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OF  
LUSAKA

**School of Postgraduate Studies**

**AN EVALUATION OF THE IMPACT OF FOREIGN AID ON ECONOMIC  
GROWTH IN ZAMBIA**

**A**

**Thesis presented**

**in partial fulfilment for requirement of the programme  
Master of Science in Economics and Finance (MSCECF)**

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**March, 2025**

## DECLARATION

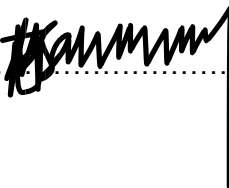
I, Bwalya Kaoma, hereby declare that this dissertation submitted to the University of Lusaka in partial fulfilment for the award of the Master of Science in Economics and Finance in the School of Postgraduate Studies was composed by myself; and that the work contained herein is my own except where explicitly stated otherwise, in the text, and that this work has not been submitted for any other degree or professional qualification.

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## **DEDICATION**

I dedicate this research to my family who has been a source of motivation in my difficult times. This is on the premise of everything they told me about the limitless possibilities of life.

## **ACKNOWLEDGEMENTS**

I place on record the contributions of many people to this study while admitting that such contributions provided inspiration and support throughout this report writing. My appreciation also goes to Dr. John Musantu, my supervisor, for his invaluable guidance and support on this study. My sincere thanks also go to my colleagues, both students and staff, for their helpful feedback and encouragement during the course of this research. I am deeply grateful to my family and relatives for their unwavering support, and most of all, I thank God for His grace and mercy, without which this accomplishment would not have been possible.

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## LIST OF ACCRONYMS

ADF	Augmented Dicky Fuller
ARDL	Autoregressive Distributed Lag
BoZ	Bank of Zambia
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
UN	United Nations
VECM	Vector Error Correction Model
WB	World Bank
ZSA	Zambia Statistics Agency

## ABSTRACT

In the context of developing countries, the role of foreign aid is truly vital. This is based on the notion whereby foreign assistance, if directed towards feasible and bankable economic areas, is likely to increase the GDP of the developing nations. This study aimed at determining the impact of foreign aid on the performance of Zambian economic activities. The study data sourced from the Zambia Statistics Agency, Ministry of Finance and National Planning and the World Bank 1990-2022. To determine the short and long run relationship between foreign aid and GDP, the research employed the Autoregressive Distributed Lag model because all variables were stationary of orders  $I(0)$  and  $I(1)$ . The dependent variable GDP in Kwacha and the independent variables were foreign aid, FDI, Government expenditure, Exchange Rate and Trade.

The study was premised on several economic theories and models that include among others, the Rostows theory of economic development and the development models of Harrod-Domar and Dependency theory to show the impact of the foreign aid and direct investment inflow on the economic development. The study found that in the short – run, FDI has a significant positive with no effect in the long run while foreign aid had no impact in the short run but had a significant positive impact on economic growth in the long run. Further, the study found that exchange had a positive significant effect on economic growth while coming out to be insignificant in the long run. On the other hand, Government expenditure and Trade came out to be insignificant both in the short run and the long run.

The findings imply that the inflow of foreign aid and foreign direct investment is likely to have a huge positive impact on the economy of developing countries. But, for this to happen some policy initiatives have to be put in place first. These include among others, fighting corruption, keeping exchange rates stable to draw in investors, creating favourable conditions for businesses, embracing new technologies, and focusing investments on important economic areas for lasting growth.

**Keywords:** *GDP, Foreign Aid, Foreign Direct Investment, Government spending, Exchange Rate and Trade*

# CHAPTER ONE: INTRODUCTION

## 1.0 Introduction

Foreign aid is integrated into the development strategies of many nations; the nations of Sub-Saharan Africa where poverty issues abound and resources are limited. The case of Zambia, a landlocked country that is blessed with multi-mineral resources, with its varied economic activities is well known as an international donor dependent country. Such support includes the provision of cash as grants, rendering technical assistance and providing humanitarian help and services in order to achieve economic growth, poverty alleviation and access to social services (World Bank, 2020).

The effectiveness of foreign aid remains a contentious debate among policy makers, economists, and development practitioners. Some supporters contend that foreign aid can encourage economic growth by supplying the essential resources for development of infrastructure, health and education, which will be the foundation for the country's economy in the longer term (OECD, 2023). In contrast, sceptics argue that international assistance could foster dependency, distort local economies and undermine political aspirations hence retarding rather than promoting economic advancement (Moyo, 2009).

The purpose of this study is to assess the impact of foreign aid on the economic growth of Zambia, taking into consideration the possible commendable and adverse effects. By looking into the historical trend of events, through case studies and through others, this study will determine whether foreign aid contributed in any way to economic advancement in Zambia, or whether it caused setbacks in the country's economic development.

The research will respond to different critical issues; for instance, what are the aid-growth nexus – what are the effects of aid on GDP growth rate? And, how may foreign aid be used in Zambia to support economic growth on a continual basis? This evaluation seeks to enrich the larger debate on whether or not foreign aid is effective in achieving its objectives with respect to economic advancement in poorer economies.

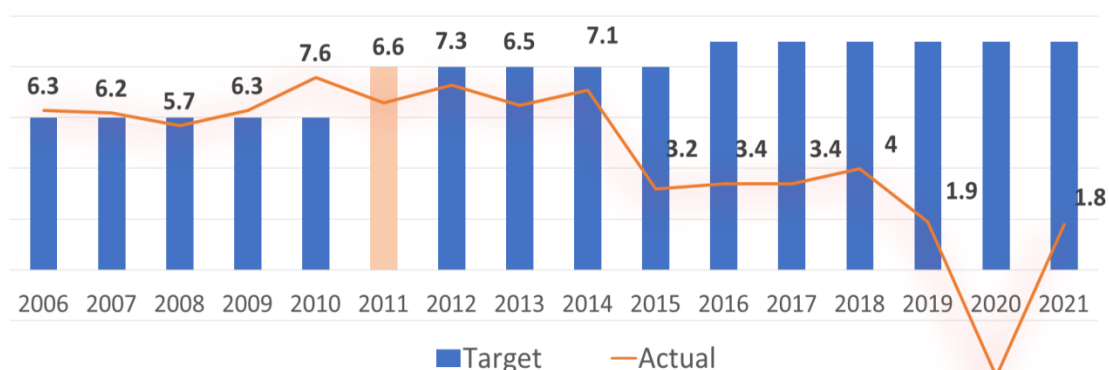
## 1.1 Background of the study

In the world of international politics and policy analysis, the framework is comprised heavily with industrialised nations such as Japan, the United Kingdom and the United States of America, alongside policies of growth and development. A prime example would be the United Nations Millennium Development Goals (MDGs), which were set by the United Nations (UN) in the year 2000, for instance, the major goals included the elimination of extreme poverty and hunger as a start (UN, 2000). Official Development Assistance (ODA) which is one of the major forms of Aid is intended to assist these goals and encourage growth of developing countries such as Zambia (OECD, 2023).

The Human Development Index (HDI) issued in 2023 brings to the fore a Zambian paradox in terms of development progress. The reason for this is that a better HDI rank would be expected considering that the country has been independent since 1964 and witnessed economic prosperity intermediately before landing among the poorest countries of the world as per the United Nations Development Programme HDI ranking. Even though there has been an improvement in a number of economic parameters due to the oil boom and FDI in the target country, much of the population is still poor with huge disparity in wealth distribution.

In the last twenty years, the Zambian aid structure has transformed, as traditional donors have withdrawn while new players such as China, Brazil, and India have stepped up even though the above economy has not been performing satisfactorily and as indicated by the following annual benchmarks:

Figure 1.1: Zambia's actual economic growth rates vs target



Source: Author (2024)

It can thus be inferred from the above that the economic performance of Zambia has been quite erratic in terms of growth over the last ten years in spite of various attempts by the cooperating partners to enhance their donor quotas to the country.

On the other hand, it has been pointed out that even though global poverty reduction attempts have made some headway, a significant portion of the population in poorer countries is still poverty-stricken. However, as per Keck, M. and Sikkink, K. (1998) economic development as prerequisite to poverty alleviation or in other words economic growth which can be approximated with the growth of the Gross Domestic Product of a country is a must for poverty reduction.

Various anthropological perspectives pose foreign aid as a strategic tool for the purpose of maintaining some level of economic order, providing relief during crises and reconstruction efforts – provided that it is carried out in a constructive manner by focusing on the production sector rather than the social one (Moyo, 2009). But still the effectiveness of substantial foreign aid in enhancing the economy of recipient countries remains a contested issue.

For instance, Zambia has been on the receiving end of funds and aid for over thirty years and the development of the Zambian economy and its studies have raised concern. This is based on the fact that the country has received an increasing inflow of foreign assistance into the economy and has not been able to achieve such a great change in economic growth and development despite different kinds of technical assistance programs sponsored by various nations (Collier & Dollar, 2004)

In light of these issues, this research aims to empirically analyse the relationship between foreign aid and Zambia's economic growth from 1990 to 2022. The aim has been to establish whether external assistance during this period assisted the growth of the Zambian economy.

## **1.2 Problem statement**

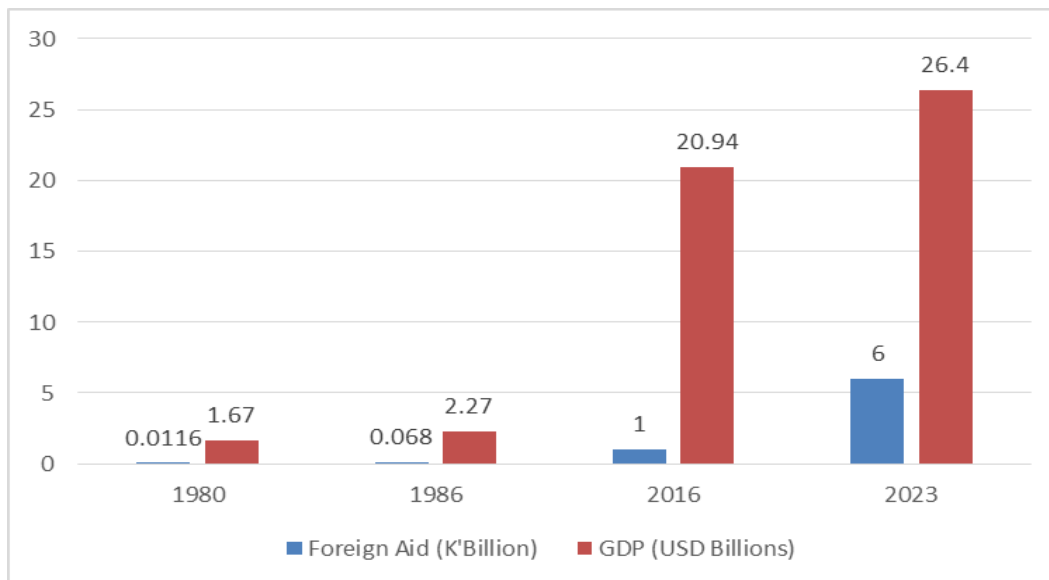
The significance of foreign aid in the development of underdeveloped nations is widely acknowledged, though research results over time have varied. Early studies by Papanek (1973), Singh (1985), and Levy (1988) identified a positive correlation between foreign aid and economic growth.

Conversely, research by Dalgaard et al. (2004) and Berthelmy (2006) has presented conflicting results, suggesting that foreign aid may not have a clear impact on economic growth. This ongoing inconsistency persists despite extensive empirical analysis.

Tonga (2019) posits that foreign aid is intended to foster economic growth by alleviating poverty, reducing unemployment, increasing government revenue, and ultimately enhancing a country's GDP. However, Zambia's experience challenges this ideal model thus for example, in 1986, despite a decrease in foreign aid from K116,019 recorded in 1980 to K68,000 recorded in 1986 GDP rose from US \$1.666 billion to US \$2.270 billion.

Additionally, the Zambian Ministry of Finance and National Planning reported that by 2016, GDP declined to US \$20.940 billion despite an increase in foreign aid to K997,730,000 while in 2023, the GDP rose to US \$26.4 billion as foreign aid increased to K6.0 billion. This inconsistent pattern highlights a contradiction where higher foreign aid is associated with both increased and decreased GDP growth as depicted by the figure below.

Figure 1.2: GDP and Foreign aid in selected years



Author (2024)

Thus, this study aims to examine the evolving relationship between foreign aid and economic growth in Zambia. It seeks to go beyond mere correlation to identify the

underlying factors that contribute to the observed discrepancies in this relationship. The research will focus on the specific contextual factors at the country level that influence how foreign aid affects economic growth.

### **1.3 Objectives of the study**

#### **1.3.1 Main objective**

This study is aimed at determining the degree of the relationship between foreign aid and economic development of Zambia.

#### **1.3.2 Specific objectives**

- i. To determine the role of foreign aid in facilitating economic growth in Zambia.
- ii. To assess contribution of foreign direct investment to the economic growth rate of Zambia;
- iii. To study the relationship between government expenditure and economic growth in Zambia;
- iv. To determine how the Exchange Rate affects the economy of Zambia.
- v. To assess the impact of Trade on Zambia's economy.

### **1.4 Research questions**

- i. What is the effect of foreign aid on the economic growth of Zambia?
- ii. What is the role of foreign direct investment to the growth of the economy in Zambia?
- iii. What is the impact of Government expenditure on economic growth in the case of Zambia?
- iv. What is the relation between exchange rate and economic growth in the case of Zambia?
- v. How does Trade affect Zambia's economy?

### **1.4 Definition of key terms**

Foreign Aid: Foreign aid refers to the transfer of resources from one country to

another, typically from a developed country to a developing country, intended to support economic, social, or political development. It can take the form of financial assistance, goods, or services. According to the OECD (2023), foreign aid aims to improve the economic conditions and quality of life in recipient countries.

**Economic Growth:** Economic growth is the increase in a country's output of goods and services over time, usually measured by the rise in Gross Domestic Product (GDP). It reflects the overall improvement in economic health and prosperity. The World Bank (2023) defines economic growth as the increase in a country's productive capacity, resulting in higher levels of income and employment.

**Exchange Rate:** The exchange rate is the value at which one currency can be exchanged for another. It can fluctuate based on various factors such as economic conditions, interest rates, and market demand. The Bank for International Settlements (BIS, 2023) describes the exchange rate as a crucial element in international trade and finance.

**Government Spending:** Government spending refers to the expenditure by the government on goods, services, and public projects. It includes spending on infrastructure, education, defence, and social services. The Congressional Budget Office (CBO, 2023) defines government spending as a key component of fiscal policy, impacting economic activity and public welfare.

**Foreign Direct Investment or FDI:** The term Foreign Direct Investment refers to the making of an investment by a corporation or an individual in one country in the business importance of another country, for instance, in establishing business activities or acquiring business assets. United Nations Conference on Trade and Development (UNCTAD, 2023) states that FDI is one of the most effective means of promoting and integrating into the world economy.

**Trade:** This is the voluntary exchange of goods, services, or assets between parties, whether within a country or across borders, driven by the principle of mutual benefit (Krugman, Obstfeld, & Melitz, 2018). From an economic perspective, it optimises resource allocation and increases welfare through specialization and efficiency (Ricardo, 1817). In business, it's the process of buying and selling for profit, encompassing all aspects of production and distribution (Czinkota, Ronkainen, &

Gupta, 2021).

## **1.5 Significance of the study**

This study assesses the impact of foreign aid on developing economies, especially on Zambia. This research will assist the policy makers in better utilising foreign aid with the aim of achieving and sustaining economic growth and development in Zambia and the region. Additionally, this research will expand on this global economic phenomenon arguing how foreign aid affects economic growth and development in poorer nations.

Finally, it is expected that the study findings will be of help to other scholars, researchers and academician in future when performing similar studies as this will be useful in contributing to the body of knowledge that seeks to evaluate the effect of foreign aid on economic growth in developing nations.

## **1.6 Scope of the study**

The purpose of this study is to assess how foreign aid influences development in Zambia, which is viewed as a developing country while the cross-section of the study has a large database for the purpose of carrying out econometric analysis. It is interesting to point out that any data for the period before 1990 was excluded in the analysis. Therefore, this particular research is concentrated on the year 1990-2022 since the years earlier than 1985, the economy of Zambia was a planned economy and not a free market, it was in the process of certain restructuring and so this would bias the results.

## **1.7 Organisation of the study**

The study has been structured into six chapters, each of them dealing with different parts of the study. The first chapter deals with the problem under investigation as well as the various aspects of the topic such as objectives, research questions, significance, and the organisation of the study. The literature review is given in chapter two, as the authors are providing an overview of the existing literature on the problem being studied along with the theories relevant to the research. Chapter three gives the research methodology and methods used in this study relating to the

impact of foreign aid on the rate of economic development. In Chapter Four, data collected is analysed, the obtained results are shown and comprehensively discussed, and the methods of data analysis used are justified. Chapter five gives a discussion of the findings following the results that were obtained in chapter four. Lastly, the sixth chapter reviews all the research findings and provides recommendations and conclusions as well as indicating gaps for further research.

## **1.8 Chapter summary**

This chapter gave the introduction on the subject thus the impact of foreign aid on economic growth in Zambia. It formulates the problem statement and the research objectives of the study. It also emphasises on the rationale of the study as well as presenting the delimitation of the study. The next chapter, reviews different types of interactions and case studies done in other countries.

# **CHAPTER TWO: LITERATURE REVIEW**

## **2.0 Introduction**

The previous chapter discussed the role of foreign aid in economic development. This chapter compiles a critical review of related literature on the role of foreign aid in economic development and growth. It further provides empirical data on the other studies done related to this problem and provides theoretical references to other closely related research and finally highlights the literature gap which this study will seek to address.

## **2.1 Theoretical review**

The relationship between Foreign aid and Economic growth has been broadly debated in economic literature. Investigations have been conducted by several researchers to study this link through numerous theoretical frameworks, often with differing conclusions.

### **2.1.1 Theory of economic growth**

Walt Rostow's theory of economic growth outlines a five-stage progression for nations to achieve development: Traditional Society, Pre-Conditions for Take-Off, Take-Off, Drive to Technical Maturity, and Ages of High Mass Consumption. In Traditional Society, economies are primarily agriculture-based, with low productivity and limited trade. Pre-Conditions for Take-Off marks a shift toward national and international production. Take-Off represents industrialisation, accompanied by institutional changes. Drive to Technical Maturity sees improved living standards and increased technological use, fostering economic growth. Ages of High Mass Consumption embodies mature economic prosperity.

Nevertheless, there are critiques of the model arguing that Rostow's model is predominantly capitalist and particularly western oriented and does not provide the scope to the multiple approaches to development. There is a critical issue with the model's depiction of the advancement of the phased theory since it portrays a specific linear convergence, neither does it consider the distinct economies that comprises of those countries that it claims to assist, and is faulted for furthering

foreign policy. The critics also note that each of the nations has different growth dynamics which is contrary to Rostow's assumptions.

Moyo (2009) refutes the idea of international aid instigating economic growth, citing Africa's inability to grow consistently because of aid dependence and historical, cultural, and institutional reasons. Nonetheless, a critical analysis of growth strategies clearly indicates that international aid is indeed at times beneficial. A good example would be the aid offered to post-World War II Europe which facilitated the European nations to effectively recoup from the devastation.

Although the Marshall Plan invested large funds in Europe, the effectiveness thereof depended on already-existing foundations and infrastructure. Relatively, African contexts differ because corruption, mismanagement, and poor leadership are some of the vices that affect how well aid is put to work. Some scholars argue that foreign aid distorts domestic savings as it discourages government's efforts to raise revenue and expand its tax bases out of donor interests. Thus, Rostow's theory and the impact of international aid on economic growth remain highly debatable issues.

With regards to Zambia, transparent governance, strategic frameworks and efficient resource allocation are extremely important in enhancing the economic performance of Zambia and making use of foreign assistance effectively. The best way for Zambia to make use of foreign aid is by promoting transparent governance systems, developing strategic frameworks and allocating resources efficiently (OECD, 2021). These include adoption of strict legal frameworks and robust oversight mechanisms which could help align foreign aid to the national priorities thereby directing it towards productive sectors (World Bank, 2020).

Equally important is linking aid programs to national development strategies and improving evaluation systems that can maximise the impact of external assistance (IMF, 2019). Such frameworks facilitate improved tracking of aid outcomes ensuring that resources are channelled where they will have the biggest effect on sustainable development.

In addition, stabilising exchange rates should be prioritised as it provides an

enabling environment for foreign investors while also contributing to long term sustainability of aid-supported initiatives (UNCTAD, 2021). A strong currency creates confidence among investors necessary for sustaining economic growth over time as well as successful implementation of projects sponsored through foreign grants.

### **2.1.2 Harrod-Domar growth model**

The Harrod-Domar growth model, on the other hand, is based on the conception of a savings gap in developing economies. This model underscores that economic growth primarily relies on investments funded by both domestic and foreign savings. Because lower-income countries often lack sufficient domestic savings to support capital accumulation and investment, international aid becomes necessary. The model can be represented by the equation  $I - S = F$ , where  $I$  signifies investment,  $S$  represents domestic savings, and  $F$  symbolises international aid.

Regarding the exchange gap, researchers such as Strout and Chenery (2006) argue that many underdeveloped countries face challenges due to their inability to generate enough foreign exchange through exports. This is attributed to inadequate export levels meeting import demands, necessitating international aid to bridge the export import gap. This can be expressed as  $M - X = F$ , where  $M$  denotes imports,  $X$  stands for exports, and  $F$  represents international aid. In order to address this inequality, Zambia must rely on international assistance to enable them import important items such as machinery, technology and raw materials which are necessary for development of industrial and agricultural sectors. International aid therefore supports economic stabilisation and growth by filling the gap between exports and imports hence enabling the country manage essential imports while also generating capacity for export.

A more comprehensive perspective comes from Kolawole (2013), who integrates equations (1) and (2) into a two-gap model within the context of national income accounting. This is presented as  $E - Y = I - S = M - X = F$ , where  $E$  signifies state expenditure,  $Y$  represents a country's output and income,  $I$  refers to investments,  $S$  denotes savings,  $M$  stands for imports,  $X$  represents exports, and  $F$  symbolises net capital inflow through international aid. This approach emphasises that when total

expenditure (E) exceeds output (Y), a country requires capital inflows or international aid to address the income gap (F fills the income deficit).

In terms of applicability, the Harrod-Domar growth model is a basic framework in understanding foreign aid facilitating economic growth in Zambia. It accentuates that growth of developing economies relies on capital investment fostered by domestic and overseas savings alike. This model is particularly relevant to countries like Zambia, where there is often a shortage of domestic savings to finance the required capital for steady development. Seen this way, international support becomes an essential precursor of investment for achieving financial autonomy, thereby permitting infrastructural improvement, human resource training among others (Harrod 1939; Domar 1946).

A more nuanced understanding is added to Easterly's (2006) financing gap model by establishing a direct relationship between aid and investment as well as growth. The model for Zambia underscores the importance of foreign aid in augmenting domestic savings that are crucial for meeting the required levels of investments needed for economic growth. Easterly's outline of a linear relationship between international aid, investments and GDP growth point towards the potential role of such assistance in driving economic transformation if properly targeted for productive sectors. It is particularly relevant to Zambia where, if directed at particular sectors such as agriculture, mining and renewable energy with high possibility of growth (Easterly, 2006).

Further, it is important to note that in Zambia where public debts and budget deficits pose great challenges, foreign assistance acts as a crucial buffer by bridging government shortfalls. Through this way, domestic resources are redirected toward private and public investments aimed at stimulating economic activities. For example, through addressing budgetary constraints international aids not only deal with immediate fiscal needs but also create a favourable environment for a long-lasting robust economy (Bacha, 1990).

Generally, the above models collectively reveal that foreign support is indispensable in enhancing Zambia's economic development. The international aid aims at bridging the gaps of savings and exchanges and addressing budget deficits

that enhance confrontation with structural difficulties and realisation of growth capacities. Nevertheless, assistance's success is a function of its in line with national priorities, transparency in its utilisation and focus on long-term developmental outcomes.

### **2.1.3 The Dependency Theory**

The Dependency Theory emerged in the 1960s and 1970s as an assessment of modernisation theories, which proposed that foreign aid and capital inflows were essential for stimulating economic growth in developing countries. This theory, rooted in Marxist economic thought, argues that underdeveloped countries remain economically stagnant and dependent on developed nations due to structural inequalities in the global economic system. Foreign aid, according to dependency theorists, perpetuates this dependency and impedes self-sustained growth. The key principles embedded in this theory have elements in which the global economy is divided into the "core" (developed nations) and the "periphery" (developing nations). The periphery supplies raw materials and labour, while the core produces finished goods and controls capital flows. Additionally, foreign aid is viewed as a mechanism for developed countries to maintain control over the economies of developing nations.

Key thinkers, include, Andre Gunder Frank (1967) who argued that foreign aid deepens underdevelopment by enabling the exploitation of peripheral economies. It creates a cycle of dependency where developing nations rely on external capital instead of building local capacity. The conditions often require recipients to adopt policies that favour donors, such as liberalising trade or prioritising debt repayment over social investments. Dependency theorists suggest that foreign aid primarily benefits political and economic elites in developing countries.

Besides, assistance is often redirected at extractive industries or export-led agriculture hence contributing to the focus on primary commodities that have little value rather than promoting industrialisation or economic diversification. This process perpetuates already-existing disparities by way of reinforcing a dependence on low-value raw materials and preventing the country from achieving autonomous growth (Moyo, 2009).

One major criticism against foreign aid in Zambia is its potential for 'dependency syndrome'. Aid flows often become a significant source of national income thereby dissuading domestic savings, investment and innovation. Instead of focusing on policies that enhance self-sufficiency governments may prioritise continued flow of aid thus undermining sustainable development strategies. The dependence on external assistance can render it difficult to invest in local capacity-building efforts by the country thereby perpetually sustaining dependency (Moyo 2009).

In Zambia, foreign assistance seems to mostly favour elites in politics and economics rather than the general public. According to dependency theorists, donor-driven aid often targets projects that concentrate on donor interests, such as securing markets or ensuring access to natural resources, rather than addressing the holistic needs of Zambians. Consequently, while major aid projects may focus on infrastructure with limited social implications, important sectors like education and health are not prioritised. This approach further widens inequality and suffocates grass root development since most of this aid serves to reinforce the status quo instead of empowering local communities (Frank 1967; Moyo 2009).

Dependency theory stresses the structural issues related to foreign aid, yet it has also been criticised for oversimplifying the relations between developed and developing countries. It is often depicted in these forms that under developed countries are simply there to be recipients of aid, and fail to express how the countries can obtain or generate greater outcomes. South Korea and Singapore are examples of countries that have transitioned successfully into advanced economies through prudent utilisation of foreign aid and proper policies. These cases indicate that strategic management of foreign aid in line with long term development objectives can promote economic growth. In Zambia, this would involve making use of aid to bolster local institutions, encourage economic diversification as well as investment in education rather than relying on donor-driven solutions only (Moyo, 2009).

On the other hand, alternative approaches like post-development theories propose assumptions of top-down growth approaches and advocate a bottom-up methodology focused on strengthening and leveraging existing local assets rather

than outside dependence. For Zambia this would imply changing the direction of international assistance to activities which empower communities, spur innovation, and reduce dependence on external resources. If Zambia is committed towards achieving sustainable economic growth, then they must place greater emphasis on building local capacity and promoting inclusive growth so as to break away from dependency syndrome (Moyo, 2009).

#### **2.1.4 Neoclassical Growth Model**

The Neoclassical Growth Model was developed by Solow and Swan in 1956 which stressed that the long run economic growth was driven by capital accumulation and exogenously technological progression. In this model, capital had diminishing returns which implied as the amount of capital stock increased, the more output from new investment incrementally decreased.

Foreign aid is capable of relaxing the constraints on capital accumulation and therefore raising short-term growth. In some instances, such as an unexpected rise in foreign aid to a country, or a surge in donations with the intention of developing human capital, may cause fluctuations in growth rates. But in the long term, growth will fundamentally be contingent on external factors. It is worth noting that in the long run, diminishing returns to capital will cease to be the most effective driver of technological achievement through continuous investment.

In the Neoclassical framework, foreign aid raises the levels to which countries converge with their steady-state by increasing saving and investing. In principle, aid should benefit more the poorer countries who have relatively low initial capital stocks, and thus more to grow faster (the "convergence hypothesis"). Neoclassical critics, however, argue that in the long run, Aid is said to be ineffective as it does not get at the root causes of growth relating to such variables as technological innovation or productivity enhancement. Romer (1986) and Lucas (1988).

Endogenous Growth Models, contrasting with the dimensional paradoxical of growth theory, argue that aid does have an impact on long-term growth through facilitating, or displacing, variables like human capital and innovation. While exogenous approaches recognise the presence of institutions, they do not explain

how aid contributes to institutional changes that support long-term growth, as endogenous approaches do.

Studies such as Burnside and Dollar (2000) indicate that aid is more effective in countries with good policies, consistent with endogenous growth theories. However, bad governance or a misallocation of resource can destroy the positive impact of aid, as demonstrated by Easterly (2006). Hence, what is required in Zambia are institutional reforms and transparent handling of aid that will ensure fostering sustainable economic well-being.

Historically, the country's infrastructure such as roads and schools were built especially with the aid targeting the human capital formation. This overseas investment has supplemented more constructional growth to the economy of Zambia. Such expenditures are consistent with the neoclassic predictions since they augment the country's physical stock for some time resulting in higher rates of growth. Nonetheless, when the stock grows bigger still newly built facilities yield increasingly smaller extra output pointing out limitations of aid to maintain long-term development (Burnside & Dollar, 2000).

The Neoclassical framework convergence hypothesis argues that since Zambia, like most poor countries, has low capital stock at the onset, it would most benefit from such a model. Their level of income could be enhanced by increased savings in the example of investment turning them into more equilibriums. Additionally, higher aid in agriculture and small-scale firms could be witnessed in the short term changing the earning and productivity scale in Zambia. However, the model emphasises that sustained capital inflows cannot influence long-term growth since it is dependent on exogenous factors such as technological progress which are not affected directly by a continuous flow of capital (Romer, 1986).

Romer (1986) and Lucas (1988) contend that the Neoclassical Model neglects the significant impact of foreign aid, which is considered as a determinant of long-run growth for the economy of any country. In addition, they concur that the model fails to emphasise foreign aid as an aid that could switch the human and institutional growth aspects of the economy. These issues have been addressed in the Endogenous Growth Models, which acknowledge how aid funds can be directed to

activities that lead to productivity increases and resulting knowledge outflows. In the case of Zambia, this implies that programmes geared towards education, research and ultimately technology development aimed at building capacity for innovation while reducing dependence on external assistance (Easterly, 2006).

While the Neoclassical Growth Model offers some basic insights into relationship between foreign aid and growth in Zambia. But this is the contribution of the Endogenous Growth Models. For better use of foreign aid in Zambia, the country needs to build a stronger human capital base as well as encourage its citizens to be more innovative and improve its institutions so that it does not get trapped in the problem of diminishing returns on investment.

## **2.2 Empirical review**

Various studies have over the years been done with the aim of providing evidence regarding the influence of foreign aid in economic development. It has been widely suggested in recent years that foreign aid can help reduce the levels of poverty and enhance the economic growth and development of the developing countries. Boone (1995) emphasised that several efforts have been made to increase aid including using international frameworks such as those set out by Clemens et al. (2012).

Conversely, Boone (1995), among other researchers, argue that historical evidence indicates aid's ineffectiveness in promoting growth in developing countries. At a more moderate position, there are particular conditions which are, but not limited to, improved macroeconomic policies and increased foreign aid. Such a viewpoint was advanced by Nowark-Lehmann et al. (2010). However, as per this empirical evidence, foreign aid with no condition tends to effectively contribute to economic growth.

Also, enlightening us in this area of research, Ranjan and Subramanian (2008) investigated the causal relationship between foreign aid and economic growth using cross-section and panel data analyses with GMM estimation on 42 developing countries. The results of their study did not find any strong link between foreign aid and economic development, arguing that the evidence concerning the effectiveness of aid under a more developed institutional environment, and specific policies is minimal, as are the arguments that some types of aid have more success than other

forms.

Their research findings were not able to generate any conclusively strong association with foreign aid and economic growth arguing that such success stories of foreign aid success are few. They furthered their argument by noting that those stories are also missing the necessary support to suggest that certain types of foreign aid achieve more success than others. Interestingly, Yiew and Lau (2018) supplemented the study with their recent research noting the assistance had long-term impact on growth across 95 developing nations.

Nevertheless, more recent research has shown a positive correlation between foreign aid and economic growth. Siddique *et al.* (2017) studied South and East Asian nations from 1995 to 2013, discovering aid's promotion of economic growth. Effective utilisation of foreign aid can indeed lead to economic growth, as indicated by the researcher. In the same vein, Karras (2006), investigating the relationship between foreign aid and per capita GDP growth from 1960 to 1997, found that an increase of 1% in aid led to a 0.26% rise in per capita growth rate. Hence this study seeks to investigate on the relationship between foreign aid and economic growth in Zambia.

Finally, Boone (1995) considered the issue of aid effectiveness from the political institution perspective framework and applied regression analysis as well as instrumental variable techniques including the Chows' test. The findings suggest that overseas assistance, more often than not, fails to increase the welfare of the impoverished and may increase public expenditure. Minoiu and Reddy (2010) concurred with a similar view in their research on 27 developing African countries. They investigated whether aid supports the growth of democracy or if it facilitates democracy and found that aid does not support growth.

### 2.3 summary of key empirical studies

Author & Year	Study Title	Methodology	Key Findings	Limitation/Gap
Boone, 1995	Politics and the Effectiveness of Foreign Aid	Cross-country regressions using data on aid, investment, and growth.	Political factors, such as the political system and government stability, influence the effectiveness of aid.	Limited focus on the microeconomic mechanisms behind aid allocation and effectiveness.
Ranjan & Subramanian, (2008)	Aid and Growth: What Does the Cross-Country Evidence Really Show?	cross-section and panel data analysis	Found little robust evidence of a positive (or negative) relationship between aid inflows into a country and its economic growth.	Difficulty in finding suitable instruments, potential for endogeneity bias, and focus on a specific channel of impact.
Nowark-Lehmann et al., (2010)	Foreign aid and recipient countries' exports: How important are improved bilateral trade relations?	Cross-country regressions and case studies.	Aid can have a positive impact on growth, but the effect is often small and contingent on the policy environment. Aid can also have distributional effects, potentially increasing inequality.	Difficulty in isolating the impact of aid,
Minoiu & Reddy, (2010)	Development Aid and Economic Growth: A Positive Long-Run Relation	Cross-country regression analysis with aid data.	Aid has a positive and significant long-run effect on economic growth. The effect is robust to various estimation techniques and controls.	Difficulty in disentangling the long-run effects of aid from other factors.
Clemens et al. (2012)	Counting Chickens When They Hatch: Timing and the Effects of Aid on Growth	Econometric analysis, emphasizing time-lagged effects.	Highlights the importance of considering the time lag between aid delivery and its observable effects on growth. Emphasized the importance of differentiating aid types, and their respective time horizons.	Difficulty in isolating the effects of specific aid types, and accurately measuring long term effects.
Siddique et al., (2017)	Foreign Aid and Economic Growth in Developing Countries: Evidence from Panel Data Analysis	Panel data analysis using fixed and random effects models.	Aid has a positive and significant effect on economic growth, especially in countries with good governance and macroeconomic stability.	Possible reliance on aggregate growth measures, and challenges in isolating the impact of specific aid types.

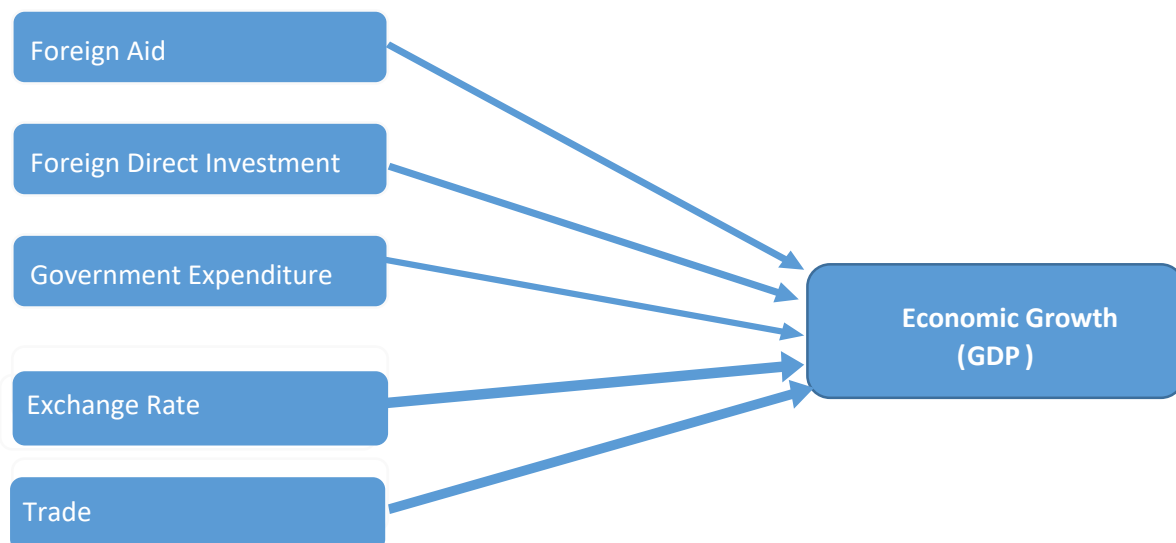
## 2.4 Research gap

The majority of available literature on foreign aid and economic growth only focuses on developed countries while only a few studies looked at Uganda, Nigeria, and Kenya. The number of studies done in Zambia is even rarer. More so there are contrasting findings from the existing literature with some scholars concluding that foreign aid has a positive impact on economic growth while others offer an opposite point of view. The aim of this research is to bridge this gap by investigating the aforementioned relationship in detail empirically of a developing country, namely Zambia.

## 2.5 Conceptual framework

This section describes the underlying theory of the research. It is significant because it illustrates how the various elements of the investigation relate to each other and to the whole body of research in question. The model presented here addresses the principal question of this investigation and serves as a basis for achieving the above-mentioned goals. The independent variables employed in this research include Foreign aid, Foreign Direct Investments (FDI), Government expenditure, Exchange rate and Trade whilst the only dependent variable is GDP. The study based the objectives on Figure 2.1 which shows conceptual framework giving basic understandings of how the variables are inter-linked.

**Figure 2.1: Conceptual Framework**



Source: Author (2024)

Based on the above conceptual framework, the independent variables of exchange rate, foreign direct investment, foreign aid, trade and government spending are suggested to have an effect on economic growth. This growth is measured as a percentage increase in GDP over time. It reflects the overall expansion of an economy attributed to increase in productive capacity, investment and consequently rise in income levels (Solow, 1956). This framework will take these independent variables particularly exchange rate, government spending, foreign aid and FDI in Zambia as the specific context to measure their degree and extent of impact toward economic growth.

Exchange rate affects inflation, trade competitiveness and capital flows. When exchange rate is stable it can promote exports, attract investments and improve economic stability which ultimately lead to growth (Mohan & Saini, 2009). Volatility on the other hand may discourage investment as well as hamper progress towards better economic performance (Edwards, 1989). In Zambia, for example, all changes that take place to the kwacha will have a significant influence to the copper mining export sub sector which will in turn impact the economy as a whole.

Another important variable is Government expenditure that encompasses various heads such as infrastructure development, education and health amongst others. Direct productive spending on these areas can address structural constraints and boost growthmanship (Barro, 1990). This implies that even wrong or inefficient use of money does not affect the economy much unlike what was assumed previously about misallocation (Ghosh & Gregoriou, 2008). Whereas the social sectors have considerable Government support, which may be considered not be economically advisable as it limits growth in Zambia's economic base.

Foreign aid is given to developing nations to help develop capital and technological resources. It can be used as an intermediary for savings and foreign exchange, therefore facilitating short-term growth (Chenery & Strout, 1966). However, critics contend that Aid leads to overreliance on it as well as inefficiencies and corruption that limit its long term beneficial impacts (Moyo, 2009). In Zambia education and healthcare sectors have been supported through aid but the effectiveness of this depends on good governance and aligning it with national priority.

Foreign Direct Investment (FDI) is also important in fostering technology transfer, job creation and capital formation. These three forces drive long run growth particularly in resource sectors such as mining and energy (Borensztein et al., 1998). Nevertheless, the influence of FDI may vary depending on aspects like human capital levels, institutional quality or external economic environment (Carkovic & Levine, 2005).

Lastly, the importance of trade in the economy cannot be overemphasized as this is the voluntary exchange of goods, services, or assets between parties, whether within a country or across borders, driven by the principle of mutual benefit (Krugman, Obstfeld, & Melitz, 2018). From an economic perspective, it optimizes resource allocation and increases welfare through specialization and efficiency (Ricardo, 1817). In business, it's the process of buying and selling for profit, encompassing all aspects of production and distribution (Czinkota, Ronkainen, & Gupta, 2021). Thus, trade determines which countries tend to have stronger economies than others.

In summary, these variables are drivers of economic growth but their effects differ among different countries depending on governance structures within each country's economy, policy frameworks put in place within an economy and state of the world economy. As for Zambia leveraging these factors effectively requires ensuring investments as well as aid are aligned with national development priorities coupled with enhancing institutional capabilities.

## **2.6 Chapter summary**

Chapter two gave the literature reviewed to guide the flow of the study, this study adopted the theory of economic growth by Rostows, the Harrod-Domar Model and the dependency theory among others to explain the effect of foreign aid on economic growth. The chapter also gave a review of the empirical literature reviewed and the conceptual framework that guided the flow of the study. The next chapter gives the methodology that shall guide the study.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.0 Introduction**

The previous chapter gave the literature review that guided the study and highlighted studies conducted on the subject. This research aims to practically evaluate the relationship between foreign aid and economic growth in Zambia. This Chapter outlines the approach that was employed to carry out the investigation. It elucidates the way the study's framework was defined, the sources and type of the data, as well as the methods and procedures used to estimating the relationships.

### **3.1 Research Design**

This study takes a quantitative approach, utilising quantitative analysis to evaluate the relationship between foreign aid inflows and economic growth. Additionally, the study relied on secondary time series data spanning from 1990 to 2022. This time frame has been selected as it makes a sample of over 30 years and would suffice to enable the study evaluate the effect of foreign aid on economic growth. This is in consonance with Johansen's view (1991) who in his discussion placed emphasis on the need to take into consideration the time series characteristics of the variables employed in studies in macroeconomics for which the nature of cause and effect is being investigated with respect to variables which bear similar trends.

### **3.2 Data**

The study used secondary data. Time series annual data on economic growth, foreign aid inflows, investment, exchange rate, trade and government expenditure for the period 1990 to 2022 shall be used. This data was sourced from MOFNP, ZSA and the World Bank statistics portal. Further, the study used Microsoft office Excel 2016 for descriptive statistics and generating of various charts in the study while E-Views 12 was be used to conduct deeper econometric analysis. The table below shows the signs expected post analysis, proxies and sources from which the data was extracted from.

**Table 3.1: Variables along with proxy and Expected Sign**

<b>Variables</b>	<b>Proxy</b>	<b>Expected Sign</b>	<b>Source</b>
<b>Dependent variable</b>			
Economic Growth	GDP		ZSA
<b>Independent variables</b>			
<b>Variable</b>	<b>Expected sign</b>	<b>Source</b>	
Foreign Aid	Positive (+)	ZSA/WB	
Foreign Direct Investment	Positive (+)	MOFNP/WB	
Government expenditure	Positive (+)	MOFNP/WB	
Exchange Rate	Negative (-)	MOFNP/WB	
Trade	Positive (+)	MOFNP/WB	

### **3.3 Definition and Justification of the Selected Variables**

This section explains variables used in the study and the justification of the variables under consideration in the quest to evaluate the effect of foreign aid on economic growth. It starts by giving justification on the dependent variable and then gives the justification on the selected independent variables.

#### **3.3.1 Dependent variable**

This section gives the justification of the dependent variable selected in the estimation of economic growth. The research employed the real GDP growth rate as a proxy in estimating economic growth.

##### **3.3.1.1 Economic Growth**

Economic growth is arguably a primary indicator of a nation's performance and one of the most essential indicators of a country's economic success. This is because it gauges the value of all ultimate products and services produced within a country's borders during a year, considering the effect of inflation. Consequently, in this research, GDP was applied as a proxy in measuring Economic Growth.

#### **3.3.2 Independent variables**

This section gives the justification of the independent variables selected in the evaluation of the impact of foreign aid on economic growth. These include Foreign

Aid, Government Spending, Foreign Direct Investment, Exchange rate and Trade (as a percentage of GDP).

### **3.3.2.1 Foreign aid**

According to the World Bank (2012), Foreign aid is defined as resources given to one country by another in what is commonly referred to as economic or developmental assistance. Foreign aid comprises an array of forms such as donation of goods, money, provision of human capital or technical support offered by the government and other international organisations to partner government agencies overseas. The study obtained data from the statistical database of the World Bank and the data from Zambia Statistics Agency.

### **3.3.2.2 Foreign Direct Investment**

In the context of developing economies, much emphasis has been laid out on the role of Foreign Direct Investment (FDI). One of the variables considered in this study was FDI, because it is closely associated with foreign aid. FDI is defined as investment made by individuals, businesses or organisations from one country into another country's economy (Sachs and Warner, 1997). FDI includes ownership or control of some combination of real assets such as industries, factories, land, and infrastructure in a foreign country. On the contrary, portfolio investment which consists of coverage of equities and bonds issued by foreign companies by the investing institutions and individual insider is usually short term in nature but involves considerable power or control of these companies' executives.

### **3.3.2.3 Government expenditure**

Government expenditure involves all monies that a government uses to finance its obligations like public goods and services to those people under its jurisdiction that satisfy their needs. It includes expenditures on education, health care delivery system development, security provision through defence forces capability enhancement. In addition, this includes social welfare programs amongst other welfare provisions for citizens and official maintenance costs among others provided by local authorities in various regions within a given country.

### **3.3.2.4 Exchange Rate**

The exchange rate can be described as the amount that one currency has to pay in

order to be able to buy another currency. It typically fluctuates due to changes in fundamental economic conditions, rates of interest and prevailing conditions of the market. The foreign exchange rate alongside the other factors is what the BIS (2023) defines the foreign exchange rate as an important factor in international commerce and finance.

Goods and services also experience fluctuating prices when a nation's currency becomes stronger or weaker in relation to other currencies. According to Forex trading basics (2012), when a country's currency is strong, foreigners have to pay more for that country's products and when the currency weakens, the products are cheaper for foreigners to buy.

The exchange rate in the model captures important external factors that can influence economic output, especially for countries with significant trade exposure or reliance on international financial flows. It provides a more holistic view of the macroeconomic environment, which helps explain the variation in output that cannot be accounted for by domestic factors alone.

### **3.3.2.5 Trade**

Trade can be described as the voluntary exchange of goods, services, or assets between parties, whether within a country or across borders, driven by the principle of mutual benefit (Krugman, Obstfeld, & Melitz, 2018). From an economic perspective, it optimizes resource allocation and increases welfare through specialization and efficiency (Ricardo, 1817). In business, it's the process of buying and selling for profit, encompassing all aspects of production and distribution (Czinkota, Ronkainen, & Gupta, 2021). The study used Trade as a percentage of GDP to measure trade.

## **3.4 Empirical model and methodology of the study**

This section presents the empirical model and the methodology which helped in the data collection, analysis, presentation and interpretation as per the requirements of the study. It commences with the research providing the empirical model of the study

and subsequently the econometric methodology that was used in the study.

### 3.4.1 Model of the study

In this regard, Zambian GDP was analysed in both short term and long term with a model that included Foreign Aid, Foreign Direct Investment, Government Expenditure, Exchange Rate and Trade. The model below indicates the relationship between economic growth (dependent variable) and Foreign Aid, Foreign Direct Investment, Government Expenditure, Exchange Rate and Trade (independent variables). Hence, this is expressed as follows:

**Equation 3.1: Empirical model specification**

$$\mathbf{RGDP = f(FA, FDI, GEX, EXR, TGDP)}$$

The equation (3.1) is transformed into linear function consequently:

**Equation 3.2: Econometric model specification**

$$\mathbf{RGDP_t = \beta_0 + \beta_1FA_t + \beta_2FDI_t + \beta_3GEX_t + \beta_4EXR_t + \beta_5TGDP_t + \epsilon_t}$$

Where,

$RGDP_t$  = Real Gross Domestic Product growth at time t

$FA_t$  = Foreign Aid at time t

$FDI_t$  = Foreign Direct Investment at time t

$GEX_t$  = Government Expenditure at time t

$EXR_t$  = Exchange Rate at time t

$TGDP_t$  = Trade as a percentage of GDP at time t

$B_0$  = the slope or the constant of the model

$B_1 - B_5$  = coefficient of the explanatory variables in the model

$\epsilon_t$  = error term at time t

To lessen the effect of heteroscedasticity, the model was transformed into natural logarithm in the time series data as per below:

**Equation 3.3: Heteroscedasticity adjusted model**

$$\ln\text{RGDP}_t = \beta_0 + \beta_1 \ln\text{FA}_t + \beta_2 \ln\text{FDI}_t + \beta_3 \ln\text{GEX}_t + \beta_4 \ln\text{EXR}_t + \beta_5 \ln\text{TGDP}_t + \varepsilon_t$$

### 3.4.3 Unit Root Test for stationarity (ADF)

As most of these variables have unit roots, they are unlikely to be stationary at level, caused by the presence of unit roots in the variables, which normally leads to spurious regression problems. The use of time series data in the analysis can, however, lead to spurious regression. In order to overcome such possibilities, stationarity tests were carried out using the Augmented Dicky Fuller (ADF) test. Any time series that exhibits a unit root is said to be nonstationary. The process of ADF test can be represented mathematically by the following equation.

Equation 3.4: ADF test equation

$$\Delta X_t = \alpha_0 + \alpha_1 t + \beta X_{t-1} + \sum_{n=1}^{\rho} \delta_j \Delta X_{t-1} + U_t$$

Whence  $\rho$  denotes lag order; Where  $\Delta X_t$  connotes the difference in the time series data for the first period and  $t$  stands for time. This shows that we accept the alternate hypothesis that variable(x) is stationary ( $H_0: \beta \neq 0$ ) if  $\beta$  is significantly negative.

If the model is found to be non-stationary at level, it can usually be transformed into first-differences so as to make them stationary and the null hypothesis was tested at 5% level of significance. However, in this study, LogEXR (Exchange Rate) is stationary at level while variables like LogGEX (Government Expenditure), LogGDP (Gross Domestic Product), LogFA (Foreign Aid), LogFDI (Foreign Direct Investment) and LogTGDP are integrated of order one(1). For this reason, the Autoregressive Distributed Lag Model (ARDL) was chosen as the appropriate econometric framework.

### 3.4.4 ARDL Model Specification

Following the unit root test, there is usually need to establish both short run and long run relationships among variables under consideration. In this regard, the bound test is applied within the framework of Autoregressive Distributed lag (ARDL) model as proposed by Pesaran *et al.* (2001). This is in order to establish the

cointegration among variables under consideration.

The bound test is usually conducted because of the following reasons:

- (i) The ARDL model tends to avoid the problem associated to integration of same order as connected with Johansen & Juselius (1990) likelihood approach;
- (ii) The conventional cointegration approach applies better for the small sample size and not as stock and watson (1988) and johansen and juselius (1990) are best for large sample sizes;
- (iii) It gives us the ability to run the parameters of both the short and long run of the model at the same time;
- (iv) There is an assumption of endogeneity thus variables must be assumed to be endogenous; and
- (v) According to Harris & Sollis, (2003), this technique tends to provides unbiased estimates of the long run and suitable t-statistics.

Further, it is important to note that to apply the bound test procedure the following ARDL will be estimated to find the cointegration relationship between economic growth and Foreign Aid, Foreign Direct Investment, Government Expenditure Exchange Rate and Trade, we specify the following model:

Equation 3.5: ARDL equation

$$\Delta \log GDP_t = C + \alpha_1 \Delta \log RGDP_{t-1} + \alpha_{12} \Delta \log FA + \alpha_{13} \Delta \log FDI + \alpha_{14} \Delta \log GEX + \alpha_{15} \Delta \log EXR + \alpha_{16} \Delta \log TGDP + \sum_{p=1}^p \alpha_{1i} \Delta \log GDP_{t-1} + \sum_{q=1}^q \alpha_{2i} \log FA_{t-1} + \sum_{r=1}^r \alpha_{3i} \log FDI_{t-1} + \sum_{s=1}^s \alpha_{4i} \log GEX_{t-1} + \sum_{w=1}^w \alpha_{5i} \log EXR_{t-1} + \sum_{v=1}^v \alpha_{6i} \log TGDP_{t-1} + \mu_t$$

The initial step of ARDL approach is to estimate the equation 3.5 above by OLS. The second step is identifying the presence of cointegration among the variables by restricting all the estimated coefficients of the lagged variable equal to zero.

### 3.4.5 ECM

The ECM was introduced by Engle and Granger to provide causal factors that may influence the variables. The negative sign of ECM and statistical significance confirms that a long run relationship can be achieved among the variables included in the model. This method has proven to be used to confirm co-integration among

the variables. According to Bannerjee *et al.* (1998), the Error correction model (ECM) among the co-integrated variables explains change in dependent variables due to independent variable. The divergence in dependent variable shows short period of time to long run equilibrium relationship.

Now co-integration relationship exists between the variables, the next steps is to estimate the equation (3.6) via ARDL technique by choosing the order of the model using Akaike Information Criteria (AIC) to achieve the short-run and long run dynamics parameters and Error correction from equation (3.6) is given as below:

Equation 3.6: ARDL equation with ECM

$$\Delta \log \text{RGDP}_t = C_0 + \sum_{k_i=1} \alpha_{1i} \log \Delta \text{FA}_{t-1} + \sum_{k_i=1} \alpha_{2i} \log \Delta \text{FDI}_{t-1} + \sum_{k_i=1} \alpha_{3i} \log \Delta \text{GEX}_{t-1} + \sum_{k_i=1} \alpha_{4i} \log \Delta \text{EXR}_t + \sum_{k_i=1} \alpha_{5i} \log \Delta \text{TGDP}_{t-1} + \sum_{k_i=1} \delta_i \Delta \text{D1}_{t-1} + \sum_{k_i=1} \gamma_i \Delta \text{D2}_{t-1} + \text{ECM}_{t-1} + \varepsilon_t$$

### 3.4.6 Diagnostic tests

Diagnostic results, Ramsey's RESET (model specification test), Normality (Jaurque-Bera test), Breusch-Godfrey Serial correlation LM TEST, Breusch-Godfrey Heteroscedacity TEST were performed under the sensitivity analysis to confirm the validity of the data used for the variables in the model.

#### 3.4.6.1 Model specification test

Model specification is a process that is used to determine the independent variables to include or exclude from the regression model. This study used the Ramsey RESET test to test for model specification. The Ramsey RESET (Regression Equation Specification Error Test) is used to check whether a regression model suffers from misspecification. This is on the premise that, it tests whether the model has:

- i. Omitted Variables – Important explanatory variables missing from the model.
- ii. Incorrect Functional Form – The relationship between dependent and independent variables may not be correctly specified (e.g., a linear model when a nonlinear one is needed).
- iii. Nonlinear Relationships – Whether higher-order terms (squares, cubes, etc.)

should be included in the model.

#### **3.4.6.2 Heteroscedasticity**

According to one of the assumptions of the classical linear regression model is that the variance of the error term should be constant, this property is called homoscedasticity. Violation of this assumption results in heteroscedasticity. Heteroscedasticity refers to a situation where the variance of the error term is not constant. Detecting the presence of heteroscedasticity as well as solving the problems (having inefficient estimators) of heteroscedasticity, in this case involved the use of Breusch Pagan Godfrey (BPG) test. Problems of heteroscedasticity affect the accuracy and certainty in forecasting.

#### **3.4.6.3 Normality Test**

To carry out a number of statistical tests it is required that the normality of the data being used is assessed. This is because normality of the data is an underlying assumption in parametric testing. The Jarque-Bera normality test was used to test for normality in order to ensure that data being used in this study is drawn from a normally distributed population.

#### **3.4.6.4 Serial correlation**

Serial correlation refers to a relationship between a particular variable and its lagged version at different time intervals. In order to avoid breaking one of the Classical Linear Regression Model assumptions, the study run a serial correlation test with variables that were devoid of serial correlation. The Breusch Pagan Godfrey test was used to carry out this non-parametric statistical test for serial correlation.

### **3.5 Chapter Summary**

This chapter has justified why the researcher chose certain methodology and explained why exactly these methods were chosen for conducting researches that bases on quantitative data. Time series data from 1990 – 2022 was taken as sample frame and size. The succeeding section provides data presentation, analysis and discussions of the findings that are based on the objectives set in chapter one.



# CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

## 4.0 Introduction

The chapter gives a presentation and discussion of findings obtained in this study. The graphs and charts obtained from Microsoft Excel and gretl as well as E-views among other econometric analysis software were used to analyse the collected data. The chapter starts by giving time series data characteristics followed by presenting basic background trends for the variables under consideration.

## 4.1 Time series data characteristics

The study under this section gives descriptive statistics of variables used in this study. Mean, standard deviation, coefficient of skewness (SK) and kurtosis are presented in table 4.1 for variables considered.

**Table 4.2: Time series data characteristics**

	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Kurtosis</b>	<b>SK</b>
<b>GDP (K)</b>	33	115195072	145410689.7	1.148	1.398
<b>Foreign Aid</b>	33	5430218.867	7794071.134	5.152	2.175
<b>Foreign Direct Investment</b>	33	28229019.94	111198373.7	15.285	3.998
<b>Government Expenditure</b>	33	70673352.5	299676610.7	32.053	5.627
<b>Exchange Rate</b>	33	5.828	5.746325666	1.341	1.398
<b>Trade (%GDP)</b>	33	67.525	7.614127254	-0.286	0.578

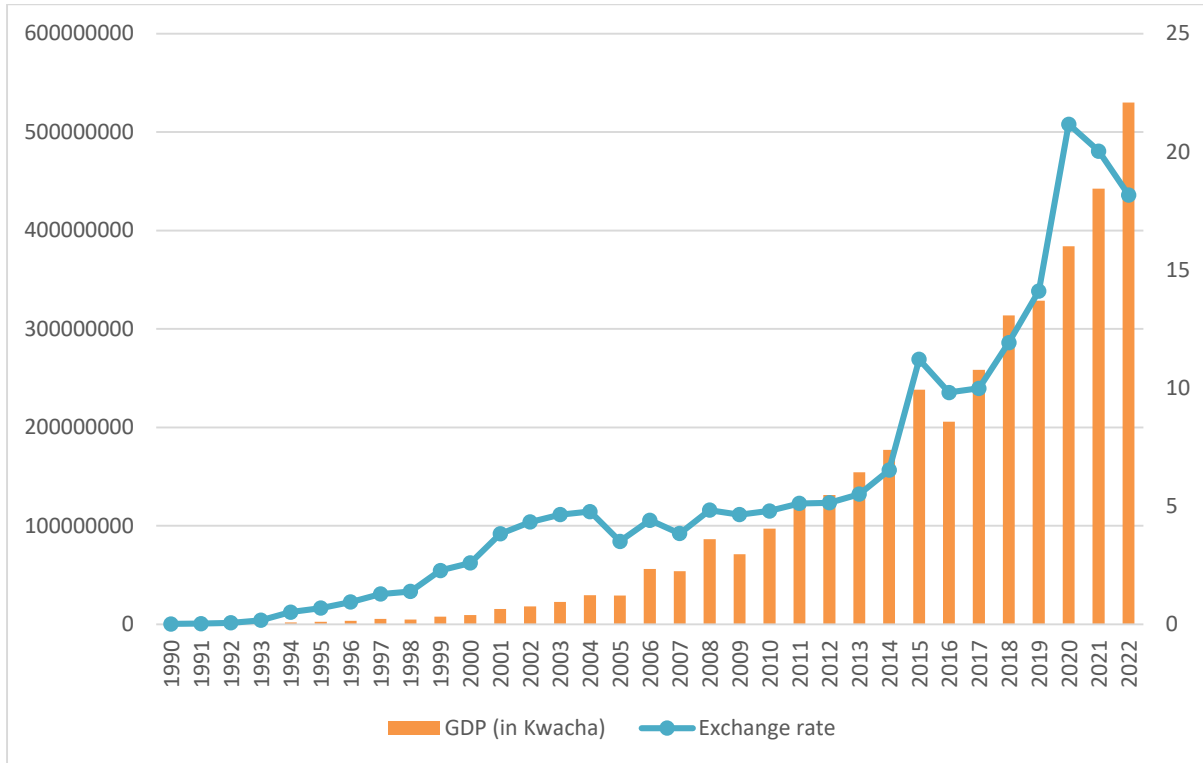
Source: Author's computation (2024)

From Table 4.1 above, it is evident that GDP's standard deviation is high showing a big variation as indicated by very high kurtosis figures indicating the existence of extreme values within the dataset. With regards to independent variables, FDI has a wider spread than others while government expenditure has a much higher kurtosis than others suggesting more concentration at either end could point out why these variables have been increasing over time due to Zambia's economic growth trend. On the other hand, Foreign Aid, Exchange Rate and Trade show a narrower range of fluctuations than the rest.

## 4.2 Zambia's GDP and Exchange rate for the years 1990 – 2020

This section gives Zambia's changes in GDP and exchange rate for the period 1990 – 2020, figure 4.2 shows the trend in this regard.

Figure 4.2: Zambia's GDP and Exchange rate for the period 1990 – 2020



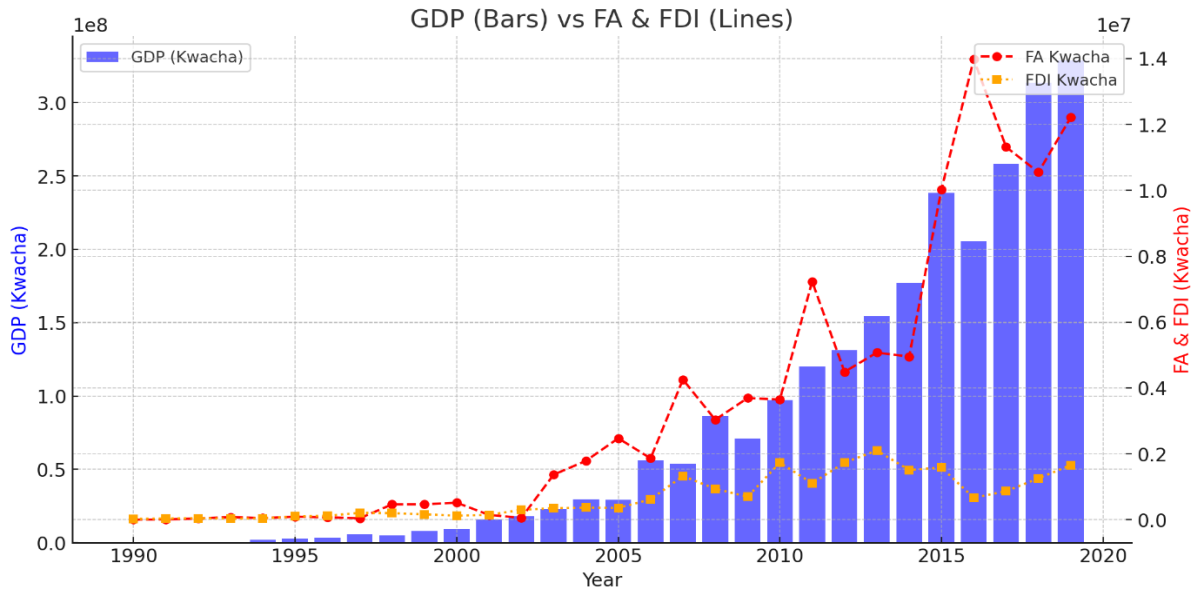
Source: Author's computation (2024)

Figure 4.2 shows the growth of the Zambian economy in terms of GDP for the years 1990 – 2020. From figure 4.1 above, we can deduce that the highest GDP was recorded in 2022 and the lowest GDP was recorded in the year 1990. Over the same time frame, the currency depreciated the most in 2020 and was strong in the 1990s.

## 4.3 Zambia's Foreign aid, FDI and GDP and for the period 1990 – 2020

Zambia's nominal GDP has been volatile over the years, figure 4.3 shows Zambia's nominal GDP over the period 1990 – 2020.

**Figure 4.3: Zambia’s foreign aid, FDI and GDP for the period 1990 – 2020**



Source: Author’s computation (2024)

Figure 4.3 above shows that the country experienced high inflows of foreign aid compared to FDI for the period under observation as shown above. thus in the years 2007, 2011 and 2016, on the other hand, inflows of foreign aid where low in the years 1986, 1988 and 1990. In terms of FDI, Zambia experienced growth in the inflow of FDI in the years 2010, 2013 and 2020 respectively, on the other hand, the country experienced reduced inflows of FDI in the years 1992 to 1994.

## 4.5 Unit Root Test results

Prior to establishing short run and long run relationship among variables, unit root test was conducted in order to determine a correct model needed to be used to determine the effect of foreign aid on economic growth. In conducting this study Augmented Dicky Fuller (ADF) was used in conducting unit root tests as follows:

$H_0: \delta = 0$  or  $(\rho = 1)$  [non-stationary or there is a unit root]

$H_1: \delta < 0$  or  $(\rho < 1)$  [stationary or there is no unit root]

**Table 4.3: Unit root test results**

Variable	At level		At first difference		Order of integration
	T-statistic	p-value	t-statistic	p-value	
LogGDP	-2.45536	0.1022	-3.37648	0.0077	I(1)
LogFA	-2.49622	0.1258	-5.584157	0.0001	I(1)
LogFDI	0.236596	0.9708	-5.609527	0.0001	I(1)
LogGEX	1.224291	0.9976	-4.250993	0.0023	I(1)
LogEXR	-6.605521	0.0000	-	-	I(0)
LogTGDP	-2.308851	0.1754	-3.612578	0.0120	I(1)

Source: Author (2024)

Based on the results above, the variable LOGEXR (Exchange Rate) was stationary at level while LOGGDP (Gross Domestic Product), LogGEX (Government Expenditure), LogFA (Foreign Aid), LogFDI (Foreign Direct Investment) and LogTGDP (Trade as a Percentage of GDP) are integrated of order one. When these results were reviewed, it was found that the Autoregressive Distributed Lag Model (ARDL) was the most suitable econometric model for this research.

#### 4.5 Short run results

This section presents the findings for the study in the quest to assess the impact of foreign aid on economic growth in the short – run.

**Table 4.4: Short-run results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGGDP(-1)	0.843238	0.075676	11.14273	0.0000
LOGFA	-0.013454	0.037008	-0.363532	0.7195
LOGFA(-1)	0.096355	0.036100	2.669101	0.0137
LOGFDI	0.046284	0.022088	2.095380	0.0473
LOGGEX	-0.023598	0.017824	-1.323903	0.1985
LOGEXR	0.778620	0.144708	5.380613	0.0000
LOGEXR(-1)	-0.717360	0.149384	-4.802114	0.0001
LOGTGDP	0.007780	0.314291	0.024754	0.9805
C	1.276514	1.213955	1.051534	0.3039
R-squared	0.997283	Mean dependent var		17.22128
Adjusted R-squared	0.996338	S.D. dependent var		2.276265
S.E. of regression	0.137739	Akaike info criterion		-0.894661
Sum squared resid	0.436354	Schwarz criterion		-0.482422
Log likelihood	23.31457	Hannan-Quinn criter.		-0.758015
F-statistic	1055.419	Durbin-Watson stat		2.056628
Prob(F-statistic)	0.000000			

\*Note: p-values and any subsequent tests do not account for model selection.

Source: Author (2024)

The findings in the table above show that in the short - run, Foreign aid (LOGFA) levels do not significantly impact GDP, foreign aid received in the previous year has a significant positive effect. Foreign direct investment (LOGFDI) positively influences GDP. In contrast, government expenditure (LOGGEX) and Trade (LOGTGDP) do not demonstrate significant effects. Finally, the exchange rate (LOGEXR) exhibits a complex relationship with GDP: the current exchange rate positively impacts GDP, while the prior year's exchange rate has a negative effect, suggesting potential short-term fluctuations and delayed consequences.

## 4.6 Long run results

This section gives the long run test results.

### 4.6.1 The bound test

The purpose behind this was to ensure that variables under consideration are bounded together in terms of their relation with each other over time. Table 4.4 contains all details about this bound test's outcomes.

H<sub>0</sub>: There is no long run relationship

H<sub>1</sub>: There is a long run relationship

**Table 4.5: Bound test results**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	8.950453	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Finite Sample: n=35				
Actual Sample Size	32	10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419
Finite Sample: n=30				
		10%	2.407	3.517
		5%	2.91	4.193
		1%	4.134	5.761

Source: Author's computation (2024)

Since the F-value of 8.95 is greater than the upper bound values as seen above, the null hypothesis of no cointegration is rejected in favour of the alternative hypothesis that there is a long run relationship. We therefore estimate the long run model.

#### 4.6.2 Long run results

Based on the findings of the bound test results shown in table 4.4 above, it was found that variables under consideration have some level of bound relationship between them and this means they are cointegrated. Table 4.6 presents these variables' tests for the cointegration test.

**Table 4.6: Long-run results**

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGFA	0.528834	0.199711	2.647994	0.0144
LOGFDI	0.295248	0.210632	1.401724	0.1743
LOGGEX	-0.150532	0.148908	-1.010910	0.3226
LOGEXR	0.390783	0.329120	1.187355	0.2472
LOGTGDP	0.049628	1.998285	0.024835	0.9804
C	8.142996	7.381641	1.103142	0.2814

EC = LOGGDP - (0.5288\*LOGFA + 0.2952\*LOGFDI - 0.1505\*LOGGEX + 0.3908\*LOGEXR + 0.0496\*LOGTGDP + 8.1430)

Source: Author (2024)

From the results above, with regards to Foreign Aid (LOGFA), the coefficient is 0.528834, with a p-value of 0.0144. This is statistically significant, indicating a positive long-run relationship between foreign aid and GDP. On the other hand, Foreign Direct Investment (LOGFDI), Government Expenditure (LOGGEX), Exchange rate (LOGEXR), Trade as a Percentage of GDP (LOGTGDP) with coefficients and p-values 0.295248 (p=0.1743), -0.150532 (p=0.3226), 0.390783 (p=0.2472), and 0.049628 (p=0.9804), respectively came out to be statistically insignificant at the 5% level of significance.

## 4.7 Error Correction Model

This section gives the results of the importance of doing error correction model on time series data. While the ECM model was being run in the study, it gave a negative sign of ECM implying that its statistically significant confirming that long-run relationship can be achieved among the variables included in the model. The results of ECM regression are as shown below.

**Table 4.7: ECM model results**

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFA)	-0.013454	0.023357	-0.575997	0.5702
D(LOGEXR)	0.778620	0.069157	11.25878	0.0000
CointEq(-1)*	-0.156762	0.026548	-5.904832	0.0000
R-squared	0.861312	Mean dependent var		0.292585
Adjusted R-squared	0.851747	S.D. dependent var		0.318580
S.E. of regression	0.122665	Akaike info criterion		-1.269661
Sum squared resid	0.436354	Schwarz criterion		-1.132248
Log likelihood	23.31457	Hannan-Quinn criter.		-1.224112
Durbin-Watson stat	2.056628			

\* p-value incompatible with t-Bounds distribution.

Source: Author (2024)

The above result reveals that error correction term is negative and significant at 5% significance level which implies that if there is a shock, the model is stable and goes back to equilibrium.

## 4.8 Sensitivity/ Diagnostic tests

This section provides diagnostic information including the Ramsey Reset test, Normality (Jarque-Bera test), Breusch Godfrey LM Serial correlation TEST and Breusch-Godfrey Heteroscedasticity TEST that were run under sensitivity analysis to confirm the credibility of variable used for modelling.

### 4.8.1 Ramsey rest test (model specification test)

Model specification is a process that is used to determine the independent variables to include or exclude from the regression model. This study used the Ramsey RESET test to test for model specification as per below.

H<sub>0</sub>: Model is correctly specified.  
H<sub>1</sub>: Model is incorrectly specified.

**Table 4.8: Ramsey RESET test results**

	Value	df	Probability
t-statistic	0.037795	22	0.9702
F-statistic	0.001428	(1, 22)	0.9702
Likelihood ratio	0.002078	1	0.9636

F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	2.83E-05	1	2.83E-05
Restricted SSR	0.436354	23	0.018972
Unrestricted SSR	0.436326	22	0.019833

LR test summary:	
	Value
Restricted LogL	23.31457
Unrestricted LogL	23.31561

Source: Author's computation (2024)

From the results above, the Ramsey RESET test consistently shows no evidence of misspecification in the models. This conclusion is based on the following:

**High p-values:** The p-values associated with the t-statistic, F-statistic, and Likelihood Ratio test are all substantially greater than conventional significance levels (e.g., 0.05).

**Insignificant coefficients:** The tests assess whether adding squared fitted values to the regression improves the model's fit. The high p-values indicate that the coefficients on these added terms are not statistically significant.

In conclusion, the Ramsey RESET test suggests that the functional form of the models used is appropriate. There's no statistical indication that the models are missing important terms or that they need to be transformed (e.g., by adding squared terms) to better capture the relationships between the variables.

#### 4.8.2 Heteroscedasticity test

Homoscedasticity refers to one of classical linear regression assumptions where variance of error term remains constant; otherwise when violated it becomes heteroscedasticity. The study therefore employed Breusch Pagan Godfrey (BPG) test.

H<sub>0</sub>: Homoscedasticity

H<sub>1</sub>: Heteroscedasticity is present.

**Table 4.9: Breusch-Pagan-Godfrey heteroscedasticity test result**

F-statistic	0.691079	Prob. F(8,23)	0.6955
Obs*R-squared	6.201358	Prob. Chi-Square(8)	0.6247
Scaled explained SS	3.465665	Prob. Chi-Square(8)	0.9018

Source: Author (2024)

From the results above, the p-value of the F-statistic of 0.6955 is greater than 0.05. We therefore fail to reject H<sub>0</sub> meaning that there is constant variance of the error term as the errors are homoscedastic.

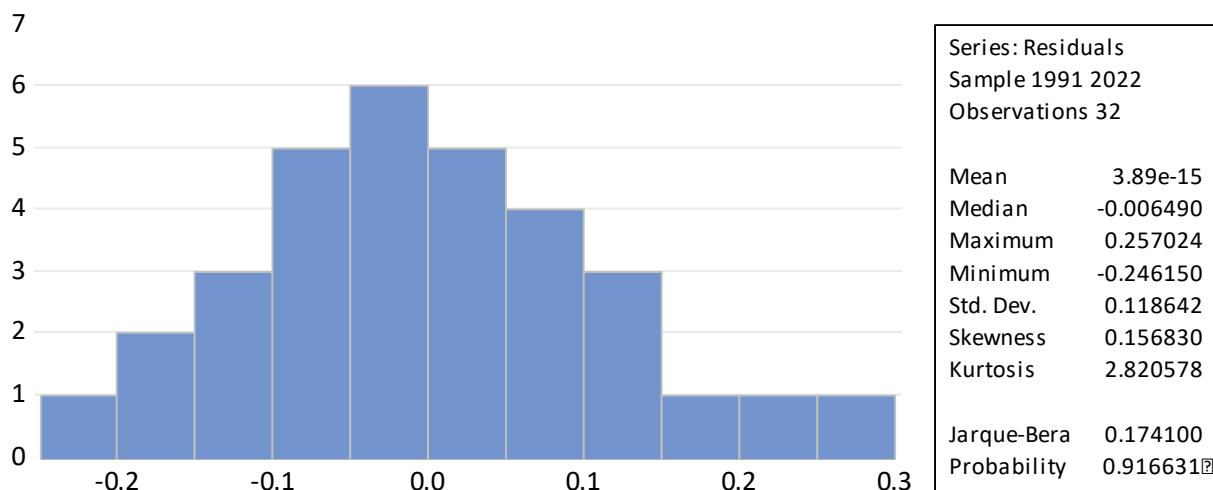
### 4.8.3 Normality Test

In order to carry out several statistical tests, it is necessary to consider normality of data at hand. For example, in this study, Jarque-Bera normality test was conducted to ensure that data used for research was drawn from a normally distributed population. The results are shown in figure 4.4.

H<sub>0</sub>: The random disturbances are normally distributed.

H<sub>a</sub>: The random disturbances are not normally distributed

**Figure 4.4: Normality test results**



Source: Author (2024)

To ensure the validity of statistical inferences, the assumption of normality of the residuals was examined. The Jarque-Bera test, a measure of departure from

normality based on skewness and kurtosis, was employed. The test statistic (Jarque-Bera = 0.174100) produced a high p-value ( $p = 0.916631$ ), failing to reject the null hypothesis of a normal distribution. Furthermore, descriptive statistics revealed a mean residual close to zero ( $3.89e-15$ ), a median of  $-0.006490$ , and a skewness of  $0.156830$ , all suggesting a distribution that is approximately symmetrical and centered around zero. The kurtosis ( $2.820578$ ) was close to the value expected for a normal distribution. Collectively, these results, and particularly the Jarque-Bera test outcome, provide evidence that the residuals are consistent with a normal distribution, thereby supporting the reliability of the statistical analysis.

In summary, based on the p-value of  $0.9166$  shown in figure 4.4 above which is greater than the accepted level of significance ( $\alpha = 0.05$ ), we therefore conclude that residuals are normally distributed.

#### 4.8.4 Serial Correlation test

The study had to be designed with variables free serial correlation in order to avoid violating assumption of Classical Linear Regression Model (CLRM). The Breusch Pagan Godfrey test was run as depicted by table 4.9 below.

$H_0$ : No serial correlation

$H_1$ : Serial Correlation present

**Table 4.10: Breusch-Pagan-Godfrey serial correlation test**

F-statistic	0.038004	Prob. F(2,21)	0.9628
Obs*R-squared	0.115404	Prob. Chi-Square(2)	0.9439

Source: Author (2024)

From the results above, the p-value of the F-statistic of  $0.9628$  is greater than  $0.05$ . We therefore fail to reject  $H_0$  and conclude that there is no serial correlation.

#### 4.9 Summary of the findings

This paper analysed various factors that influence economic growth in Zambia, with specific attention to foreign aid, FDI, government spending, Exchange rate and Trade.

#### **4.9.1 Foreign Aid and Economic Growth**

In the short run, the study found that Foreign aid (LOGFA) does not significantly impact GDP. On the other hand, with a coefficient of 0.528834, with a p-value of 0.0144, Foreign aid came out to have a significant positive impact on economic growth. The long run results are consistent with Bigsten (2006) who stated that well-targeted aid programs can sustainably lead to development and Minoiu and Reddy (2010) who agree that properly targeted interventions can ensure sustainability. Conversely, Moyo (2009) argues that aid does not promote economic growth.

#### **4.9.2 FDI and Economic Growth**

The findings in this chapter show that short-term economic growth in Zambia is also influenced by FDI, a situation that causes capital inflow, technology transfer for improved productivity and job creation. This is in accordance with the findings of Borensztein et al. (1998) who argue that human capital maximization leads to greater FDI benefits and Mody & Wang's (1997) assertion that FDI can promote domestic economic activities. However, this is opposed to Carkovic & Levine (2005) who believe that the effects of FDI depend on proper economic policies as well as institutional frameworks.

#### **4.9.3 Government Expenditure and Economic Growth**

The evidence strongly shows that government spending does not have a statistically significant effect on economic growth at 5% significance level in both the short-run and long-run. Mostly, this money is spent on social areas rather than being used to drive the economy towards effective growth. The results are consistent with Barro (1990), Ghosh & Gregoriou (2008) findings about which forms of government expenditure may be ineffective for the purpose of promoting growth. However, these findings differ from those of Aschauer (1989) who argued the necessity of productive public investments in adding value to GDP.

#### **4.9.4 Exchange Rate and Economic Growth**

Though, it was found that the exchange rate did not have any immediate impact on economic growth at all as revealed in the study. It means that continuous exchange rate changes can impede growth by introducing instability in commerce and

investment. This is equally consistent with other studies done by Mohan & Saini (2009), Edwards (1989) and Ghosh et al. (2000) which put more emphasis on the negative effects of exchange rate volatility over a period for developing nations.

#### **4.9.5 Trade and Economic Growth**

The short run and long run results in sections 4.5 and 4.6 show that that trade did not have any significant impact on economic growth both in the long run and short run. The findings of this study are at variance with the findings of Pesaran et al. (2001) who found that trade plays a pivotal role in ensuring sustainable economic growth in both developing and developed countries.

#### **4.10 Chapter summary**

This chapter aimed at explaining how the data was analysed and results were interpreted. The next chapter gives a discussion of the findings following the analysis in this chapter (four).

# CHAPTER FIVE: DISCUSSION OF FINDINGS

## 5.1 Introduction

Chapter four above, highlighted the data presentation and analysis obtained in this study. On the other hand, this chapter discusses the findings that were obtained in the preceding chapters. The results have been discussed based on objectives that were set in chapter one of this study.

## 5.2 Discussion of the findings

The study sought to evaluate the effect of foreign aid on economic growth. The direction for the study was as follows;

- i. To determine the role of foreign aid in facilitating economic growth in Zambia.
- ii. To assess the contribution of foreign direct investment to the economic growth rate of Zambia;
- iii. To study the relationship between government expenditure and economic growth in Zambia;
- iv. To determine how the Exchange Rate affects the economy of Zambia.
- v. To assess the impact of Trade on Zambia's economy.

Therefore, the discussion of the findings was based on the above objectives. Sections 4.9.1, 4.9.2 and 4.9.3 focus on findings and recommendations based on objectives.

### 5.2.1 Objective one: To determine the role of foreign aid in facilitating economic growth in Zambia

In the short run, the results had R-squared values of up to 0.997 and adjusted R-square values as high as 0.996; meaning that, in this model, independent variables explain about 99.7% and 99.6% of the GDP variation respectively. The results show that in the short run, Foreign aid (LOGFA) levels do not significantly impact GDP, foreign aid received in the previous year has a significant positive effect.

In the long run, the study found that Foreign Aid (LOGFA), the coefficient is 0.528834, with a p-value of 0.0144. This is statistically significant, indicating a positive long-run relationship between foreign aid and GDP. According to this study's long-term perspective, it was found out that foreign aid has a positive coefficient of

0.528834 thereby showing increased levels of GDP due to foreign aid.

It is also worth mentioning that the results indicate that although foreign aid can have long-run impacts on GDP growth, this study supports Bigsten (2006)'s view that if channelled properly, it can lead to sustainable economic growth in developing countries. However, its findings are consistent with those of Minoiu and Reddy (2010) who established through a research that foreign aid have been used by most developed nations to improve the economies of underprivileged states through different means like grants, technical assistance as well as implementation of education and health programs aimed at human resource capacity building. The results of the study contradict with the view of Moyo (2009), which assert that aid does not and will not help developing countries to grow their economies.

### **5.2.2 Objective two: To assess contribution of foreign direct investment to the economic growth rate of Zambia**

The findings in the previous chapter show that short-term economic growth in Zambia is also influenced by FDI, a situation that causes capital inflow, technology transfer for improved productivity and job creation. The results of this research are consistent with those of Borensztein et al. (1998) who found that FDI not only contributes to economic growth but has greater impact in countries characterized by high levels of human capital. Furthermore, they argued that FDI benefits like advanced technology and managerial skills do better in settings dominated by educated labour force.

The study's outcomes agree with the stance held by Mody & Wang (1997) that FDI can help local investments lead to higher GDP. This means, therefore, that these findings point out that expansion in foreign investment encourages more internal economic activities.

Contrary to this study, Carkovic & Levine (2005) reported opposing views on how FDI affects economic development. They further wrote that the association between them depends on specific economic policies and institutional frameworks implying; therefore, that mere increase in FDI without corresponding sound economic policies might not essentially result into growth.

### **5.2.3 Objective three: To study the relationship between government expenditure**

## **and economic growth in Zambia**

The findings of this study show that government expenditure does not have a statistically significant effect on growth at 5% level of significance for both short and long-run periods. This may suggest that increasing government spending does not contribute to economic growth which means that most of the Government's expenditure is directed to social sectors rather than economic ones, which may in turn not contribute much to economic growth compared to being directed to economic sectors.

In contrast with several economics models which are in favour of the role played by government expenditures to stimulate economy during recessions, this research found otherwise. These findings support Barro's (1990) seminal work, which observed that there might be certain types of government spending that are ineffectual as a driver for growth. Additionally, Barro's research indicated that capital formation such as infrastructure could boost the rate of growth while other unproductive expenditures may not.

In comparison, Ghosh and Gregoriou (2008) have similar results that the total amount of money spent by the government does not affect economy growth in some countries and they argued that since wasteful spending reduces its effectiveness. Additionally, this research contradicts Aschauer (1989) who claimed that productivity and growth are significantly determined by public investment.

### **5.2.4 Objective four: To determine how the Exchange Rate affects the economy of Zambia**

It is an undeniable fact that exchange rate holds a relevant position as a monetary policy variable, and has relevance in terms of economic stabilisation, therefore, this study sought to find out the impact exchange rate has on economic growth. In contrast, according to this study's findings, at 5% level of significance in the short run, there was no statistical significance for Exchange Rate both in the long-run and the short-run.

This might suggest that economic performance does not necessarily fluctuate based on short-term changes in exchange rates due to time lag, or temporary fiscal capacity of economies with respect to absorbing rate volatility.

Mohan and Saini (2009) argue with these findings as they argue that exchange rate volatility affects developing countries' economies negatively. According to them, volatile exchange rates create uncertainty, which impedes investments and other economic activities thus supporting the thesis of long-run negative effects.

Secondly, the finding of this study also argues with the results of Edwards (1989) who carried out a wide-ranging review on exchange rates and economic growth and discovered that impact of exchange rates can vary hugely between short-run and long-run contexts. While temporary impacts might be insignificant, he suggested that in order to ensure sustainable economic growth there is a need for stability in the exchange rate over the long term.

Lastly, these findings are at variance with those of Ghosh et al. (2000) who examined how different types of exchange rate regimes affect economic performance. According to them flexible foreign rates may result into more risk especially during short-term period.

#### **5.2.5 Objective four: To assess the impact of Trade on Zambia's economy**

As indicated by its short-run and long-run results in sections 4.6 and 4.7, arrives at a conclusion that contradicts the prevailing view on the relationship between trade and economic growth. Specifically, it found no statistically significant impact of trade on economic growth, neither in the short term nor the long term. This finding stands in stark contrast to the widely cited work of Pesaran, Shin, and Smith (2001), who, utilising their bounds testing approach to cointegration, demonstrated the crucial role of trade in fostering sustainable economic growth across a variety of nations, both developed and developing.

To provide a more comprehensive understanding of this complex relationship, it's essential to consider studies that both support and challenge the notion of a strong trade-growth nexus. Research that aligns with the findings of Pesaran et al. (2001) includes Frankel and Romer (1999), who, using geographical determinants of trade to address endogeneity, found a robust positive effect of trade on income (Frankel & Romer, 1999). Similarly, Dollar and Kraay (2003) explored the interaction between institutions and trade, concluding that trade openness, especially when coupled with sound institutions, significantly contributes to economic growth, particularly in

developing countries. Further reinforcing this perspective, Wacziarg and Welch (2008) examined the effects of trade liberalisation using a revised dataset and found a positive and significant impact on economic growth, supporting the idea that trade is a key driver of development (Wacziarg & Welch, 2008).

Conversely, several studies have found weak or no significant links between trade and economic growth, mirroring the findings of the initial study. Rodríguez and Rodrik (2000) critically reviewed cross-national evidence, raising concerns about the robustness of many findings and highlighting potential issues such as omitted variable bias and endogeneity. Levine and Renelt (1992) conducted a sensitivity analysis of cross-country growth regressions, concluding that very few variables were robustly correlated with growth, underscoring the difficulty in firmly establishing relationships between variables and growth (Levine & Renelt, 1992). More recently, Francisco and Ali (2020), focusing on Sub-Saharan African countries, found mixed results regarding the impact of trade openness on economic growth, highlighting that the trade-growth nexus is not uniform across all regions.

### **5.3 Chapter summary**

This chapter aimed at discussing the findings highlighted in chapter four above. The next chapter concludes what the findings have shown and gives recommendations on how the Government of Zambia can improve the inflow of foreign aid by establishing stronger ties with other countries in Southern Africa as well as around the world.

# CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

## 6.0 Introduction

The previous chapter of this study tried to analyse the data collected and discussed the results based on econometric analyses conducted in the last chapter. Thus, this chapter provides a summary of findings, conclusion as well as recommendations and suggestions for further research that can be done on this topic.

## 6.1 Conclusion

This research paper investigates the impact of foreign aid on economic growth in Zambia between 1990 and 2022 and highlights that economic growth is positively correlated with foreign aid especially under favourable policies. It identifies increased inflow of foreign capital as one of the most significant outcomes of foreign aid especially due to cross-sectoral resources.

It has been stressed in this investigation that assistance might come under such forms as money, technology or enhancement of skills. In terms of developing governance structure into which flows are poured from both Official Development Cooperation (ODA) and direct investment, construction aimed at fighting against corruption and development planning, monitoring and evaluation, coordination with internal partners and strategic inter – Governmental links should be deepened for an upsurge in growth rates.

The findings are parallel those of other scholars on the matter who emphasise that foreign direct investment has a positive and significant impact on growth rates in the short run, however, this does not mean that FDI alone is enough. It takes into account components such as human capital skills and quality institutions to reap the maximum benefits out of foreign investments. In terms of Government Expenditure, it was found that it has no relation with economic growth both in the long run and short run where public expenditures were shown to intricately interact with economic growth and proven that not all government expenditure leads to economic gains.

The study has shown that exchange rate does not significantly impact economic growth in the short term, but this does not mean it should be downplayed especially when it comes to stabilising it. This therefore means that for a country to achieve

sustainable economic growth in the long run there is a need to implement policies aimed at stabilising exchange rates. At the same time, exchange rates have been found to be negatively correlated with GDP growth rates in the long-run, meaning that policies aimed at controlling them are very important.

Lastly, the study found that trade does not influence economic growth, to gain a more comprehensive understanding of this complex relationship, the study examined studies that both support and contradict the notion of a robust trade-growth nexus. Research supporting a positive link includes Frankel and Romer (1999), who found a strong positive effect of trade on income using geographical instruments, and Dollar and Kraay (2003), who emphasised the role of institutions in enhancing the positive impact of trade openness on growth, particularly in developing countries. Wacziarg and Welch (2008) further reinforced this view by showing that trade liberalisation positively impacts economic growth. Conversely, studies like Rodríguez and Rodrik (2000) raise concerns about the robustness of the trade-growth relationship, highlighting issues like omitted variable bias and endogeneity. Levine and Renelt (1992) found that few variables robustly correlate with growth, indicating the difficulty in establishing clear relationships. Francisco and Ali (2020), focusing on Sub-Saharan Africa, found mixed results, suggesting that the trade-growth nexus is not uniform across all regions.

## **6.2 Recommendations**

Based on the analysis given in chapter four above, some country specific strategies can improve economic performance through effective utilisation of foreign aid and investment in Zambia. It is recommended from these findings that Zambia strengthens its governance frameworks towards improving transparency, accountability and efficiency in the use of foreign aid and FDI. This could include setting up sound frameworks and stringent legal measures which will block any inflow of investments or aid coming from corrupt tendencies.

Secondly, foreign aid must be aligned with comprehensive and strategic development frameworks so that they support national foreign strategies leading to improvement of evaluation systems as far as external assistance and FDI are

concerned hence ensuring efficient allocation of resources.

Furthermore, stable exchange rate mechanisms should be in place to encourage and maintain foreign investors for the sustainability and development of the economy. Moreover, there is a need for enhancing business enablement environment and application of advanced technologies so as to boost productivity and competitiveness in various sectors.

It is also important to note that specific attention must be placed on executive functions if an analysis of government spending and changes in investment policies are able to ensure that expenditures from economic sectors with high economic outputs are targeting them. The management of the public investment cycle will be bettered by making stronger management choices regarding public investments.

### **6.3 Suggestions for further studies**

Even as it measures the impact of foreign aid on economic growth, this study admits that economic growth is complex and can be influenced by several other factors such as labour or immediate investment being just two examples. It sees GDP as a measure of economic growth in this work but recognizes that alternative indicators including GNI (gross national income), education/living standards, per capita GDP, household incomes, technological progressions, investments etc. might have been used in the estimation of economic growth. The other area worth researching about would be gauging the extent to which corruption affects inflow of foreign into the country.

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## Appendix I: Data set

Year	GDP/Billion USD	FA Kwacha	FDI Kwacha	GEX	EXR	GDP (K)	TGDP
1990	3288381.797	1363.5	20270	486571.51	0.0138368	45500.7799	64.262551
1991	3376806.697	6009	34300	658087.48	0.0315135	106415.0344	64.122025
1992	3182810.841	36742.5	45000	592644.47	0.064452	205138.3652	63.9815
1993	3273507.754	78957.2	31400	283876.7	0.172214	563743.8643	63.840974
1994	3656808.233	47017.6	40000	293603.7	0.52045	1903185.845	66.650595
1995	3806982.679	90200	97000	344000	0.68762	2617757.43	69.226775
1996	3597220.962	70700.8	117100	373880.59	0.94715	3407107.834	63.821482
1997	4303288.48	42100	207400	373839.4	1.28244	5518709.278	58.272863
1998	3537741.942	463700	198000	318333.49	1.39397	4931506.135	56.250307
1999	3404284.891	466100	162000	256547.7	2.2813641	7766413.304	59.767534
2000	3600632.111	515367.52	121700	201037.45	2.5952565	9344563.97	60.387469
2001	4094441.301	144795.13	145000	230135.2	3.8304	15683347.96	64.668283
2002	4193850.445	54448.943	298390	273110.05	4.3344	18177825.37	64.916497
2003	4901869.764	1366379.5	347000	332791.46	4.64548	22771537.95	62.312845
2004	6221110.219	1786705.1	364040	440647.62	4.77131	29682845.4	70.813075
2005	8331870.169	2471809.1	356940	492989.52	3.50898	29236365.79	62.200282
2006	12756858.9	1862000	615790	548856.41	4.40667	56215267.41	57.856819
2007	14056957.98	4255295.4	1323900	570898	3.84481	54046332.6	65.771459
2008	17910858.64	3034750.9	938620	584586.35	4.83226	86549925.76	59.454889
2009	15328342.3	3692464.9	694800	630651.12	4.64056	71132092.16	56.121381
2010	20265559.48	3647485.4	1729300	627678.33	4.79611	97195852.5	65.014703
2011	23459515.28	7232501	1108500	729528.28	5.11704	120043278	72.795432
2012	25503060.42	4487686	1731500	749433.86	5.14661	131254305.8	75.36771
2013	28037239.46	5073030	2099800	921078.47	5.5126111	154558397.8	80.456241
2014	27141023.56	4951232	1507800	41094000	6.5261111	177125335.4	76.1935
2015	21251216.8	10023450	1582666.67	51545000	11.215278	238338299.5	79.865269
2016	20958412.54	13980145	662813.94	53135825	9.8144118	205694490.6	73.958561
2017	25873601.26	11316340	865903.09	64510000.3	9.9859375	258372165.1	71.585695
2018	26311507.27	10547440	1253000	69931000	11.92375	313731834.9	74.88837
2019	23308667.78	12212102	1657514.2	86080000	14.107059	328816747.5	68.791205
2020	18137764.93	16127494	1728914.74	106010000	21.166	383903932.5	79.206849
2021	22096416.93	33625808	390000000	119600000	20.03	442591231.1	86.208511
2022	29163782.14	25485602	519471295	1729000000	18.17	529905921.5	69.297315

## Appendix II: Selected econometric result outputs

Null Hypothesis: LOGFDI has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	0.236596	0.9708
Test critical values:		
1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOGFDI)

Method: Least Squares

Date: 03/12/25 Time: 14:01

Sample (adjusted): 1991 2022

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGFDI(-1)	0.023642	0.099928	0.236596	0.8146
C	0.009823	1.312090	0.007486	0.9941
R-squared	0.001862	Mean dependent var	0.317232	
Adjusted R-squared	-0.031409	S.D. dependent var	1.017987	
S.E. of regression	1.033850	Akaike info criterion	2.964918	
Sum squared resid	32.06537	Schwarz criterion	3.056526	
Log likelihood	-45.43868	Hannan-Quinn criter.	2.995283	
F-statistic	0.055978	Durbin-Watson stat	2.132723	
Prob(F-statistic)	0.814578			

Null Hypothesis: LOGGEX has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	1.224291	0.9976
Test critical values:		
1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOGGEX)

Method: Least Squares

Date: 03/12/25 Time: 14:04

Sample (adjusted): 1991 2022

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGEX(-1)	0.078637	0.064230	1.224291	0.2304
C	-0.865204	0.926553	-0.933788	0.3579
R-squared	0.047585	Mean dependent var	0.255490	
Adjusted R-squared	0.015838	S.D. dependent var	0.817970	
S.E. of regression	0.811467	Akaike info criterion	2.480515	
Sum squared resid	19.75434	Schwarz criterion	2.572123	
Log likelihood	-37.68823	Hannan-Quinn criter.	2.510880	
F-statistic	1.498889	Durbin-Watson stat	1.819414	
Prob(F-statistic)	0.230370			

Null Hypothesis: LOGGDP has a unit root

Exogenous: Constant

Lag Length: 6 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	-3.355366	0.0224
Test critical values:		
1% level	-3.711457	
5% level	-2.981038	
10% level	-2.629906	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOGGDP)

Method: Least Squares

Date: 03/12/25 Time: 13:54

Sample (adjusted): 1997 2022

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGDP(-1)	-0.141839	0.042272	-3.355366	0.0035
D(LOGGDP(-1))	-0.866172	0.202218	-4.283360	0.0004
D(LOGGDP(-2))	-0.261003	0.249916	-1.044363	0.3101
D(LOGGDP(-3))	-0.013483	0.135576	-0.099448	0.9219
D(LOGGDP(-4))	-0.089864	0.112639	-0.797810	0.4354
D(LOGGDP(-5))	-0.121861	0.114745	-1.062011	0.3023
D(LOGGDP(-6))	-0.192832	0.114541	-1.683518	0.1095
C	3.081036	0.864491	3.563991	0.0022
R-squared	0.680984	Mean dependent var	0.194109	
Adjusted R-squared	0.556922	S.D. dependent var	0.207853	
S.E. of regression	0.138355	Akaike info criterion	-0.870323	
Sum squared resid	0.344560	Schwarz criterion	-0.483216	
Log likelihood	19.31419	Hannan-Quinn criter.	-0.758850	
F-statistic	5.489076	Durbin-Watson stat	1.779888	
Prob(F-statistic)	0.001671			

Null Hypothesis: LOGFA has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	-2.496224	0.1258
Test critical values:		
1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOGFA)

Method: Least Squares

Date: 03/12/25 Time: 13:57

Sample (adjusted): 1991 2022

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGFA(-1)	-0.148475	0.059480	-2.496224	0.0183
C	2.344389	0.829647	2.825768	0.0083
R-squared	0.171983	Mean dependent var	0.307369	
Adjusted R-squared	0.144382	S.D. dependent var	0.915117	
S.E. of regression	0.846480	Akaike info criterion	2.565001	
Sum squared resid	21.49585	Schwarz criterion	2.656610	
Log likelihood	-39.04002	Hannan-Quinn criter.	2.595367	
F-statistic	6.231133	Durbin-Watson stat	2.212447	
Prob(F-statistic)	0.018275			

Null Hypothesis: D(LOGFDI) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.609527	0.0001
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGFDI,2)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:01  
 Sample (adjusted): 1992 2022  
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFDI(-1))	-1.040110	0.185419	-5.609527	0.0000
C	0.323261	0.197758	1.634630	0.1129
R-squared	0.520398	Mean dependent var	-0.007721	
Adjusted R-squared	0.503860	S.D. dependent var	1.491995	
S.E. of regression	1.050920	Akaike info criterion	2.999549	
Sum squared resid	32.02853	Schwarz criterion	3.092064	
Log likelihood	-44.49301	Hannan-Quinn criter.	3.029707	
F-statistic	31.46680	Durbin-Watson stat	1.999611	
Prob(F-statistic)	0.000005			

Null Hypothesis: D(LOGGEX) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.250993	0.0023
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGGEX,2)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:04  
 Sample (adjusted): 1992 2022  
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGGEX(-1))	-0.935681	0.220109	-4.250993	0.0002
C	0.242570	0.156617	1.548811	0.1323
R-squared	0.383909	Mean dependent var	0.076426	
Adjusted R-squared	0.362664	S.D. dependent var	1.057726	
S.E. of regression	0.844418	Akaike info criterion	2.562003	
Sum squared resid	20.67822	Schwarz criterion	2.654518	
Log likelihood	-37.71104	Hannan-Quinn criter.	2.592161	
F-statistic	18.07094	Durbin-Watson stat	1.703676	
Prob(F-statistic)	0.000202			

Null Hypothesis: D(LOGFA) has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.584157	0.0001
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGFA,2)  
 Method: Least Squares  
 Date: 03/12/25 Time: 13:58  
 Sample (adjusted): 1994 2022  
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFA(-1))	-1.976456	0.353940	-5.584157	0.0000
D(LOGFA(-1),2)	0.607847	0.255213	2.381725	0.0252
D(LOGFA(-2),2)	0.289281	0.167003	1.732194	0.0956
C	0.463384	0.179725	2.578294	0.0162
R-squared	0.692379	Mean dependent var	-0.035936	
Adjusted R-squared	0.655465	S.D. dependent var	1.391743	
S.E. of regression	0.816913	Akaike info criterion	2.560873	
Sum squared resid	16.68366	Schwarz criterion	2.749466	
Log likelihood	-33.13266	Hannan-Quinn criter.	2.619938	
F-statistic	18.75631	Durbin-Watson stat	2.223061	
Prob(F-statistic)	0.000001			

Null Hypothesis: LOGEXR has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.605521	0.0000
Test critical values:		
1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGEXR)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:07  
 Sample (adjusted): 1991 2022  
 Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEXR(-1)	-0.140453	0.021263	-6.605521	0.0000
C	0.350530	0.041931	8.359669	0.0000
R-squared	0.592573	Mean dependent var	0.224381	
Adjusted R-squared	0.578993	S.D. dependent var	0.325450	
S.E. of regression	0.211168	Akaike info criterion	-0.211862	
Sum squared resid	1.337761	Schwarz criterion	-0.120253	
Log likelihood	5.389786	Hannan-Quinn criter.	-0.181496	
F-statistic	43.63291	Durbin-Watson stat	1.896989	
Prob(F-statistic)	0.000000			

Null Hypothesis: LOGGDP has a unit root  
 Exogenous: Constant  
 Lag Length: 6 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.355366	0.0224
Test critical values:		
1% level	-3.711457	
5% level	-2.981038	
10% level	-2.629906	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGGDP)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:23  
 Sample (adjusted): 1997 2022  
 Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGDP(-1)	-0.141839	0.042272	-3.355366	0.0035
D(LOGGDP(-1))	-0.866172	0.202218	-4.283360	0.0004
D(LOGGDP(-2))	-0.261003	0.249916	-1.044363	0.3101
D(LOGGDP(-3))	-0.013483	0.135576	-0.099448	0.9219
D(LOGGDP(-4))	-0.089864	0.112639	-0.797810	0.4354
D(LOGGDP(-5))	-0.121861	0.114745	-1.062011	0.3023
D(LOGGDP(-6))	-0.192832	0.114541	-1.683518	0.1095
C	3.081036	0.864491	3.563991	0.0022
R-squared	0.680984	Mean dependent var	0.194109	
Adjusted R-squared	0.556922	S.D. dependent var	0.207853	
S.E. of regression	0.138355	Akaike info criterion	-0.870323	
Sum squared resid	0.344560	Schwarz criterion	-0.483216	
Log likelihood	19.31419	Hannan-Quinn criter.	-0.758850	
F-statistic	5.489076	Durbin-Watson stat	1.779888	
Prob(F-statistic)	0.001671			

Null Hypothesis: D(LOGFDI) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.609527	0.0001
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGFDI,2)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:01  
 Sample (adjusted): 1992 2022  
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFDI(-1))	-1.040110	0.185419	-5.609527	0.0000
C	0.323261	0.197758	1.634630	0.1129
R-squared	0.520398	Mean dependent var	-0.007721	
Adjusted R-squared	0.503860	S.D. dependent var	1.491995	
S.E. of regression	1.050920	Akaike info criterion	2.999549	
Sum squared resid	32.02853	Schwarz criterion	3.092064	
Log likelihood	-44.49301	Hannan-Quinn criter.	3.029707	
F-statistic	31.46680	Durbin-Watson stat	1.999611	
Prob(F-statistic)	0.000005			

Null Hypothesis: D(LOGTGDP) has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=8)

	t-Statistic
Augmented Dickey-Fuller test statistic	-3.612578
Test critical values:	
1% level	-3.689194
5% level	-2.971853
10% level	-2.625121

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOGTGDP,2)  
 Method: Least Squares  
 Date: 03/12/25 Time: 14:13  
 Sample (adjusted): 1995 2022  
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic
D(LOGTGDP(-1))	-1.735215	0.480326	-3.612578
D(LOGTGDP(-1),2)	0.647284	0.426761	1.516739
D(LOGTGDP(-2),2)	0.226985	0.324685	0.699092
D(LOGTGDP(-3),2)	0.475381	0.221200	2.149098
C	0.007513	0.015704	0.478387
R-squared	0.689269	Mean dependent var	-0
Adjusted R-squared	0.635229	S.D. dependent var	0
S.E. of regression	0.081378	Akaike info criterion	-2
Sum squared resid	0.152315	Schwarz criterion	-1
Log likelihood	33.26586	Hannan-Quinn criter.	-1
F-statistic	12.75475	Durbin-Watson stat	1
Prob(F-statistic)	0.000013		

Vector Autoregression Estimates  
Date: 03/12/25 Time: 14:54  
Sample (adjusted): 1992 2022  
Included observations: 31 after adjustments  
Standard errors in ( ) & t-statistics in [ ]

	LOGGDP	LOGFA	LOGFDI	LOGGEX	LOGEXR	LOGTGDP
LOGGDP(-1)	0.245089 (0.35493) [ 0.69052]	2.591457 (1.16542) [ 2.22363]	-0.859088 (1.91227) [-0.44925]	-0.011606 (1.08915) [-0.01066]	-0.581206 (0.34348) [-1.69212]	0.018628 (0.12381) [ 0.15046]
LOGGDP(-2)	0.538105 (0.38247) [ 1.40691]	-1.636760 (1.25584) [-1.30332]	0.489584 (2.06063) [ 0.23759]	0.046450 (1.17365) [ 0.03958]	0.561041 (0.37013) [ 1.51581]	0.119410 (0.13342) [ 0.89502]
LOGFA(-1)	0.160347 (0.07596) [ 2.11082]	0.096282 (0.24943) [ 0.38601]	-0.105271 (0.40927) [-0.25722]	-0.000795 (0.23310) [-0.00341]	0.086253 (0.07351) [ 1.17331]	0.038401 (0.02650) [ 1.44921]
LOGFA(-2)	0.075885 (0.06721) [ 1.12906]	-0.417312 (0.22068) [-1.89100]	0.149685 (0.36211) [ 0.41337]	-0.040787 (0.20624) [-0.19776]	0.044158 (0.06504) [ 0.67893]	-0.034904 (0.02344) [-1.48878]
LOGFDI(-1)	0.016567 (0.05037) [ 0.32889]	0.008803 (0.16540) [ 0.05322]	0.857676 (0.27140) [ 3.16018]	0.363087 (0.15458) [ 2.34888]	0.005062 (0.04875) [ 0.10384]	-0.020017 (0.01757) [-1.13914]
LOGFDI(-2)	-0.149991 (0.15910) [-0.94273]	0.703588 (0.52241) [ 1.34682]	0.059791 (0.85719) [ 0.06975]	-0.023530 (0.48822) [-0.04820]	-0.118924 (0.15397) [-0.77240]	-0.057021 (0.05550) [-1.02743]
LOGGEX(-1)	0.025783 (0.07397) [ 0.34856]	0.231192 (0.24287) [ 0.95190]	0.156458 (0.39852) [ 0.39260]	0.581851 (0.22698) [ 2.56345]	0.089055 (0.07158) [ 1.24411]	0.013515 (0.02580) [ 0.52381]
LOGGEX(-2)	-0.043837 (0.07136) [-0.61433]	0.103381 (0.23430) [ 0.44123]	0.050691 (0.38445) [ 0.13185]	0.141107 (0.21897) [ 0.64442]	-0.084202 (0.06905) [-1.21937]	-0.025076 (0.02489) [-1.00741]
LOGEXR(-1)	0.189699 (0.40393) [ 0.46963]	-2.040932 (1.32629) [-1.53883]	1.433617 (2.17624) [ 0.65876]	0.429375 (1.23950) [ 0.34641]	1.291309 (0.39089) [ 3.30350]	0.156646 (0.14090) [ 1.11175]
LOGEXR(-2)	-0.271474 (0.42604) [-0.63720]	1.625352 (1.39889) [ 1.16189]	-0.877945 (2.29536) [-0.38249]	-0.420435 (1.30734) [-0.32159]	-0.512923 (0.41229) [-1.24409]	-0.242651 (0.14861) [-1.63277]
LOGTGDP(-1)	-0.035668 (0.66733) [-0.05345]	-0.513425 (2.19115) [-0.23432]	2.030197 (3.59533) [ 0.56468]	2.433250 (2.04775) [ 1.18825]	-0.572094 (0.64579) [-0.88589]	0.463157 (0.23278) [ 1.98969]
LOGTGDP(-2)	0.491405 (0.76213) [ 0.64478]	-3.145877 (2.50242) [-1.25713]	-3.331412 (4.10609) [-0.81134]	3.768135 (2.33866) [ 1.61124]	0.596676 (0.73753) [ 0.80902]	-0.064589 (0.26585) [-0.24296]
C	0.943216 (2.65419) [ 0.35537]	4.013319 (8.71497) [ 0.46051]	9.008752 (14.2999) [ 0.62999]	-26.39679 (8.14464) [-3.24100]	0.302094 (2.56852) [ 0.11761]	1.329458 (0.92584) [ 1.43594]
R-squared	0.993341	0.934072	0.818066	0.960781	0.984846	0.732767
Adj. R-squared	0.988902	0.890119	0.696777	0.934634	0.974744	0.554611
Sum sq. resids	0.850433	9.168669	24.68542	8.007898	0.796416	0.103479
S.E. equation	0.217362	0.713702	1.171073	0.666996	0.210346	0.075821
F-statistic	223.7650	21.25192	6.744747	36.74647	97.48509	4.113069
Log likelihood	11.75086	-25.10507	-40.45659	-23.00693	12.76802	44.39974
Akaike AIC	0.080590	2.458392	3.448812	2.323028	0.014967	-2.025790
Schwarz SC	0.681939	3.059741	4.050162	2.924377	0.616316	-1.424440
Mean dependent	17.40341	14.19880	13.41243	14.54285	1.270275	4.209376
S.D. dependent	2.063292	2.153059	2.126683	2.608848	1.323576	0.113611
Determinant resid covariance (dof adj.)		7.42E-07				
Determinant resid covariance		2.84E-08				
Log likelihood		5.398312				
Akaike information criterion		4.683980				
Schwarz criterion		8.292077				
Number of coefficients		78				

VAR Lag Order Selection Criteria

Endogenous variables: LOGGDP LOGFA LOGFDI LOGGEX LOGEXR LOGTGDP

Exogenous variables: C

Date: 03/12/25 Time: 14:55

Sample: 1990 2022

Included observations: 31

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-188.4971	NA	0.011346	12.54820	12.82575	12.63868
1	-16.70414	266.0021*	1.86e-06*	3.787364*	5.730185*	4.420675*
2	5.398312	25.66736	6.07e-06	4.683980	8.292077	5.860129

\* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Dependent Variable: LOGGDP

Method: ARDL

Date: 03/12/25 Time: 14:56

Sample (adjusted): 1991 2022

Included observations: 32 after adjustments

Maximum dependent lags: 1 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (1 lag, automatic): LOGFA LOGFDI LOGGEX LOGEXR  
LOGTGDP

Fixed regressors: C

Number of models evaluated: 32

Selected Model: ARDL(1, 1, 0, 0, 1, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGGDP(-1)	0.843238	0.075676	11.14273	0.0000
LOGFA	-0.013454	0.037008	-0.363532	0.7195
LOGFA(-1)	0.096355	0.036100	2.669101	0.0137
LOGFDI	0.046284	0.022088	2.095380	0.0473
LOGGEX	-0.023598	0.017824	-1.323903	0.1985
LOGEXR	0.778620	0.144708	5.380613	0.0000
LOGEXR(-1)	-0.717360	0.149384	-4.802114	0.0001
LOGTGDP	0.007780	0.314291	0.024754	0.9805
C	1.276514	1.213955	1.051534	0.3039

R-squared	0.997283	Mean dependent var	17.22128
Adjusted R-squared	0.996338	S.D. dependent var	2.276265
S.E. of regression	0.137739	Akaike info criterion	-0.894661
Sum squared resid	0.436354	Schwarz criterion	-0.482422
Log likelihood	23.31457	Hannan-Quinn criter.	-0.758015
F-statistic	1055.419	Durbin-Watson stat	2.056628
Prob(F-statistic)	0.000000		

\*Note: p-values and any subsequent tests do not account for model selection.

ARDL Long Run Form and Bounds Test  
 Dependent Variable: D(LOGGDP)  
 Selected Model: ARDL(1, 1, 0, 0, 1, 0)  
 Case 2: Restricted Constant and No Trend  
 Date: 03/12/25 Time: 15:16  
 Sample: 1990 2022  
 Included observations: 32

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.276514	1.213955	1.051534	0.3039
LOGGDP(-1)*	-0.156762	0.075676	-2.071492	0.0497
LOGFA(-1)	0.082901	0.041967	1.975394	0.0603
LOGFDI**	0.046284	0.022088	2.095380	0.0473
LOGGEX**	-0.023598	0.017824	-1.323903	0.1985
LOGEXR(-1)	0.061260	0.072678	0.842891	0.4080
LOGTGDP**	0.007780	0.314291	0.024754	0.9805
D(LOGFA)	-0.013454	0.037008	-0.363532	0.7195
D(LOGEXR)	0.778620	0.144708	5.380613	0.0000

\* p-value incompatible with t-Bounds distribution.

\*\* Variable interpreted as  $Z = Z(-1) + D(Z)$ .

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGFA	0.528834	0.199711	2.647994	0.0144
LOGFDI	0.295248	0.210632	1.401724	0.1743
LOGGEX	-0.150532	0.148908	-1.010910	0.3226
LOGEXR	0.390783	0.329120	1.187355	0.2472
LOGTGDP	0.049628	1.998285	0.024835	0.9804
C	8.142996	7.381641	1.103142	0.2814

EC = LOGGDP - (0.5288\*LOGFA + 0.2952\*LOGFDI - 0.1505\*LOGGEX + 0.3908\*LOGEXR + 0.0496\*LOGTGDP + 8.1430)

ARDL Error Correction Regression  
 Dependent Variable: D(LOGGDP)  
 Selected Model: ARDL(1, 1, 0, 0, 1, 0)  
 Case 2: Restricted Constant and No Trend  
 Date: 03/12/25 Time: 15:37  
 Sample: 1990 2022  
 Included observations: 32

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFA)	-0.013454	0.023357	-0.575997	0.5702
D(LOGEXR)	0.778620	0.069157	11.25878	0.0000
CointEq(-1)*	-0.156762	0.026548	-5.904832	0.0000
R-squared	0.861312	Mean dependent var		0.292585
Adjusted R-squared	0.851747	S.D. dependent var		0.318580
S.E. of regression	0.122665	Akaike info criterion		-1.269661
Sum squared resid	0.436354	Schwarz criterion		-1.132248
Log likelihood	23.31457	Hannan-Quinn criter.		-1.224112
Durbin-Watson stat	2.056628			

\* p-value incompatible with t-Bounds distribution.

F-Bounds Test				
Null Hypothesis: No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	8.950453	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Finite Sample: n=35				
Actual Sample Size	32	10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419
Finite Sample: n=30				
		10%	2.407	3.517
		5%	2.91	4.193
		1%	4.134	5.761

Ramsey RESET Test  
Equation: UNTITLED  
Omitted Variables: Squares of fitted values  
Specification: LOGGDP LOGGDP(-1) LOGFA LOGFA(-1) LOGFDI LOGGEX  
LOGEXR LOGEXR(-1) LOGTGDP C

	Value	df	Probability
t-statistic	0.037795	22	0.9702
F-statistic	0.001428	(1, 22)	0.9702
Likelihood ratio	0.002078	1	0.9636

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.83E-05	1	2.83E-05
Restricted SSR	0.436354	23	0.018972
Unrestricted SSR	0.436326	22	0.019833

LR test summary:

	Value
Restricted LogL	23.31457
Unrestricted LogL	23.31561

Unrestricted Test Equation:  
Dependent Variable: LOGGDP  
Method: Least Squares  
Date: 03/12/25 Time: 15:58  
Sample: 1991 2022  
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGDP(-1)	0.828968	0.385416	2.150839	0.0427
LOGFA	-0.013425	0.037847	-0.354712	0.7262
LOGFA(-1)	0.095097	0.049702	1.913323	0.0688
LOGFDI	0.045239	0.035695	1.267362	0.2183
LOGGEX	-0.023948	0.020444	-1.171419	0.2540
LOGEXR	0.767296	0.334149	2.296270	0.0316
LOGEXR(-1)	-0.703988	0.385355	-1.826854	0.0813
LOGTGDP	0.005251	0.328237	0.015997	0.9874
C	1.422822	4.065259	0.349996	0.7297
FITTED^2	0.000472	0.012498	0.037795	0.9702

R-squared	0.997284	Mean dependent var	17.22128
Adjusted R-squared	0.996172	S.D. dependent var	2.276265
S.E. of regression	0.140830	Akaike info criterion	-0.832226
Sum squared resid	0.436326	Schwarz criterion	-0.374183
Log likelihood	23.31561	Hannan-Quinn criter.	-0.680397
F-statistic	897.4196	Durbin-Watson stat	2.057892
Prob(F-statistic)	0.000000		

Breusch-Godfrey Serial Correlation LM Test:  
 Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.038004	Prob. F(2,21)	0.9628
Obs*R-squared	0.115404	Prob. Chi-Square(2)	0.9439

Test Equation:  
 Dependent Variable: RESID^2  
 Method: Least Squares  
 Date: 03/12/25 Time: 16:18  
 Sample: 1991 2022  
 Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.479864	0.130882	3.666384	0.0013
LOGGDP(-1)	0.005810	0.008159	0.712059	0.4836
LOGFA	0.008564	0.003990	2.146352	0.0426
LOGFA(-1)	-0.008804	0.003892	-2.262039	0.0335
LOGFDI	-0.000205	0.002381	-0.086276	0.9320
LOGGEX	-0.001087	0.001922	-0.565669	0.5771
LOGEXR	0.029555	0.015602	1.894342	0.0708
LOGEXR(-1)	-0.026696	0.016106	-1.657528	0.1110
LOGTGDP	-0.131803	0.033885	-3.889706	0.0007

R-squared	0.531772	Mean dependent var	0.013636
Adjusted R-squared	0.368911	S.D. dependent var	0.018693
S.E. of regression	0.014850	Akaike info criterion	-5.349345
Sum squared resid	0.005072	Schwarz criterion	-4.937107
Log likelihood	94.58952	Hannan-Quinn criter.	-5.212700
F-statistic	3.265177	Durbin-Watson stat	2.559146
Prob(F-statistic)	0.012346		

Heteroskedasticity Test: Breusch-Pagan-Godfrey  
Null hypothesis: Homoskedasticity

F-statistic	0.691079	Prob. F(8,23)	0.6955
Obs*R-squared	6.201358	Prob. Chi-Square(8)	0.6247
Scaled explained SS	3.465665	Prob. Chi-Square(8)	0.9018

Test Equation:  
Dependent Variable: RESID^2  
Method: Least Squares  
Date: 03/11/25 Time: 23:33  
Sample: 1991 2022  
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.456427	0.354063	1.289113	0.2102
LOGGDP(-1)	-0.005216	0.011249	-0.463733	0.6472
LOGFA	0.002295	0.009517	0.241166	0.8116
LOGFA(-1)	0.000636	0.009022	0.070473	0.9444
LOGFDI	-0.001456	0.005948	-0.244817	0.8088
LOGEXR	0.010684	0.040929	0.261023	0.7964
LOGEXR(-1)	-0.003319	0.041832	-0.079351	0.9374
LOGGEX	-0.002608	0.005173	-0.504124	0.6190
LOGTGDP	-0.080594	0.079971	-1.007798	0.3240

R-squared	0.193792	Mean dependent var	0.023607
Adjusted R-squared	-0.086628	S.D. dependent var	0.035279
S.E. of regression	0.036776	Akaike info criterion	-3.535702
Sum squared resid	0.031106	Schwarz criterion	-3.123464
Log likelihood	65.57124	Hannan-Quinn criter.	-3.399057
F-statistic	0.691079	Durbin-Watson stat	2.569585
Prob(F-statistic)	0.695454		