

**FOREIGN DIRECT INVESTMENT INFLOWS-ECONOMIC GROWTH NEXUS
AMONG THE COMESA MEMBER STATES**

BY

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**A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND
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DECLARATION

I, **OKELLO PATRICK** hereby declare that this dissertation report titled “***FOREIGN DIRECT INVESTMENT INFLOWS-ECONOMIC GROWTH NEXUS AMONG THE COMESA MEMBER STATES***” is my original work and has never been presented for a degree in another University.

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APPROVAL

We as University supervisors confirm that the dissertation entitled ***“FOREIGN DIRECT INVESTMENT INFLOWS-ECONOMIC GROWTH NEXUS AMONG THE COMESA MEMBER STATES”*** has been done by the candidate under our supervision.

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DEDICATION

I am pleased to dedicate this research work to my heroes Mr. and Mrs. Ochola David not forgetting my fiancé Adikini Salome who encouraged me to upgrade in the course. I am blessed to have you by my side.

ACKNOWLEDGEMENT

This study was a success due to the divine grace of God almighty upon me and not forgetting the relentless support from my lecturers, course mates who encouraged me at times when I was between a rock and a hard ground. The following people deserve special recognition for the selfless contribution offered to me during the study, Michael Omeke (PhD) and Dickson Turyareeba (PhD). I pray that the good Lord continue to bless you as the struggles for academic excellence continues in Kyambogo University. I also take this moment to extend my heartfelt gratitude to the apple of my eye and fiancé Adikini Salome for providing me with a conducive environment for learning.

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ABBREVIATIONS

ADF	Augment Dickey-Fuller
AIC	Akaike Information Criterion
AR	Autoregressive
ARDL	Autoregressive Distribution Lag
CET	Common External Tariffs
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
FEM	Fixed Effect Model
GFCF	Gross Fixed Capital Formation
HQIC	Hannan Quinn Information
IPS	Im-Persaran-Shin
OECD	Organization for Economic Co-operation and Development
PVAR	Panel Vector Autoregressive
RFEM	Random Fixed Effect Model
SBIC	Schwartz Information Criterion
SSA	Sub-Saharan Africa
T-FTA	Tripartite Free Trade Area
UNCTAD	United Nation Conference on Trade and Development
VEC	Vector Error Correction
WDI	World Development Indicators

ABSTRACT

This dissertation examines the nexus between foreign direct investment inflows and economic growth among COMESA member states, while controlling for the effects of gross capital formation, domestic credit to the private sector, exports and inflation. Analysis was focused on two fronts: the causality relationship and cause-effect relationship. Panel data for the period 1994-2019 was utilized to examine the underlying relationships. The study employed the panel vector auto regression with exogenous regressors (PVARX) and the first difference generalized method of moments (D-GMM) analytical techniques to achieve the study objectives. Results from the study revealed a uni-directional causality, with causality running from economic growth to FDI net inflows. However, results indicated that FDI and gross capital formation had a joint causality on economic growth among the COMESA member states. The regression estimates from D-GMM estimation showed that the partial slope coefficient on the FDI variable was positive but statistical insignificant at 5 percent testing level, which suggested that FDI net inflows did not have a significant effect on economic growth among the COMESA member states. Among the control variables included in panel regression model, results showed that gross capital formation and domestic credit to the private sector had a significant positive causal effect on economic growth among the COMESA member states while the inflation variable had a negative but insignificant effect on economic growth among the COMESA member states. This study has been unique of its kind by employing PVARX and D-GMM analytical methods to uncover causality and cause-effect relationship between economic growth and FDI in the COMESA member states. Results suggest that FDI alone does not have ability to predict economic prosperity among the COMESA member states but FDI and gross capital formation can jointly help to predict economic growth in the COMESA member states.

Key words: Causality, GDP, FDI, PVARX, D-GMM, COMESA.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study focuses on the investigation of the nexus between foreign direct investment (FDI) inflows and economic growth (GDP) among the COMESA member states. The study looks at both literature review and empirical investigations using data from COMESA member states to investigate the underlying relationship. Empirical literature presents three strands of authors; one strand arguing that FDI causes Economic growth, the second strand arguing that Economic growth causes FDI and the third strand argues that there is no causality between economic growth and FDI Inflows. This study contributes to the debate in literature on causality between FDI Inflows and economic growth with empirical evidence among COMESA Member states. FDI is an ownership stake in a foreign company or project made by an investor, company or government from another country (Hayes, 2023).

Given the experience from the four Asian Tigers that have formed regional blocs, have attracted FDI Inflows and hence achieved fast growth, this study therefore seek to investigate whether COMESA is on the right path to attracting FDI and economic growth through the formation of a regional trade bloc since her inception in 1994.

1.1 Background of the Study

The global economy is a very complex phenomenon in which every country has a unique role to play at varying levels of wealth and economic activities through numerous factors, including FDI inflows and domestic funding. Economic growth is measured by analyzing gross domestic product (GDP), which reflects the total value of goods and services produced within a certain territorial boundary. According to the Internal Monetary Fund (IMF), the global GDP for 2022 was projected to be \$104 trillion of which Africa's GDP comprised only \$2.975 trillion. According to the same source, United States of America is the world's largest economy with a GDP of \$25.5 trillion, followed by China with a GDP of \$18.1 trillion.

Due to a huge influx of overseas investment, FDI in Africa reached a record of \$83 billion in 2021, which amounted to 2.79 percent of African GDP. However, FDI in COMESA member countries amounted to only 2.424 percent of their combined GDPs. As the global economy has

become more collaborative, the relationship between economic (GDP) growth and foreign direct investment inflows (FDI) in the world and developing countries of Africa has become a subject of discussion for many policy analysts, researchers and economists.

Following the much-publicized 1980s global economic crisis, Sub-Saharan Africa (SSA) remained backward in terms of levels of Gross Fixed Capital formation, exchange rates and financial deepening with high levels of inflation across the continent and the rate of economic growth in general. This prompted many Sub-Saharan African countries to unite into regional economic blocks including the SADC, COMESA, EAC, and ECOWAS. The Common Market for Eastern and Southern Africa (COMESA) consists of 20 member states with rapidly-growing economies that have a combined GDP of \$805 billion, a population of 767,233,700, a global trade worth US \$324 billion, and a land area of 10,975,399 square kilometers (COMESA database, 2013). Among all African economic trade blocs, COMESA is the leading contributor to global trade, followed by EAC, ECOWAS and SADC respectively. Kenya and Rwanda are the top two trading members of COMESA. This study therefore investigates how Foreign Direct Investment Inflows (FDI) has boosted Economic (GDP) Growth in COMESA.

Since the establishment of COMESA in 1994, it has made efforts to attract FDIs by promoting excellent working relations (both formal and informal) and through collaboration with other regional blocs like EAC, SADC, IOC and IGAD. Ensuring trade openness, good governance, peace and security within the bloc was a crucial step in attracting FDIs into the region. COMESA attained free trade area status in 2000 and launched its customs union in 2009. Under the customs union arrangement, it achieved the harmonization of common external tariffs (CET) with EAC. Additionally, the launch of a tripartite free trade area (T-FTA) in 2015 among COMESA, EAC and SADC has further facilitated market integration from Cape Town to Cairo. These policies and agreements were done to sort out the conflicting regional trade policies which were a hindrance to FDI inflows within the region (COMESA, 2017).

In an attempt to consolidate and promote good governance, peace and security, COMESA streamlined its operations by adopting the framework put in place by African Union's Peace and Security Council, which was formed to prevent, manage and resolve conflicts in African states. In the COMESA summit held in May 1999 in Nairobi, Kenya, matters regarding peace, economic stability and good governance in the region were emphasized and it was resolved that representatives from member states meet annually.

Looking at FDI intelligence monthly reports of 2018, the COMESA region witnessed a growing number of projects established by multinational companies, hitting a staggering total of 274 FDI projects during that year.

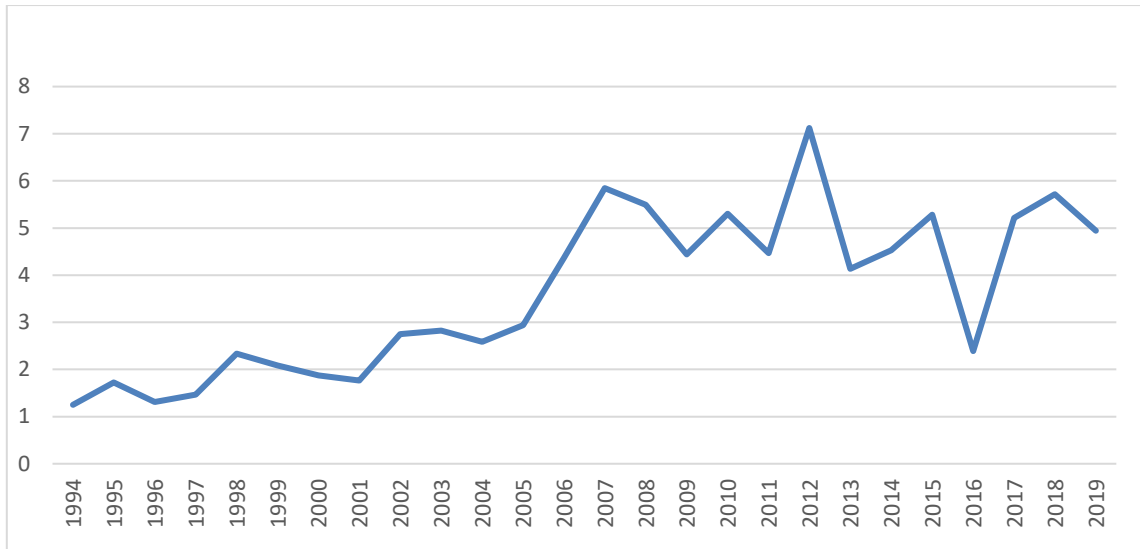


Figure 1. 1: Average (in billions) of US \$ inflows of FDIs to COMESA, 1994-2019
Source: Generated by author from raw data obtained from WDI, last updated 2022

Figure 1.1 above shows a steady increase in FDI-inflows into the COMESA region between 1994 to 2005 and a sharp increase between 2005 and 2007 before declining from 2007 to 2009 as a result of the restrictive trade barriers in the form of trade tariffs which were harmful to both foreign and local investments. It hit a peak in 2012 which was followed by a subsequent drastic fall in 2013 and 2016 before rising again in 2017 followed by moderate fall in 2019.

For developing economies, COMESA included, FDI majorly flows into the primary sector, like natural resource exploitation. This raises concerns because this kind of investment does not significantly translate into economic growth, especially when these resources are being exported as cheap raw materials and re-imported as expensive finished products to the region. FDI inflows are also known for stunting growth by creating inadequate employment opportunities in the host economies due to the influx of expatriates and foreign manual laborers. The profit repatriation by the aforementioned expatriates also led to exploitation of the host economies, hence disadvantaging them in terms of economic growth (Ugochukwu et al., 2013).

1.2 Statement of the Problem

In 2001, the United Nations formulated the New Partnership for Africa's Development (NEPAD) which was envisioned to aid Africa in achieving the Millennium Development Goals (MDGs) whose major objective was to eradicate poverty in Africa by 2015. One of the strategies, among others, was to promote foreign direct investment inflows and trade in order to boost economic growth. Given this effort, there is unsettled debate in literature on whether FDI causes growth or the other way round. Additionally, some studies support the nexus, others disagree by asserting that there is no causal relationship. Recent studies by Kalai and Zghidi (2019) and Sokhanvar (2019) confirmed the existence of causality while studies done by Zandile and Phiri (2019), Nyoni (2018), Abdouli and Hammami (2017) questioned the FDI-growth nexus.

This study extends the debate on the causality to COMESA member states in order to further examine the link between FDI and Economic growth. Relying on the general perception of the importance of FDIs to economic growth especially with respect to developing countries, it becomes imperative to conduct more empirical investigations on the nexus between FDI and economic growth. It is upon this backdrop that this study attempts further investigate the link between FDI and economic growth among the countries in the COMESA region.

1.3 General Objective of the Study

The general objective of the study is to examine the nexus between foreign direct investment inflows and economic growth among COMESA member states.

1.3.1 Specific Objectives of the Study

This study sought to address the following specific objectives;

- i. To investigate the direction of granger causality between foreign direct investment (FDI) and economic growth (GDP) among COMESA member states.
- ii. To investigate the causal effect of foreign direct investment (FDI) on economic growth (GDP) among the COMESA member states.

1.4 Hypothesis of the Study

The study sought to test the following research hypotheses:

- i. The study postulates that FDI does not granger cause GDP and GDP does not granger cause FDI among COMESA member states.
- ii. FDI is postulated to have no significant causal effect on GDP among COMESA member states.

1.5 Scope of the Study

1.5.1 Geographical Scope of the Study

This study examines the nexus between FDI inflows and economic growth among the 20 countries of COMESA.

1.5.2 Time Scope of the Study

The study covers a 26-year period span from 1994 to 2019. This period span has been considered because of availability of data for all the variables across all the COMESA member countries, which enabled establishment of a strongly balanced panel.

1.5.3 Conceptual Scope of the Study

The study is conceptually founded on the ongoing debate in the empirical literature about the nature of the causality relationship between economic growth and FDI inflows. The existing growth theories are then used to frame ground work to model the nexus between FDI inflows and economic growth.

1.6 Significance of the Study

This study is significant to different individuals, institutions, policy makers as well as researchers and academicians. The study examined the nexus between foreign direct investment inflows and economic growth among COMESA member states. It would therefore inform governments and policy makers of the effect of FDI inflows on economic growth of the host countries (COMESA member states). It provides an opinion where relevant policies would be deployed by policy makers during the implementation of growth strategies in an

attempt to achieve the seventeen (17) Sustainable Development Goals (SDGs) as adopted by the United Nations in 2015.

The findings from this study is helpful in informing Policy decisions regarding foreign direct investments. Investment is a function of consumption, saving and disposable income. With the influx of FDI Inflows, disposable income for households greatly increased. In response to the increase in disposable income, savings largely increase as well as increase in consumption patterns. Policy makers would find the study valuable as it would inform on critical areas to prioritize on when making policies to enhance economic growth.

Furthermore, researchers and academicians will also find this study to be helpful as it will guide them in undertaking their literature review. The study adopted an explanatory research design to determine the relationship between the dependent and independent variable hence other researchers can adopt the same. The study also provided a basis for establishing a research gap which also offer a ground to either support or critique findings of their studies. This study examined the nexus between foreign direct investment inflows and economic growth among COMESA member states but can also trigger more academic research when researchers benchmark this study in their empirical studies and also take on similar studies among other trade blocs like the East African Community (EAC) , Gulf Cooperation Council (GCC) among others.

1.7 Conceptual Framework of the Study

The nexus between FDI Inflows and economic growth is conceptualized on two facets of relationship: Direction of causality and cause-effect. Below is a conceptual frame work indicating the flow of causal-effect and causality relationship between the study variables (Figure 1.2).

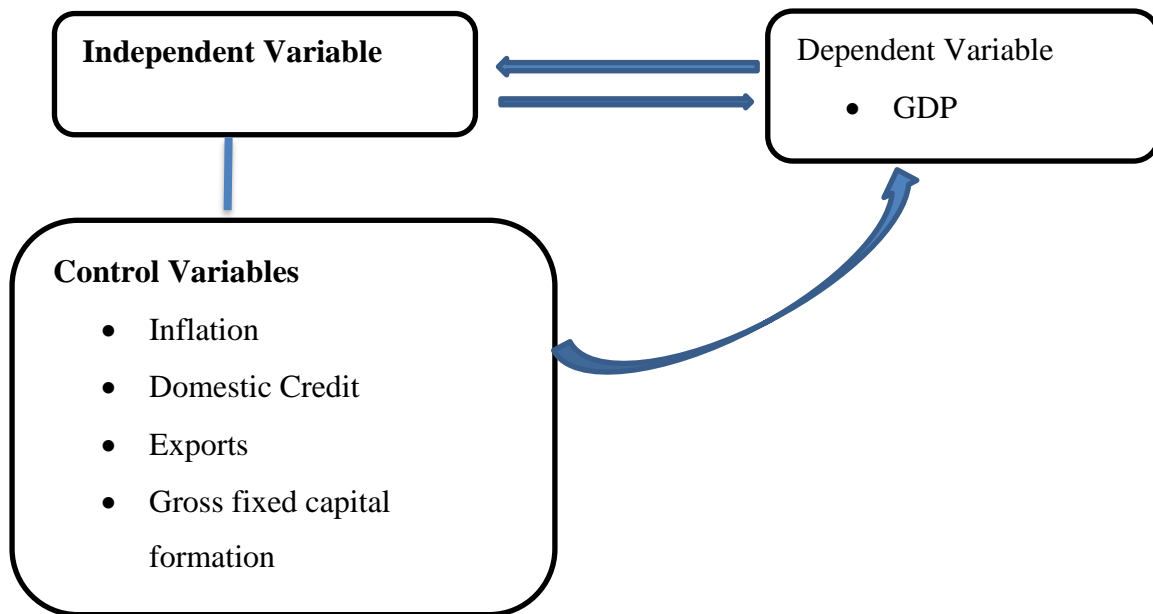


Figure 1. 2: Conceptual framework relating the study Variables.
Source: Adopted from Rumanzi et al. (2021) and modified by the author

The conceptual framework indicates that the independent variable under analysis is foreign direct investment inflows (FDI) measured by the net FDI inflows (in Current US dollars). It also shows that there are other independent variables as control variables which are included in the regression model to reduce on omitted variable bias. These control variables are: Inflation that was determined by the inflation rate, domestic credit as measured by amount of total credit to the private sector by banks (in current US dollars), exports measured by the value of all goods and other market services exported to the rest of the world (in current US dollars) and gross fixed capital formation measured by outlays on additions to the fixed assets of the economy plus net changes in the level of inventories (in current US dollars).

The above conceptual framework also shows the perceived causal and causality relationship between the study variables. FDI and economic growth are assumed to have a bidirectional relationship as indicated by the to and fro arrows, while inflation, domestic credit and exports are assumed to have a unidirectional effect on economic growth as indicated by one right pointed arrow. This kind of perceived relationships have been guided by both economic theory and empirical evidence.

1.8 Stylized Channel through which FDI affects Economic growth in COMESA Region

Building on the perceived and empirical-based relationship between FDI and economic growth as depicted on the conceptual framework, the study extends the flow in the relationship between the study variables by dispelling the potential channel through which FDI may affect economic growth as shown in Figure 1.3.

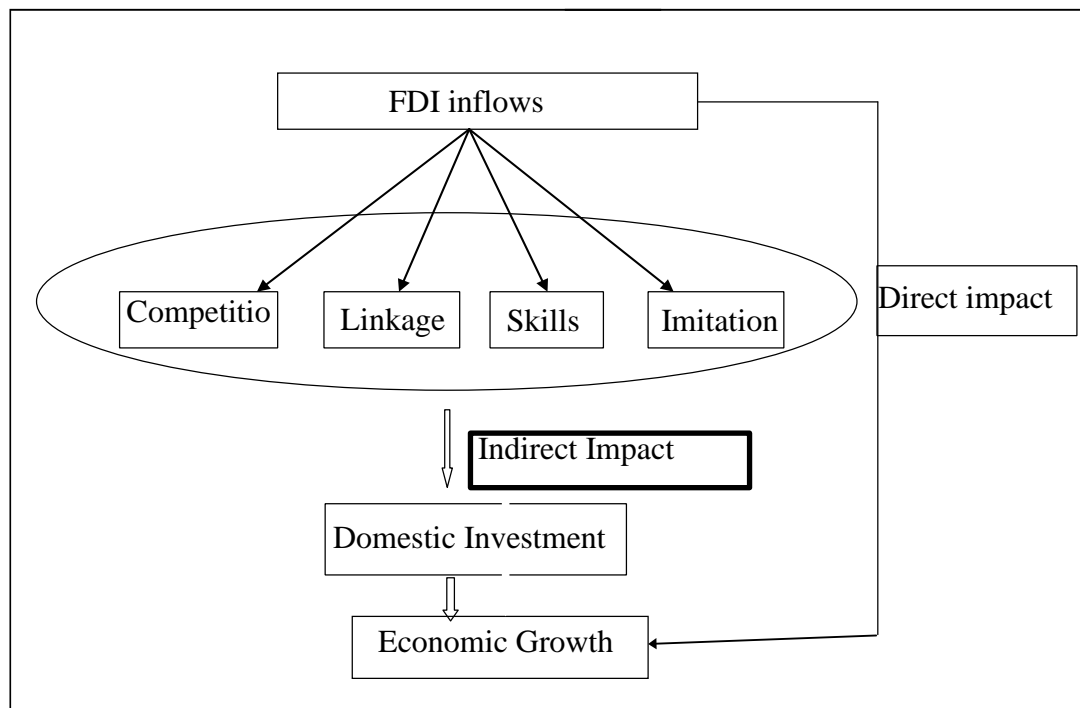


Figure 1. 3: Channel through which FDI affects Economic growth in COMESA Region
Source: Researcher’s conceptualization

Figure 1.3 above shows how FDI inflows influence Economic growth. The character of relationship is sub-divided to form two major effects: the direct impact and indirect effects. The direct effect is indicated by the arrow flowing directly from FDI to Economic growth, the indirect effects are indicated by the flows of arrows emanating from FDI spill-overs namely: competition; linkages, skills, imitation. The effect of FDI spill-overs depend much on the absorption capacity which also depends on some conditional factors.

1.9 Organization of the Study

This dissertation has been organized in five chapters. Chapter one consists of introduction of the study, problem statement, objectives, research hypotheses, significance of research and organization of the study. Chapter two consists of theoretical literature review and empirical

literature review. Chapter three presents the methodology. Chapter Four presents study findings and discussion of the findings while Chapter Five presents the summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter first presents the demographic characteristics of COMESA member states, a review of the related growth theories, lays down a review of empirical studies related to the current study and presents the gaps identified from the reviewed literature.

2.1 Demographic Characteristics of COMESA Member States

The demographic characteristics of COMESA focus on the topography description of every COMESA member states, areas in kilometers, population, official business language and year of independence, as of the year 2022.

Table 2. 1: Demographic Characteristics of COMESA Member States

S/ N	Country Name	Topography	Areas (Km ²)	Populatio n	Official language	Year of Indepe ndence
1	Uganda	Landlocked	241,038	47,249,58 5	English	1962
2	Comoros	Island	1,861	836,774	Comorian, Arabic and French	1974
3	Dem Rep	Non- landlocked	48,670	99,010,21 2	French	1960
4	Djibouti	Non-land locked	23,000	1,012,000	French and Arabic	1977
5	Egypt	Non- landlocked	1,001,00 0	110,990,1 03	Modern Standard Arabic	1922
6	Eritrea	Non- landlocked	118,000	3,684,032	Tigrinya, Tigre, Saho, Rashaida, Bilen, Afar, Beni, Amir, Nera, Arabic	1991

7	Ethiopia	Landlocked	1,104,000	123,379,924	Amharic	1935
8	Kenya	Non-landlocked	580,000	54,027,487	Kiswahili and English	1963
9	Libya	Non-landlocked	1,760,000	6,812,341	Arabic	1951
10	Madagascar	Island	587,000	29,611,714	Malagasy and French	1960
11	Malawi	Land-locked	118,000	20,405,317	English	1964
12	Mauritius	Island	2,040	1,299,469	English	1968
13	Rwanda	Landlocked	26,000	13,246,394	Kinyarwanda, French and English	1962
14	Seychelles	Island	460	107,118	French, English and Seychellois	1976
15	Sudan	Landlocked	1,879,000	46,874,204	Arabic and English	1956
16	Swaziland	Landlocked	17,000	8,740,472	Swati and English	1968
17	Zambia	Land locked	753,000	19,610,769	English	1964
18	Zimbabwe	Land-locked	391,000	16,320,537	Shona, English, Tshwa, Ndebele, and Southern Sotho	1980
19	Burundi	Landlocked	28,000	12,889,576	Kirundi, French and English	1962
20	Tunisia	Non-Landlock	163,610	12,277,109	Arabic and French	1956

Source: COMESA statistics data portal (2022)

Table 2.1 above shows that 9 out of 20 COMESA member states are landlocked, while 4 of them are Islands and the rest are non-landlocked countries. 12 of the COMESA member states have English as one of their official or business languages except Madagascar, Comoros, Congo Brazzaville, Democratic Republic of Congo, Tunisia, Libya and Ethiopia that use either

Arabic or French while Eritrea has its own unique official or business language. The majority of them had their independence in the 1960's and three of them in the 1968. The entire COMESA region covered a total area of 10,975,399 km² which is comparable with United State of America of about 9,826.675 km².

The Congo has the largest land area of 2,345,000 km² of the entire COMESA land area. The total COMESA population in 2022 was 617,309,698 people of which Ethiopia had the highest population of 123,379,924 people. As every developing country endeavors to develop its economy, COMESA member States inclusive need resources to undertake sustainable capital investment in order to align with Sustainable Development Goals (SDGs). Although natural resources are abundant in COMESA member states, the resources are not being fully utilized to maximize economic growth as huge volumes of the resource are being exported as raw or semi-raw materials attracting low returns. FDI can assist in providing necessary resources needed to undertake capital investment in these economies noted in chapter one. Its funds are less inflationary tool to stimulate economy. To that regard, COMESA has developed policies and procedures to encourage foreign investors (COMESA, 2017). Furthermore, COMESA member states depend on substantial investment from foreign countries to realize their long-term economic goals and have developed policies and strategies to attract FDI inflows (see Regional Indicative Strategic Development Plan (RISDP) for COMESA). The strategy components that COMESA region has adopted toward attracting FDI inflows include promoting entrepreneurship in industries and development of attractive tax incentives for foreign firms (COMESA, 2017)

2.2 Economic Growth, Relevant Theories of Growth and Theories of FDI

2.2.1 Meaning of Economic Growth

Economic growth is defined by Denison (1962) as the incremental units of GDP per capita of national products and or real GDP calculated at a constant price. Economists believe that economic growth can be as a result of both the direct and the indirect factors of growth. Direct factors are human resources, natural resources, and capital including technology. The indirect factors can be in form of institutions, the size of demand, savings and investment rates, and mobility of labor and capital.

2.2.2 Growth theory by Robert Solow

Solow's (1956) growth model presents a ground breaking revelation for growth accounting. From Solow's growth model we derive the impacts of output growth on input factors like management skills of labor, capital accumulation, inflation rates, domestic credits to private sectors, technological advancement as elements of FDI inflows and by incorporating other vectors such as imports and exports as dummy variable among others in a linear equation as shown below;

$$Y = A \Phi(K, L, \Omega) \quad (1)$$

From the functional equation 1 above, output (Y), capital (K), labour productivity (L) and Ω represented an ancillary vector variable. The model is in a Cobb-Douglas form and log transformed with a time derivative.

$$g Y = g A + \alpha g K + \beta g L + \gamma g \Omega \quad (2)$$

In the linear equation 2 above, consider γg to be growth rate of K, A, Ω and L all expressed in terms of per capita income while elasticity of output (α), capital formation (β) and labour productivity (γ) are the ancillary variables in the model equation.

Findlay (1978) modified Solow's growth model by adding the contribution of technological transfers and taking growth rate as an increasing function of FDI inflows. Findlay distinguished between foreign capitals as inputs into recipient economy (FDI-outflows) and local economies' capital (FDI-inflows). Findlay (1978) suggested that an increase in foreign capital outflows in the developing countries increases their domestic capital and a proper use of combination of technological advancement with human capital (L) leads to economic growth. Romer, (1993) also modified Solow's model by including human capital accumulation.

2.2.3 The Endogenous Growth Theory

The endogenous growth theory, introduced by Romer (1986) and extended by Lucas (1988), is the concept that economic growth is due to factors that are internal to the economy and not because of external ones. The theory is built on the idea that improvements in innovation, knowledge, and human capital lead to increased productivity, positively affecting the economic outlook. The endogenous growth theory was first created due to deficiencies and dissatisfaction

with the idea that exogenous factors determined long-term economic growth. In particular, the theory was established to refute the neoclassical exogenous growth models, as it made predictions about economic growth without factoring in technological change. The endogenous growth theory challenges such an idea by placing importance on the role of technological advancements. Since long-term economic growth is derived from the growth rate of economic output per person, it would depend on productivity levels. In turn, productivity would depend on the progress of technological change, which relies on innovation and human capital; these factors are considered internal to an economy, not external.

Romer (1986) developed the endogenous growth theory stressing the fact that that technological change is the result of efforts by researchers and entrepreneurs who respond to economic incentives. Following Romer's early work, Lucas (1988) was supremely influential in modelling endogenous-led growth by utilizing newly available data after Romer's earlier work on cross-country economic performance while encompassing how enormous differences in living standards can persist across countries.

2.2.4 Uzawa–Lucas Growth Model

The Uzawa-Lucas growth model initially introduced by Uzawa (1965) and further developed by Lucas (1988) explains how economic growth, in the long term, is attributed to the accumulation of human capital. The Uzawa-Lucas growth model is part of the endogenous growth theory. The Uzawa-Lucas model postulates that human capital is produced from education and that economic output is developed by using physical capital and human capital. As a result, the ratio of physical capital to human capital is the measurement used to determine the total capital in an economy, which has an effect on the long run economic growth of the economy.

2.2.5 The Dunning Eclectic Model of FDI

The Dunning eclectic model is a theory based on a three-tiered framework that companies follow to determine if a direct foreign investment would be beneficial: Ownership, Location and Internationalization (OLI). The Theory was first expounded upon by the scholar Dunning (Dunning, 1979) to explain how Ownership, Location and Internationalization (OLI) possibilities can be adopted by companies in their strategic choice of FDI flow. These three OLI pre-conditions must be satisfied if firms are to engage in foreign direct investment.

Ownership strategy (O) stress that a firm may have ownership advantages unlike other firms that compel her excel in her international dealings than others. A firm may possess key tangible or intangible assets that enables her gain more benefits from using it. This implies that for FDI to take place, the firm must have ownership and internationalization advantages while a foreign country must have locational advantages over the firm's home country. Key notable ownership advantages include: rights to key information, copy rights, trademarks and specialized skills and management. All these advantages are typically intangible. Location advantages (L) that a company may possess include: all natural and created resources which are generally immobile. They require partnership with a foreign investor in that location to be utilized to full advantage. Internalization advantages (I). This concerns other questions like should a company outsource or produce locally, the needed service or material? Outsourcing or insourcing may have benefits and risks that require proper analysis before a decision is made. Perhaps, through outsourcing, the foreign company can offer better, cheaper service.

2.3 Empirical Review on the Link between Foreign Direct Investment Inflows and Economic Growth

The analysis of the relationship and link between FDI and economic growth has been the subject of many empirical studies. Some researchers have sought to ascertain the causal relationship between the two variables while others have only tried to study the impact of FDI on economic growth or vice versa (Lo et al., 2013). The following paragraphs present some of the previous studies that examined the connection between foreign direct investment (FDI) and economic growth (GDP).

Suliman et al. (2018) tested the endogenous association between FDI and economic growth in using annual data from the Economic and Social Commission on Western Asia countries. The study employed the VAR approach using annual data for the period 1980-2011. Analysis from the study found a bidirectional relationship between FDI and economic growth. Further, the study reported that FDI positively and significantly impacted economic growth and that growth rate stimulated positively FDI inwards.

A study by Kosztowniak (2016) employed the VAR approach to examine the causality relationship occurred between GDP and FDI in Poland using a sample of annual data for the period 1992–2012. The study found a bidirectional relationships between FDI and GDP.

By employing the Granger causality test, Owolabi-Merus (2015) examined the relationship between FDI and economic growth using the sample of annual data for the period 1981–2013 in Nigeria. The Granger causality test results from the study showed a unidirectional causation from FDI to GDP but not vice-versa.

A related study by Khun (2018) examined the linkage between foreign direct investment and economic growth for the period 2006-2016 in Cambodia using Granger Causality test. The results of the study showed that causality run from foreign direct investment to economic growth.

Another related study by Nistor (2014) employed a co-integration approach to analyze the causality between FDI inflows and economic growth of host country for the period 1990-2012 for Romanian economy. The result revealed a bi-directional causality between FDI and economic growth.

A study by (Pegkas, 2015) conducted over the period 1980–2012 employed a generalized method of moments (GMM) estimators to confirm the important role of FDI in stimulating economic growth in the Eurozone countries. The study came to a conclusion that FDI stimulated economic growth in the countries examined.

In another related study, Adams & Opoku (2015) applied the generalized method of moments (GMM) estimators to a dataset of 22 Sub-Saharan African countries for the period 1980 to 2011 to investigate the effect of FDI on economic growth. The study concluded that FDI did not have an independent impact on economic growth. Moreover, the authors referred to a study by Agbloyor et al. (2019) who had found that FDI had a negative impact on economic growth in the case of 14 African countries based on GMM estimators.

Using cointegration analytical techniques, Agrawal (2015) examined the relationship between foreign direct investment (FDI) and economic growth in the five BRICS economies over the period 1989–2012. The study found that foreign direct investment and economic growth are co-integrated at the panel level, indicating the presence of a long-term equilibrium relationship between them.

Tang and Tan (2015) employed the co-integration test to examine how the foreign capital flow effects the European Union (EU) economic growth over the period 1987–2012. Results from the study found that the higher foreign direct investment (FDI) and portfolio investment (PI) triggered by the European Monetary Union (EMU) had not contributed to growth.

A study by Aga (2014) employed time series techniques to analyze the effect of foreign direct investment on economic growth in Turkey over the period 1980–2012. The study results indicated that there was no long-term relationship between foreign direct investment and economic growth in Turkey; he inferred that there is no Granger causal relationship between FDI and economic growth by means of a Granger Causality (GC) test.

A related study by Shawa et al. (2014) on Kenya s investigated how foreign direct investment (FDI) related to the Kenya’s GDP growth, domestic investment and exports. The study utilized time series data for the period 1980 to 2013. The study employed the cointegration and the Granger Causality analytical tools. The cointegration test results indicated that there was a long-term relationship among the four variables being analyzed in the study.

Aluvarado et al. (2017) examined the effect of FDI on economic growth for 19 Latin American countries for the study period 2005-2015. The study employed vector auto-regressive models. The result showed that FDI did not cause economic growth. The results also showed that FDI is not a mechanism to accelerate economic growth in Latin American.

2.4 Review of Empirical Studies on the Link between Economic Growth and the Other Predictor Variables Included in the Model of the Current Study

The other predictor variables, apart from FDI, indicated in the empirical model of the current study have been considered as control variables. These included Exports (EXPORTS), gross fixed capital formation (GKF), domestic credit to the private sector (DOMCRED) and inflation (INFLATION).

2.4.1 Export Trade and Economic Growth

Mosikari and Eita (2020) conducted a study to investigate Namibia’s major export sectors (manufactured goods, diamond mining, food, and live animals) and her economic growth. The study used quarterly data for the period 2009 to 2018 and employed nonlinear autoregressive

distributive lag (NLARDL) analysis. The study discovered an asymmetrical relationship between Namibia's most important export sectors and economic growth.

A study by Lawal et al. (2016) conducted in a period (1987-2014) applied the ARDL methodology to Nigeria and found a negative long-run impact of export trade on economic growth but a positive growth effect in the short run. Further, a two-way causality was found between the two variables.

Adams and Opoku (2015) investigated the long run impact of export trade on economic growth for the period 1970-2011 on the Ghana economy using ARDL approach. The empirical results revealed that the interaction of export is crucial in fostering economic growth in Ghana.

2.4.2 Inflation and Economic Growth

Majumder (2016) conducted research on the impact of inflation on economic growth of Bangladesh using a selected time period (1975 to 2013). Augmented dickey fuller (ADF) (Dickey and Fuller, 1979) was applied to test for stationarity and the independent variable were inflation, remittances and money supply while the GDP was a dependent variable. The finding was that there is positive relationship between economic growth of GDP and inflation in Bangladesh.

Hossin (2015) examined the impact of inflation on economic growth in Bangladesh using time series data from (1961 to 2013). A Granger causality test, error correction model and co-integration test were conducted. An increase in inflation rate effect economic growth negatively.

Other studies also determined the relationship between the GDP growth rate and inflation rate in Ghana and applied the methods of scatter plot, correlation analysis and simple linear regression estimated by OLS, and the result showed that there was a strong negative linear relationship between GDP growth rate and inflation rate in Ghana (Patrick et al., 2013; Nurlanova, et al., 2020).

2.4.3 Gross Fixed Capital Formation and Economic Growth

Ncanywa and Makhenyane (2016) examined the impact of gross fixed capital formation (INFRA) on economic growth of South Africa between 1960-2014, using the Johansen cointegration and Vector Error Correction model. The result showed that gross fixed capital formation (GFCF) has positive relationship with economic growth both in short run and long run and it also showed unidirectional causality between gross fixed capital formation (GFCF) and economic growth.

Gulzar (2015) examined the impact of GFCF on the economy of Pakistan for the period 1981-2014 using time series data. The variable for the study included Economic growth as dependent variable and gross fixed capital formation (GFCF), Private physical capital investment, and public capital investment ratio to GDP. The study employed Johansen cointegration test and Error correction Model for regression analysis. The result reveals that GFCF positively affect economic growth in Pakistan.

2.4.4 Domestic Credit and Economic Growth

Domestic credit reflects the financial development of a country (Bui, 2019) and contributes to efficient investment allocation. Domestic credit availability to private sectors allows firms to make investments that they would not have made with their own funds (Kiriga, et al., 2020). As domestic credit availability increases, so does consumption and investment demand, raising output and employment.

A study by Duican and Pop (2015) aimed at investigating implications of credit activity on economic growth in eight development regions of Romania for the period 2005-2014, namely Northeast, Southeast, South, Southwest, West, Northwest, Centre and Bucharest Ilfov. The study found out that credit to private sector has a positive influence on gross domestic product. The study concluded that it is important to a strong legal framework that would inject more funds toward innovative and profitable products in economy and that the population should have adequate knowledge not only on the benefits of credit but also on risks associated with credits.

Another study by Bui (2020) examined how providing domestic credit to the private sector can stimulate economic growth in 6 ASEAN Countries from 2014 to 2017 through the Lenses of a non-linear approach and GMM style estimation method. His study uses variables such as Domestic credit in the private sector, square of domestic credit while including trade openness and Inflation as controlled variables. The non-linearity intends to capture how domestic credit to the private sector will affect economic growth over time. He found that domestic credit has a positive impact on economic growth, but after a threshold of 97.5 percent, domestic credit will negatively affect economic growth. Over time the more the increase in domestic credit will affect economic growth if the credit is not used in productive investment.

Ananzeh (2016) studied the relationship between bank credits to all economic sectors (i.e. industry, construction, tourism) and individual sectors in Jordan with economic growth using quarterly data from 1993-2014 by employing a Granger causality test and VECM estimation method. The causality analysis indicated the availability of bank credit to agriculture and construction is determined by the level of economic growth but there is bidirectional causality between economic development and bank credit to the construction sector. The concluded that increasing efficiency and improving the banking credit facilities can tremendously stimulate economic growth.

Begum and Aziz (2019) examined the relationship between domestic credits to the private sector and GDP in Bangladesh. The study utilized the bank's real GDP in Bangladesh from 1983 to 2017. They found a statistically significant negative relationship between real GDP and domestic credit to private sectors.

A related study by Sipahutar et al. (2016) utilized a VAR approach to investigate how credit availability by banks can promote economic growth, unemployment, and poverty in Indonesia from 1990 to 2014. They found that bank credit and economic growth had a bi-directional causality. In their study, the authors asserted that an increase in economic growth will provide more credit available to businesses and increasing credit availability also stimulates economic growth and this also improves financial development.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methods and procedures followed to examine the causality and causal-effect relationship between FDI inflows and economic growth among COMESA member states. It presents the research study design, the research approach, data type and sources, study variables and their measurements, and the data analytical techniques employed.

3.1 Research Design

To investigate the causal link between FDI inflows and economic growth in the COMESA region, the study adopted an explanatory research design, which establishes causal relationships between variables. Data on COMESA member states has been put in panel form and panel data analytical techniques (regression analysis tools) have been employed to investigate the underlying relationship.

3.2 Research Approach

This study adopts a quantitative research approach. The study variables are quantitatively measured. The study employs both statistical and econometric techniques to investigate the nexus between the study variables. While econometric tools are employed to uncover the underlying causal connections between the study variables, the statistical tools establish the coefficients significance and aid in the tests of hypotheses.

3.3 Data Types and Source

The study used secondary panel data obtained from the World Development Indicators (WDI) data base. World Bank Data from which the WDI database is obtained is a recognized and official data source for macro studies simply because it is a trusted data source which is available on online platform as WDI data bank. The WDI bank has been used by many scholars with many published articles (Kiriga, et al., 2020, Khun (2018) and Sipahutar et al. (2016)).

3.4 Study Variables and their Measurements

The variable names, variable description, units of measurement and expected signs are summarized in Table 3.1 as shown below;

Table 3. 1: Variable names, notation, description, units of measurement and expected signs

Full variable Name	Variable notation	Variable specification/definition	Original units of measurements	Expected sign
Gross Domestic product	GDP	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	Current US \$	Not applicable
Foreign Direct investment, net inflows	FDI	Foreign direct investment refers to direct investment equity flows in the reporting economy	BoP, Current US \$	+/-
Domestic credit	DOMCRE DIT	Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of no equity securities, trade credits, and other	Current US \$	+

		accounts receivable that establish a claim for repayment.		
Exports of goods and services	EXPORTS	Exports of goods and services represent the value of all goods and other market services provided to the rest of the world	Current US \$	+
Inflation, GDP deflator	INFLATION	Inflation, as measured by the annual growth rate of the GDP implicit deflator, is a measure that shows the rate of price change in the economy as a whole.	Annual percentage:	-/+
Gross fixed Capital Formation	GFCF	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories	Current US \$	+

Source: Researcher's compilation

The independent variable under investigation is FDI, which is expected to have a positive or negative effect on GDP as reported by some empirical evidence (e.g. Pegkas, 2015; Suliman et al., 2018, among others). The prior expected sign of the DOMCREDIT variable on economic growth is positive. This is because an increase in the volume of credit enhances economic activity, increase employment and leads to production of more goods and services. Increased

domestic credit also creates a multiplier effect on money supply which enhances economy expansion.

Export trade is expected to have a positive relationship with GDP. An increase in export trade increases export sales which fetches larger foreign exchange. Increases in exports therefore have a positive relationship with level of country's economic growth.

The study expects a positive relationship between gross fixed capital formation and GDP. This is because an increase in GFCF induces foreign investors to take advantage of the existing good infrastructures to establish more businesses and create more employment for the people hence promoting economic growth.

Inflation is expected to have either a negative or positive relationship on GDP growth depending on the magnitude of the inflation. A very high level of inflation in the long-run negatively affects GDP as it erodes the values of the local currencies and a subsequent reduction in production of goods and services in COMESA region. And this discourages economic growth in COMESA as assets lose values. On the other hand low levels of inflation in the short-run is a good indicator of economic stability and foreign investors are attracted to invest in stable economies.

3.5 Specification of the Empirical Models

The empirical models have been specified according to the research objectives it is intended to address. This study had two specific objectives, and therefore laid down two separate model specifications: the first specification is a panel Vector Auto regression with exogenous variables (PVARX) model which is used to address the first specific objective and the second specification is a linear panel model to which a Generalized Method of Moments (GMM) estimator is employed to address the second specific objective of this study.

3.5.1 Specification of the Empirical Models to Address Objective one of the Study

The study specified a panel VAR model with exogenous regressors (PVARX). In this specification, the endogenous variable are: Logarithm of GDP (*Loggdp*), Logarithm of FDI inflows (*Logfdi*) and logarithm of gross fixed capital formation (*Loggfkf*). The rest of the variables, such as Logarithm of domestic credit (*Logdomcredit*), Logarithm of Exports

(*Logexports*) and Inflation (*Inflation*) are treated as exogenous in the PVARX. The PVARX model with some exogenous regressors is thus specified as:

$$\begin{aligned} \text{Loggdp}_{it} = & \beta_{10} + \sum_{i=1}^m \beta_{1i} \text{Loggdp}_{it-i} + \\ & \sum_{j=1}^m \beta_{1j} \text{Logfdi}_{it-j} + \sum_{k=1}^m \beta_{1k} \text{Loggfkf}_{it-j} + \rho_{11} \text{Logdomcredit}_{it} + \rho_{12} \text{Logexports}_{it} + \\ & \rho_{13} \text{Inflation}_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Logfdi}_{it} = & \beta_{20} + \sum_{i=1}^m \beta_{2i} \text{Logfdi}_{it-i} + \\ & \sum_{j=1}^m \beta_{2j} \text{Loggdp}_{it-j} + \sum_{k=1}^m \beta_{2k} \text{Loggfkf}_{it-j} + \rho_{21} \text{Logdomcredit}_{it} + \\ & \rho_{22} \text{Logexports}_{it} + \rho_{23} \text{Inflation}_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Loggfkf}_{it} = & \beta_{30} + \sum_{i=1}^m \beta_{3i} \text{Loggfkf}_{it-i} + \\ & \sum_{j=1}^m \beta_{3j} \text{Loggdp}_{it-j} + \sum_{k=1}^m \beta_{3k} \text{Logfdi}_{it-j} + \rho_{31} \text{Logdomcredit}_{it} + \rho_{32} \text{Logexports}_{it} + \\ & \rho_{33} \text{Inflation}_{it} \end{aligned} \quad (3)$$

3.5.1.1 Lag Selection Criterion in the Panel VAR model

Selection of optimal lags in PVARX estimation has remained a critical concern in empirical modelling of time series relationships (Ozcicek & McMillin, 2001). The central role of lag length determination in VAR models was demonstrated by Braun and Mittnik (1993) who indicated that estimates of a VAR whose lag length differs from the true lag length yield inconsistent results. This study based on the Hansen's (1982) J statistic and three moment model selection criteria (MMSC) developed by Andrews and Lu (2001), namely the MMSC-Bayesian information criterion (MBIC), MMSC-Akaike information criterion (MAIC), and MMSC-Hannan and Quinn information criterion (MQIC) to select the optimum number of lags to include the panel PVARX model.

3.5.2 Specification of the Empirical Model to Address Objective Two of the Study

Objective two of this study aims at investigating the causal effect of FDI inflows on economic growth among the COMESA member states. Because of the bi-directional causality between the two study variables reported in empirical research (e.g. Nistor, 2014; Khun, 2018), there is potential endogeneity in the economic growth-FDI relationship. Consequently, this relationship may yield biased and inconsistent estimates when estimated by the panels least squares estimation procedures such as fixed effects (FE), random effects (RE) or even the

pooled OLS estimation procedure (Musiiita et al., 2023). On similar grounds, the empirical model consists of the gross capital formation (GKF) as a control variable, which has also been reported to be an endogenous regressor in a growth function by some empirical studies (e.g. Nweke et al., 2017; Ongo and Vukenkeng, 2014)

To address the endogeneity bias that may arise from the endogeneity of the FDI and GKF variables in the economic growth-FDI relationship, this study specified a panel empirical model of the economic growth-FDI relationship that allows the application of some Instrumental Variable (IV) estimator which removes the endogeneity bias brought about by the endogenously determined FDI and GKF variables which have been included in the empirical regression model as independent variable and control variable respectively.

More specifically, this study adopts the Arellano and Bond (1991) dynamic first differenced generalized method of moments (D-GMM) estimator to estimate the empirical panel model so as to address objective two of the study. The D-GMM estimator uses moment conditions in which lags of the dependent variable and first differences of the exogenous variables are instruments for the first-differenced equation.

A more generalized dynamic panel model to be estimated is specified as follows:

$$y_{it} = \alpha y_{it-1} + x'_{it}\beta + \mu_i + \gamma_t + \varepsilon_{it} \quad (4)$$

Where subscript i indicates the cross section dimension, subscript t indicates the time dimension, y is the dependent variable, y_{t-1} is the first lag of the dependent variable, α is the dynamic term coefficient, x' is a vector of the regressor variables, β is a vector the partial slope coefficients, μ represents the unobserved heterogeneity effect, γ is the time dummy which captures shocks that affect y across the individual countries being studied and ε is the idiosyncratic error term.

The specific panel model to be estimated has been specified as a log-linear dynamic panel model in scalar notations as follows:

$$\begin{aligned} \log gdp_{it} = & \alpha \log gdp_{i,t-1} + \beta_1 \text{Logfdi}_{it} + \beta_2 \text{Loggfkf}_{it} + \beta_3 \text{Logdomcredit}_{it} + \\ & \beta_4 \text{Logexports}_{it} + \beta_8 \text{inflation} + \mu_i + \gamma_t + \varepsilon_{it} \end{aligned} \quad (5)$$

3.6 Diagnostic Tests

The study conducted diagnostic tests before model estimation and also after model estimation. The diagnostic tests conducted before model estimation were to assess data behavior in the panel model, some of which were to justify the selection on model analytical procedures. The pre-estimation diagnostic tests included among others the multicollinearity tests, panel unit tests and panel cointegration tests.

On the other hand, the post-estimation diagnostic tests which were conducted after the empirical model was estimated by the D-GMM procedure were conducted to assess the validity or the robustness of the model estimates. The robustness tests that were conducted included among others: the Hausman specification test (which tested whether there was a systematic difference in the coefficients between the D-GMM estimates and the OLS estimates); the Sargan test which tested for presence overidentifying restrictions); the Wald test (which tested for composite linear hypotheses for significance all partial slope estimates simultaneously); the Serial correlation test (which tested for presence of first-order and second-order serial correlation in the first-differenced residuals) and the normality of residuals tests (which tested normality of residuals from the D-GMM regression model).

3.6.1 Multicollinearity Test in the Empirical Model

Unlike in natural sciences where experimental based studies are mostly conducted under controlled conditions, in economics, modelling economic variables are not subjected under controlled conditions. Consequently, economic modelling does not rule out the possibility of the existence of high inter-correlations among explanatory variables. This phenomenon associated to highly correlated variables is referred to as multicollinearity (Mukras, 1993:337). Multicollinearity arises from the presence of interdependence, or the lack of independence among explanatory variables in multivariate regression model.

This study took two steps to test for multicollinearity: the first step was a pre-estimation multicollinearity check where a correlation matrix was estimated in which estimates of the pairwise correlation coefficients were analyzed. In this case, correlation coefficients of 0.8 (in absolute terms) and above would be an indicator of high multicollinearity (Gujarati, 2004; Rendón, 2012). The second step was a post-estimation diagnostic test for multicollinearity in

which the variance inflating factors (VIFs) of each independent variable were estimated. In this case the VIFs in excess of 10 were considered to be an indicator of high multicollinearity.

3.6.2 Panel Unit Root Tests in the Empirical Model

The study conducted the panel unit root tests on each variable in the empirical model to assess stationarity status of the model variables. The panel unit root tests are also a pre-condition for panel cointegration test. This is because cointegration establishes long run equilibrium relationships between non-stationary variables, and so for a cointegration test, either all the variables are non-stationary in levels or at least the dependent variable is non-stationary in levels though one or all the independent variable may be stationary in levels.

This study implemented a Fisher-type (Choi, 2001) panel unit root test procedure. This panel unit root test allows for both balanced and unbalanced panels with panel dimensions $T > N$. The study period of this study spans from 1994 -2019 ($T = 26$) on 19 COMESA member states ($n=19$). Thus, the selected panel unit root procedure is appropriate given the panel dimensions of the panel of countries being considered in this study.

3.6.3 Panel Cointegration Test in the Empirical Model

A panel cointegration test requires that either all the variables are non-station in levels but are integrated of some order or at least a dependent variable is non-stationary in levels. In this study, the adopted panel unit root test showed the dependent variable was non-stationary in levels and became stationary in first difference. The independent variables showed mixed orders of integration. Some were $I(0)$ and others were $I(1)$. By the fact that at least the dependent variable was integrated of order one, the condition for a cointegration test was fulfilled. This study employed the Johansen-Fisher cointegration test for panel data which is an appropriate cointegration test in a panel model with variables that are integrated of different orders (Maddala & Wu, 1999).

3.6.4 Specification Tests

The study implemented the Hausman specification test, which tested whether there was a systematic difference in the coefficients between the D-GMM estimates and the OLS estimates. Stata allow implementation of this test after the panel model has been estimated by D-GMM, under the null hypothesis that there is no systematic difference in the coefficients between the

D-GMM estimates and the OLS estimates. The null hypothesis is rejected if the reported p-value of the associated test statistic is less than the significance level of 0.05, and in this case the use of the instruments in the model estimation would be justified.

3.6.5 Endogeneity Tests

This study employed an IV-based estimation method (i.e. the D-GMM) to estimate the empirical panel model that addresses objective two of the study. This method was selected for estimation on the basis of both theoretical and empirical evidence that “the regressors FDI inflows and gross fixed capital formation present a simultaneity causality with gross domestic product”. Thus it was necessary to conduct a (joint) endogeneity test of these two regressors after the D-GMM estimation, under the null hypothesis that the two regressors are jointly exogenous. The null hypothesis is rejected if the reported p-value of the associated test statistic is less than the significance level of 0.05, and in this case the two regresses would have been found to be joint endogenous in the specified model, and the use of the instruments in the model estimation would be justified.

3.6.7 The Wald Test of Joint Linear Hypothesis

The study also tested whether all the estimated slope coefficients of the empirical panel model were jointly insignificant at the testing level of 0.05. For this purpose, the study implemented the Wald test after the D-GMM estimation, which tests the null hypothesis that all the slope coefficients are simultaneously equal to zero. The null hypothesis is rejected if the reported p-value of the associated test statistic is less than the significance level of 0.05, and in this case the all the model estimated would be simultaneously statistically significant at the testing level of 0.05.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION

4.0 Introduction

The chapter presents empirical research findings, interpretations and discussions of the findings. The chapter first presents the findings from the descriptive statistics, followed by the key pre-estimation diagnostic tests results which includes a multicollinearity test, panel unit root tests and panel cointegration tests. The chapter then presents, interprets and discusses the regression estimates together with the relevant post-estimation diagnostic test results.

4.1 The Descriptive Statistics

The key descriptive statistics of interest in this study have been analyzed at two forms: first one is the tabular and the second one is the graphical form.

4.1.1 The key Descriptive Statistics in Tabular Form

The tabular form descriptive statistic of interest in this study were: the mean, minimum values, maximum values and the coefficient of variation. All the descriptive statistics of interest are conducted on variables in their original units. The mean values have preferred because they represent the average values of each variable. Minimum and maximum values represent the extreme values in the data while the coefficient of variation (CV) is good measure of data spread and easier to interpret. In this case a CV in excess of 25 percent would indicate a high level of variability in the variable under investigation, and this would reduce of the level of parameter accuracy (Kelly, 2007). The key descriptive statistics are summarized in Table 4.1. (All countries in the panel; study period: 1994-2019; Variables in original units of measurement)

Table 4. 1: Key Descriptive Statistics on All Model Variables

Variable	Obs	Mean	Min.	Max.	CV
GDP (billion US dollars)	364	27.7933	0.3192	332.4420	1.8488
FDI (billion US dollars)	364	0.6796	-0.4827	11.5781	2.2311
GKF (billion US dollars)	348	5.3004	0.0242	63.9066	1.7088
EXPORTS (billion US dollars)	364	6.561433	0.0282	64.2663	1.7115
DOMCREDIT(billion US dollars)	364	6.8201	0	113.4790	2.3229
INFLATION (GDP deflator, %)	364	97.6356	-27.0487	26765.8600	14.4341

Source: Compiled by the Researcher

As shown in the Table 4.1, there were 364 observations in each variable except gross capital formation (GKF) which had 348 observations, and this was attributed to some missing observations on GKF for Zambia for the period 1994-2009. All variables recorded a coefficient of variation that is less than 25, suggesting that data variability/spread is good to yield accurate parameter estimates as suggested by Kelly (Kelly, 2007).

For the variable GDP, the summary descriptive statistics in Table 4.1 show that the mean value in the GDP variable for all the countries studied in the panel was approximately 27.8 billion US dollars over the study period. The minimum GDP was approximately 0.3 billion US dollars and the maximum GDP was approximately 332.4 billion US dollars. Further analysis of raw data revealed that the minimum value of GDP was recorded in Comoros in the year 1994. The maximum value of GDP was recorded in Egypt in the year 2016.

The FDI (net inflows) variable indicated a mean value of approximately 0.68 billion US dollars for all the countries over the study period. The descriptive statistics in Table 4.1 indicate that the minimum value in the FDI net inflows was approximately -0.48 billion US dollars while the maximum value of the FDI net inflows was recorded at approximately 11.58 billion US dollars. Information from raw data reveal that the minimum FDI net inflows value was registered in Egypt in the year 2011 while the maximum FDI net inflows value was registered Egypt in the year 2007.

The descriptive statistics in Table 4.1 show that the GKF variable had a mean value of approximately 5.3 billion US dollars for all the countries in the panel over the study period. The GKF had a minimum value of approximately 0.02 billion US dollars with a maximum

value of approximately 63.9 billion US dollars. Further scrutiny of the raw data reveal that the minimum value of GKF variable was recorded in Burundi in the year 2000 and the maximum value of GKF variable was recorded in Egypt in the year 2019.

For the EXPORTS variable, the descriptive statistics in Table 4.1 show that mean value of EXPORTS was approximately 6.56 billion US dollars for all the countries in the panel over the study period. The minimum value of the EXPORTS variable was recorded at approximately 0.023 billion US dollars and the maximum value recorded at approximately 64.27 billion US dollars. Further analysis of the raw data revealed that the minimum value of the EXPORTS variable was recorded in Comoros in the year 1994 and the maximum value of the EXPORTS was recorded in Libya in the year 2008.

The descriptive statistics in Table 4.1 indicate that mean value in the DOMESTIC CREDIT variable for all the countries in the panel over the study period was 6.82 billion US dollars; the minimum value was 0 billion US dollars and the maximum was approximately 113.48 billion US dollars. Analysis of raw data reveal that the minimum value of 0 billion US dollars in the DOMESTIC CREDIT was recorded in Zambia over the period 1994-2001 while the maximum value of 113.48 billion US dollars was recorded in Egypt in the year 2016.

Furthermore, the descriptive statistics in Table 4.1 show that the INFLATION variable measured as percentage GDP deflator, indicate that mean value in the INFLATION variable for all the countries in the panel over the study period was approximately 97.6 percent; the minimum INFLATION was approximately -27.15 percent and the maximum INFLATION was 26765.86 percent. According to the information contained in the raw data, the minimum INFLATION rate of approximately -27.15 percent was recorded in Zimbabwe in the year 1998 while the maximum INFLATION rate of 26765.86 percent was recorded in Dem. Rep. of Congo in the year 1994.

4.1.2 The Over identifying Restrictions Tests

Estimation by Instruments variables requires that the number of instruments selected in the estimation be optimal and valid. This study implemented the Sargan test of overidentifying restrictions under the null hypothesis that the instruments used are jointly valid. The null hypothesis is rejected if the reported p-value of the associated test statistic is less than the significance level of 0.05, and in this case the instruments used in the D-GMM estimation

would be jointly invalid. The instruments would only be jointly valid if the reported p-value of the associated test statistic exceeds the significance level of 0.05.

4.1.3 The Key Descriptive Statistics in Graphical Form

The study’s preferred descriptive statistics in graphical form is the trend in the variables under investigation, that is, trend in foreign direct investment inflows and economic growth. The trends have been generated for each country in the panel in the log-transformed variables and are shown in Figure 4.1

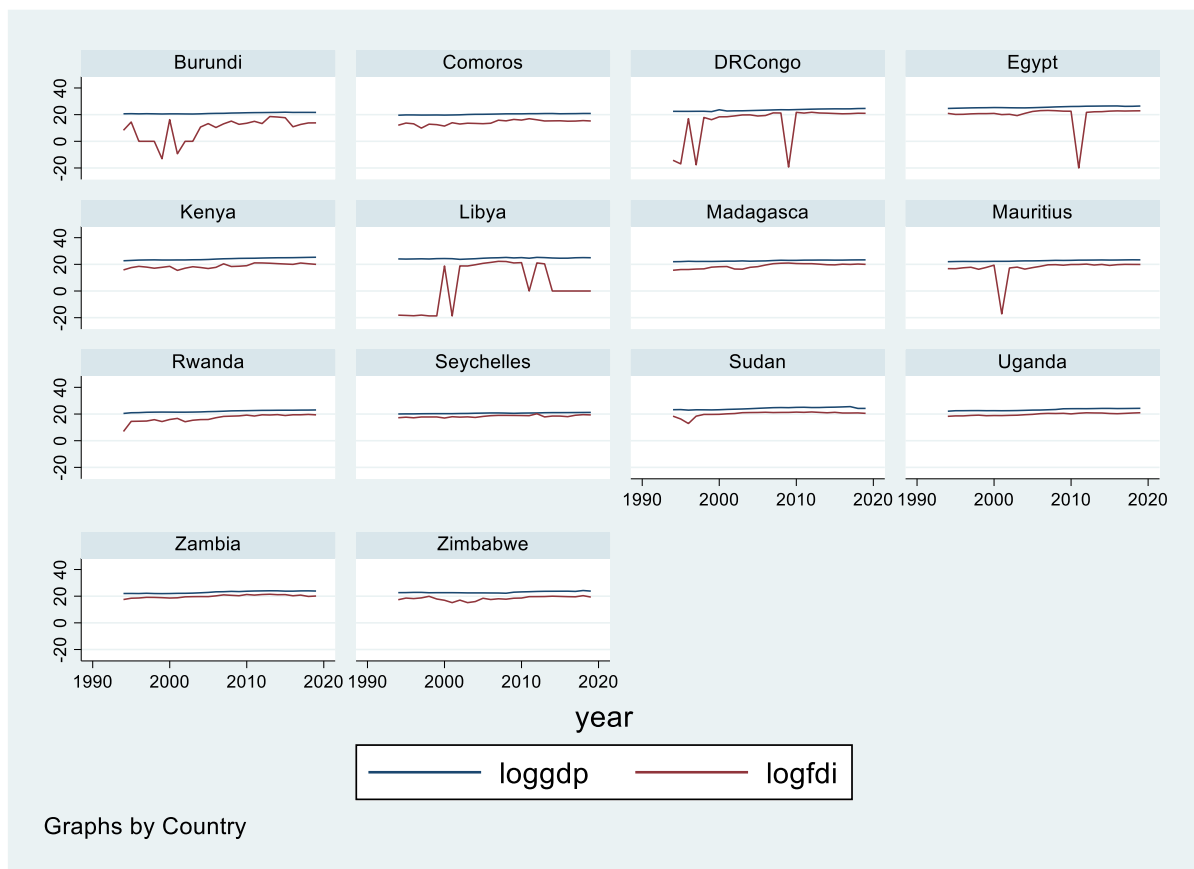


Figure 4. 1: Trend analysis of Foreign Direct Investments net inflows and GDP among COMESA Member Countries (period 1994-2019).

Source: Generated by the author from raw data.

The trends in the FDI net inflows over the study period, as indicated in figure 4, show that on average, the FDI net inflows and GDP have been slightly trending upwards together. Such slight joint upward trend may be a pointer that the FDI net inflows and DGP may be poorly associated among the COMESA member states. It is further observed that, the trend in the FDI net inflows shows significant upward and downward spikes at some points for Libya and Dem.

Rep. of Congo, while there is at most one down ward spike in the FDI net inflows in Mauritius and Egypt respectively.

4.2. Multicollinearity Test Results

As a pre-estimation diagnostic check to investigate the level of linear relationships between explanatory variables, this study estimates pairwise correlation coefficients between the explanatory variables in the model were analyzed. The summary of the estimates of the pairwise correlation coefficients between the independent variables in the empirical model is summarized in Table 4.2.

Table 4. 2: Pairwise Correlation Coefficients between the Independent Variables

(Figures in parentheses are p-values)

Variable	Log (FDI)	Log (GKF)	Log (DOMCRED)	Log (EXPORTS)	Inflation
Log (FDI)	1				
	0.2666***				
Log (GKF)	(0.0000)	1			
Log (DOMCRED)	0.1679***	0.7877***	1		
	(0.0015)	(0.0000)			
	0.1988***	0.7205****	0.7757****		
Log (EXPORTS)	(0.0001)	(0.0000)	(0.0000)	1	
	-0.2003***	-0.0390	-0.0932	-0.0091	
Inflation	(0.0001)	(0.4689)	(0.0792)	(0.8630)	1

Source: Compiled by the researcher. *** indicates significance at 1% level.

The estimates of the simple correlation coefficients summarized in Table 4.1 show that the correlation coefficients range from the smallest estimate of 0.1988 to the highest estimate of 0.7877. The upper limit from the correlation coefficient estimates (i.e. $r = 0.7877$) is less than the threshold value of 0.8 in absolute terms to cause the multicollinearity problem, suggesting that the inclusion of all the independent variables in the model does not raise the problem of high multicollinearity.

4.3 Panel unit Root Test Results

Having a panel with a panel dimension that exceeds the time dimension, this study implemented a Fisher-type (Choi, 2001) panel unit root test procedure which is appropriate for such kind of panel size. Table 4.3 gives the summary of the unit root test results as well as order of integration of variables in the model being estimated.

Table 4. 3: Panel unit root results on all variables in the final model for empirical estimation

Variable	Fisher-type unit-root test Statistic and P-value									
	Fisher-type unit-root test Statistic and P-value (Variable in Levels)					Fisher-type unit-root test Statistic and P-value (Variable in in First difference)				
	P	Z	L*	Pm	Mod. inv. Chi.sqd	P	Z	L*	Pm	Mod. inv. Chi.sqd
Log(GDP)	10.72 (0.9987)	2.56 (0.9947)	2.38 (0.9900)	-2.31 (0.9895)	314.99*** (0.0000)	- (0.0000)	- (0.0000)	- (0.0000)	38.35*** (0.0000)	I(1)
Log(FDI)	46.67* (0.0148)	1.97* (0.0243)	2.22* (0.0148)	2.49* (0.0063)	-	-	-	-	-	I(0)
Log(GKF)	12.55 (0.9947)	2.15 (0.9842)	2.03 (0.9772)	-2.06 (0.9805)	131.91*** (0.0000)	- (0.0000)	- (0.0000)	- (0.0000)	13.88*** (0.0000)	I(1)

					(0.000 0)	(0.000 0)	(0.000 0)	(0.00 00)	
					88.41* **	- 5.78**	- 6.2***	8.07* **	I(1)
Log(DOMC RED)	23.21 (0.722 3)	2.02 (0.97 86)	2.03 (0.976 9)	-0.64 (0.738 8)	(0.000 0)	* (0.000 0)	(0.000 0)	(0.00 00)	
					146.02 ***	- 8.91**	- 10.73*	15.77 ***	I(1)
Log(EXPO RTS)	15.75 (0.969 3)	2.62 (0.99 56)	2.42 (0.991 1)	-1.63 (0.949 1)	(0.000 0)	* (0.000 0)	** (0.000 0)	(0.00 00)	
					-	-	-	-	I(0)
Inflation	174.38 *** (0.000 0)	-8.47 (0.00 00)	12.38 *** (0.000 0)	19.56 *** (0.000 0)					

(Figures in Parenthesis are p-values)

Source: Compiled by the author. *** and ** indicate significance at 1% and 5% respectively. OOI designates order of Integration.

Table 4.3 shows the summary of the panel unit root test results from the Fisher-type unit-root test procedure. The variables have been tested for stationarity in levels and in first differences (where applicable). In all cases, the testing level is 5 percent (i.e. $\alpha = 0.05$). The adopted panel unit root procedures (i.e. the Fisher-type unit-root test) produces four statistics: Inverse chi-squared (P), the Inverse normal (Z), Inverse logit (L*) and the Modified inverse chi-squared (Lm).

According to the results summarized in Table 4.3, all the four statistics produced by Fisher-type unit-root test did not reject the null hypothesis of having a unit root (or of being non-stationary) in levels for variables Log (GDP), Log (GKF), Log (DOMCRED) and Log (EXPORTS). However, all the four statistics produced by Fisher-type unit-root test rejected the null hypothesis of having a unit root (or of being non-stationary) in the first differences of each of these variables. The implication of these panel unit root test results is that the variables

Log(GDP), Log(GKF), Log(DOMCRED) and Log(EXPORTS) were integrated of order one, I(1).

On the other hand, all the four statistics produced by Fisher-type unit-root test rejected the null hypothesis of having a unit root (or of being non-stationary) in levels for variables Log(FDI) and INFLATION, suggesting that the variables of Log(FDI) and INFLATION were integrated of order zero, I(0).

4.4 Cointegration Test Results in the Empirical Panel Model

Having found mixed orders of integration in the variables of the empirical panel model, the study employed the Johansen-Fisher cointegration test (Maddala & Wu, 1999). This test well accommodates panel variables that exhibit mixed orders of integration. Because the version for STATA that was used in the analysis of data in this study (Stata/MP 17.0) did not have a command to run the Johansen-Fisher panel cointegration test, the panel data was exported to EViews software version 9 and the Johansen Fisher panel cointegration test was conducted. The cointegration test results are summarized in Table 4.4.

Table 4. 4: Johansen-Fisher Panel cointegration test results

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized	Fisher Stat.*	Prob.	Fisher Stat.*	Prob.
No. of CE(s)	(from trace test)		(from max-eigen test)	
None	464.9***	0.0000	231.5***	0.0000
At most 1	267.9***	0.0000	138.6***	0.0000
At most 2	154.3***	0.0000	101.0***	0.0000
At most 3	74.99***	0.0000	50.53***	0.0027
At most 4	47.09***	0.0069	41.29***	0.0290
At most 5	36.52*	0.0825	36.52*	0.0825

Source: Generated by the Author. *** and * indicate significance at 1% and 10% levels respectively

Results of the Johansen-Fisher cointegration test, as shown in Table 4.4, indicate that both the Trace test and Max-Eigen test reject the null hypothesis of existence of at most four cointegration equations at 5 percent level of significance. The cointegration test results suggest that there are five cointegrating equations in the empirical panel being estimated in this study.

4.4.1 Implications of Presence of Cointegration for Estimation

The cointegration tests results have shown that there is presence of cointegration in the empirical panel model. This suggests presence of long run equilibrium relationships between economic growth and the determinants of economic growth identified as independent variables in the empirical panel model. Presence of cointegration in the panel has two key implications for estimation: (i) The dependent variables can be regressed against the independent variables with non-differenced variables (that were non-stationary in levels) without worrying about possibility of spurious regression estimates, (ii) One can employ cointegration regression estimation procedure such as the fully modified OLS (FMOLS) or the dynamic OLS (DOLS) to estimate the empirical panel model.

The focus of this study was not the analysis of long run relationships between variables, rather the focus of the study were to investigate the direction of casualty between FDI and economic growth as well as to investigate the effect of FDI inflows on economic growth among the COMESA member states. Now that the cointegration test results have shown that the variables may not necessarily be differenced (to avoid spurious regression estimates), this study employs the panel vector auto regression (PVAR) technique to address the first objective of this study and the first difference generalized of moments (D-GMM) estimator which removes endogeneity bias brought about by presence of some endogenous determined regressors appearing in the empirical model.

4.5 Estimating the Panel Vector Auto Regression with Exogenous Regressors (PVARX) to Address Objective One.

Before the estimation of the PVARX model, the study first conducted a lag-section order. This was aimed at including the optimal number of lags in the PVARX model. Thereafter, post estimation procedures after PVARX were conducted for two main reasons: to directly address

objective one (that is, establishing the direction of causation between FDI inflows and economic growth) and to check for the validity of PVARX estimates.

4.5.1 Lag-order Selection for Panel VAR

The study first identified the optimal number of lags to be used in the PVARX estimation on the estimation sample. The optimal lag selection has been based on the Hansen's (1982) J statistic and a combination of three moment model selection criteria (MMSC) namely; the MMSC-Bayesian information criterion (MBIC), MMSC-Akaike information criterion (MAIC), and MMSC-Hannan and Quinn information criterion (MQIC). Table 4.5 shows the lag-order selection statistics for panel VAR.

Table 4. 5: Lag-order Selection in the Panel VAR

Lag	CD	J	J-value	MBIC	MAIC	MQIC
1	1	.	.	.	.	.
2	1	.	.	.	.	.
3	1	.	.	.	.	.
4	0.9998905	2.19e+07	0.0000	2.19e+07	2.19e+07	2.19e+07

Source: Generated by the author

The Lag-selection results indicated in Table 4.5 show that Hansen's (1982) J statistic together with MBIC, MAIC and MQIC all agree that the optimal lag-length in the panel VAR be four. Thus, this study included four lags in the estimation of the empirical panel VAR in which some exogenous regressors were included (PVARX).

4.5.2 Estimates from Panel VAR with Exogenous Regressors

The study fits a homogeneous panel vector auto regression with exogenous regressors (PVARX) models by fitting a multivariate panel regression of each endogenous variables in the panel, i.e. Log (GDP), Log (FDI) and Log (GKF) on lags of itself and on lags of all other endogenous. In the estimation of PVARX model, STATA uses an interactive version of generalized method of moments (GMM) with analytic derivatives. The PVARX model thus instrumental variables in its estimation. Particularly the PVARX uses lag orders of dependent variable as instruments in its estimation. The PVARX estimates and the panel VAR granger causality Wald tests after PVARX are summarized in Tables 4.6 and 4.7 respectively.

Table 4. 6: Summary of the Estimates of Panel VAR with Exogenous Regressors

[Optimal Lags=4; Only the Equations for Log (GDP) and Log (FDI) are Summarized]

Endog. Var. Equation	Coef.	Std. Err.	P-value
Equation for Log(GDP)			
Log(GDP)			
L1	0.8363***	0.130215	0.000
L2	-0.1071	0.115555	0.354
L3	-0.1376	0.102912	0.181
L4	0.18105***	0.061607	0.003
Log(FDI)			
L1	0.0002	0.001796	0.932
L2	-0.0011	0.001323	0.421
L3	0.0012	0.001563	0.434
L4	0.0024	0.001565	0.114
Log(GKF)			
L1	-0.0821	0.059726	0.169
L2	0.1281**	0.052961	0.016
L3	0.0042	0.054110	0.937
L4	-0.0677**	0.031728	0.033
Log(DOMCRED)	-0.0245	0.048452	0.613
Log(EXPORTS)	0.2156***	0.080542	0.007
INFLATION	0.0006***	0.000051	0.000
Equation for Log(FDI)			
Log(FDI)			
L1	-0.1029	0.101645	0.312
L2	0.0653	0.095308	0.493
L3	-0.0003	0.076671	0.997
L4	0.0406	0.0589346	0.491
Log(GDP)			
L1	-13.0704***	4.098875	0.001
L2	5.5037	4.601970	0.232
L3	9.6834**	4.183860	0.021

L4	-4.9456	3.285313	0.132
Log(GKF)			
L1	3.2085*	1.796230	0.074
L2	-0.5428	2.259842	0.810
L3	-2.5202	1.864498	0.176
L4	2.2073	1.448072	0.127
Log(DOMCRED)	-5.1578**	2.151877	0.017
Log(EXPORTS)	8.5223***	2.976308	0.004
INFLATION	-0.0025	0.0019528	0.197

Instruments : L(1/6).(loggdp logfdi loggkf), logdomcredit, logexports, inflation

Final GMM Criterion Q(b) = 0.0672

GMM weight matrix: Robust

No. Obs = 250

No. of panels = 14

Hansen's J chi-sq. = 16.794516 (p = 0.537)

Source: Compiled by the author. ***, ** & * indicate significance at 1%, 5% and 10% levels respectively.

Robustness of the PVARX Estimates

STATA uses instrumental variables by implementing an interactive version of GMM with analytic derivatives to estimate a panel VAR. In the PVARX estimation, this study controlled for panel-specific fixed effects by instructing STATA to use forward orthogonal deviation or Helmert transformation. Additionally, the study instructed STATA to report standard errors that are robust to any kind of model misspecification. On the validity of the instruments used in the PVARX estimation, the estimated Hansen's J chi-square statistic of 16.7945, with a corresponding p-value of 0.535 does not reject the null hypothesis that the instruments used in the PVARX are jointly valid and exogenous, which suggests that the instruments used in the PVARX estimation are in fact jointly valid and exogenous.

Table 4. 7: Panel VAR-Granger causality Wald test results after PVARX

Equation	Excluded variables	Chi-sq. stat.	p-value
Log(GDP)	Log (FDI)	7.900*	0.089
	Log (GKF)	9.526**	0.049
	ALL	11.184**	0.041
Log(FDI)	Log (GDP)	13.569***	0.009
	Log (GKF)	5.668	0.225
	ALL	20.173**	0.010
Log(GKF)	Log (GDP)	12.253**	0.016
	Log (FDI)	7.598	0.107
	ALL	23.119***	0.003

Source: Compile by the author. ***, **& * indicate significance at 1%, 5% and 10% levels respectively.

4.5.2.1 Interpretation and Discussion of the Estimates from PVARX and the Panel VAR-Granger Causality Wald test Results: Addressing Objective One of this Study

The first objective this study was to investigate the direction of causality between FDI inflows and economic growth among COMESA member states. In the PVARX estimates (Table 4.6), causality is expressed by dynamics. As long as the lags used in the PVARX estimation are optimal, each block of the estimates of the PVARX that contains lagged variables is an OLS regression that represent the short-run dynamics between the endogenous variables being analyzed individually and taken together/jointly. But because of many lags in each block which may exert varying influences on the given endogenous variable, it is valuable to conduct a panel VAR granger casualty test as a sufficient condition to examine the nature of causality relationships between the endogenous variables being modeled (Table 4.8). The panel VAR granger test results can then be used to established direction of causality, noting that Granger causality is an econometric test used to verify the usefulness of one variable to forecast another. Table 4.8 shows the summary of the results from the panel VAR granger casualty test after PVAX.

Under the null hypothesis that Log (FDI) does not granger cause Log (GDP), the estimated chi-square statistic from the panel granger causality test, as indicated in Table 4.7, does not reject this null hypothesis at 5 percent level of significance (Chi. sq. = 7.900; $p = 0.089$). This result suggests that causality does not run from Log (FDI) to Log (GDP). The implication of this result is that FDI net inflows do not help to predict economic growth among the COMESA member states. On contrary however, the estimated chi-square statistic from the panel granger causality test, as indicated in Table 4.7, rejects this null hypothesis that Log (GDP) does not granger cause Log (FDI) at 5 percent level of significance (Chi. sq. = 13.569; $p = 0.009$), suggesting that causality runs from GDP to FDI. The implication of this result is that is that economic growth (measured by growth in GDP) can help to predict or forecast FDI net inflows among the COMESA member states, but FDI inflows cannot help to predict or economic growth among the COMESA member states.

Considering the results of joint/combined causality of FDI and GKF variables on GDP, the estimated chi-square statistic indicated in Table 4.7 rejects the null hypothesis at 5 percent level of significance that Log(FDI) and Log(GKF) jointly do not granger cause Log(GDP) (Chi. sq.= 11.184, $p = 0.041$). This result suggests that causality runs from Log (FDI) and Log (GKF) jointly to Log (GDP). The implication of this result is that FDI net inflows and gross capita formation jointly can help to forecast economic growth among the COMESA member states.

It is observed from the panel granger causality test results summarized in Table 4.7 that Log (GKF) granger causes Log (GDP) (Chi. sq.= 9.526, $p = 0.049$) and that Log (GDP) granger causes Log (GKF) (Chi. sq.= 12.253, $p = 0.016$). This result suggests a bidirectional causality between Log (GDP) and Log (GKF) among the COMESA member states.

4.5.2.2 Conclusion on estimates from PVARX and Panel Granger Causality Tests

In a nutshell, estimates from panel granger causality test after PVARX indicate a unidirectional causality from GDP to FDI net inflows, and not causality from FDI net inflows to GDP among the COMESA member states. This result suggests that whereas on one hand economic growth has the ability to predict FDI net inflows, FDI inflows on the other hand does not have ability to predict GDP among the COMESA member states. The results from this study on causality nexus between FDI and economic growth tall well with the findings of some related studies, for instance, a study by Aluvarado et al. (2017) who employed VAR approach on 19 Latin American countries for the study period 2005-2015 and reported that that FDI did not cause

economic growth. The results from this study on the other hand contract findings of some related studies, for instance a study by Owolabi-Merus (2015) on Nigeria for the period 1981–2013 using Granger causality test and reported a uni-directional causation from FDI to GDP. In addition, results from this study do not tally very well with findings of Khun (2018) who employed Granger Causality test to examine causality between foreign direct investment and economic growth for Cambodia for the study period 2006-2016 and found a bi-directional causality between FDI and economic growth.

4.5 Regression Estimates from D-GMM Estimation: Addressing Objective Two of the Study

The study implemented the Arellano-Bond (1991) Difference Generalized Method of moments (D-GMM) dynamic panel estimator which is an appropriate estimator for panels that may contain fixed effects, idiosyncratic errors that are heteroskedastic and correlated within but not across individuals and deals with endogeneity bias due to presence of the endogenously determined independent variables in the panel model. The summary of the regression estimates from the D-GMM estimation is provided in Table 4.8.

Table 4. 8: Regression Estimates from D-GMM Estimation

Dependent variable: Log (GDP)_{i,t}			
Independent Variables	Coef.	Std. Err.	p-value
Log(GDP) _{i, t-1}	0.15151****	0.056255	0.007
Log(FDI) _{i,t}	0.00257	0.001705	0.132
Log(GKF) _{i,t}	0.46167**	0.215283	0.032
Log(DOMCRED) _{i,t}	0.16478**	0.073578	0.025
Log(EXPORTS) _{i,t}	0.08275	0.126717	0.514
INFLATION _{i,t}	-0.00006	0.000161	0.689

ROBUTNESS TESTS

Wald Chi-sq test under Ho: All slope coefficients are simultaneously zero: Wald Chi.sq. stat. = 1435.52 (p = 0.000)

Arellano-Bond test for serial correlation under Ho: No AR(1) in first difference errors: z = -0.93 (0.3530)

Arellano-Bond test for serial correlation under under Ho: No AR(2) in second difference errors: z = -1.25 (0.210)

Jarque-Bera normality of residuals test under Ho: Normally distributed residuals: Chi.sq. stat. = 1.840 (p= 0.424)

Sargan test for overidentifying restrictions under Ho: instruments are jointly valid: Chi.sq. stat. = 2.66 (p = 0.265)

Diff.-in-Sargan test under Ho: subset of instruments in the levels equation are exogenous: Chi.sq.=0.61 (p=0.736)

Source: Author's compilation. ***, ** indicate significance at 1% and 5% levels respectively

4.5.1 Interpretation of Results from Robustness Tests

Before interpreting the regression coefficient estimates and their statistical significance, the study first interpreted the results from the robustness tests conducted after the D-GMM estimation. This is done to first ensure that the regression estimates are in fact valid to subject them to interpretations and discussions. The results from the key robustness tests conducted after D-GMM in this study are interpreted as follows:

The Wald Chi—square test: This test has the null hypothesis that all the slope coefficients are simultaneously equal to zero. This null hypothesis also means that the whole model is insignificant. The reported Chi—square statistic from the Wald test, as indicated in Table 4.8, is statistically significant at the testing level of 5 percent (Chi.sq. stat. = 1435.52, p = 0.000). In this case the Wald Chi—square test rejects the null hypothesis. This test result suggests that the whole model is significant. The Wald Chi—square test results also suggest that the included explanatory variables jointly can help to explain variations in economic growth among the COMESA member states.

Arellano-Bond tests for AR (1) and AR (2) errors: These tests are conducted to test for serial correlation in first difference and second difference errors respectively. In each case the null hypothesis is that there is no serial correlation. The estimated Z-statistics from the Arellano-Bond tests for AR(1) and AR(2) are both statistically insignificant at 5 percent testing level (z = -0.93, p= 0.3530; z = -1.25, p = 0.210). The estimated Z-statistics thus do not reject the null hypotheses of no serial correlation in the first difference errors and second difference errors respectively. This result suggests that the estimates of the regression coefficients are efficient.

Jarque-Bera normality of residuals: The Jarque-Bera normality tests the null hypothesis that the estimated residuals from the D-GMM regression are normally distributed. The estimated Chi—square statistic of 1.840 with a p-value of 0.424 implies that the null hypothesis is not rejected at 5 percent testing level. This result suggest that the residuals from the D-GMM regression are normally distributed. The implication of this result is that inferences conducted using the estimated test statistics are valid.

Sargan test for overidentifying restrictions: Since the D-GMM uses instrumental variables, it is vital to test for the validity of the instruments used in the D-GMM estimation. The Sargan test is used to test the null hypothesis that all the instruments as a group used in the D-GMM estimation are jointly valid and exogenous. The results, as indicated in Table 4.8, show that this test produced a Chi—square statistic of 2.66 with a corresponding p-value of 0.265. Since the p-value exceeds the testing level of 5 percent, the test does not reject the null hypothesis, which suggests that the instruments used in the D-GMM estimation were jointly valid and exogenous.

Difference.-in-Sargan test: The Difference-in-Sargan test is used to test for the validity/exogeneity of subset of instruments or validity/exogeneity of the instruments used in the levels equation. Cognizant that D-GMM estimation utilizes instruments in both the first differenced equation and in the levels equation, the Difference.-in-Sargan test is used to test for the validity/exogeneity of subset of instruments or validity/exogeneity of the instruments in the levels equation. Results in Table 4.8 indicate that the estimated Chi—square statistic from this test is 0.61 with a corresponding p-value of 0.736. The estimated Chi—square statistic thus does not reject the null hypothesis at 5 percent testing level. This result suggests that the subset of instruments used in the levels equation are valid and exogenous.

4.5.2 Interpretation and Discussion of the Regression Estimates from D-GMM Estimation: Addressing the Second Objective of this Research Study.

The second objective of this study was to investigate the causal effect of FDI on economic growth among the COMESA member states. The related null hypothesis that was set to be tested was that FDI has no significant causal effect on GDP among COMESA member states.

The Effect of FDI Net Inflows on Economic Growth among COMESA Member States

The regression estimates from the D-GMM estimation summarized in Table 4.8 show that the estimated slope coefficient on the Log (FDI) variable is positive and statistically insignificant at 5 percent testing level (Coef. = 0.00257, $p = 0.132$). The positive sign on the FDI variable is consistent with the a priori expectations, suggesting that the estimated regression coefficient on Log (FDI) is theoretically plausible. The corresponding p-value on the estimated slope coefficient on Log (FDI), i.e. p-value of 0.132 is however greater than the testing level of 0.05 implying that the estimated slope coefficient on Log (FDI) is statistically insignificant. This result suggests that net foreign direct investment inflows do not help to explain variations in economic growth among the COMESA member states. The statistical insignificance of the estimated partial slope coefficient on Log (FD) further implies that the null hypothesis that was set to be tested in relation to Log (FDI) is not rejected.

It is observed that, the estimates from D-GMM regression tall well with the results earlier obtained through PVARX and the panel granger causality test results in Table 4.6 and Table 4.7 respectively, in which the study results revealed that FDI net inflows do not granger cause economic growth among the COMESA member states, rather it is economic growth that granger causes FDI net inflows. The argument here is that, if the lags of the FDI variable did not help to predict economic growth as it was indicated by the PVARX results, then we find that it is sensible for the regression estimates to reveal that current values of FDI do not influence the current values of economic growth among the COMESA member states, and therefore the PVARX results match well with the D-GMM estimates.

The insignificant effect of FDI net inflows on economic growth among the COMESA member states could be explained by the meagre FDI-GDP ratios experience by the COMESA member states. Owing to the fact that FDI net inflows are measured by the direct investment equity flows in the reporting economy, most of the COMESA states have recorded small proportions of the investments equity in most of the projects while lions share equity accrue to foreigners. The skewness in investments equity in favour of foreigners makes the contribution of the net FDI inflows being insignificant in the host economies. Further, most FDIs come with their own labour and most of the profits from FDIs are repatriated. These factors combined make the FDI exerting an insignificant effect on economic prosperity among the COMESA member states. The inability of FDI to explain economic growth has been reported by other authors in related studies, for instance studies by Adams & Opoku (2015), Seyoum et al. (2015), Tang & Tan

(2015), Aga (2014), Aluvarado et al. (2017), Ramadhan et al. (2016), Kelly (2016), among others

4.5.3 Conclusion from the PVARX and Panel Granger Causality Results and D-GMM Regression Estimates in Relation to Study Objectives and Hypotheses

While the PVARX and panel granger causality tests were implemented to address objective one of this study, the D-GMM regression estimation was implemented to address objective two of the study. Results from the PVARX and panel granger causality tests revealed a uni-directional causation in which causality run from economic growth to FDI net inflows and not in the reverse direction. With this result, the first research hypothesis that was set to be tested in this study has been neither rejected nor not rejected. The D-GMM regression estimates indicated that FDI net inflows do not have a significant effect on economic growth among the COMESA member states. With this result, the second research hypothesis that was set to be tested in this study has been not rejected.

4.5.4 Interpretation of Regression Estimates on Control Variables

The control variables that were included in the empirical panel model were the log-transformed capital formation, Log (GKF); the Log-transformed exports, Log (EXPORTS); Log-transformed domestic credit to the private sector, Log (DOMCRED) and inflation (INFLATION). Estimates from D-GMM regression, as indicated in Table 4.8, show that all the coefficients on the control variables have right signs, i.e. positive sign on the coefficients of Log (GKF), Log (EXPORTS) and Log (DOMCRED) and negative sign on the coefficient of INFLATION. Results further reveal that among the control variables included in the empirical panel model, the variables of Log (GKF) and Log(DOMCRED) emerged out with estimates that were statistically significant at 5 percent test level (Coef. = 0.46167, $p=0.032$; Coef. = 0.16478, $p=0.025$ respectively). These estimates imply that that gross capital formation and domestic credit to the private sector have a positive significant effect on economic growth among the COMESA member states. Such results suggest that gross capital formation and domestic credit to the private's sector are important factors affecting economic growth among the COMES member states.

The positive and significant effect of gross fixed capital formation on economic growth is in agreement with the findings of a related study by Ncanywa and Makhenyane (2016) who examined the impact of gross fixed capital formation on economic growth of South Africa between 1960-2014 and found that gross fixed capital formation had a positive relationship with economic growth both in short run and long run. With regard to the domestic inflation variable, our study results are consistent with other related study for instance a study by Patrick et al. (2013) who determined the relationship between the GDP growth rate and inflation rate in Ghana and applied the methods of scatter plot, correlation analysis and simple linear regression estimated by OLS, and the result showed that there was a strong negative linear relationship between GDP growth rate and inflation rate in Ghana.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the study by highlighting the aim of the study, the study focuses and methodological procedure. The chapter also presents the conclusion from the study findings and provides policy recommendations on the basis of the findings from the study.

5.1 Summary

This study was launched with the aim of examining the nexus between foreign direct investment inflows and economic growth among COMESA member states. Two key objectives were investigated: first one focusing on the causality relationship between FDI inflows and economic growth, and the second one focusing on cause- effect relationship between the two variables under investigation. In the panel regression model to address the second study objective, the study included gross capital formation, domestic credit to the private sector, exports and inflation as control variables in the economic growth-foreign direct investment relationship. The study utilized panel data for the for the study period 1994-2019. Analysis to investigate causality has been achieved by implementing the panel vector auto regression with exogenous regressors (PVARX) and the panel granger causality tests after PVARX while analysis to investigate cause-effect relationship has been achieved by implementing first-difference generalized of moments (D-GMM).

Estimates from the PVARX and the results from the panel granger causality tests revealed that whereas causality run from economic growth to FDI net inflows, the causality did not run from FDI net inflows to economic growth among the COMESA member states. However, the panel granger causality results indicated that causality run from FDI and gross capital formation jointly to economic growth among the COMESA member states. The regression estimates from D-GMM estimation showed that the partial slope coefficient on the FDI variable was positive but statistically insignificant at 5 percent testing level, which suggested that FDI net inflows did not have a significant causal effect on economic growth among the COMESA member states. Among the control variables included in panel regression model, results showed that gross capital formation and domestic credit to the private sector had a significant positive

causal effect on economic growth among the COMESA member states while the inflation variable had a negative but insignificant effect on economic growth among the COMESA member states.

5.2 Conclusion

This study was set to examine the economic growth-FDI nexus among the COMESA member states by investigating both causality and cause-effect relationship between the variables. Estimates from analysis of data showed a uni-directional causality running from economic growth to FDI net inflows among the COMESA member states. Regression estimates showed that FDI inflows have no ability to influence economic growth in the COMESA member states. The other key findings from this study are: FDI and gross capital formation jointly granger caused economic growth and that gross capital formation and domestic credit to the private sector showed a positive and significant causal effect on economic growth among the COMESA member states.

5.2 Recommendations of the Study

Relying on the findings and conclusions of this study, this study suggests the following recommendations to COMESA governments to enhance economic growth.

- (i) First, it appears that FDI have the potential to cause economic growth only if it is jointly interacted with gross capital formation. In essence the study would recommend that FDI investment policies be strengthened and governments in the region should increase on budget allocations to finance gross fixed capital formation. Similarly, governments in the COMESA region may enforce granting of tax breaks to investors, ease regulations on trade, increased infrastructure development and purchase of new modern technologies that aid productivity by lowering the costs of production. This way gross capital formation will grow and aid FDI inflows in fostering economic growth in the region.
- (ii) Secondly, arising from the significant positive effect of domestic credit on economic growth, policy makers in the COMESA member states may consider putting in place policies and strategies that enhance domestic credit competitiveness to the private sector. Private sector credit enhancement can be achieved by ensuring policies that ease credit access such as establishing widespread credit institutions that cover both rural and urban

areas, introducing user friendly online credit access options, making the credit appraisal more efficient, developing public credit guarantee schemes and stimulating private mutual guarantees, among others. Private sector credit enhancement can also be achieved by making credit affordable by putting in place mechanisms to access cheap credit. Additionally, private sector credit enhancement can be achieved by way of implementation of favorable monetary policies such as lowering interest rates and reducing reserve requirements by the central bank to deliberately enable commercial banks, cooperatives banks and development banks to grow and hence enabling the private sector to easily and adequately acquire credit for lucrative investments but also acquire financial and investment literacy as well as other extension services that are all directed to support development of the private sector. Such interventions are likely to accelerated economic growth among the nations in the COMESA region.

(iii) Lastly from analysis, gross fixed capital formation was positive and significant. As such, COMESA member states should increase their investments in ventures that create capital and inventories. This can be achieved by putting in place and implementing polices that improves investment climate by way of increase cross border trade (relaxing of tariffs), capital transfers, encouraging savings for re-investment and adoption of modern production techniques.

5.3 Some Suggestions for Further Research

Further research could be done in FDI- economic growth relationship while controlling for governance to access whether governance interplays with FDI inflows and whether this interplay has a causal connection with economic growth. Additionally, future studies may consider to assess the relationship between FDI inflows and sectoral output growth among the COMESA member states.

5.4 Limitations of the Study

Limitations refer to the bottlenecks that restricts the research scope and may make it difficult for the research to achieve its set objectives (cooper and Schindler, 2002).

The research was bias by not taking into consideration all the macro-economic variables such as politic and governance that affect economic growth and hence the result of the study is not 100% reliable due to omission errors.

The study was conducted on COMESA for a period of 26 years starting from 1994 to 2019 and as such it failed to capture the post COVID-19 effects on economic growth in the region.

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APPENDICES

Appendix 1: List of COMESA countries and Countries included in the Analysis

S/N	Country Name	Included /Excluded	Notes
01	Burundi	Included	Had all data
02	Comoros	Included	Had all data
03	Dem. Rep. of	Included	Had all data
04	Congo	Excluded	No data on Exports & GKF for years 1994-2012
05	Djibouti	Included	Had all data
06	Egypt	Excluded	No data on GDP, Exports & Inflation for years 2012-
07	Eritrea	Excluded	2019
08	Ethiopia	Included	No data on Exports & 0 values of GKF for years 1994-
09	Kenya	Included	2010
10	Libya	Included	Had all data
11	Madagascar	Excluded	Had all data
12	Malawi	Included	Had all data
13	Mauritius	Included	No data on GKF & Exports over the study period 1994-
14	Rwanda	Included	2019
15	Seychelles	Included	Had all data
16	Sudan	Excluded	Had all data
17	Swaziland	Included	Had all data
18	Uganda	Included	Had all data
19	Zambia	Included	Not found in World Bank Development indicators data
20	Zimbabwe	Excluded	bank
	Tunisia		Had all data
			Had most of the data
			Had all the data
			No data on Exports & GKF for years 1994-2012

Source: Common Market for Eastern and Southern Africa (COMESA) Secretariat, 2023