012). Finally, the chapter indicates that locally aid allocation has been challenging due to political interference and corruption (Blas, 2013). However, some progress has been registered in social sectors. Finally, non-DAC donors like China have lately increased their significance although they equally seem to harbor own self-interests.

CHAPTER FOUR: EMPIRICAL FINDINGS AND DISCUSSIONS

4.1 Introduction

The research question posed in the introductory chapter is premised on the hypothesis that aid exerts a positive and significant impact on growth. Hence, this chapter investigates this hypothesis by focusing on time-series data for Malawi

from 1960 to 2012. To execute this, the study adopts a deductive reasoning approach. Simply put, “a deductive approach is concerned with developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis” (Wilson, 2010, p.7). Chart 2 below outlines the core steps in deductive reasoning approach suggested by Burney et al. (2006) and Wilson (2014). The first section of this chapter discusses study’s methodology while the second section focuses on discussing the findings from the empirical investigation.

Chart 3: Major Stages in Deductive Reasoning Approach



Source: Constructed by author

4.2 Research Methods and Techniques

It is crucial to choose correct research methods and data analysis recognizing that they profoundly affect quality of results (Creswell, 2013). Hence, the subsequent subsections discuss some key methods, techniques and procedures employed in this study.

4.2.1 Econometric Analytical Techniques

In order to investigate aid-growth nexus quantitatively, the paper adopts a linear-regression analysis which focuses on estimating the dependence of one variable, *dependent variable* on other variables, *explanatory variables* (Gujarati and Porter,

2009). Specifically, a multivariate-regression model for time-series is adopted to accommodate many explanatory-variables. To estimate regression models, the study employs method of Ordinary Least Square (OLS) which is 'one of the most powerful and popular methods of regression analysis' (Gujarat et al., 2009, p.55). These measures are adopted to ensure that results are valid and correspond with theoretical underpinnings.

4.2.2 Model Selection

Recognizing increasing importance of policies in aid-growth literature, the study adopts aforesaid aid-policy-growth model by Burnside et al. (2000) as its main model. However, a simple model by Papanek (1973) plus a model by Collier et al. (2002) on aid's diminishing returns are incorporated for comparative purposes. This approach is adopted in order to address the study's minor-objective of ascertaining if indeed model-choice matters in examining aid-growth nexus as premised by Hansen et al. (2001) and Roodman (2007).

Firstly, before introducing the main model, it is logical to start with a simple model by Papanek (1973) where per capita growth, in country i at time t , $G_{i,t}$ may be expressed as follows;

$$G_{i,t} = \alpha + \beta Aid_{i,t} + X_{i,t} \eta + \varepsilon_{i,t} \quad (4.1)$$

Here, $Aid_{i,t}$ = ODA/GDP, $X_{i,t}$ = vector of country-characteristics with η as vector-coefficient, $\varepsilon_{i,t}$ =white noise. The test is on whether parameter coefficient for aid, β , is positive, negative or significant.

Secondly, the study incorporates policy variables as suggested by Burnside et al. (2000), plus a lagged aid variable to capture aid's timing effect proposed by Clemens et al. (2012). In order to do this, the study adopts a policy index for Malawi time-series designed by Shields and IMF (2001), expressed as:

$$\text{Policy} = 1.26 + 8.4 * \text{Budget surplus} - 1.4 * \text{Inflation} + 2.2 * \text{Openness} \quad 4.2$$

Therefore, equation 4.1 becomes:

$$G_{i,t} = \alpha + \beta_1 \text{Aid}_{i,t} + X_{i,t} \eta + \beta_2 \text{Policy}_{i,t} + \beta_3 (\text{Aid}_{i,t} * \text{Policy}_{i,t}) + \beta_4 \text{Aid}_{i,(t-1)} + \varepsilon_{i,t} \quad 4.3$$

Here, β_3 measures aid-impact subject to policies; β_4 captures aid's lagged effect on growth. Again, testing is on whether these coefficients are positive, negative or insignificant.

4.2.3 Inclusion of Regime Changes Dummies

Furthermore, to check whether type of political regime (governance) matters in aid-effectiveness as suggested by Boone (1996), dummies were constructed given as 'autocracy' and 'democracy'. Autocracy dummy covers period from 1960s to 1993 while democracy dummy captures the period 1994 to date. These are imbedded into revised version of aid-policy model (equation 4.3).

4.2.4 Diminishing Returns Role of aid

Finally, to determine whether aid in Malawi exhibits diminishing returns, the following model by Collier et al. (2002) is used:

$$G_{i,t} = \alpha + \beta_1 \text{Aid}_{i,t} + X_{i,t} \eta + \beta_2 \text{Policy}_{i,t} + \beta_3 (\text{Aid}_{i,t} * \text{Policy}_{i,t})$$

$$+ \beta_4 Aid_{i,t-1} + \beta_4 AidSQ + \varepsilon_{i,t} \quad 4.4$$

Here, negative β_4 theoretically implies presence of diminishing returns; the opposite is true while the rest are as explained previously.

4.2.5 Description on Data Variables

Credibility of data is crucial in any research; hence, data has been obtained from reliable sources only like World Bank, OECD, and PENN Tables. Still, data availability in developing countries is a challenge (Hudson, 2015). Notably, this dissertation uses ODA/GDP as a proxy for ‘development aid’ but realistically not all ODA is given for growth (Alesina and Dollar, 2000). Equally, as argued earlier per-capita GDP growth attracts criticisms as a measure of economic-advancement, (Sen, 1999). Still, the study adopts per-capita GDP since it is the best available option (Bergh, 2009). Table 5 describes selected indicators and their sources.

Table 5: Description of Data Variables

VARIABLE ABR	DESCRIPTION	SOURCE
Growth	GDP per capita growth (annual %)	WB
AID	aid as a percentage of GNI	OECD/WB
POLICY	Policy index = 1.26 + 8.4*Budget surplus - 1.4*Inflation + 2.2 Openness	IMF (2001)
AIDPOLICY	Aid*Policy index	Constructed
AID(-1)	Lagged aid	Constructed
AIDSQ	aid*aid	Constructed
DOMINVEST	Gross capital formation (% of GDP)	WB
POPULN	Population growth (annual %)	WB
FDI	Foreign direct investment, net inflows (% of GDP)	WB
GOVT	General government final consumption expenditure (% of GDP)	WB
SAVINGS	Gross domestic savings (% of GDP)	WB
INFLATN	Inflation, GDP deflator (annual %)	WB
LIFEEXP	Life expectancy at birth, total (years)	WB

M2	Money and quasi money (M2) as % of GDP	WB
HUMANCAP	Secondary School enrolment as a % of total school enrolment	WB/PENN World
MANUF	Manufacturing value added (% of GDP)	WB
TRADE	Trade Openness as a % of GDP	WB
DEBT	Gross Debt service as a % of GDP	WB
AUTOCRACY	Dummy for Autocratic era (Repressive Policies) (1964-1993)	Constructed
DEMOCRACY	Dummy for democratic era (Liberalized economy) (1994-todate)	Constructed

Source: Constructed by author

4.2.6 Empirical design

In regression analysis, certain techniques and procedures must be carried to detect possible regression problems, which if left uncorrected may lead to spurious results (Koop, 2013). These problems include outliers, non-linearity, multicollinearity, autocorrelation, heteroscedasticity, non-stationarity and model misspecification (Gujarati et al., 2009). To detect these, various graphical detections and formal diagnostic tests are used. These include Durbin-Watson (D-W) test for autocorrelation, variance-inflating factor (VIF) or tolerance (TOL) for multicollinearity, White test for heteroscedasticity, and Unit root tests like Augmented Dickey Fuller (ADF) tests for non-stationarity, see appendices. However, non-stationarity is the most common cause of spurious regressions for time-series (Gujarati and Porter, 2010).

4.2.7 Cointegration Analysis

To avoid problems related to non-stationery, it is important to verify that despite being non-stationery regression-variables still share a long-run relationship or that they are cointegrated (Gujarati et al., 2009). Hence to test cointegration, the study adopts Augmented Engle-Granger method which entails that testing co-integration

is equivalent to proving stationerity of error-terms, μ_t , (Engle and Granger, 1987), given as:

$$\hat{u}_t = y_t - \hat{\beta}_0 - \hat{\beta}_1 x_t \quad 4.5$$

The next step hence involves running ADF tests for the following two regressions, with an intercept and with an intercept and a trend:

$$\Delta \hat{u}_t = \alpha + \rho \hat{u}_{t-1} + \varepsilon_t \quad 4.6$$

$$\Delta \hat{u}_t = \alpha + \beta t + \rho \hat{u}_{t-1} + \varepsilon_t \quad 4.7$$

Here, Δ = first difference operator, ε =white noise, t = trend. Thus, in equation 4.6 with an intercept only if calculated t ($=tau$) values of lagged-residuals, μ_{t-1} , exceed Dickey Fuller asymptomatic (tabulated) values, the unit root test is rejected thus the time-series is stationery (co-integrated). The test is similar in equation 4.7 with an intercept and a trend where testing is on whether regression-model becomes stationery after data trending (Gujarati et al., 2009).

4.2.8 Estimation of Error Correction Mechanism (ECM)

After proving cointegration, the next critical step is to ascertain the long run (LR) and short run (SR) elasticity of regressors and speed of adjustment towards equilibrium using the Error Correction Mechanism (ECM) model (Engle et al., 1987), expressed as:

$$\Delta y_t = \gamma_0 + \gamma_1 \hat{u}_{t-1} + \gamma_2 \Delta x_t + v_t \quad 4.8$$

Here, Δ is first difference operator, μ_{t-1} , v = white noise error term, coefficient γ_1 = speed of adjustment and is expected to be negative to evade unit root problems, γ_2 = SR elasticity for any X variable while LR elasticity involves coefficients of regressors given in main model 4.3.

Another important test in time-series studies is proving 'causality' amongst variables using techniques like Granger tests. However, as argued already proving causality in aid-growth nexus may yield spurious results due to endogeneity problems between aid and growth (Clemens et al., 2013). Moreover, not all aid is realistically for growth as argued earlier (Alesina and Dollar, 2000).

4.3 Results and Discussions

Having looked at the methodology, this section discusses the findings of the study based on empirical investigation in relation to prevailing literature. The analysis employs both descriptive tools and OLS regression analysis discussed earlier. The first part of OLS analysis discusses individual regressions from the three models. After presenting their comparative analysis, the study proceeds with the revised aid-policy model for final discussions.

4.3.1 Descriptive Diagnosis

Before further analysis, it is useful to provide a descriptive diagnosis of study's variables to identify possible data problems using graphical analysis and statistical tabulations. Indeed, in Appendix 1.A the correlation matrix table reveals that most pairwise correlations are below 0.8, except for a few explained subsequently. Hence, based on the rule of thumb, multicollinearity may not be problematic (Gujarati et al., 2009); though profound diagnosis has been captured by tests like VIF and TOL (Appendix 3.A). Likewise, all plots of residuals (Appendix 1.B) also dismiss problems of outliers, except in the basic model to be addressed later. Again, plots of actual against fitted in all regressions hint that model misspecification may not be worrisome. Equally, regressions' autocorrelograms indicate no severe autocorrelation. Still, autocorrelation graphs of regressors reveal non-stationerity problem except for their first differences. Admittedly, descriptive analysis though useful is inadequate (Koop, 2013), hence, a more profound diagnosis is subsequently obtained through OLS estimations.

4.3.2 Regression Problems Diagnosis and Unit Root Tests

Understandably, an automatic signal for spurious regression is an R-squared value exceeding D-W statistic (Gujarati, 2010), which evidently is not the case here. However, collaborating graphical analysis, unit root tests particularly ADF tests for various random walks reveal that most variables are non-stationery (Appendix 4.A). Indeed, their first differences are stationery meaning that the series are integrated of order one, $I(1)$ (Koop, 2013). For instance, ADF tests based on random walk model demonstrate that at ordinary level, computed tau-values of

variables are less than their corresponding 95% asymptotic values thereby suggesting non-stationarity. Contrary, computed tau values for first differences exceed critical values confirming that the series are indeed I (1) (Appendix 4.B). Non-stationarity instigates spurious regressions (Sjö, 2008). Regardless, cointegration tests for all three models demonstrate that the variables are cointegrated thereby hinting that the regressions are non-spurious (Appendix 4).

4.3.3 OLS Regression Results from Papanek Model

A simple model with no interactive terms by Papanek (1973), given as equation 4.1 was first to be tested (table 7 or Appendix 2.A). Briefly, results indicate that aid exhibits a negative but insignificant impact on growth thereby contradicting the theory that aid promotes growth (Papanek, 1973). Aid coefficient is -0.17865 and insignificant at 21% (0.206). However, these results are not robust. For instance, R-squared, which measures goodness of fit at 0.34982 is notably low for time-series. Moreover, most variables are either insignificant or have wrong coefficient signs. Still, D-W statistic of 2.0163 is close to 2 implying that autocorrelation may not be problematic and is higher than R-squared implying that the regression is possibly non-spurious (Gujarati et al., 2010).

4.3.4 Regression Results from Simple Aid Policy Model

The next analytical stage involved testing aid-policy model by Burnside et al. (2000), which in principle is simply an extension of Papanek model by incorporating policy index (equation 4.2) and an interactive term, aid-policy to formulate equation 4.3. The results were as follows.

Table 6: Regression Results from Aid-Policy Original Model

Ordinary Least Squares Estimation			

Dependent variable is GROWTH			
53 observations used for estimation from 1960 to 2012			

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	-58.6482	15.5530	-3.7709[.001]
POLICY	-.39580	.081306	-4.8680[.000]
AID	-.41620	.15460	-2.6922[.010]
AIDPOLICY	.0014327	.0015885	.90195[.373]
DOMINVEST	-.20865	.13307	-1.5680[.125]
POPULN	-.66453	.67683	-.98182[.332]
SAVINGS	.29137	.18381	1.5851[.121]
FDI	.87406	.57754	1.5134[.138]
INFLATN	-.13685	.072970	-1.8755[.068]
LIFEEXP	2.4060	.51760	4.6485[.000]
DEBT	-1.6990	.37122	-4.5769[.000]
GOVT	-3.0828	.64599	-4.7723[.000]
TRADE	.61719	.16318	3.7822[.001]
HUMANCAP	-.72676	.16458	-4.4160[.000]
M2	-.66701	.20782	-3.2095[.003]

R-Squared	.62556	R-Bar-Squared	.48761
S.E. of Regression	3.7142	F-Stat. F(14,38)	4.5346[.000]
Mean of Dependent Variable	1.3694	S.D. of Dependent Variable	5.1888
Residual Sum of Squares	524.2290	Equation Log-likelihood	-135.9321
Akaike Info. Criterion	-150.9321	Schwarz Bayesian Criterion	-165.7093
DW-statistic	1.8432		

Source: All OLS Tables Generated from Microfit

Evidently, incorporation of policy variables greatly improved the regression as most coefficients now contain right signs and are highly significant below 10%. Comparatively, r-squared of 0.63 is reasonable while D-W statistic of 1.8 is close to 2, indicating that there is no serious autocorrelation. Again, results suggest that aid exhibits a significant negative impact on growth. Precisely, aid's coefficient is -0.4162 and significant at 1% suggesting that, ceteras paribus; one unit increase in ODA/GDP reduces growth by 0.42. Likewise, coefficient for policy index is -0.39580, and highly significant at 0.000 suggesting that weak economic policies were detrimental to growth (Shields, 2001). 'Aidpolicy' interactive term although positive is still insignificant implying that weak policies had a null effect on aid effectiveness. Although most macroeconomic variables have expected signs,

human capital coefficient is surprisingly negative and significant. Apart from data challenges, Pritchett (2001) confirms that this puzzle is common in countries like Malawi due to high unemployment levels amongst educated people and overreliance on unproductive (public) sectors supported by aid. Overall results suggest that most macroeconomic variables are underperforming as hinted previously.

4.3.5 Regression Results from Aid-growth Non-Linear Model

Importantly, apart from comparative analysis Collier's non-linear model also serves to examine whether aid shares a non-linear relationship with growth. Consequently, equation 4.4 was tested and results were indeed robust like aid-policy regression, see table 7 or Appendix 2.B. Interestingly, aid variable now turns insignificant at 22% implying again that aid is immaterial to growth (Rajan et al., 2008). Coefficient for aid-squared term is negative, -0.03125, and highly significant at 2%. A negative aid-squared coefficient indicates presence of non-linear linkage between aid and growth (Moreira, 2005). This is not surprising since aid covers 40% of Malawi's budget (World Bank, 2012). Clemens et al. (2012) warn that when aid reaches 15%-25% of GDP its impact on growth starts diminishing. Noticeably, inclusion of aid-squared variable compromised significance of aid in the regression as aid coefficient dramatically turned insignificant.

4.3.6 Summary of Preliminary Results: Comparative Analysis

Table 7 provides a brief summary of preliminary results from the three models for comparative purposes. This also helps address study's minor objective of

evaluating the preposition by Hansen et al. (2005) and Roodman (2007) that model choice matters in aid-growth nexus.

Table 7: Summary of Preliminary Results

Dependent variable is GROWTH						
53 observations used for estimation from 1960 to 2012						
VARIABLE	PAPANEK's BASIC MODEL		AID-POLICY MODEL		NON-LINEAR MODEL	
	Coefficient	T-Ratio[Prob]	Coefficient	T-Ratio[Prob]	Coefficient	T-Ratio[Prob]
C	-29.2997	-1.6197[.113]	-58.6482	-3.7709[.001]	-58.6384	-3.9915[.000]
AID	-0.17865	-1.2859[.206]	-0.4162	-2.6922[.010]	0.52733	1.2410[.222]
POLICY	N/A	N/A	-0.3958	-4.8680[.000]	-0.31679	-3.7824[.001]
AIDPOLICY	N/A	N/A	0.0014327	.90195[.373]	-0.0024981	-1.1155[.272]
AID-SQ	NA	NA	NA	NA	-0.031254	-2.3644[.023]
DOMINVEST	-0.22062	-1.3000[.201]	-0.20865	-1.5680[.125]	-0.12299	-.94025[.353]
FDI	0.99794	1.4314[.160]	0.87406	1.5134[.138]	0.4881	.85718[.397]
POPULN	-1.3109	-1.5913[.119]	-0.66453	-.98182[.332]	-0.79063	-1.2324[.226]
SAVINGS	0.31014	1.3209[.194]	0.29137	1.5851[.121]	0.12292	.65494[.517]
TRADE	-0.10371	-.90270[.372]	0.61719	3.7822[.001]	0.61594	3.9960[.000]
DEBT	-0.84149	-1.9758[.055]	-1.699	-4.5769[.000]	-1.503	-4.1713[.000]
HUMANCAP	-0.43694	-2.2529[.030]	-0.72676	-4.4160[.000]	-0.72117	-4.6386[.000]
M2	-0.35868	-1.4218[.163]	-0.66701	-3.2095[.003]	-0.51811	-2.5131[.016]
GOVT	-0.095841	-.31741[.753]	-3.0828	-4.7723[.000]	-3.3191	-5.3680[.000]
LIFEEXP	1.3741	2.2316[.031]	2.406	4.6485[.000]	2.3196	4.7312[.000]
INFLATN	0.11454	1.7960[.080]	-0.13685	-1.8755[.068]	-0.1773	-2.4966[.017]
R-SQUARED	0.34982		0.62556		0.67471	
D-W-Statistic	2.0163		1.8432		1.9539	

Source: Constructed from Microfit's OLS estimations

Evidently, all preliminary results contradict the theory by suggesting that aid failed to promote growth. This also implies that the hypothesis by Hansen et al. (2001) that model choice matters may not hold for Malawi. Comparatively, Papanek model results are not very robust owing to wrong signs and insignificance of most variables. Contrary, once policy index and its interactive terms are incorporated as conjectured by Burnside et al. (2000); the regression turns robust implying that aid effectiveness and growth are highly sensitive to economic policies (Shields, 2001). Furthermore, the non-linear model demonstrates presence of diminishing returns of aid (Clemens et al., 2012). However, the drawback of this model although with better r-squared and D-W values is that aid coefficient turns again insignificant.

Comparatively, aid-policy model seems to explain theory best judging by significance and right coefficients of most variables. Hence, in the interest of parsimony, further analysis proceeds with the aid-policy model.

4.3.7 Analysis of Parsimonious (Revised) Aid-Policy Regression

In order to ensure that results are non-spurious, the revised (parsimonious) regression underwent various diagnostic tests and procedures. For instance, some few insignificant (problematic) variables, particularly, domestic investments and human capital were replaced by more significant proxies. Yet, to avoid problem of model misspecification as advised by Gujarati et al. (2009), all variables with strong theoretical implications like policy variables were maintained. A proxy on manufacturing variable was adopted to replace investments variables. To incorporate possible lagged effect of aid as suggested by Clemens et al. (2013), a lag of aid was embedded. Lastly, recognizing the critical role of governance (political) systems in aid effectiveness, new dummies capturing regime types ('autocracy' and 'democracy') were incorporated as proposed by Boone (1996).

Table 8: Revised (Parsimonious) regression results

Ordinary Least Squares Estimation			

Dependent variable is GROWTH			
52 observations used for estimation from 1961 to 2012			

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	-13.1792	10.5214	-1.2526[.218]
POLICY	-.28992	.061799	-4.6914[.000]
AID	-.55270	.13329	-4.1466[.000]
AIDPOLIC	.1682E-6	.7767E-7	2.1652[.037]
GOVT	-3.0435	.58320	-5.2186[.000]
TRADE	.42259	.15132	2.7928[.008]
DEBT	-.75652	.34295	-2.2059[.034]
INFLATN	-.21631	.069387	-3.1175[.003]
LIFEEXP	1.4392	.39839	3.6126[.001]
M2	-.75445	.26293	-2.8694[.007]
MANUF	-.68869	.40435	-1.7032[.097]
AID(-1)	.30911	.13805	2.2391[.031]

AUTOCRACY	4.5779	1.8514	2.4726[.018]
DEMOCRACY	-7.4564	2.4160	-3.0862[.004]

R-Squared	.67551	R-Bar-Squared	.56450
S.E. of Regression	3.4393	F-Stat. F(13,38)	6.0851[.000]
Mean of Dependent Variable	1.2960	S.D. of Dependent Variable	5.2116
Residual Sum of Squares	449.4843	Equation Log-likelihood	-129.8631
Akaike Info. Criterion	-143.8631	Schwarz Bayesian Criterion	-157.5218
DW-statistic	2.0910		

Evidently, results demonstrate great statistical improvement over earlier versions as all regressors are now significant below 10% whereas most *t*-ratios are above 2. Goodness of fit as measured by R-squared has improved from 63% to 68% even both AIC and SBC are equally high. D-W statistic at 2.091 is now closer to 2 implying absence of severe autocorrelation (Koop, 2013). Clearly, multicollinearity although detectable in few variables is not worrisome as all pairwise correlations are around 0.8 whereas most VIFs from auxiliary regressions are below 10 (Appendix 3.A). Again, plot of residuals within the two bands demonstrate absence of outliers (Appendix 2). Furthermore, the plot of squared-residuals and White tests reveal absence of serious heteroscedasticity (Appendix 3.E). Albeit, ADF tests reveal non-stationerity while demonstrating that the regression is integrated of order one, *I* (1), see, Appendix 4. Regardless, subsequent cointegration analysis reveals that the variables are cointegrated meaning the regression is non-spurious (Sjö, 2008). Further comments on the results are provided after proving cointegration for validity purposes.

4.3.8 Cointegration Analysis

As mentioned, it is crucial to demonstrate that although variables are non-stationery, they still share equilibrium relationships (cointegration). Hence, the study adopted Augmented Engle-Granger (AEG) two-step method to test

cointegration. AEG method postulates that testing cointegration is equivalent to proving non-stationarity of lagged-residuals (Engle et al., 1987), given as equations 4.6 and 4.7. Accordingly, Tables 9 and 10 display AEG cointegration results generated from Microfit for regression with constant and that with constant and trend.

Table 9: Cointegration Results for Revised Aid-Policy Model with Intercept only

```

Ordinary Least Squares Estimation
*****
Dependent variable is DRESC
51 observations used for estimation from 1962 to 2012
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
RESC (-1)      -1.0707           .14300              -7.4874[.000]
*****
R-Squared      .52854            R-Bar-Squared      .52854
S.E. of Regression  2.9768          F-Stat.            *NONE*
Mean of Dependent Variable .038339        S.D. of Dependent Variable  4.3354
Residual Sum of Squares  443.0707        Equation Log-likelihood  -127.4944
Akaike Info. Criterion  -128.4944        Schwarz Bayesian Criterion  -129.4603
DW-statistic    1.9634
*****

```

Table 10: Cointegration Results for Revised Aid-Policy Model with Intercept and Trend

```

Ordinary Least Squares Estimation
*****
Dependent variable is
DRESCT
51 observations used for estimation from 1962 to 2012
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
RESCT (-1)      -1.1214           .14091              -7.9580[.000]
*****
R-Squared      .55881            R-Bar-Squared      .55881
S.E. of Regression  2.8346          F-Stat.            *NONE*
Mean of Dependent Variable .012167        S.D. of Dependent Variable  4.2676
Residual Sum of Squares  401.7606        Equation Log-likelihood  -124.9986
Akaike Info. Criterion  -125.9986        Schwarz Bayesian Criterion  -126.9646
DW-statistic    2.0171
*****

```

Briefly, (table 9) demonstrates that variables are indeed cointegrated, as the lagged residuals are stationery. Precisely, the computed t ($=\tau$) value of lagged-residuals given as -7.4874 at 0.000 significant level exceeds (in absolute-terms) Dickey Fuller (DF) asymptomatic (tabulated) values of -3.58 (1%) and -2.93 (5%). Thus, the series indeed share an equilibrium relationship (Gujarati et al., 2010). Likewise, (table 10) with a trend, computed t -value of -7.9580 also exceeds corresponding critical values of -4.15 and -3.50 at 1% and 5%, respectively. These findings signify that the revised regression results are non-spurious (Koop, 2013). Further this reveals that the series are difference stationery (stochastic) process (DSP) rather than trend stationary process (DSP) as non-stationarity is eliminated after taking first differences (Gujarati, 2011). Consequently, to obtain an ECM focus is placed on the intercept model (revised equation 4.3).

4.3.9 Estimation of Error Correction Mechanism (ECM)

Another critical phase after proving cointegration is to establish speed of adjustment towards equilibrium and further observe both short and long run elasticities of relevant regressors through ECM method (equation 4.8). Accordingly, ECM results computed through AEG tests with relevant variables are given in Appendix 4.C. For example, a coefficient of ΔAID of -0.34140 at 0.083 significant-levels indicates that in a short-term a unit increase in ODA/GDP leads to -0.34 points decline in per capita-GDP growth. Its corresponding long-term multiplier is -0.55270 from (co-integrating) revised aid-policy model on table 8.

Contrary, coefficient for RESC (-1), measuring speed of adjustment of growth towards equilibrium is negative as premised given as -0.68875 at 0.060 significance level. Being negative, it implies that, ceteras paribus, increasing discrepancies (errors) in the relevant regressors induce a fall in growth (Koop, 2013). Thus, a unit increase in regressors tends to reduce growth by -0.69 in the next period. This is a quick adjustment possibly owing to endogeneity problem between aid, growth and other regressors as argued earlier and presence of negligible collinearity from interactive variables like policy variables, which were maintained to avoid model misspecification (Gujarati et al., 2009). Again, Malawi's economy is highly volatile, heavily aid dependent and largely undiversified; hence very susceptible to rapid shocks (disturbances) (Chiumia and Simwaka, 2012).

4.3.10 Interpretation of Revised Regression Results

Having validated the results from the parsimonious model through demonstrating cointegration, the following are the key discussions drawn mainly from the revised results (table 6).

Aid, Policies and Growth

Likewise, revised results indicate that a unit increase in ODA/GDP is followed by a decrease in growth of -0.55270 at 0.000 significance levels, ceteras paribus. However, the policy index is negative (-0.28992) and highly significant (0.000) suggesting that erratic economic policies were detrimental to growth. Similarly, Shields (2001) argues that aid influx in Malawi weakens policy-index through the

Dutch Disease effects. Coefficient for aidpolicy variable although significant is close to zero ($0.1682E-6$) hinting that poor economic policies did not stimulate sufficient growth. Nevertheless, results support a theory by Burnside et al. (2001) that aid effectiveness is sensitive to policies owing to high significance of 'aidpolicy' coefficient.

Coefficient for aid lag, Aid (-1) is positive (.30911) at 3% significant level hinting that aid impact is affected by a time lag (Clemens et al., 2013). Nevertheless, inclusion of aid lag is heavily criticized as positive aid lag may mistakenly result from reverse causation where poor growth is followed by more aid (Roodman, 2007b). Possibly, this is what explains Malawi's scenario as preceding chapter already highlighted contradictory patterns between aid and growth (figure 10). Moreover, selection of the right timing-lag interval is a question that remains largely unsettled amongst economists (Clemens et al., 2013).

Aid, Macroeconomic Variables and Growth

Understandably, inflation, debt and government spending coefficients are negative and highly significant below 3%. As argued already, possibly aid was not sterilized into productive investments thereby generating adverse inflationary effects (Musila, 2002). No wonder, money supply (M2) which is associated with rise in government spending and inflation significantly exhibits a negative effect of -0.75652. Such effects signify the Dutch disease phenomenon where aid becomes a resource curse rather than a blessing (Rajan and Subramanian, 2011). Equally, manufacturing exports exhibit a significant negative impact at 10%. Indeed,

manufacturing sector has been deteriorating since 1980s possibly due to above Dutch disease effects plus misaligned SAPs reforms spearheaded by the World Bank and IMF, e.g. IMF-led massive devaluations around 1990s (Mapulanga, 2012). As premised, trade and life expectancy have a positive and significant impact. Arguably, trade oftentimes has profound growth effects than aid, hence the logic behind aid for trade (Stiglitz and Charlton, 2006).

Incorporation of Regime Types in Aid-Growth Nexus

Interestingly, results reveal that coefficient for one-party regime 'autocracy' has a highly positive and significant growth impact of 4.577 at 0.004 levels. Ironically, democratic era demonstrates highest negative and significant value of -7.4564 at 0.018. Literature often associates democracies with economic progress but some African democracies seem to defy this supposition (Werlin, 2005). As discussed earlier, autocratic regime's strong economic management including stern fiscal controls, effective foreign-exchange policies encouraged aid effectiveness and growth (Brown, 2000). Paradoxically, democratization has been associated with increased mismanagement of public funds and overall laxity in governance systems (Majanga, 2014). Dionne et al. (2013) also reported that aid-allocation now is highly responsive to political and ethnic targeting rather than growth. Indeed, a simple regression model interacting regime dummies with aid was computed (table 11). Results confirm that only aid-autocracy interactive dummy turns significantly positive. These results support findings by Boone (1996) that what matters in aid-effectiveness is availability of enabling governance systems irrespective of regime type.

Table 11: Regression Results on Aid and Regime Interactive Dummies

Ordinary Least Squares Estimation			

Dependent variable is GROWTH			
52 observations used for estimation from 1961 to 2012			

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	-.70415	1.0278	-.68511[.497]
AIDDEMOCRAC	.091901	.066283	1.3865[.172]
AIDAUTOCRAC	.30212	.10621	2.8446[.006]

R-Squared	.14320	R-Bar-Squared	.10822
S.E. of Regression	4.9215	F-Stat. F(2,49)	4.0946[.023]
Mean of Dependent Variable	1.2960	S.D. of Dependent Variable	5.2116
Residual Sum of Squares	1186.8	Equation Log-likelihood	-155.1077
Akaike Info. Criterion	-158.1077	Schwarz Bayesian Criterion	-161.0346
DW-statistic	2.3173		

4.4 Limitations to the study

The study has not incorporated any causality test like Granger causality as doing so may yield spurious results due to endogeneity and fungibility problems between aid and growth as explained earlier (Clemens et al., 2013). Thus, these results depict correlation linkage rather than true causality (Clemens et al., 2013). Furthermore, availability of data was a challenge hence not all problematic variables were easily replaced for fear of a more serious problem of model misspecification (Gujarati and Porter, 2009). Still, above OLS analysis and favourable results from various statistical tests hint that the study satisfies all critical statistical properties of validity (Koop, 2013).

4.5 Chapter Summary

The chapter investigated the hypothesis that aid promotes growth using time-series (1960-2012) for Malawi. Overall, OLS regression results contradict aid-growth hypothesis by hinting that aid discourages growth. Notably, the study has

distinguished itself by testing the hypothesis on three most popular models. Notwithstanding, all models yielded similar findings thereby contradicting proposition by Hansen et al. (2001) that model-choice matters. Precisely, aid-policy model goes further depicting strong negative significant impact as reported elsewhere by Easterly (2003) and in Malawi by Shields (2001). Otherwise, results reveal that policies matter in aid effectiveness (Burnside et al., 2000). Unfortunately, Malawi's economic policies were weak to enhance aid effectiveness. Nevertheless, aid lag is positive although this is not reliable as a positive aid-lag may occur due to reverse causation problem, where poor growth attracted additional aid (Roodman, 2007b).

Ironically, aid-inflows seem to correlate with increasing government-expenditure rather than investments as suggested by Boone (1996). Aid-influx corresponds with deterioration of key macroeconomic variables thereby signifying the Dutch Disease effects (Shields, 2001). Interestingly, regime dummies reveal that aid effectiveness and growth were more effective during one-party regime possibly due to strict financial-controls (Brown, 2000). Albeit, the study's main limitation is data inadequacy. Again, causality test was not conducted due to endogeneity problems and that not all aid realistically supports growth (Alesina et al., 2000).

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The main objective of this dissertation was to examine the hypothesis that aid promotes economic growth in recipient-countries. Its minor objectives included examining whether policies matter in aid-growth nexus, investigating the impact of aid influx on other key macroeconomic variables and finally to check whether model-choice matters in aid-growth nexus as suggested by Roodman (2007a). To test the main hypothesis, the study employed OLS time-series regressions for Malawi. Empirical results reveal that there is a negative and highly significant relationship between aid and growth in Malawi. Possibly, the bulk of aid supports consumption rather than productive sectors (Shields, 2001). This evidence

contradicts the economic theory that aid promotes growth via savings and investments (Papanek, 1973). Still, results corroborate previous findings for Malawi by Dionne et al., (2013) and Shields (2001).

Notwithstanding, the study distinguished itself from previous studies by testing three most popular models by Papanek (1973) for non-interactive variables, Burnside et al. (2000) for policy effect and Collier et al. (2002) for diminishing returns, respectively. Thus, the study further demonstrates that the proposition by Roodman (2007) that model choice matters does not hold for Malawi as all models generate similar findings. Instead, aid-inflows seem to correlate with adverse inflationary effects including increased government spending and inflation rather than savings and investments thereby confirming the Dutch disease phenomenon (Rajan et al, (2011). Nevertheless, aid lag is positive although this is unreliable as a positive aid-lag often occurs due to reverse causation problem, where poor growth attracts more aid (Roodman, 2007b). Hence, the positive aid lag ought not to be taken at face value. Moreover, economists fail to agree on the selection of timing lag interval (Clemens et al., 2012).

In summary, the study's key findings constitute the following points. Firstly, results indicate that the impact of aid on growth is circumstantial; conditional on countries having the right policy and governance structures as suggested by Burnside et al. (2000). Secondly, results reveal that aid shares a non-linear-relationship with growth as suggested by Clemens et al. (2012). This is not surprising considering

that Malawi is highly dependent on aid covering over 40% of its budget (Morton, 2010). No wonder any additional increase in aid-inflows would not result into meaningful growth effects. Thirdly, results indicate that aid-inflows are associated with declining performance of key macroeconomic variables thus the Dutch disease problem also reported by Shields (2001). Fourthly, one interesting observation is that aid effectiveness and growth were more robust during one-party era as opposed to democratic-era. This is possibly due to sound economic policies and strong fiscal controls as opposed to widespread mismanagement and politicization of public funds including aid in the democratic era (VonDoepp, 2001, Brown, 2000).

Although OLS results indicate that aid is failing at macro (growth) level, other scholars like De et al. (2014) suggest that aid in Malawi works at micro (project) level like health projects. If true, this signals presence of the aforesaid 'macro-micro' paradox (Mosley, 1987). Furthermore, coefficient for trade is positive and highly significant. This supports the preposition that trade might be an alternative to aid as donor fatigue escalates (Moyo, 2009). Indeed, there is a proposal to consider aid for trade as an alternative to the current aid paradigm in addition to other options like remittances (Stiglitz et al., 2006). Lastly, the study's main limitation was data deficiency hence relevant proxies were incorporated where necessary. Again, due to endogeneity problem of aid, causality tests were not conducted as doing so may yield spurious results. Hence, these results ought to

be understood from correlation perspective rather than causality (Clemens et al., 2012).

To encapsulate, although the study suggests a negative and highly significant relationship between aid and growth, it still argues that prevailing circumstances (policies and governance structures) matter in aid-growth nexus (Burnside et al., 2000). Granted, other growth determinants like trade and possibly remittances may still have higher economic gains than aid (Hudson, 2015). Hence, the study completes with the following policy recommendations.

5.2 Policy Recommendations

Some suggested recommendations with respect to study's findings are as follows.

1. In order to offset adverse economic effects of aid influx (e.g. Dutch-Disease), authorities in Malawi ought to institute effective sterilization measures by channeling aid-funds into investments rather than increasing government spending.
2. In recognition that good governance and policies matter in aid-growth nexus, policy makers ought to promote measures of good governance including strong financial controls and sound policies. This may encourage prudent management of public resources including aid.

3. Finally, a long-term strategy is to diversify the economy to reduce overreliance on aid. Some measures to consider include trade and industrialization (manufacturing), commercializing agriculture and value-addition to increase terms of trade. Other measures though not part of study's analysis include investing in other potential sectors like tourism and newly discovered minerals and oil. Still, it must be noted that just like aid inflows natural-resource extraction may act as a resource-curse rather than a blessing where proper institutions (policies) are not in place (Rodrik, 2002).

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Appendix 1: Graphical Analysis and Correlation Matrices for All Models

1. A: Correlation matrices for all Variables

Estimated Correlation Matrix of Variables
52 observations used for estimation from 1961 to 2012

	GROWTH	POLICY	AID	DOMINVEST	POPULN	SAVINGS	FDI	INFLATN	LIFEEXP	DEBT
GROWTH	1.0000	0.20344	-0.22165	0.036927	-0.21009	0.035693	0.1668	0.026293	-0.074276	-0.30568
POLICY	0.20344	1.0000	-0.40786	0.006123	0.030536	-0.051515	0.48901	-0.46047	0.042852	-0.682
AID	-0.22165	-0.40786	1.0000	-0.01502	-0.13428	-0.27157	-0.16188	0.49951	0.53881	0.27674
DOMINVEST	0.036927	0.006123	-0.01502	1.0000	0.1483	0.59583	0.0017968	-0.14499	0.22233	0.087383
POPULN	-0.21009	0.030536	-0.13428	0.1483	1.0000	0.51584	-0.097187	-0.16294	0.087522	0.345
SAVINGS	0.035693	-0.051515	-0.27157	0.59583	0.51584	1.0000	-0.34762	-0.18655	0.10217	0.41825
FDI	0.1668	0.48901	-0.16188	0.0017968	-0.097187	-0.34762	1.0000	-0.29652	-0.13782	-0.61387
INFLATN	0.026293	-0.46047	0.49951	-0.14499	-0.16294	-0.18655	-0.29652	1.0000	0.30247	0.29861
LIFEEXP	-0.074276	0.042852	0.53881	0.22233	0.087522	0.10217	-0.13782	0.30247	1.0000	0.18319
DEBT	-0.30568	-0.682	0.27674	0.087383	0.345	0.41825	-0.61387	0.29861	0.18319	1.0000
GOVT	-0.29428	-0.5651	0.22071	0.026617	-0.086911	-0.19622	-0.089272	5.89E-04	0.14969	0.17184
TRADE	0.10336	0.7139	-0.062885	-0.044803	-0.12599	-0.35706	0.54171	-0.24202	0.37612	-0.67572
HUMANCAP1	-0.066103	0.097403	0.50408	-0.042958	-0.038481	-0.13426	-0.013314	0.46544	0.8391	0.0088391
M2	-0.14258	-0.17417	0.2008	0.34853	0.19222	0.38412	-0.084102	-0.048947	0.57776	0.20433
AID1	0.1453	-0.28545	0.74011	-0.06201	-0.22136	-0.24818	-0.27426	0.69543	0.51084	0.19595
DEMOCRACY	-0.041372	-0.099198	0.45773	-0.15357	-0.28759	-0.39294	0.10657	0.6075	0.3066	-0.035765
AUTOCRACY	0.28772	0.39018	-0.33238	0.13048	-0.011914	0.041687	0.46081	-0.4127	-0.17338	-0.56705
AIDPOLIC2	-0.19491	0.63941	-0.39498	0.18277	0.11033	0.07557	0.41345	-0.77175	-0.03267	-0.42172
AIDPOLICY	0.20903	0.92521	-0.59606	-0.028761	0.17166	0.12849	0.31	-0.49648	-0.054222	-0.50382
AIDSQ	-0.25965	-0.50873	0.97189	0.026246	-0.20467	-0.29131	-0.15602	0.48595	0.45267	0.28773

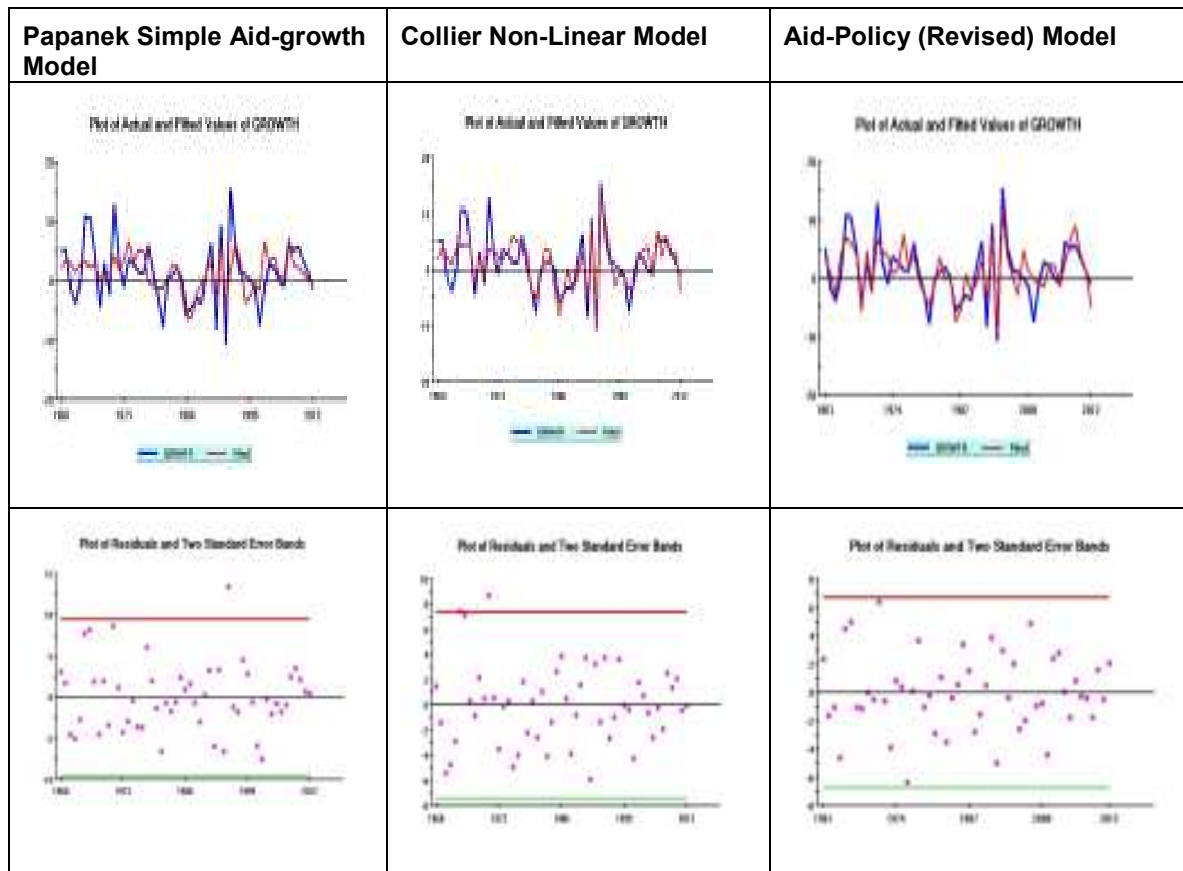
Estimated Correlation Matrix of Variables
52 observations used for estimation from 1961 to 2012

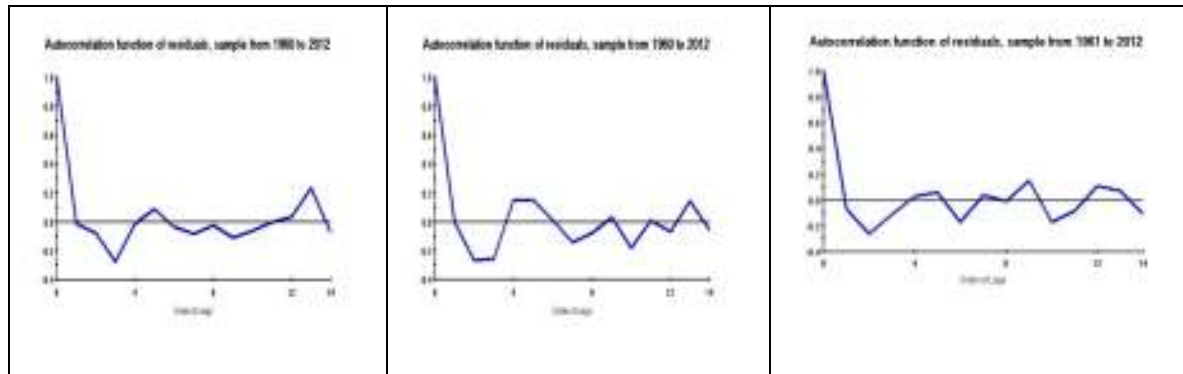
	GOVT	TRADE	HUMANCAP1	M2	AID1	DEMOCRACY	AUTOCRACY	AIDPOLIC2	AIDSQ
GROWTH	-0.29428	0.10336	-0.066103	-0.14258	0.1453	-0.041372	0.28772	-0.19491	-0.25965
POLICY	-0.5651	0.7139	0.097403	-0.17417	-0.28545	-0.099198	0.39018	0.63941	-0.50873

AID	0.22071	-0.062885	0.50408	0.2008	0.74011	0.45773	-0.33238	-0.39498	0.97189
DOMINVEST	0.026617	-0.044803	-0.042958	0.34853	-0.06201	-0.15357	0.13048	0.18277	0.026246
POPULN	-0.086911	-0.12599	-0.038481	0.19222	-0.22136	-0.28759	-0.011914	0.11033	-0.20467
SAVINGS	-0.19622	-0.35706	-0.13426	0.38412	-0.24818	-0.39294	0.041687	0.07557	-0.29131
FDI	-0.089272	0.54171	-0.013314	-0.084102	-0.27426	0.10657	0.46081	0.41345	-0.15602
INFLATN	5.89E-04	-0.24202	0.46544	-0.048947	0.69543	0.6075	-0.4127	-0.77175	0.48595
LIFEEXP	0.14969	0.37612	0.8391	0.57776	0.51084	0.3066	-0.17338	-0.03267	0.45267
DEBT	0.17184	-0.67572	0.0088391	0.20433	0.19595	-0.035765	-0.56705	-0.42172	0.28773
GOVT	1.0000	0.058058	-0.017477	0.42162	-0.015693	-0.094227	0.042543	-0.091191	0.33001
TRADE	0.058058	1.0000	0.38839	0.13799	-0.068309	0.064961	0.40491	0.45711	-0.12498
HUMANCAP	-0.017477	0.38839	1.0000	0.26019	0.52383	0.63722	-0.23836	-0.087613	0.39403
M2	0.42162	0.13799	0.26019	1.0000	0.013751	-0.33212	0.30657	0.082414	0.2147
AID1	-0.015693	-0.068309	0.52383	0.013751	1.0000	0.51019	-0.32715	-0.60798	0.67989
DEMOCRACY	-0.094227	0.064961	0.63722	-0.33212	0.51019	1.0000	-0.44164	-0.3053	0.42508
AUTOCRACY	0.042543	0.40491	-0.23836	0.30657	-0.32715	-0.44164	1.0000	0.35504	-0.3284
AIDPOLIC2	-0.091191	0.45711	-0.087613	0.082414	-0.60798	-0.3053	0.35504	1.0000	-0.39889
AIDPOLICY	-0.62699	0.51828	0.0033111	-0.18162	-0.41161	-0.24607	0.31587	0.58859	-0.71629
AIDSQ	0.33001	-0.12498	0.39403	0.2147	0.67989	0.42508	-0.3284	-0.39889	1.0000

Source: Amalgamated from Microfit correlations matrices computations

1. B: Graphical Analysis for All Models





Appendix 2: Preliminary Regression Results

2. A: Papanek Model Regression Results

```

Ordinary Least Squares Estimation
*****
Dependent variable is GROWTH
53 observations used for estimation from 1960 to 2012
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
C              -29.2997          18.0892             -1.6197[.113]
AID            -1.17865         .13893              -1.2859[.206]
DOMINVEST     -1.22062         .16970              -1.3000[.201]
POPULN        -1.3109          .82382              -1.5913[.119]
SAVINGS       .31014           .23480              1.3209[.194]
FDI           .99794           .69717              1.4314[.160]
INFLATN       .11454           .063776            1.7960[.080]
LIFEEXP       1.3741           .61572              2.2316[.031]
DEBT          -.84149          .42590              -1.9758[.055]
GOVT          -.095841         .30195              -.31741[.753]
TRADE         -.10371          .11489              -.90270[.372]
HUMANCAP      -.43694          .19394              -2.2529[.030]
M2            -.35868          .25227              -1.4218[.163]
*****
R-Squared      .34982          R-Bar-Squared      .15477
S.E. of Regression  4.7704      F-Stat.      F(12,40)      1.7935[.083]
Mean of Dependent Variable  1.3694      S.D. of Dependent Variable  5.1888
Residual Sum of Squares  910.2709      Equation Log-likelihood  -150.5552
Akaike Info. Criterion  -163.5552      Schwarz Bayesian Criterion  -176.3621
DW-statistic   2.0163

```

2. B: Collier Non-Linear Model Regression Results

Ordinary Least Squares Estimation

```

*****
Dependent variable is GROWTH
53 observations used for estimation from 1960 to 2012
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
C              -58.6384          14.6909             -3.9915[.000]
POLICY         -.31679           .083754             -3.7824[.001]
AID            .52733            .42494              1.2410[.222]
AIDPOLICY     -.0024981         .0022395            -1.1155[.272]
AIDSQ         -.031254          .013219             -2.3644[.023]
DOMINVEST     -.12299           .13081              -.94025[.353]
POPULN        -.79063           .64154              -1.2324[.226]
SAVINGS       .12292            .18768              .65494[.517]
FDI            .48810            .56943              .85718[.397]
INFLATN       -.17730           .071017             -2.4966[.017]
LIFEEXP       2.3196            .49027              4.7312[.000]
DEBT          -1.5030           .36032              -4.1713[.000]
GOVT          -3.3191           .61831              -5.3680[.000]
TRADE         .61594            .15414              3.9960[.000]
HUMANCAP1     -.72117           .15547              -4.6386[.000]
M2            -.51811           .20616              -2.5131[.016]
*****
R-Squared      .67471          R-Bar-Squared      .54283
S.E. of Regression  3.5084      F-Stat.      F(15,37)      5.1162[.000]
Mean of Dependent Variable  1.3694      S.D. of Dependent Variable  5.1888
Residual Sum of Squares  455.4200      Equation Log-likelihood  -132.2033
Akaike Info. Criterion  -148.2033      Schwarz Bayesian Criterion  -163.9657
DW-statistic   1.9539

```

Appendix 3: Final Regression Problems Diagnosis (Revised Aid-Policy Model)

A) Multicollinearity Tests: Variance Inflating Factor (VIF) and TOL

Variable	R-squared from Auxiliary Regressions ^{AX}	VIF	TOL	Decision
AID	0.86221	7.3	0.1	No Multicollinearity
POLICY	0.81432	5.4	0.2	No Multicollinearity
INFLATN	0.83772	6.2	0.2	No Multicollinearity
DEBT	0.84679	6.5	0.2	No Multicollinearity
GOVT	0.96268	26.8	0	Multicollinearity*
LIFEEXP	0.75994	4.2	0.2	No Multicollinearity
M2	0.89019	9.1	0.1	No Multicollinearity
HUMANCAP1	0.93554	15.5	0.1	Dropped
AUTOCRACY	0.74743	4	0.3	No Multicollinearity
AID1	0.83959	6.2	0.2	No Multicollinearity
TRADE	0.96133	25.9	0	Multicollinearity*
AIDPOLIC2	0.81432	5.4	0.2	No Multicollinearity
MANUF	0.8459	6.5	0.2	No Multicollinearity
DEMOCRACY	0.84163	6.3	0.2	No Multicollinearity

Source: Calculated from auxiliary regressions of regressors

Rule of Thumb: Multicollinearity present if: $VIF > 10$ or TOL close to 0, where $VIF = (1/(1-R_j^2))$ and $TOL = 1/VIF$

Multicollinearity* = Variable maintained to avoid misspecification-error but still not serious problem as their pairwise correlations are around 0.8, see Appendix 1(A)

AX = R-Squared obtained from auxiliary regressions of each regressor against other regressors.

B) Outliers

Based on plot of residuals, evidently all the residuals for revised aid-policy model are within the two standard error bands (refer to appendix 1(b)), hence no outliers.

C) Autocorrelation

DW Test, D-W of 2.03 close to 2; Rule of Thumb= No autocorrelation

D) Non Stationerity

Most variables non-stationery at ordinary level calculated DF values less than DF critical values. First differences, stationery (Refer to Appendix 4a and 4b).

E) Heteroscedasticity Problem Analysis

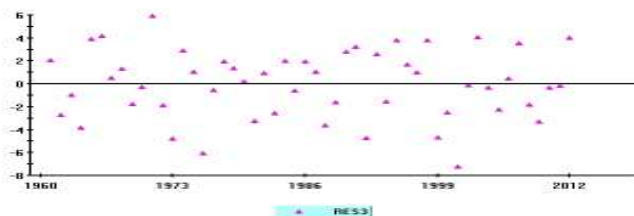
1) White Test Results

```
Ordinary Least Squares Estimation
*****
Dependent variable is RES3SQ
52 observations used for estimation from 1961 to 2012
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
C              60.6137         192.8747           .31426[.756]
AID            -5.1724          2.8148            -1.8375[.077]
POLICY         1.6893          1.1285            1.4969[.146]
INFLATN       -.23767         .20900            -1.1372[.265]
DEBT          -7.2806          6.0786            -1.1977[.241]
TRADE         -3.5332          3.9543            -.89351[.379]
GOVT          -2.4930         13.0936           -1.9040[.850]
LIFEEXP       2.4521          2.1162            1.1587[.256]
HUMANCAP      .50465          .59199            .85246[.401]
M2            5.1965          3.7779            1.3755[.180]
AUTOCRACY     14.5836          7.7402            1.8841[.070]
AIDSQ         .15646          .064067           2.4421[.021]
AIDPOLIC2     -.4461E-5        .4114E-5           -1.0843[.287]
MANUF        -.56560          6.8717            -.082310[.935]
POLICYSQ     .0061869         .0042184           1.4666[.154]
DEBTSQ       .078197         .26113            .29945[.767]
TRADESQ      .019461         .031056           .62663[.536]
GOVTSQ       .10600          .39944            .26538[.793]
M2SQ        -.16342         .087819           -1.8608[.073]
MANUFSQ      -.10916         .38485            -.28365[.779]
AIDPOSQ      .0000           0.00              *NONE*
AIDMANUF     .043234         .23967            .18039[.858]
DEBTM2       .24898          .27435            .90753[.372]
POLITRADE    -.026683        .016177           -1.6494[.110]
*****
R-Squared      .53285      R-Bar-Squared      .14911
S.E. of Regression  9.8083      F-Stat.      F(23,28)      1.3886[.203]
```

R^2 from auxiliary Regression	# of Observations	Calculated Chi-Value	# of Regressors	Critical Chi-Square value		
R^2	n	$n \cdot R = 0.53285 \cdot 52$	df	χ^2 (5%)	χ^2 (10%)	χ^2 (25%)
0.53285	52	27.7082	23	35.1725	32.0069	27.1413

Based on regression above: $\chi^2 = 35.1725$ (5%) = 32.0069 (10%), i.e. exceeds 27.7, therefore no heteroscedasticity. Also below no distinct pattern of residuals, hence no serious heteroscedasticity

2) Informal Diagnosis: Plot of residuals



Appendix 4: Unit Root (DF/ADF) Tests, Cointegration and ECM Results

Appendix 4.A: Unit Root Test at Ordinary Level

VARIABLE	WITH CONSTANT			CONSTANT AND TREND			DECISION
	Computed tau, DF	Computed tau, ADF	Critical Value	Computed tau, DF	Computed tau, ADF	Critical Value	
GROWTH	-7.1618	-4.3006	-2.9228	-7.1819	-4.3384	-3.5045	Stationery
POLICY	-2.7047	-3.0228	-2.9228	-2.7159	-3.0267	-3.5045	Non-Stationery
AID	-2.6158	-1.8033	-2.9228	-3.4585	-2.4268	-3.5045	Non-Stationery
AID1	-2.5818	-1.8293	-2.9241	-3.0116	-2.0447	-3.5066	Non-Stationery
AIDPOLICY	-3.4797	-3.6458	-2.9228	-3.4404	-3.6048	-3.5045	Non-Stationery
DOMINVEST	-3.8013	-3.0879	-2.9228	-2.7483	-2.593	-3.5045	Non-Stationery
POPULN	-1.6261	-8.8728	-2.9228	-1.6417	-8.8913	-3.5045	Stationery
SAVINGS	-2.6821	-2.2874	-2.9228	-3.0164	-2.6149	-3.5045	Non-Stationery
FDI	-3.7518	-3.0569	-2.9228	-3.6993	-2.996	-3.5045	Non-Stationery
INFLATN	-3.9679	-3.0517	-2.9228	-4.2769	-3.3041	-3.5045	Non-Stationery
LIFEEXP	1.9594	-1.5991	-2.9228	0.75114	-14.67	-3.5045	Non-Stationery
DEBT	-1.6805	-1.7046	-2.9228	-1.6605	-1.6298	-3.5045	Non-Stationery
GOVT	-4.3451	-3.7428	-2.9228	-4.3418	-3.7073	-3.5045	Stationery
TRADE	-0.33653	-0.11589	-2.9228	-1.0549	-0.8237	-3.5045	Non-Stationery
HUMANCAP	-0.47403	-0.44692	-2.9228	-2.5869	-2.6539	-3.5045	Non-Stationery
M2	-0.82529	-1.0466	-2.9228	-0.9888	-1.161	-3.5045	Non-Stationery
Manuf	-2.332	-1.6954	-2.9228	-2.2168	-1.4814	-3.5045	Non-Stationery
DEMOCRACY	-1.5628	-1.5885	-2.9228	-1.4018	-1.4616	-3.5045	Non-Stationery
AUTOCRACY	-1.4815	-1.5333	-2.9228	-0.8755	-0.8961	-3.5045	Non-Stationery

Constructed using data computed from Microfit ADF tests

Appendix 4.B: Unit Root Test for First Differences

VARIABLE	WITH CONSTANT			CONSTANT AND TREND			DECISION
	Computed tau, DF	Computed tau, ADF	Critical Value	Computed tau, DF	Computed tau, ADF	Critical Value	
ΔGROWTH	-13.9419	-7.0474	-2.9241	-13.795	-6.9642	-3.5066	Stationery
ΔPOLICY	-6.4952	-6.6829	-2.9241	-6.4287	-6.6375	-3.5066	Stationery
ΔAID	-9.5851	-5.629		-9.4742	-5.538	-3.5066	Stationery
ΔAID1			-2.9241			-3.5066	Stationery
ΔAIDPOLICY	-7.1971	-6.8514	-2.9241	-7.1194	-6.7835	-3.5066	Stationery
Δ DOMINVEST	-9.2185	-6.4062	-2.9241	-9.1937	-6.4398	-3.5066	Stationery
ΔPOPULN	-1.9709	-10.3108	-2.9241	-1.9521	-10.219	-3.5066	Stationery
Δ SAVINGS	-8.4266	-5.9961	-2.9241	-8.4608	6.089	-3.5066	Stationery
Δ FDI	-8.9309	-7.3428	-2.9241	-8.8661	-7.3107	-3.5066	Stationery
Δ INFLATN	-9.4524	-7.2515	-2.9241	-9.363	-7.2074	-3.5066	Stationery
Δ LIFEEXP	-0.625	-9.0207	-2.9241	-0.7506	-8.7971	-3.5066	Stationery
Δ DEBT	-6.7187	-6.2726	-2.9241	-6.8817	-6.6518	-3.5066	Stationery
Δ GOVT	-8.9318	-7.0531	-2.9241	-8.8693	-7.0348	-3.5066	Stationery
Δ TRADE	-7.4458	-5.2362	-2.9241	-7.7258	-5.584	-3.5066	Stationery
Δ HUMANCAP	-6.9104	-5.7643	-2.9241	-6.8359	-5.7072	-3.5066	Stationery
ΔM2	-6.5709	-4.6326	-2.9241	-6.6069	-4.6867	-3.5066	Stationery
Δ MANUF	-10.9074	-5.3461	-2.9241	-11.1093	-5.5535	-3.5066	Stationery
Δ DEMOCRACY	-6.7082	-4.6904	-2.9241	-6.7097	-4.7177	-3.5066	Stationery
ΔAUTOCRACY	-6.7082	-5.1308	-2.9241	-7.0357	-5.4595	-3.5066	Stationery

Appendix 4.C: ECM Results for Revised Aid-Policy Model

```

Ordinary Least Squares Estimation
*****
Dependent variable is DGROWTH
51 observations used for estimation from 1962 to 2012
*****
Regressor          Coefficient          Standard Error          T-Ratio[Prob]
C                   .063134                1.3848                  .045590[.964]
DAID                -.34140                .19184                  -1.7796[.083]
RESC(-1)           -.68875                .35653                  -1.9318[.060]
DTRADE             -.30257                .19350                  -1.5636[.126]
DDEBT              .19918                .72253                  .27568[.784]
DINFLATN           .083443               .063533                 1.3134[.197]
DMANUF             -.79886                .64142                  -1.2454[.220]
DPOLICY            .036071               .039201                 .92016[.363]
DLIFEEXP           .16711                3.3458                  .049947[.960]
DAUTOCRAC          2.4242                4.5230                  .53597[.595]
DDEMOCRAC          -4.4361               6.3408                  -.69961[.488]
*****
R-Squared           .46459                R-Bar-Squared           .33074
S.E. of Regression  6.2075                F-Stat. F(10,40)        3.4709[.002]
Mean of Dependent Variable -.12108            S.D. of Dependent Variable 7.5879
Residual Sum of Squares 1541.3            Equation Log-likelihood  -159.2846
Akaike Info. Criterion -170.2846          Schwarz Bayesian Criterion -180.9097
DW-statistic        2.4870
*****

```

Appendix 4.D: Cointegration for Papanek Regression Model

First: Cointegration for Regression with an Intercept only

```

Ordinary Least Squares Estimation
*****
Dependent variable is DRESC
52 observations used for estimation from 1961 to 2012
*****
Regressor          Coefficient          Standard Error          T-Ratio[Prob]
RESC(-1)           -1.0136              .13928                  -7.2774[.000]
*****
R-Squared           .50939              R-Bar-Squared           .50939
S.E. of Regression  4.2018              F-Stat.                 *NONE*
Mean of Dependent Variable -0.052139          S.D. of Dependent Variable  5.9988
Residual Sum of Squares  900.3954          Equation Log-likelihood  -147.9262
Akaike Info. Criterion  -148.9262          Schwarz Bayesian Criterion -149.9018
DW-statistic        2.0107
*****

```

N.B: Computed t-value at -7.2774 exceed (in absolute terms) critical values of -3.58 (1%) and -2.93 (5%), i.e. Time series cointegrated

Second: Cointegration for Regression with an Intercept and Trend

```

Ordinary Least Squares Estimation
*****
Dependent variable is DRESC T
52 observations used for estimation from 1961 to 2012
*****
Regressor          Coefficient          Standard Error          T-Ratio[Prob]
RESC T(-1)         -1.0090              .13952                  -7.2319[.000]
*****
R-Squared           .50621              R-Bar-Squared           .50621
S.E. of Regression  4.0474              F-Stat.                 *NONE*
Mean of Dependent Variable -0.074705          S.D. of Dependent Variable  5.7597
Residual Sum of Squares  835.4419          Equation Log-likelihood  -145.9794
Akaike Info. Criterion  -146.9794          Schwarz Bayesian Criterion -147.9551
DW-statistic        2.0036
*****

```

N.B: Computed t-value at -7.2319 exceed critical values of -4.15 (1%) and -3.50 (5%), i.e. Time series cointegrated

Appendix 4.E: Cointegration for Collier Regression Model

First: Cointegration for Regression with an Intercept only

```

Ordinary Least Squares Estimation
*****
Dependent variable is DRESCK
52 observations used for estimation from 1961 to 2012
*****
Regressor          Coefficient          Standard Error          T-Ratio[Prob]
RESCK(-1)          -.99946              .13960                  -7.1597[.000]
*****
R-Squared           .50127              R-Bar-Squared           .50127
S.E. of Regression  2.9499              F-Stat.                 *NONE*
Mean of Dependent Variable -0.0082947          S.D. of Dependent Variable  4.1771
Residual Sum of Squares  443.7928          Equation Log-likelihood  -129.5318
Akaike Info. Criterion  -130.5318          Schwarz Bayesian Criterion -131.5074

```

```

DW-statistic          1.9916
*****

```

N.B: Computed t-value at -7.1597 exceed critical values of -3.58 (1%) and -2.93 (5%), i.e. Time series cointegrated

Second: Cointegration for Regression with an Intercept and Trend

```

                          Ordinary Least Squares Estimation
*****
Dependent variable is DRESCT
52 observations used for estimation from 1961 to 2012
*****
Regressor          Coefficient          Standard Error          T-Ratio[Prob]
RESCT(-1)          -1.0027          .14007          -7.1585[.000]
*****
R-Squared          .50119          R-Bar-Squared          .50119
S.E. of Regression          2.9257          F-Stat.          *NONE*
Mean of Dependent Variable          .8234E-3          S.D. of Dependent Variable          4.1426
Residual Sum of Squares          436.5606          Equation Log-likelihood          -129.1046
Akaike Info. Criterion          -130.1046          Schwarz Bayesian Criterion          -131.0802
DW-statistic          1.9908
*****

```

N.B: Computed t-value at -7.1585 exceed critical values of -4.15 (1%) and -3.50 (5%), i.e. Time series cointegrated