ANALYSIS OF THE IMPACT OF FOREIGN DIRECT INVESTMENT NET INFLOWS ON ECONOMIC GROWTH USING ERROR CORRECTION MODEL (ECM): Empirical Study from Rwanda (1991-2022)

By

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DECLARATION

I, **MUSHIMIYIMANA Omere** hereby declare that this thesis entitled "**Analysis of the Impact of Foreign Direct Investment Net Inflows on Economic Growth Using Error Correction Model (ECM): Empirical Study from Rwanda (1991-2022)"** is my own work and has not been presented for any purpose to any other institution.

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APPROVAL

This is to certify that the work entitled "**Analysis of the Impact of Foreign Direct Investment Net Inflows on Economic Growth Using Error Correction Model (ECM): Empirical Study from Rwanda (1991-2022)"** is a study carried out by MUSHIMIYIMANA Omere under my guidance and supervision.

Dr. Radjab NYABYENDA

Date: 10/11/2023

Signature: 

DEDICATION

To my husband. To my beloved brothers and sisters. To my fellow colleagues. To all my lecturers at Kigali Independent University (ULK).

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ABSTRACT

The purpose of this study was to explore the impact of Foreign Direct Investment (FDI) Net Inflows on economic growth in Rwanda. In this study secondary data were used and they cover the time period from 1991-2022. This study attempted to determine empirical impact of FDI on Rwandan economy using macroeconomic annual time series data of gross domestic product as dependent variable and foreign direct investment, gross capital formulation and exports which are considered as the endogenous variables. This study used the Error Correction Model (ECM) to analyse both short-run and long-run impact of foreign direct investment (FDI) on Rwanda's economic growth from 1991 to 2022 and the research used the Johansen Cointegration test to analyse the long-run relationship. The study aimed to ascertain if inflows of foreign direct investment impact positively or negatively, the real GDP growth in the long run. The study revealed a statistically insignificant and negative association between real GDP growth and FDI inflow in long-run and insignificant and positive relationship between real GDP and FDI net inflow in short-run. Furthermore, the study revealed a positive and significant relationship between gross capital formation (GCF), exports and the real GDP.

Key words: Economic Growth, Foreign Direct Investment, Cointegration, ECM.

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LIST OF ABBREVIATIONS, ACRONYMS AND SIGNS

ADF: Augmented Dickey Fuller

ARDL Autoregressive Distributed Lag

BNR: Banque Nationale du Rwanda

DRC: Democratic Republic of Congo

ECM: Error Correction Model

FDI: Foreign Direct Investment

GCF: Gross Capital Formation

GDP: Gross Domestic Product

MINECOFIN: Ministry of Finance and economic Planning

MINICOM: Ministry of Trade and Industry

NES: National Export Strategy

OLS: Ordinary Least Squares

UAE: United Arab Emirates

ULK: Kigali Independent University

VAR: Vector Autoregression

VECM: Vector Error Correction Model

WB: World Bank

WTO: World Trade Organisation

CHAPTER 1: INTRODUCTION

1.1 General introduction

Rwanda is one of the Sub-Saharan East Africa nations; it is a developing country with a higher density of population among Sub-Saharan African countries and is landlocked with few natural resources and low levels of industrialization.

Economies are classified into two categories depending on the level of development, the level of living standards, the socio-political structure and the state of infrastructures. Some economies are said to be developed while others are less developed or developing (Boskin & lau, 1990). In developing economies, more people are less or not skilled and are engaged in subsistence agriculture, their productivity is relatively lower which leads to a low level of living standard, poor socio-political structure and low level of infrastructure while more people in developed economies are skilled and are employed in off-farm activities where their marginal productivity is high which leads to a high level of living standard, effective and stable socio-political structure and higher level of infrastructure (Ntamwiza & Masengesho, 2022).

Rwanda is a developing country, and it has been experiencing an excess of imports over exports leading to a persistent budget deficit. The severity of deficit increases the debt level of a country and reduces its capacity to finance development project due to heavy debt repayment (Ntamwiza & Masengesho, 2022).

Since the last decade, the country formulated policies which encourage investors to invest in Rwanda. The aim of the country is to become a middle-income country by 2035 and higher-income country by 2050 (MINECOFIN, 2017; MINECOFIN, 2020). To become a middle-income country by 2035 requires achieving the annual average growth rate of 9.01% over the period of the national strategy for transformation one (2018-2024). This study was to investigate the impact of Foreign

Direct Investment on economic growth in Rwanda, using time series data for the period 1991-2022.

1.2 Background of the study

Krugman and Obstfeld (2008) highlighted Foreign Direct Investment (FDI) as transnational flow of capital where a parent company in one economy initiates its subsidiary in another economy. UNCTAD (2016), defined FDI as an investment by entity which belongs to one country which aim to undertake business investment in another country for more than a year. FDI is a crucial mechanism to foster economic development of the growing economies as it boosts exports and trade balance (Hailu, 2010).

The relationship between Foreign Direct Investment and economic growth has been an interested issue for several decades. In the new growth theory, FDI is an important factor which contributes to economic growth through technology transfer efficiency improvement. FDI affects economic growth in several ways. It is argued that FDI has been a major channel for the access to advanced technologies by recipient countries and hence plays a central role in the technological progress of these countries. It is asserted that the host countries can benefit from the "contagion effect" associated with the advanced technology, management practices and marketing skills used by the foreign firms. Outputs from FDI activities are often exported mainly to third-country markets outside the host and source countries. As inputs, FDI activities have used capital goods and other intermediate inputs supplied by host and other foreign countries (Koojaroenprasit, 2012).

Thus, FDI is associated with both import and export trade in goods, and the host country can benefit from an investment-led export growth. FDI is an agent for the transformation of both the host and source economics (Lyold, 1996). Multinational corporations (MNCs) have played a central role in developing the host countries' production capacities which are often directed

towards export-oriented activities. As a result, FDI contributes to the transformation of the industrial structure of host economy and the commodity composition of its exports. The presence of foreign firms in the economy with their superior endowments of technology and management skills will expose local firms to fierce competition. Local firms may also be under pressure to improve their performance and to invest in research and development (R&D). Thus, FDI enhances the marginal productivity of the capital stock in the host economies and thereby promote growth. In addition, it was observed that higher efficiency of foreign firms may help lower prices and hence increase consumers' surplus. Furthermore, FDI raises employment by either creating new jobs directly or using local inputs (thus creating more jobs indirectly) (Koojaroenprasit, 2012).

According to Fan and Dickie (2000), FDI contributes to growth through several channels. It directly affects growth through being a source of capital formation. Capital formation refers to net additions to capital stock of an economy, including the creation of factories, new machinery and improved transportation. As a part of private investment, an increase in FDI will, by itself, contribute to an increase in total investment. An increase in investment directly contributes to growth. FDI also contributes to growth indirectly. FDI beneficially influences other macroeconomic variables, such as employment, export, consumption and saving. These, in turn, enhance growth (Koojaroenprasit, 2012).

FDI not only affects the level of investment, but also the quality of investment. In the view of industrial organization theory of FDI (Hymer, 1972), MNCs face some disadvantages imposed by both geographic and cultural distances when competing with indigenous firms. To overcome these inherent disadvantages, MNCs must possess some kind of ownership advantage in order to compete with local firms. These ownership advantages can be expressed as technology, cost effectiveness, established market and financial strength. These advantages enable them to operate in a foreign market. As such, FDI also consist of a bundle of intangible assets, including capital,

new technology, management skills and market channels. The inflow of FDI can therefore contribute to improved technology, equipment and infrastructure in host countries (Koojaroenprasit, 2012).

Related to the technological advantages of FDI is the benefit accruing to domestic firms through the "spillover effects". When FDI flows into a host country, there is a potential for FDI to act as a vehicle through which new ideas, technologies, and best working practices can be transferred to domestic firms. During this process, domestic firms can gain through several channels. The technology of local firms may improve as foreign firms demonstrate new technologies, provide technological assistance to their local suppliers and customers and train workers whom local firms may later employ. Furthermore, the competitive pressures from foreign firms may force local firms to operate more efficiently and stimulate them to introduce new technologies (Koojaroenprasit, 2012).

FDI also strengthens the capability of a host economy to reach international markets through its international links (Chia, 1995).

Many MNCs use global trading and distribution channels established by parent firms to produce capital goods and intermediate inputs and to export their products. Even though FDI augments growth through direct as well as indirect channels, it is difficult to quantitatively measure the contribution of FDI to growth. This is especially true for the indirect effects of FDI. FDI can contribute to the upgrading of the whole industrial structure of economies through affecting macroeconomic variables such as employment, exports, consumption and saving. All of these factors contribute to technological progress and efficiency improvement, not only stimulate economic growth, but also directly to raising living standards within host countries (Koojaroenprasit, 2012).

The relationship between FDI and economic growth has motivated much empirical literature focusing on both industrial and developing countries. Neoclassical models of growth as well as endogenous growth models provide the basis for most of the empirical work on the FDI-growth relationship. However, empirical evidence has shown that the effect of FDI on economic growth is dependent upon a set of conditions in the host countries or local economy, for example, the level of human capital, government policies, location and infrastructure (Balasubramanyam, et al. (1996).

In the recent years, FDI policies has become one of the central economic policies for the developing countries, learned from the experiences of newly industrialized countries (NICs) like South Korea, Singapore, Hong Kong and Taiwan which promoted FDI as the catalyst of rapid economic growth in the early stage of their economic development. The relationship between FDI and economic growth is one of the well-studied subjects in the field of development economics especially after the advent of endogenous growth model (Koojaroenprasit, 2012).

Numerous researches have attempted to establish the link between FDI and macroeconomic performances including GDP, however, the results are rather mixed. Many papers have mentioned that FDI influence growth in various ways, others have portrayed the negative influence of FDI to economic growth and others showed insignificant results (MWITTA, 2023).

Despite reasonable theoretical grounds for presuming a positive impact of FDI on economic growth, existing empirical evidence on this relationship is inconclusive (Trinh and Nguyen, 2015).

The government of Rwanda has promoted a series of reforms to improve the investment climate and encourage private investment, especially FDI. The latter includes a range of favourable regulations, e.g., corporate tax income exemptions, duty-free imports of inputs, no restrictions on foreign ownership and one of the most open visa regimes in the region (NBR, 2023). While it is

difficult to assess whether and to what extent the provision of fiscal incentives is a driver of FDI inflows, the establishment of a business environment that is supportive of private sector activity has been emphasized in the empirical literature as a main determinant of FDI (Bloningen and Piger, 2014).

The investment climate is also influenced by international treaties to protect foreign investors after they have established operations. Rwanda has so far signed 14 bilateral investment treaties (BITs), 6 of which are currently in force (including one with the U.S., South Korea, and Singapore). Provisions on investment are also included in broader trade agreements with other regional partners (EAC, COMESA). Rwanda has adopted the Investment Protocol of the African Continental Free Trade Area (AfCFTA) that aims to help member states put in place rules to protect investors from regulatory risks and improve their investment competitiveness by setting up dispute prevention and grievance mechanisms.

The initial investment that firms report when they register with RDB tend to be significantly greater than the realized inflows. Similarly, foreign investors tend to overestimate the number of jobs they expect to create when registering their FDI projects with the RDB. As discussed subsequently, the reasons for the discrepancy are unclear and call for further investigation, as they are likely to have policy implications. These are important to understand and will differ depending on the underlying cause. If the cause reflects untapped capacity caused by unforeseen constraints, it suggests a focus on determining whether and how the constraining factors can be addressed. If the difference reflects efforts by investors to access specific tax or other incentives provided by the investment code that depends on the magnitude of the investment (the estimated magnitude of the investment and number of jobs that will be created, it may be important for policy makers to revisit the design of the incentives (World Bank Group, 2023).

1.3 Problem statement

Rwanda, as a developing nation, has strategically encouraged Foreign Direct Investment (FDI) as a means to foster economic growth and development. However, the precise relationship between FDI and economic growth in Rwanda remains a topic of significant interest and investigation. This means that, the effectiveness of FDI in contributing to Rwanda's economic growth is a topic of paramount importance and scrutiny. Despite the influx of FDI, there is a need for an in-depth analysis to understand the nuanced impact of foreign investments on Rwanda's economic landscape.

The existing literature provides limited insights into the specific channels through which FDI influences economic growth in Rwanda. Moreover, the contextual factors unique to Rwanda, such as its political stability, regulatory frameworks, and socio-economic conditions, necessitate a focused investigation. While previous studies have examined the relationship between FDI and economic growth in various countries, a comprehensive examination of this relationship in the Rwandan context is not yet achieved at a good level.

Moreover, the existing literature has often employed various econometric models to analyse this relationship, but there is a notable gap in the application of the Error Correction Model (ECM) in the Rwandan context. The ECM, a dynamic model that captures both short-term deviations from the long-term equilibrium and the speed of adjustment towards this equilibrium, is particularly pertinent when studying the impact of FDI on economic growth.

The problem at hand can be broken down into several key aspects to be covered by this study:

The application of the Error Correction Model (ECM) to analyse the relationship between FDI and economic growth in Rwanda is notably rare in the existing research landscape. Utilizing this model can offer a nuanced understanding of the short-term and long-term effects of FDI on the Rwandan

economy, considering the dynamic nature of both variables. The use of ECM will help to investigate and understand the long-term equilibrium relationship between FDI and economic growth: Does Rwanda have a stable and sustainable long-term relationship with FDI, and if so, what factors influence this equilibrium? How does this equilibrium contribute to the overall economic development goals of the country?

Apart from the long-term dynamics, investigating the short-term dynamics of the FDI-economic growth relationship is equally important. How do short-term deviations from the equilibrium impact economic growth in Rwanda? What are the immediate effects of changes in FDI on the economy, and how quickly does the economy adjust to these changes?

Furthermore, identifying the policy levers that can influence the equilibrium relationship and the speed of adjustment is crucial for policymakers: what policies can Rwanda implement to attract more FDI and ensure a quicker adjustment of the economy towards the long-term equilibrium, thus fostering sustained economic growth?

Ultimately, evaluating the robustness of the ECM in the Rwandan context is vital. Are the results consistent across different time periods and economic scenarios? How sustainable is the relationship between FDI and economic growth over time, considering external shocks and changing global economic conditions?

The above aspects were addressed through the application of the Error Correction Model to provide a comprehensive and in-depth analysis of the long-term and short-term dynamics between Foreign Direct Investment on economic growth in Rwanda.

The research will not only contribute to an improved understanding of the Rwandan context but may also offer a methodological framework for analysing similar relationships in other emerging economies. Ultimately, the findings will assist Rwandan policymakers in formulating strategies that maximize the positive impact of FDI while mitigating any adverse effects, ultimately driving sustainable and equitable economic growth.

1.4 Research objectives

1.4.1. Overall objective

The overall objective of this study was to quantify the impact of Rwanda's FDI inflows on GDP growth. Additionally, the research examines the impact of gross capital formation and exports on the GDP growth.

1.4.2. Specific objectives

The specific objectives of the study were:

1) To apply the Error Correction Model (ECM) to analyse the relationship between FDI and economic growth (measured as GDP) in Rwanda.
2) To investigate the long-term and short-term relationship between FDI and economic growth (measured as GDP) and the speed of adjustment.
3) To identify the area of improvement for FDI to significantly contribute to the economic growth.

1.5 Research Hypotheses

The hypothesizes regarding the long run association of FDI with growth have been established and are outlined below in accordance with the research purpose:

- Ho: Foreign Direct Investment has a negative short-run and long-run effect on Rwanda's GDP;
- H_1: Foreign Direct Investment has a positive short-run and long-run effect on Rwanda's GDP;

These hypotheses were tested using econometric modelling techniques where Johansen Cointegration test was used.

1.6 Scope of the study

The study was limited to macroeconomic research by using Error Correction Model (ECM) as modelling technique. Also, the study was limited to analyse the impact of Foreign Direct Investment on economic growth in Rwanda from 1991 to 2022.

1.7 Significance of the study

The government of Rwanda has promoted a series of reforms to improve the investment climate and encourage private investment, especially FDI. Studying the impact of foreign direct investment (FDI) on economic growth in Rwanda holds great significance for several reasons:

Conducting research on the impact of foreign direct investment (FDI) on economic growth can offer several personal benefits. These include but not limited to:

Knowledge expansion: this means that engaging in this research will help to deepen the understanding of economic theories, international business, and statistical methods related to FDI and economic growth;

Skill development: conducting this research will enhance research skills, including data analysis, literature review, hypothesis formulation, and critical thinking;

Networking: since research often involves collaboration with experts, scholars, and professionals in the field, this will lead to expand the academic network;

Educational pursuits: the present research topic may serve as a foundation for advanced studies, such as pursuing a doctoral degree.

In academic domain, studying the impact of FDI on economic growth in Rwanda will add to the body of academic knowledge. It will provide a case study that can be compared with similar studies from other countries, contributing to the overall understanding of the relationship between FDI and economic growth globally. Also, this research will contribute to filling gaps in existing literature by providing new perspectives, insights, or methodologies. Finally, findings of this research will challenge and expand existing economic theories and this could contribute significantly to the theoretical framework of the field.

At country level, conducting this kind of research on the impact of FDI on economic growth can help policymakers formulate effective strategies to attract more FDI. By understanding the factors that attract foreign investors, Rwanda can tailor its policies to create a more conducive environment for investment, potentially leading to higher economic growth rates.

In terms of technology transfer and innovation, multinational corporations often introduce advanced technologies and managerial know-how. Research in this area can highlight how FDI contributes to technology transfer and innovation within domestic industries, fostering long-term economic growth and competitiveness. In additional to that, assessing the sustainability of FDI is crucial. It’s important to understand whether FDI leads to sustainable economic growth or if it has

negative environmental or social consequences. This knowledge can guide sustainable development policies.

Furthermore, FDI often integrates domestic economies into the global market. Understanding how Rwanda's economy is integrating into the global economy through FDI can provide insights into the country's competitiveness on the international stage.

In summary, the current study was designed to assess and appreciate the efforts that Government of Rwanda has made to promote the private investment, especially foreign direct investment. The results of this study are very important in the development of the investment policy reform toward the economic growth of Rwanda. This is helpful to the policy professionals and graduate academia in determination of the areas of improvement. Eventually, the research findings are expected to help policy-makers to make evidence-based decisions on policy direction and focus on interventions that favour not only economic growth but also the economic development.

1.8 Structure of the thesis

The study was divided into five chapters as presented below:

Chapter one on introduction provides the background on the study, problem statement, study objectives, research hypotheses, scope of the study and its significance. Chapter two on literature review covers the theoretical and empirical literature in line with the current study objective and scope and it was summarized in conceptual framework section. Chapter three on methodology discusses type and source of data used for this study, transformation process, unit root test procedures, cointegration test and it is concluded by model specification. The chosen methodology was applied in chapter four which presents empirical results and interpretation with reference to the set objectives and hypotheses. Finally, chapter five presents the summary of key findings from the current study. From the study findings, conclusions and key recommendation are highlighted.

CHAPTER 2: LITERATURE REVIEW

2.1. Theoretical Review

2.1.1. Principal determinants of FDI flows

There is widespread agreement on what determines the flow of FDI to one country rather than another. Countries attracting large amounts of FDI generally have good economic fundamentals, that is, they have achieved a high degree of macroeconomic and political stability and have favourable growth prospects. They also tend to possess a good infrastructure and legal system (including enforcement of laws), a skilled labour force, and a foreign sector that has been liberalized to some extent (membership in free trade areas is a particular attraction). Location, country (market) size and natural endowments are generally important as well (Hunya, 2000).

2.1.2. Foreign Direct Investment Theories

I. Theories Assuming Perfect Markets

The most important theories that assume perfect markets are the differential rates of return theory, the portfolio diversification theory and the market size theory.

The differential rates of return theory

The theory of differential rates of return is among the oldest theories that attempts to clarify why some companies run after new markets or indulge in FDI. The main idea and hypothesis of this theory is that capital flows from countries with low rates of return towards countries with higher rates of return. It is obvious that this theory assumes risk neutrality hence making the rate of return alone as main determinant why a foreign investor selected a specific location or mode of investment (Hykmete & Nazmi, 2019).

The portfolio diversification theory

The impact of this theory is observed in increasing international trade, FDI and capital mobility. In contrast to the differential rates of rate of return theory, here risk is an essential determinant. According to Moosa (2002) “capital mobility and FDI will be constrained by the desire to minimize or reduce the risk, which is achieved by diversification”. There are numerous ways to test the relationship between the amount of FDI and risk existence in a particular area or a group of countries. As documented in different studies, the simplest approach to test relationship between the amount of FDI and risk, is to examine the relationship between the amount of FDI going to a group of countries and two decision variables: the rate of return and risk - measured by the variance or the standard deviation of the rate of the return.

Like the differential rates of return theory, the portfolio and diversification theory does not explain why Multi National Cooperations (MNC) are the greatest contributors to FDI, and why they prefer FDI to portfolio investment. In the case of developing countries, financial markets are not only imperfect but also rudimentary, hence making portfolio investment less attractive than FDI. Another reason might be also the degree of control. MNCs prefer FDI compared to portfolio investment because it gives more control over the assets and other financial means in the host country (Hykmete and Nazmi, 2019).

The market size theory

The market size theory explains the volume and directions of FDI in light of the market size of the host country. According to this theory, large market size is expected to have a positive impact on FDI volume. The market size hypothesis argues that “inward FDI is a function of the size of the host country market, usually measured by GDP” (Majeed & Ahmad, 2008).

II. Theories Assuming Imperfect Markets

The FDI theories that assume imperfect markets are the location theory, the internalization theory, the eclectic theory and the international product life cycle theory.

The location theory

The main idea of this theory is mobility of some factors of production, such as labour and natural resources. According to this theory and hypothesis, FDI exists because of mobility of some factors of production hence such mobility leads to location-related differences in the cost of factors of production. One of the most important elements that can influence location related differences is human capital accounted in terms of wages paid by foreign investors. In terms of human capital, the location hypothesis attempts to argue that countries with low relative wages are a preferred destination for FDI (Hykmete & Nazmi, 2019).

However, what matters, is not just the wage but also the quality and productivity of workforce that foreign investors rank very high. Another important element for foreign investors as to selecting a specific location is the cost of the reallocation and adjustment of resources. When these costs are high, they lower the possibilities to attract foreign investors (though some researchers argue that reallocation and adjustment costs are very small and not decisive factor). In terms of human capital, the location hypothesis also emphasizes the degree of unionization by workers' representatives in the host country, because is assumed that unionized and centralized trade unions have higher bargaining power thereby pushing future wages higher. Nowadays, involvement of MNCs in FDI would prefer flexible and non-unionized labour markets in preference to centralized and unionized (Hykmete & Nazmi, 2019).

The internalization theory

The main hypothesis of this theory is that FDI arises from the efforts by companies to replace market transactions with internal transactions. Due to market imperfections, this theory is superior in explaining firm-specific advantages and demonstrates that companies are conditionally involved in FDI. According to the theory, companies will undertake FDI only if the benefits of exploiting firm-specific advantages are higher than the relative costs of the operations abroad (Hykmete & Nazmi, 2019).

The eclectic theory

The main idea of eclectic theory is integration of internalization theory, industrial organization theory and location theory into one general framework. According to Dunning (2008), "the eclectic paradigm seeks to offer a general framework for determining the extent and patterns of both foreign owned productions undertaken by country's own companies, and that of domestic production owned and controlled by foreign investors. Eclectic theory is referred to as the "OLI paradigm," which attempts to explain the international flows and FDI in terms of what is the motive rather than what should be the level and the structure of foreign investment. The OLI paradigm includes both macroeconomic location advantages and microeconomic ownership advantages, as they are incomplete if taken separately. According to Dunning (2008) "it prescribes a conceptual framework for explaining 'what is' rather than 'what should be', the level and structure of the foreign value activities of enterprises". Eclectic theory and its framework is based on three advantages: Ownership (O); Location (L) and Internalization (I).

According to eclectic theory, "ownership (O) advantage" explains the "why" or motivation, of MNCs activities. Dunning (2008) postulates that "ownership advantages are defined as the degree to which a firm possess sustainable ownership-specific advantages over other firms in the market.

Some examples of these advantages are: innovative capacity, access to financial resources, and organizational and marketing systems". This includes all the specifics, often intangible assets, which a company can either create (through managerial and organizational skills and knowledge,) or purchase (e.g., brand names, patents, etc) compared to local competitors that do not possess.

Another important advantage of eclectic theory is "location (L) advantage" that explains the "where", or location of the companies and which are specific to the country. Examples of such specifics are: labour force (availability and quality), natural resources and societal structure (political structure and legal systems) as explained above under the heading of location theory and hypothesis. The logical consequence will be that company will supply the foreign market from home country base, but location advantage such as distributions of inputs makes it profitable for a company to exploit its assets overseas.

Finally, internalization (I) advantage explains the "how", or the manner, of MNCs activities. Internalization" is the degree of ownership and control. At one end of the spectrum is no control or ownership. Transactions are made at arm's length or through the market. At the other end of the spectrum is full control. The firm "internalizes" the market transactions by owning or controlling the other firm and the transactions are not arm's-length" (Dunning 2008). The more ownership specific advantages a company has compared to competitors the higher is the incentive to internalize their use.

The international product life cycle theory

The international product life cycle theory started to take hold after World War II in viewing the international production as a sequential process. The theory was developed by Raymond Vernon (1966) who combined micro theory of the product cycle with trade theory. Vernon believes that

there are “four stages of production cycle: innovation, growth, maturity and decline” (Denisia, 2010).

In this respect Vernon (1966) explained his arguments by stating “that in the early stages of the life of a product, production is undertaken in the home country because of the need of producers to have easy access to inputs and to maintain swift communication with suppliers and competitors. At this stage, the product is highly differentiated and its demand fairly inelastic”. Producers later begin to export the product to advanced countries, which have demand and supply characteristics similar to those of home country. Denisia (2010) finds such hypotheses useful and central for interpretation of FDI too though recognize the fact that such hypothesis is referential particularly for products and services that are highly technological and related with income elasticity of demand.

Three stages of the products are central in explanation of this theory: 1) the initial production that takes place from innovating companies at home close to the customers and companies can charge high prices because the demand for the new products is inelastic; 2) the maturity of products hence “export of the product to countries having the next-highest level of income as demand emerges in these developed countries; and 3) complete standardization of the product and its production process, which is no longer an exclusive possession of the innovating company hence FDI in developing or less developed countries with lower level of incomes, in order to save costs and explore possible cost advantages. Such hypothesis is evident today where we can find many well-known innovative products switching from the country of innovation, in the beginning acting as the net exporter, but later as net importer (for example Apple products) (Hykmete & Nazmi, 2019).

III. The Economic Consequences of Foreign Direct Investment for Host Countries

Foreign direct investment and multinational corporations can have both positive and negative economic effects on host countries. Positive effects come about largely through transfer of technology and other intangible assets, leading to productivity increases that improve the efficiency of resource utilization and ultimately result in higher per capita income. Such effects can be direct, for example, if subsidiaries of multinational corporations are more productive than local rivals, or if they transfer technologies or other assets to local suppliers. distributors, or other firms with which the multinational corporations do business and, by doing so, enhance the productivity of these. But these effects can also come about indirectly, for example, if increased interfirm rivalry engendered within a sector by the entry of multinational corporations leads to all firms in that sector becoming more productive (Graham, no date).

Technology spillovers from multinational corporations tend to occur more frequently when the social capabilities of the host country and the absorptive capacity of the firms in the economy are high. While relatively backward countries have a certain scope for catching up, it is often difficult for the country to build the necessary social capabilities and absorptive capacities that allow firms to take advantage of the technology spillovers that are potentially available to the economy. Countries (and firms) without the capability to assimilate new technology tend to attract mainly market-seeking or resource-seeking foreign investment, while countries with this capability tend to attract more efficiency-seeking and asset-seeking foreign investment. Closing the technology gap will be difficult without the relevant capabilities. As a result, there appears to be a certain threshold of development that countries must cross before the potential for technological spillovers can be realized (Verspagen, 1991).

Technology spillovers occur when TNCs improve the technology of their affiliates and this in turn diffuses to other firms in the host economy. They tend to occur more frequently in countries with relatively high levels of “social capabilities” (e.g., education levels, technological capabilities, good legal systems, etc.). In contrast, productivity spillovers can occur without any transfer of technology. For example, a TNC can create competitive pressures that force less efficient firms to close, thus increasing the average productivity of the industry in the host economy (Verspagen, 1991).

External benefits associated with multinational corporations can also boost productivity. For example, a multinational corporation might employ local workers (including at technical and managerial levels), who, as a result of this employment, upgrade their own knowledge and skills and subsequently leave the multinational corporation and become employed elsewhere. To the extent that their new knowledge and skills can be utilized in their new positions, such knowledge and skills must be counted as external benefits associated with the multinational corporation, that is, benefits that are captured neither by the multinational corporation itself nor the users of its products or services. Both direct benefits, brought about by linkages between multinational corporations and local firms, and indirect benefits, whether created via increased rivalry or the generation of external benefits, are typically termed "spillover effects." (Graham, no date).

TNCs are responsible for much of this technological accumulation, yet growth theory rarely acknowledges the important role that these organizations play. In neo-classical analysis, FDI does not influence the long-run growth rate, but only the level of income. An exogenous increase in FDI would increase the amount of capital (and output) per person, but this would only be temporary, as diminishing returns (on the marginal product of capital) would impose a limit to this growth. FDI can influence the long-run growth rate only through technological progress or growth of the labour force, which are both considered exogenous (Temple, 1999).

If FDI is not only finance but also a bundle of fixed assets, knowledge (codified and tacit) and technology, then it can be expected to generate growth endogenously. According to recent endogenous growth theory, FDI influences growth via variables such as R&D and education (or human capital). Even if diminishing returns prevail inside the enterprise, various externalities (outside the enterprise) can provide the necessary positive feedback to sustain growth in the long run. TNCs create such positive externalities for the local economy when they transfer new technology and organizational forms directly to its affiliate. They can also create them indirectly through subcontracting, joint ventures and strategic alliances, technology licensing, imports of capital goods and migration. Through technology transfer and technology spillovers, these growth models suggest that FDI can speed up the development of new intermediate product varieties (the horizontally differentiated inputs model), raise product quality (the quality ladder model), facilitate international collaboration on R&D, and introduce new forms of human capital. By providing firms in relatively backward countries with greater access to finance and a wider range of intermediate products (Romer, 1986).

Negative economic effects can also be both direct and indirect. Direct negative effects, from a purely economic perspective, can arise from the market power of the multinational corporation and its ability to use this power to generate supernormal profits and transfer these to its shareholders, who presumably are not residents of the host country. In addition to negative economic effects, the multinational corporation might be capable of indirectly creating negative economic effects for the host country. For example, multinational corporations might be able to influence the local political process to the economic detriment of the host country ' s economy (for example, by inducing politicians to grant to the multinational corporation direct or indirect subsidies, such as investment incentives or protection from imports in the local market) (Graham, no date).

There is no reason why, in principle, the positive effects should be dominated by the negative effects or vice versa. This indeterminacy is perhaps why debate over multinational corporations has long been lively and subject to "sea change." Given that, in principle, the economic effects of foreign direct investment can be in net positive or negative, the issue becomes an empirical one: as events actually transpire, which effects dominate? The first thing to be said on this issue is that it is truly difficult to measure the effects of foreign direct investment and multinational corporations (Graham, no date).

IV. Macroeconomic profile of Rwanda

This section provides insight into the state of the Rwanda's economy in last few decades. It comprises the trade and economic growth performance and key macroeconomic variables trend analysis. Those variables include gross domestic product, gross capital formation and exports.

Rwanda is a small but growing market. From 2000 to 2019, Rwanda recognized a rapid GDP growth from US$ 2.7 billion in 2000 to US$ 11.2 billion in 2019 at current prices. Exports increased from US$ 176 million to US$ 2,418 million (World Development Indicator, 2023).

The principal imports include electrical machinery and parts; electronic equipment and parts; machinery appliances and parts, vehicles and accessories, cereals, and other foodstuff, pharmaceutical products, cement, and construction equipment including iron and steel, energy, and petroleum products. China, Europe, Uganda, Kenya, India, the United Arab Emirates, and Tanzania are among Rwanda's major suppliers (Hemzawi & Umutoni, 2021).

Major destinations of Rwandan exports aligned with the changes in the composition of top export products. As of 2019, major goods exports went to the United Arab Emirates (UAE), the Democratic Republic of Congo (DRC), Switzerland, Pakistan and the United Kingdom (UK).

Rwanda exported mostly gold to UAE, wheat flour to DRC; coffee to Switzerland and UK; and tea to Pakistan (Raga, 2022).

To boost exports, Rwanda has amongst others set up the exchange rate policy whose core objective is to preserve the external value of the national currency and also to ensure the effective operation of the foreign exchange market. Rwanda introduced a flexible exchange rate regime in 1995 with the goal to stabilize the exchange rate and prices to enhance the economic growth as well as to link that national foreign exchange market to the world (Kabayiza et al, 2019).

According to Kabayiza et al (2019), there exists a long-run relationship between the volume of a countries exports and the level of economic activity of the importing country, the real exchange rate as well as the measure of exchange rate risk. The end results of exchange rate volatility on trade have long been at the centre of the discussions on the optimality of different exchange rate regimes. The exchange rate volatility impacts on exports by creating gains or losses to farmers and exporters. The total value of export earnings depends not only on the volumes of exports traded abroad but also on the worth paid for them.

The increasing Rwanda trade deficit has been mainly due to export growth that has not kept up with import growth. Indeed, Rwanda's exports and imports have grown substantially but imports have grown faster than exports. High growth in imports has been in line with high economic growth recorded in the period under review as well as due to increase in people's disposable income which led to high imports of consumer goods. This increase in demand for imports has led to high demand for foreign exchange thereby putting pressure on the exchange rate (Nuwagira & Muvunyi, 2016).

2.1.3. Concept of Gross Fixed Capital

Capital formation is analogous to an increase in the physical capital stock of a nation with investment in social and economic infrastructures. Gross fixed capital formation can be classified as gross private domestic investment and gross public domestic investment. The gross public investment includes investment by government and/or public enterprises. Gross domestic investment is equivalent to gross fixed capital formation plus net changes in the level of inventories. Capital formation perhaps leads to the production of tangible goods (i.e., plants, tools & machine) and intangible goods (i.e., qualitative & high standard of education, health, scientific tradition and research) in a country (Oyedokun & Godwin, 2018).

A lot of economies depend on investments to resolve several economic problems, crisis and challenges. Less developed countries in Africa such as Nigeria is introducing various economic policies that will attract as well as keep hold of private investors. This is due to the fact that investments in certain sectors of the economy can rapidly transform the numerous economic challenges we are facing as a nation. Therefore, the Nigerian government at any given opportunity works a lot to attract investments into various sectors of the economy. The motive for this is not farfetched. Investment both private and the public comes with a lot of benefits such as job creation, increase in per capita income, reduction in the level of poverty, increase in standard of living, increase in GDP etc (Oyedokun & Godwin, 2018).

Real investment in the economy is an acceptable way of increasing capital formation in the economy has been known to increase productivity and output. Investment of this type can be undertaken by the public or private sectors, with the government being involved mainly with autonomous investments which act as the main drivers of other investment in the economy. Autonomous investment had dwindled drastically while the expenditure being made by the public

sector are not delivering value where rightly conceived. Capital accumulation is often suggested as a means for developing countries to increase their long-term growth rates. To increase capital accumulation, it is necessary to: increase savings ratios, maintain good banking system and system of loans, avoid corruption, good infrastructure to make investment more worthwhile (Oyedokun & Godwin, 2018).

V. Trend analysis of variables

1. Gross Domestic Product (GDP)

The trend of GDP is presented in appendix 1. There was a general decrease of GDP between 1991 and 1994 and sharp decrease was observed in in 1994 which went below the GDP in 1991. This may be attributed to the liberation war and genocide against Tutsi in 1994. From 1995 there was a general increase of GDP.

The general increase in GDP beyond 2005 might have been sustained by the reforms and implementation of different policies and strategies, mainly Economic Development and Poverty Reduction Strategy I and II (EDPRS I & II). The purpose of EDPRS I was to maintain momentum in the social sectors through sectoral allocation of public expenditure in education, health and water and sanitation while also targeting agriculture, transport and Information and Communication Technology ICT, energy, housing and urban development, good governance and rule of law, proper land use management and environmental protection (MINECOFIN, 2007).

The EDPRS I was followed and reinforced by EDPRS II, which formulated such that the private sector takes the driving seat in economic growth and poverty reduction. Through this strategy the government efforts were put on transforming the economy, the private sector and alleviating constraints to growth of investment (MINECOFIN, 2013).

Eventually, it may be true that these strategies might have led to the general higher increase of imports and exports volumes in same period as for GDP.

2. Gross Capital Formation (GCF)

Gross capital formation (GCF) refers to the total value of new capital investments in a country's economy over a specific period, typically a year. It includes both public and private investments in assets such as machinery, equipment, buildings, and infrastructure.

The trend of GCF is presented in appendix 2. In general, there is a positive trend for Rwanda gross capital formation from 1991 to 2022 except for years such 1994 during the genocide against Tutsi and in 2016.

This positive GCF trend for Rwanda is a good economic indicator that measures the total value of new physical assets (like buildings, machinery, equipment, and infrastructure) that have been produced in the country economy over 32 years. In simpler terms, it represents the net increase in physical assets within Rwandan economy for that period of time and this could serve to assess how well the investment levels in Rwanda has performed. GCF includes both private and public sector investment in fixed assets and it is an essential component of the calculation of a nation's Gross Domestic Product (GDP). For that reason, GCF is crucial for economic growth because it signifies the economy's ability to produce more goods and services in the future. Higher levels of GCF generally indicate increased investments in productive assets, which can lead to higher productivity, employment, and overall economic growth. Conversely, lower levels of GCF may indicate a slowdown in economic activity and potential challenges for future growth.

3. Exports (EXP)

Rwanda has experienced significant economic growth over the past few decades, and exports have played a crucial role in this growth. The country has implemented various economic reforms and policies to promote exports and enhance economic development.

The trend of exports is presented in appendix 3. In general, there is a positive trend for Rwanda exports from 1991 to 2022 except for years such 1994 during genocide against Tutsi, 2008 during the Great Recession in USA which affected other parts of the World and in 2020 during the Covid-19 pandemic.

Here are some key points regarding exports and economic growth in Rwanda:

Diversification of Exports: Rwanda has focused on diversifying its export base to reduce dependency on a few products. Traditional exports include coffee and tea, but the country has been promoting non-traditional exports such as minerals, horticultural products, and services.

Export-Oriented Policies: The Rwandan government has implemented export-oriented policies to attract foreign investments and boost exports. These policies include tax incentives, streamlined regulations, and support for export-oriented industries.

Regional Integration: Rwanda is a member of the East African Community (EAC), which promotes regional integration and trade among its member states. Being part of this regional bloc has allowed Rwanda to access larger markets and enhance its export potential.

Investment in Infrastructure: Investments in infrastructure, such as roads and ports, are crucial for facilitating trade and exports. Rwanda has been investing in infrastructure development to improve connectivity and reduce the cost of doing business.

Promotion of Tourism: Tourism is a significant contributor to Rwanda's economy. The country has invested in promoting its tourism sector, including ecotourism and wildlife tourism, which has led to an increase in foreign exchange earnings.

Technology and Innovation: Embracing technology and innovation has allowed Rwandan businesses to improve their products and services, making them more competitive in the global market. E-commerce and digital services have also played a role in expanding the export sector.

Good governance and political stability: Rwanda's political stability and good governance have contributed to creating a favourable environment for investments and business growth. Political stability attracts foreign investments, which, in turn, boost exports and economic growth.

Despite the positive trends in exports, Rwanda has experienced some challenges for some years to continue increasing its exports. These challenges include but not limited to: 1994 genocide against Tutsi, The Great Recession of USA in 2008 and covid-19 pandemic.

As it could be realized, during 1994 most of all socio-economic activities had declined that why the exports and other macroeconomic indicators had fallen down considerably.

In 2008, the Great Recession didn't just affect the United States; all countries with rapid credit growth and large account deficits were impacted. Global trade nearly collapsed, declining by 15% between 2008 and 2009. Global unemployment rose by 3 percent between 2007 and 2010 for an astounding 30 million total jobs lost.

In 2020/21, the COVID-19 pandemic had a significant impact on Rwanda's economy, including its exports sector. Here are some of the key ways in which the pandemic affected Rwanda's exports:

Disruption of Supply Chains: The pandemic disrupted global supply chains, making it difficult for Rwandan exporters to import necessary raw materials and components for production. This disruption affected various industries, limiting their export capacity.

Reduced demand for exports: Many countries implemented lockdowns and travel restrictions, leading to reduced consumer demand and a decline in exports. Rwandan products faced lower demand in international markets due to economic uncertainties and reduced consumer spending.

Impact on tourism and services: Rwanda's tourism sector, a significant source of foreign exchange earnings, was severely impacted due to travel restrictions and border closures. The decline in international tourists directly affected the export of tourism-related services and products.

Decline in commodity prices: The global economic slowdown led to a decline in commodity prices, affecting Rwanda's export earnings from commodities such as minerals and coffee. Lower prices meant reduced revenue, impacting the country's export income.

Logistical challenges: Transportation and logistics were disrupted due to restrictions and safety measures, causing delays in the shipment of goods. This situation added extra costs and affected the competitiveness of Rwandan exports.

In summary, the COVID-19 pandemic significantly disrupted Rwanda's exports, leading to reduced demand, logistical challenges, and changes in export priorities. However, government interventions and the resilience of Rwandan businesses played a role in helping the country navigate these challenges and work towards recovery and adaptation in the post-pandemic period.

4. Trend of FDI Inflows

Investigating the implications of attracting FDI is important for Rwanda given the national development objective of promoting economic growth by fostering private sector development. The National Strategy for Transformation (NST) highlights the promotion of public and private investment as a key strategic goal. The institution in 2017 of the “National Investment Policy” in place of the “National Public Investment Policy” is a clear sign of attention to the role of the private

sector. Increases in domestic savings and, especially, the attraction of foreign capital in the form of FDI are at the core of NST (World Bank Group, 2023). The trend of FDI is presented in appendix 4.

The government of Rwanda has promoted a series of reforms to improve the investment climate and encourage private investment, especially FDI. The latter includes a range of favourable regulations, e.g., corporate tax income exemptions, duty-free imports of inputs, no restrictions on foreign ownership and one of the most open visa regimes in the region. While it is difficult to assess whether and to what extent the provision of fiscal incentives is a driver of FDI inflows, the establishment of a business environment that is supportive of private sector activity has been emphasized in the empirical literature as a main determinant of FDI. Rwanda's good track in terms of governance is therefore an important factor influencing potential entry by foreign investors (World Bank Group, 2023).

It is therefore not surprising that in the annual Foreign Private Capital (FPC) conducted by the

National Bank of Rwanda, foreign investors in Rwanda report a favourable opinion about several dimensions related to doing business in the country. The most recent census (National Bank of Rwanda, 2023) shows an overall high level of satisfaction by foreign fi rms, especially in relation to specific c dimensions such as the legal framework (almost 90 percent report satisfaction), governance (82.7 percent) and tax incentives and the investment framework (81.6 percent) (World Bank Group, 2023).

The investment climate is also influenced by international treaties to protect foreign investors after they have established operations. Rwanda has so far signed 14 bilateral investment treaties (BITs), 6 of which are currently in force (including one with the U.S., South Korea, and Singapore). Provisions on investment are also included in broader trade agreements with other regional

partners (EAC, COMESA). Rwanda has adopted the Investment Protocol of the African Continental Free Trade Area (AfCFTA) that aims to help member states put in place rules to protect investors from regulatory risks and improve their investment competitiveness by setting up dispute prevention and grievance mechanisms (World Bank Group, 2023).

The initial investment that firms report when they register with RDB tend to be significantly greater than the realized inflows. Similarly, foreign investors tend to overestimate the number of jobs they expect to create when registering their FDI projects with the RDB. As discussed subsequently, the reasons for the discrepancy are unclear and call for further investigation, as they are likely to have policy implications. These are important to understand and will differ depending on the underlying cause. If the cause reflects untapped capacity caused by unforeseen constraints, it suggests a focus on determining whether and how the constraining factors can be addressed. If the difference reflects efforts by investors to access specific tax or other incentives provided by the investment code that depends on the magnitude of the investment (the estimated magnitude of the investment and number of jobs that will be created, it may be important for policy makers to revisit the design of the incentives (World Bank Group, 2023).

The sources of FDI in Rwanda are quite concentrated. According to the detailed FDI project information, 41 percent of registered FDI projects in Rwanda during 2016–2022 were financed or co-financed by investors from China, India, and the United States. Most of the investors from the region were from Nigeria, Eritrea, and Egypt, which together financed 7 percent of projects (World Bank Group, 2023).

2.2. Empirical Review

Numerous researches have attempted to establish the link between FDI and macroeconomic performances including GDP, however, the results are rather mixed. Many papers have mentioned that FDI influence growth in various ways, others have portrayed the negative influence of FDI to economic growth and others showed insignificant results. Balasubramanyam, Salisu and Sapsford (1996) argued that FDI can speed up growth of the receiving countries through improving foreign trade and ensuring stability of macroeconomic variables. Further, they concluded that FDI inflows can effectively boost economic growth than local investments in developing economies which implement export promotion policies. For nations with high institutional competence, FDI has a significant beneficial influence on their growth. When FDI is directed toward the mining industries, it has favourable impact on Tanzania's GDP. Despite reasonable theoretical grounds for presuming a positive impact of FDI on economic growth, existing empirical evidence on this relationship is inconclusive (Trinh and Nguyen, 2015).

2. 2. 1. Studies that support the positive effect of FDI on economic growth

Bahname (2012) studies the impact of FDI on economic growth in Southern Asia for the period 1977-2009. The results reveal that FDI, along with other variables such as human capital, economic infrastructure and capital formation have positive and significant effects on economic growth. Consistent with the work of Abdullahi et al. (2012) conclude that FDI promotes economic growth among selected countries of Africa and Asia in the period 1990-2009 and thus, they recommend for more openness of the economies, more investment in infrastructure and more political commitment to the fight against corruption.

In another study, Carp (2012) emphasizes the importance of the FDI flows on the host country economic growth, through the view of the representative, theoretical and empirical research for

the approached field. By analysing the literature review concerning the effects of FDI in the beneficiary country, the results reveal that the impact of capital flows exerted in the host country is significant and the main channels through which the effects are transmitted are: financial markets, host country absorptive capacity, human capital and technological. Similarly, following Insah (2013), the elasticity of economic growth with respect to FDI had a positive sign and also significant at the 1% level by applying the Dynamic Ordinary Least Squares technique.

By focusing on the impact of inward FDI stock on output growth in the U.S. economy, the estimation results indicate the strong impact of FDI stock on output growth and verify the hypothesis that FDI stock, as compared with domestic capital, labour, export and multifactor productivity, constitutes an essential factor of economic growth in the U.S. economy (Kornecki and Borodulin, 2011).

Agrawal et al. (2011) investigated the effect of FDI on economic growth of China and India for the time period of 1993-2009. They built the modified growth model from the basic growth model. The factors included in growth model were GDP, Human Capital, Labour Force, FDI and Gross Capital Formation. After running OLS method of regression, they found that 1% increase in FDI would result in 0.07% increase in GDP of China and 0.02% increase in GDP of India. They also found that China's growth is more affected by FDI than India's growth. The majority of the foreign investors prefer China over India for investment because China has a bigger market size than India, offers easy accessibility to export market, government incentives, developed infrastructure, cost – effectiveness, and macro-economic climate (Koojaroenprasit, 2012).

Recently, using time series data between 1970 and 2012, Adamu et al. (2015) finds a positive and significant relationship between FDI and real GDP proxy for economic growth in Nigeria.

Therefore, the existence of this positive linkage necessitates the need to continue implementing policies that will attract FDI especially in the non-oil sectors of Nigeria.

According to Koojaroenprasit (2012), it was found that the impacts of exports and FDI on economic growth of South Asian countries namely Bangladesh, India, Pakistan and Sri Lanka. The study used secondary data ranging from 1980 to 2009 and simple log linear regression model. He found that the impacts of exports and FDI are statistically significant. He proposes that the policy makers of each country of South Asia should diversify the country's exports to enlarge exports volume and increase FDI inflows because it has the potential of accelerating economic growth in the future of South Asian economies.

In Vietnam, Nguyen (2006) finds that FDI and economic growth are important determinants of each other in Vietnam as their expected coefficients are positive and statistically significant. His study also concludes that the link between FDI and domestic investment in Vietnam is complementary. Likewise, by using the panel data that covers 61 Vietnam's provinces in 1995-2006, Hoang et al. (2010) reveal that there is a strong and positive effect of FDI on economic growth in Vietnam as a channel of increasing the stock of capital. Human capital and trade in Vietnam are not yet the channels that give access to advance technology and knowledge transfers from FDI inflows to increase Vietnam's economic growth.

Mallick and Moore (2008) estimated the endogenous growth model by using panel data for 60 developing countries during 1970-2003. They found that FDI inflows have a positive and significant effect on economic growth across all income groups. But the indirect impact of FDI on economic growth through their contribution to investment could be weaker in the lower income group countries. Chang (2007) used the ADF test, the Peron test, and Divot and Andrew's unit-root test to test the stationary of the variable in Taiwan. He applied the Johansen cointegration test,

the multivariate error correction model, and the Granger causality test. He found that these are no causal relationship between FDI inflows and economic growth.

De Gregorio (2003) has noted that technologies and knowledge that are not readily available to host country, investors may be brought to them along with FDI and led to productivity growth. FDI may also bring in expertise that the country does not possess, and foreign investors may have access to global markets. In the empirical studies during the period 1950-1985, he found that increasing aggregate investment by 1 percentage point of GDP increased economic growth of Latin American countries by 0.1% to 0.2% a year. But increasing FDI by the same amount increased growth by 0.6% a year. This indicated that FDI is three times more efficient than domestic investment.

Huang (2003) pointed out that Chinese partners were eager to form foreign invested enterprises with foreign investors because Chinese investment policies were friendlier to foreign invested enterprises than to domestic firms. Having exploited the preferential policies and even possessed privileges in competing for local scarce resources, these joint ventures eventually crowded out domestic investment.

Kim and Seo (2003) analysed the dynamic relationship between FDI and economic growth and domestic investment in Korea for the period of 1959-1999 using vector auto regression models. They found that there were some positive effects of FDI on economic growth but insignificant. Their findings show that FDI does not crowd out domestic investment in Korea.

Zhang (2001) tested the causality between FDI inflows and economic growth by using annual real FDI stock and real GDP data for 11 high-income and low-income developing countries in East Asia and Latin America. The Johansen cointegration test, the error-correlation model and the Granger causality test were applied. He concluded that the impact of FDI on host countries is

country-specific. FDI inflows appeared to enhance growth in East Asian countries such as Taiwan. FDI tends to be more likely to promote economic growth when host countries adopt liberalize trade regime, improve education and human capital.

Ramirez (2000) His empirical works on Mexico supported the positive effect of FDI inflows on economic growth. He employed the Johansen cointegration test and the error-correction model for the period 1960 -1995. He showed that the growth rate of the private and foreign capital stock, as well as the export variable, have a positive and significant effect on the labour productivity growth rate.

2.2.2. Studies that do not support the positive effect of FDI on economic growth

Some other studies find the impact of FDI on growth is ambiguous. For instance, Carkovic and Levine (2002) employ statistical techniques and two databases to reassess the relationship between economic growth and FDI. After resolving biases plaguing past work, they find that exogenous component of FDI does not exert a robust, independent influence on growth. Similarly, Katerina et al. (2004) conduct empirical research on the effects of FDI on economic growth mainly focuses on the US and the western European countries. By employing Bayesian analysis, the empirical results show that FDI does not exhibit any significant relationship with economic growth for the transition countries.

In the case of Bangladesh, Shimul et al. (2009) attempt at finding the long-run relationship or cointegration between FDI and economic growth using time series data of 1973-2007. The results of Granger Causality test indicate that FDI and openness are not significantly causing the GDP per capita both in the short and long run. The study thus suggests adopting appropriate steps so that FDI can be used as a contributing factor to the economic development. Geijer (2008) also finds

the similar results by using a multiple regression analysis with GDP per capita as dependent variable in Mexico.

Louzi and Abadi (2011) study the FDI-led growth hypothesis in Jordan. Based on time series data from 1990 to 2009, the econometric framework of cointegration and error correction mechanism is employed to capture two-way linkages between interested variables. The empirical results reveal that FDI inflows do not exert an independent influence on economic growth, while domestic investment and trade liberalization have positive impacts on GDP growth.

Recently, Mehrara and Musai (2015) examine the causal relationship between FDI and GDP for Middle East and North Africa region countries by applying panel unit root tests and panel cointegration analysis for the period 1970-2010. Their findings indicate that FDI does not have any significant effects on GDP in short-run and long-run with no growth benefit for the recipient country.

2.2. 3. Studies that support the conditional positive effect of FDI on economic growth

Various explanations have been offered for the obscure effect FDI has on growth. It has been argued that the effect of FDI on growth depends on the stock of human capital, degree of development of the financial sector, openness of the trade regime and the size of the economy.

Borensztein et al. (1998), by using data on FDI flows from industrial countries to 69 developing countries over the period 1970-1989, find that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. Nevertheless, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Therefore, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy.

Omran and Bolbol (2003) suggest that Arab FDI inflows have a favourable effect on growth if interacted with financial variables at a given threshold level of development. The authors also find that, in reform countries, FDI could Granger cause financial development. Likewise, Zadeh and Madani (2012) aim to investigate the role financial market developments play in mediating the impact of FDI on economic growth. The findings suggest that the impact of FDI on GDP growth rate is non-linear in nature. FDI has a negative effect on economic growth when financial development is low level but FDI has a positive effect on economic growth when financial development exceeds a threshold level, which is the ratio of private creditors in GDP.

Using threshold regression techniques developed by Caner and Hansen (2004), Jyun-Yi and Chih-Chiang (2008) investigate whether the impact of FDI on economic growth is dependent upon different absorptive capacities. The empirical results show that FDI alone plays an ambiguous role in contributing to economic growth based on a dataset of 62 countries covering the period from 1975 to 2000. Moreover, under the threshold regression, they find that initial GDP and human capital are important factors in explaining FDI. FDI is found to have a positive and significant impact on growth when host countries have better levels of initial GDP and human capital. The importance of the stock of human capital as a determinant for FDI's effect on growth is highlighted by other studies using the same analytical framework (Wijeweera et al., 2010; Shahrivar & Jajri, 2012).

2.3. **Conceptual framework**

This section provides a visual representation of an expected relationship between variables of interest in this study as shown in the figure below:

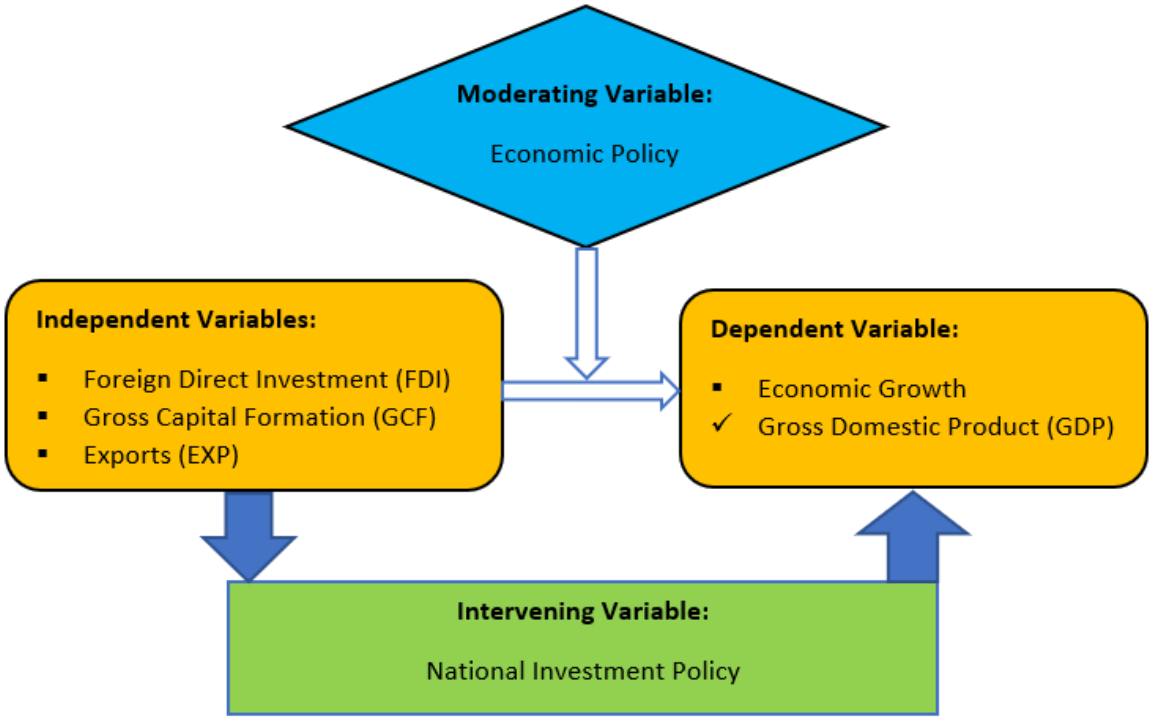

Figure 2. 1: Conceptual framework of the impact of FDI on Economic Growth (GDP)

Source: Elaborated by the researcher, 2023

The figure above shows that the Foreign Direct Investment and other variables (Gross Capital Formation and Exports) may affect the economic growth measured in terms of GDP as a proxy. Between independent and dependent variables investment policy intervenes as enabling environment. This means that good investment policy promotes FDI inflows, exports and hence domestic saving and ultimately it leads to the economic growth. Some key provisions of the policy that promotes the investment include but not limited to the incentives (fiscal and non-fiscal incentives) and subsidies. In Rwanda, there is a recent National Investment Policy 2013.

The relationship between independent and dependent variables is moderated by the economic policies available in the country such trade policy and monetary policy as these two policies affect the international trade in a way or another as far as FDI is concerned. This is because, the economic policy is the initiative or any activity that a government uses to influence or manage an economy and monetary policy and trade policy are part of economic policy that government can implement to manage the economy of a given region, state, city or a country.

CHAPTER 3: RESEARCH METHODOLOGY

The variables of interest in this study are real Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Gross Capital Formation (GCF) and Exports (EXP) for Rwanda. The study covers the period of 1991-2022.The selection of this period was based on availability of data and researcher judgment after testing different model assumptions. This section discusses type and source of data, data transformation process, unit root test procedure and Johansen cointegration test for the selection of the suitable model. It is concluded by the model specification.

3.1. Research Design

This study investigates the impact of foreign direct investment on economic growth in Rwanda for the period of 32 years: from 1991 to 2022. Many of economic and social changes have been taken place in Rwanda during this period in terms of economic transformation as far as foreign investment and export promotion are concerned and it was deemed very important to analyse and evaluate the impact of those variables on country economic growth. This study used Error Correction Model (ECM) as an econometric modelling technique.

3.2. Type and source of data

The dataset on these variables was collected from World Bank (WB) website (available at https://datatopics.worldbank.org/world-development-indicators/themes/economy.html, accessed on 19/08/2023). These data are presented in appendix 5. Since they are time series variables, an econometric modelling method of analysis was confirmed after conducting the unit root test to analyse the behaviour/ dynamics of the data/variables for the time period of 1991-2022. The dataset consists of secondary data and WB website under the theme of world development indicators and are organized by internationally agreed statistical standards. These data were

downloaded in excel format. Gross Domestic Product, Foreign Direct Investment, Gross Capital Formation and Exports) were in USD and exchange rate was in USD.

3.3. Data transformation

The data used for this study were subjected to logarithmic transformation for two main reasons: first, many economic time series exhibit a strong trend (i.e., a consistent upward or downward movement in the values) and when this is caused by some underlying growth process, a plot of the series reveals an exponential curve. In such cases, the exponential /growth component dominates other features of the series (e.g., cyclical and irregular components of the series) and thus obscure the more interesting relationship between this variable and another growing variable. Therefore, taking the natural logarithm of such a series effectively linearizes the exponential trend. The second advantage of using logarithmic transformation is that it allows the regression coefficients to be interpreted as elasticities (Asteriou & Hall, 2007).

Therefore, before carrying out the unit root test, the trend analysis of all variables data was carried out to check whether they are highly skewed or they exhibit an exponential feature. It was found that all variables exhibit an exponential feature and highly skewed. Due to those exhibited features, all variables' data were subjected to log transformation in order to achieve a log-normal distribution of the data.

3.4. Unit root test

A unit root test is a statistical method used to determine whether a time series data set has a unit root, which is a characteristic of a non-stationary process. In simple terms, a unit root indicates that a variable has a stochastic trend and does not revert to a constant mean over time. Non-stationary time series data can create problems in statistical analyses because many statistical techniques assume that the data is stationary, meaning that the statistical properties such as mean and variance are constant over time.

There are several unit root tests available, with the Dickey-Fuller test and the Augmented Dickey-Fuller (ADF) test being among the most common. These tests compare the null hypothesis that a unit root is present in a time series against the alternative hypothesis that the data is stationary.

Most macroeconomic time series are trended and therefore in most cases are non-stationary. The problem with non-stationary or trended data is that the standard OLS regression procedures can easily lead to incorrect conclusions. It can be shown that in these cases the norm is to get very high values of R^2 (sometimes even higher than 0.95) and a very high values of t-ratios (sometimes even higher than 4) while variables used in the analysis have no interrelationships. Many economic series typically have an underlying rate of growth, which may or may not be constant. Such series are not stationary as the mean is continually rising and they are also not integrated as no amount of differencing can make them stationary. This gives rise to one of the main reasons for taking the logarithm of data before subjecting it to form econometric analysis. The transformation into log of a series, which exhibits an average growth rate, turns it into a series which follows a linear trend and which is integrated (Asteriou & Hall, 2007).

The used data for this research are time series data and the unit root test was performed to see whether they are stationary or not. After transforming data into logarithm from 1991 to 2022, the

E-views 12 software enabled us to carry out Augmented Dickey – Fuller (ADF) test to analyse if variables have unit root or not, it means that all variables are stationary or not at level. This test allowed to select the appropriate model for the analysis. The process of model of selection was performed as described in the chart below:

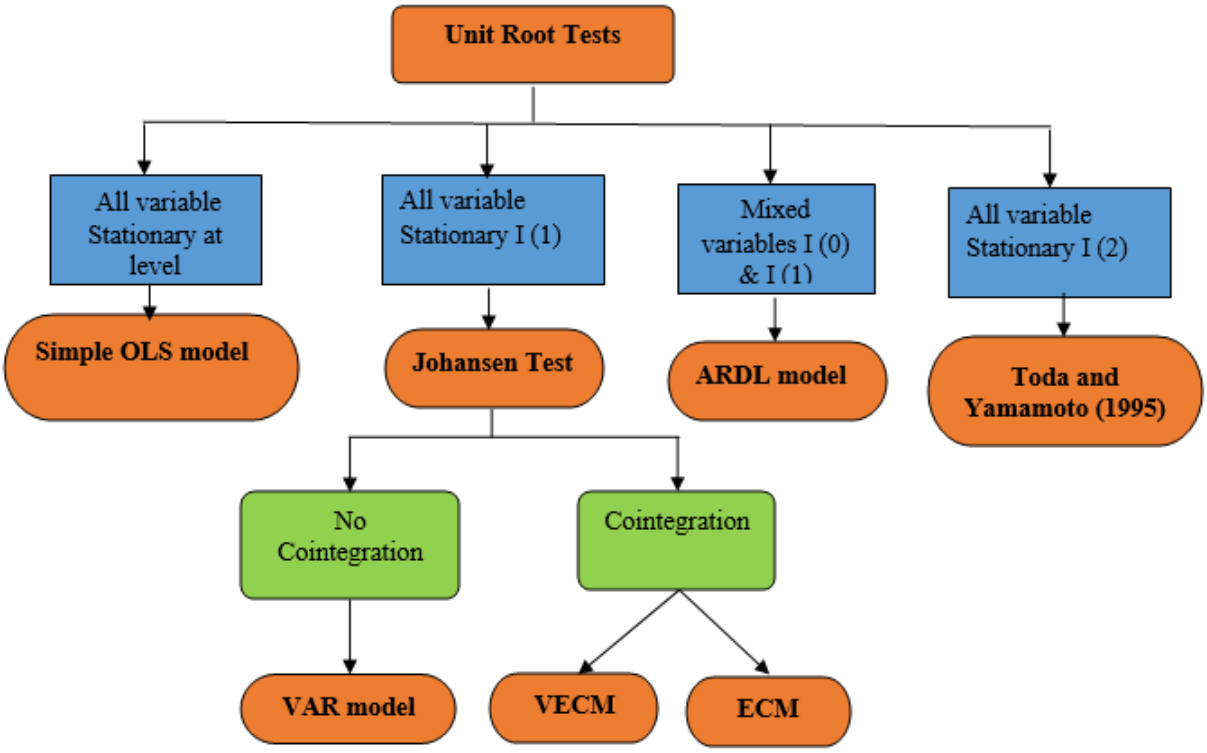

Figure 3. 2: Selection of method of analysis flow chart

Source: Radjab, 2020

It was found that all variables' data are not stationary at level but stationary at first difference, I (1). With this result, it was further required to perform the Johansen test for ultimate confirmation of the appropriate model for analysis.

3.5. Johansen Cointegration Test

The Johansen cointegration test is a statistical method used to determine whether there are cointegrating relationships among a set of non-stationary time series variables. Cointegration is a crucial concept in econometrics and time series analysis because it helps identify long-term relationships among variables, even if they are individually non-stationary. Before performing the Johansen cointegration test, each individual time series variable in the system needs to be tested for stationarity. This can be done using unit root tests like the Dickey-Fuller test or the Augmented Dickey-Fuller (ADF) test.

Johansen cointegration test estimates the number of cointegrating relationships in the VAR system. It involves estimating two types of tests: trace test and maximum eigenvalue test. These tests help determine the number of cointegrating vectors, indicating how many linear combinations of the variables are stationary (i.e., cointegrated).

Trace Test: The null hypothesis is that the number of cointegrating vectors is less than or equal to r versus the alternative that the number of cointegrating vectors is r+1 or more.

Maximum Eigenvalue Test: The null hypothesis is that the number of cointegrating vectors is r versus the alternative that the number of cointegrating vectors is r+1.

The choice of r (the number of cointegrating vectors) is often based on statistical criteria or economic theory.

Depending on the results of the trace test and maximum eigenvalue test, you can determine the number of cointegrating relationships in the system. If there are cointegrating relationships, it suggests that there are long-term equilibrium relationships among the variables, even though they may be individually non-stationary.

The Johansen cointegration test is widely used in econometrics to analyse the relationships among economic variables and is especially valuable in studying multivariate time series data.

After realizing that all variables are non-stationary at level, it was necessary to test if their linear combination is stationary or they are cointegrated. After the test, it was found that there is only one cointegrating equation, that is, variables are cointegrated and there is long run relationship between them. From this result, Error Correction Model (ECM) was appropriate for the analysis.

3.6. Error Correction Model (ECM)

3.6.1. Definition

The Error Correction Model (ECM) is a statistical model used in econometrics to analyse and correct for deviations from a long-run equilibrium or relationship between variables. It is often applied to time series data and is particularly useful for studying relationships among variables that are non-stationary, meaning they exhibit trends or have a unit root. The term “error correction” relates to the fact that last-period's deviation from a long-run equilibrium, the error, influences its short-run dynamics. Thus, ECMs directly estimate the speed at which a dependent variable returns to equilibrium after a change in other variables. ECM is a crucial tool in econometrics and is widely used in various fields such as finance, economics, and engineering.

The mathematical representation of Error Correction Model is as follow:

$$\Delta y_t = \beta_3 + \beta_4 \Delta x_t - \pi_1 \hat{u}_{t-1} + \varepsilon_t \quad (3.1)$$

Where:

$$\hat{u}_{t-1} = y_{t-1} - \hat{\beta}_1 - \hat{\beta}_2 x_{t-1} \text{ (Error correction term)} \quad (3.2)$$

- Δy_t is the first difference of the dependent variable;
- y_t and x_t are the levels of the cointegrated variables;
- π_i is the speed of adjustment parameter, representing how fast the disequilibrium is corrected.
- β_2 represents the long-term relationship between the variables;
- β_4 represents the short-term relationship between variables. The short-run model coefficients measure the dynamics of the model.

3.6.2. Estimation

The first step of this method is to pretest the individual time series one uses in order to confirm that they are non-stationary in the first place. This can be done by standard unit root DF testing and ADF test (to resolve the problem of serially correlated errors). Take the case of two different series x_{t} and y_{t}. If both are I(0), standard regression analysis will be valid. If they are integrated of a different order, e.g., one being I (1) and the other being I (0), one has to transform the model.

If they are both integrated to the same order (commonly I (1)), we can estimate an ECM model of the form:

$$\Delta y_t = \beta_3 + \beta_4 \Delta x_t - \pi_1 (y_{t-1} - \hat{\beta}_1 - \hat{\beta}_2 x_{t-1}) + \varepsilon_t \tag{3.3}$$

This has a nice economic interpretation: y can wander away from its long-run (equilibrium) path in the short run, but will be pulled back to it by the ECM over the longer term.

The second step is then to estimate the model using ordinary least squares:

$$y_t = \beta_1 + \beta_2 x_t + u_t \tag{3.4}$$

If the regression is not spurious as determined by test criteria described above, Ordinary least squares will not only be valid, but also consistent. Then the predicted residuals

$$\hat{u}_{t-1} = y_{t-1} - \hat{\beta}_1 - \hat{\beta}_2 x_{t-1} \tag{3.5}$$

from this regression are saved and used in a regression of differenced variables plus a lagged error term:

$$\Delta y_t = \beta_3 + \beta_4 \Delta x_t - \pi_1 \hat{u}_{t-1} + \varepsilon_t \tag{3.6}$$

Economic theory often suggests that certain subset of variables should be linked by a long-run equilibrium relationship. Although the variables under consideration may drift away from equilibrium for a while, economic forces or government actions may be expected to restore equilibrium.

3.6.3. Key Concepts

Cointegration: ECM is commonly used when the variables in the model are cointegrated. Cointegration implies that the variables have a long-term relationship, meaning they move together over time despite short-term fluctuations.

Error Correction Term (ECT): ECM includes an error correction term, which represents the short-term dynamics that adjust the system back to its long-term equilibrium after a shock. The ECT captures the speed of adjustment towards equilibrium.

Long-term Relationship Analysis: ECM helps in understanding the long-term relationship between variables. It shows how variables are related in the long run and how they adjust to deviations from this long-term relationship.

Short-term Dynamics: ECM captures short-term adjustments. It shows how the system corrects itself when there are deviations from the long-term equilibrium, indicating the speed at which the system converges back to its equilibrium state.

Forecasting: ECM can be used for short-term forecasting by predicting future values of the dependent variable based on the values of the independent variables and the error correction term.

In summary, the Error Correction Model is a valuable tool for understanding and modelling the relationships between variables, especially when these variables exhibit cointegration, indicating a long-term relationship between them.

3.7. Model specification

The general form of an Error Correction Model can be represented as follows:

$$\Delta y_t = \beta_3 + \beta_4 \Delta x_t - \pi_1 (y_{t-1} - \hat{\beta}_1 - \hat{\beta}_2 x_{t-1}) + \varepsilon_t \quad (3.7)$$

Specifically, for this study, the Error Correction Model was estimated in order to maintain the long-term equilibrium established between GDP, FDI, GCF and EXP and it was specified as follow:

$$\Delta lnGDP_t = \beta_1 \Delta lnFDI_t + \beta_2 \Delta lnGCF_t + \beta_3 \Delta lnEXP_t + \beta_4 U_{t-1} + U_t \quad (3.8)$$

Where

$$U_{t-1} = lnGDP_{t-1} - vlnFDI_{t-1} - wlnGCF_{t-1} - zlnEXP_{t-1} \text{ (Error correction term)} \quad (3.9)$$

β_1, β_2 and β3 are short term relationship coefficients and β4 being the speed at which the equilibrium adjusts itself within a period of time.

CHAPTER 4: RESULTS AND INTEPRETATION

This chapter covers analysis and interpretation of results on the impact of foreign direct investment on economic growth in Rwanda. The research covers 32-year period for which secondary data from 1991 to 2022 were used for the analysis. Regression analysis was used in analysis of the data and E-views package was used in modelling and different tests. From trend analysis in chapter 2, it was realized that all variables exhibit exponential feature and they were transformed into logarithmic form and subjected to unit root test.

4.1. Unit root test

To determine the relationship between time-series data, testing for stationarity before estimation is deemed necessary as most time series variables might be non-stationary and any estimation with such non-stationary series might produce spurious results. Therefore, the researcher tested if all variables used in this study are stationary using Augmented Dick Fuller (ADF) test (Hemzawi & Umutoni, 2021).

The test for stationarity was performed under the null hypothesis:

H0: There is unit root or the series is not stationary

H1: The series is stationary

The results of unit root test for all variables at their level are summarized in the table below:

Table 4. 1: Unit root test results

Variable	Test critical value at 5%	t-Statistic	P-Value	Inference
lnGDP	-2.967	0.195	0.967	Has a unit root
lnFDI	-2.967	-0.928	0.764	Has a unit root
lnGCF	-2.960	-0.739	0.821	Has a unit root
lnEXP	-2.963	0.044	0.955	Has a unit root

[Source: Researcher's computation using EViews 12, 2023]

The results of unit root test for GDP: Since t statistic is less than critical value (in absolute value) at 5% and p-value greater than 0.05, the null hypothesis could not be rejected. This means lnGDP has a unit root and therefore it is a non-stationary series. The same result could be also demonstrated graphically as presented below:

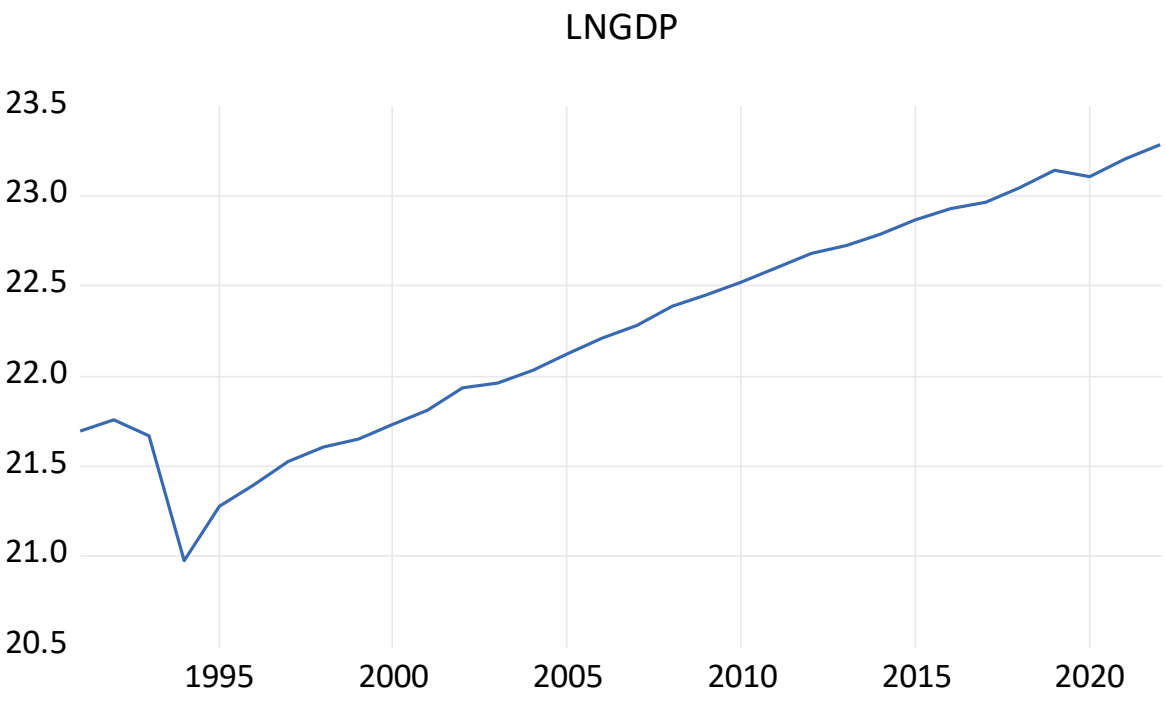

Figure 4. 3: Graphical representation of unit root of GDP at level

[Source: Researcher's plot using EViews 12, 2023]

From the graph above, the lnGDP series exhibits fluctuations with time, with varying mean. This trend affects the value of the time series/lnGDP at different times and hence, it is not stationary.

The results of unit root test for FDI: Since t statistic is less than critical value (in absolute value) at 5% and p-value greater than 0.05, the null hypothesis could not be rejected. This means lnFDI has a unit root and therefore it is a non-stationary series. The same result could be also demonstrated graphically as presented below:

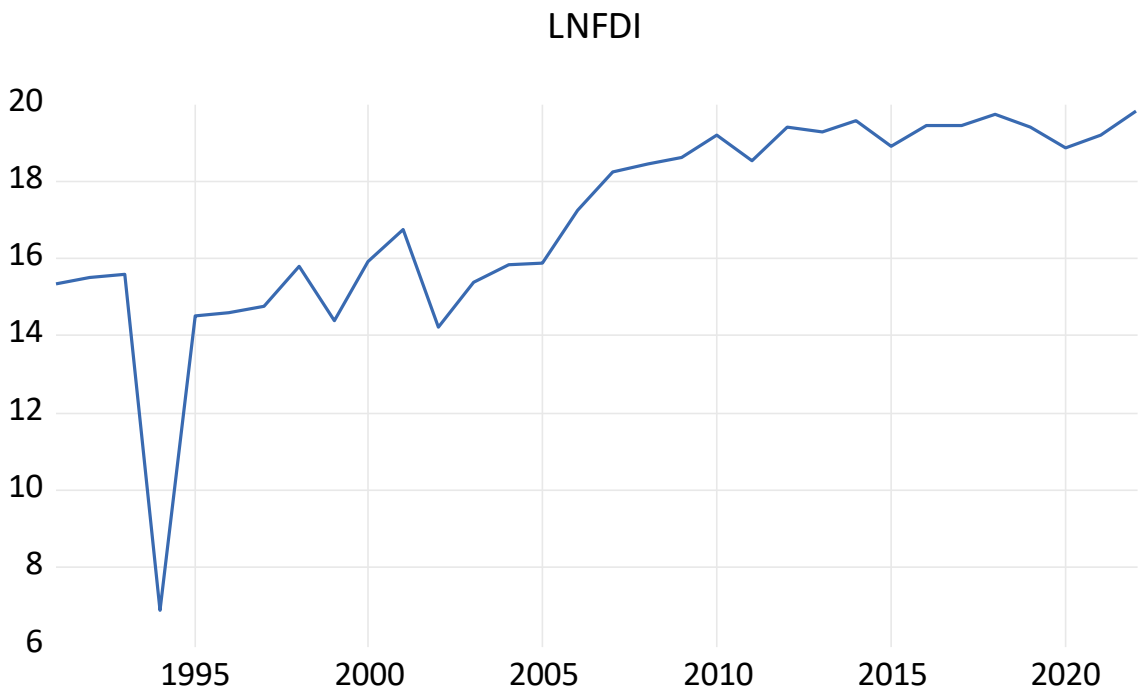

Figure 4. 4: Graphical representation of unit root of FDI at level

[Source: Researcher's plot using EViews 12, 2023]

From the graph above, the lnFDI series exhibits fluctuations with time, with varying mean. This trend and few cycles affect the value of the time series/lnFDI at different times and hence, it is not stationary.

The results of unit root test for GCF: Since t statistic is less than critical value (in absolute value) at 5% and p-value greater than 0.05, the null hypothesis could not be rejected. This means lnGCF has a unit root and therefore it is a non-stationary series. The same result could be also demonstrated graphically as presented below:

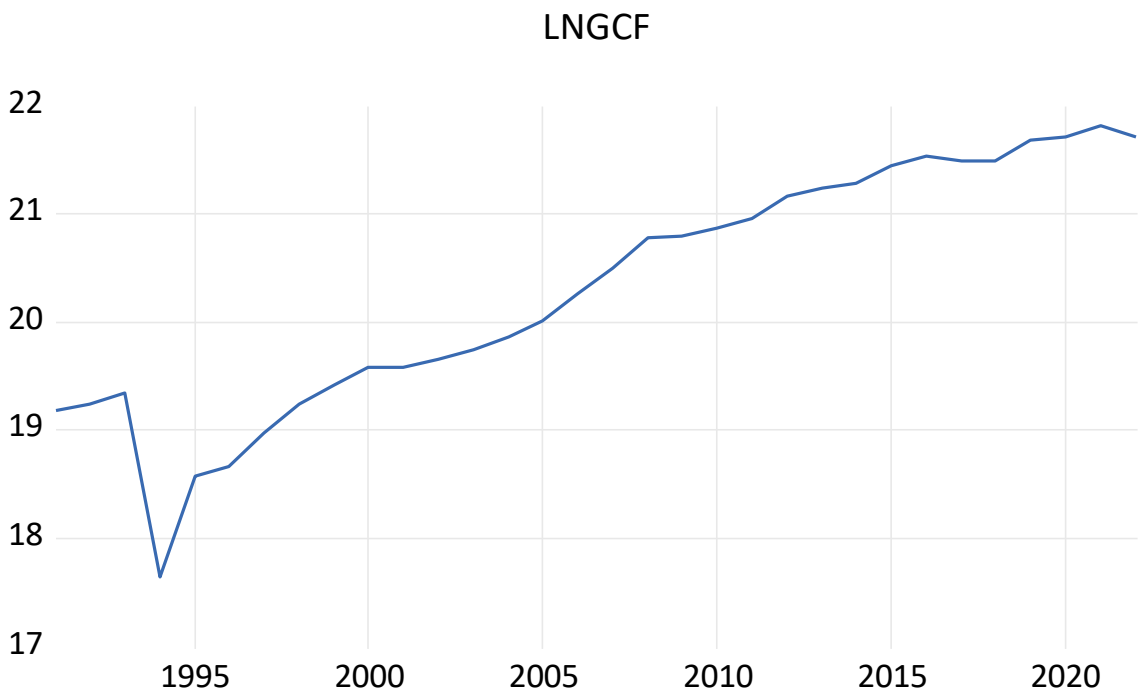

Figure 4. 5: Graphical representation of unit root of GCF

[Source: Researcher's plot using EViews 12, 2023]

From the graph above, the lnGCF series exhibits fluctuations with time, with varying mean. This trend and few cycles affect the value of the time series/lnGCF at different times and hence, it is not stationary.

The results of unit root test for EXP: Since t statistic is less than critical value (in absolute value) at 5% and p-value greater than 0.05, the null hypothesis could not be rejected. This means lnEXP has a unit root and therefore it is a non-stationary series. The same result could be also demonstrated graphically as presented below:

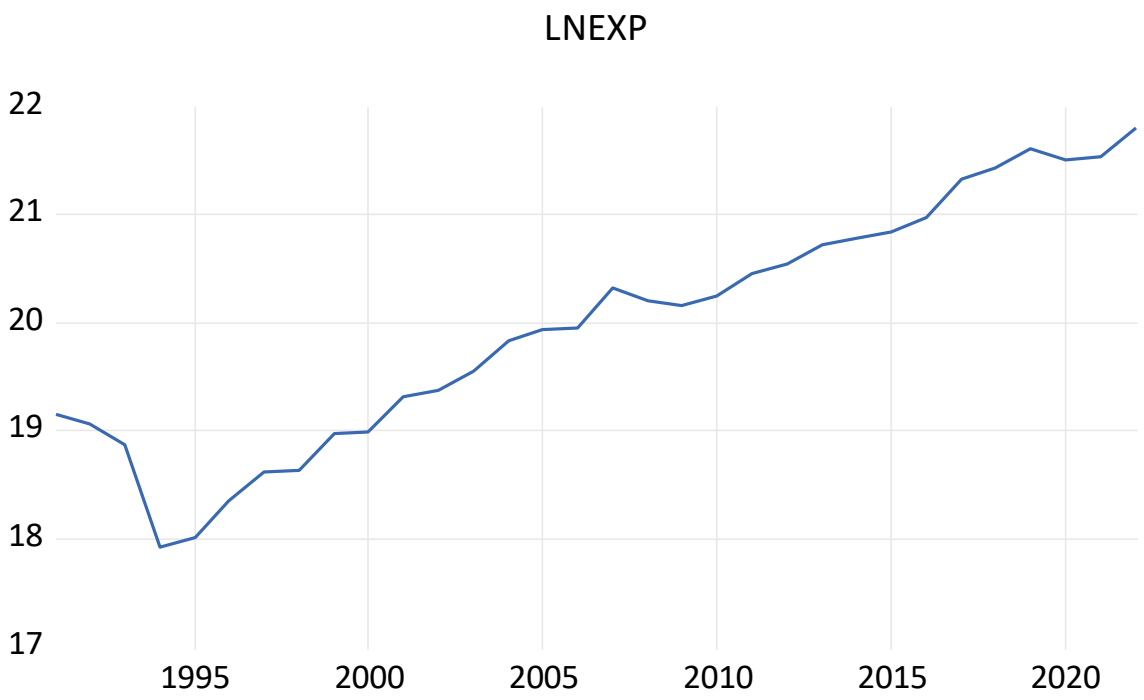

Figure 4. 6: Graphical representation of unit root of Exports at level

[Source: Researcher's plot using EViews 12, 2023]

From the graph above, the lnEXP series exhibits fluctuations with time, with varying mean. This trend and few cycles affect the value of the time series/lnEXP at different times and hence, it is not stationary. It was realized that all four series are non-stationary at their level, that is, they are not I (0). Therefore, further treatments were required to determine order of integration.

4.2. Order of integration

It was realized that all series are non-stationary at their level, that is, they are not I (0). Therefore, further treatments were required to determine order of integration and eventually, test for cointegration was carried out. Order of integration of each and every series required that we correct non-stationarity of each series in its log form to become stationary and observe at what difference it becomes stationary to determine the order of integration. The results for all variables are summarized in the table below:

Table 4. 2: Order of integration

Variable	Test critical value at 5%	t-Statistic	P-Value	Inference
DlnGDP	-2.963	-5.780	0.000	I (1)
DlnFDI	-2.963	-8.876	0.000	I (1)
DlnGCF	-2.963	-7.572	0.000	I (1)
DlnEXP	-2.963	-4.522	0.001	I (1)

[Source: Researcher's computation using EViews 12, 2023]

Order of integration for GDP: Since the t-statistic is more negative than critical value at 5% and p-value is less than 0.05, this means that DlnGDP is stationary. Since lnGDP becomes stationary at its first difference, it is an I (1), that is, the order of integration is one. The same result on stationarity is demonstrated graphically as presented below:

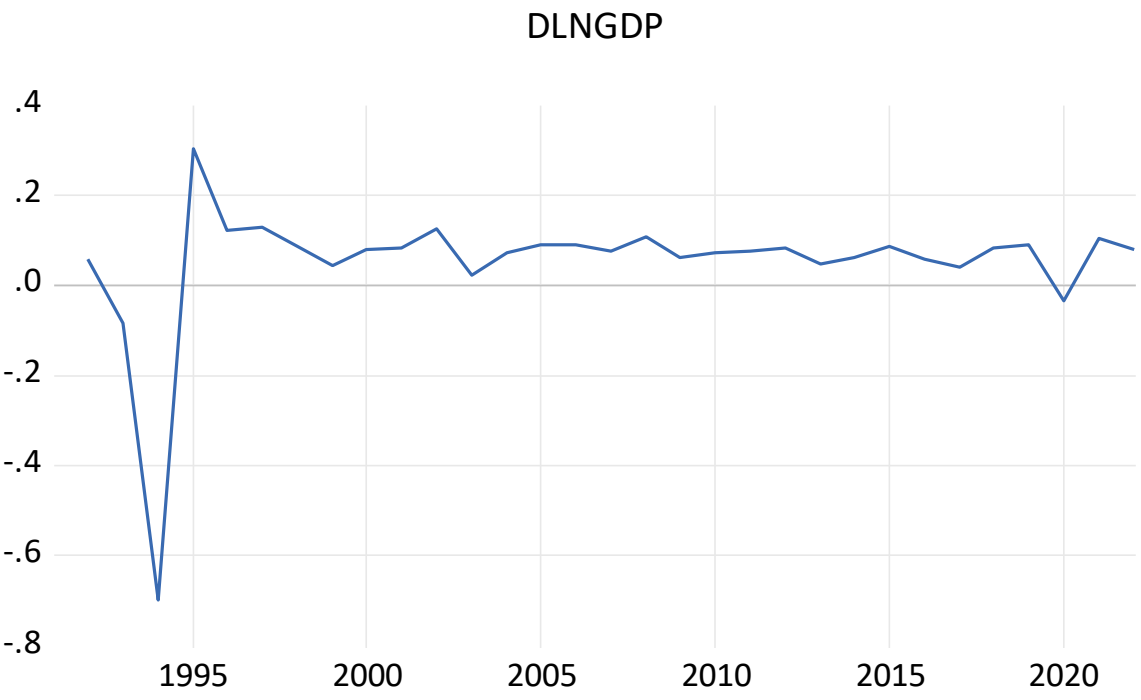

Figure 4. 7: Graphical representation of stationarity of GDP at first difference

[Source: Researcher's plot using EViews 12, 2023]

From the above graph, it can be realized that process/ DlnGDP series fluctuates around its constant mean value. The variable has no predictable patterns in the long-term and seems to be roughly horizontal. With these characteristics, the lnGDP series is stationary at its first difference.

Order of integration for FDI: Since the t-statistic is more negative than critical value at 5% and p-value is less than 0.05, this means that DlnFDI is stationary. Since lnFDI becomes stationary at its first difference, it is an I (1), that is, the order of integration is one. The same result on stationarity is demonstrated graphically as presented below:

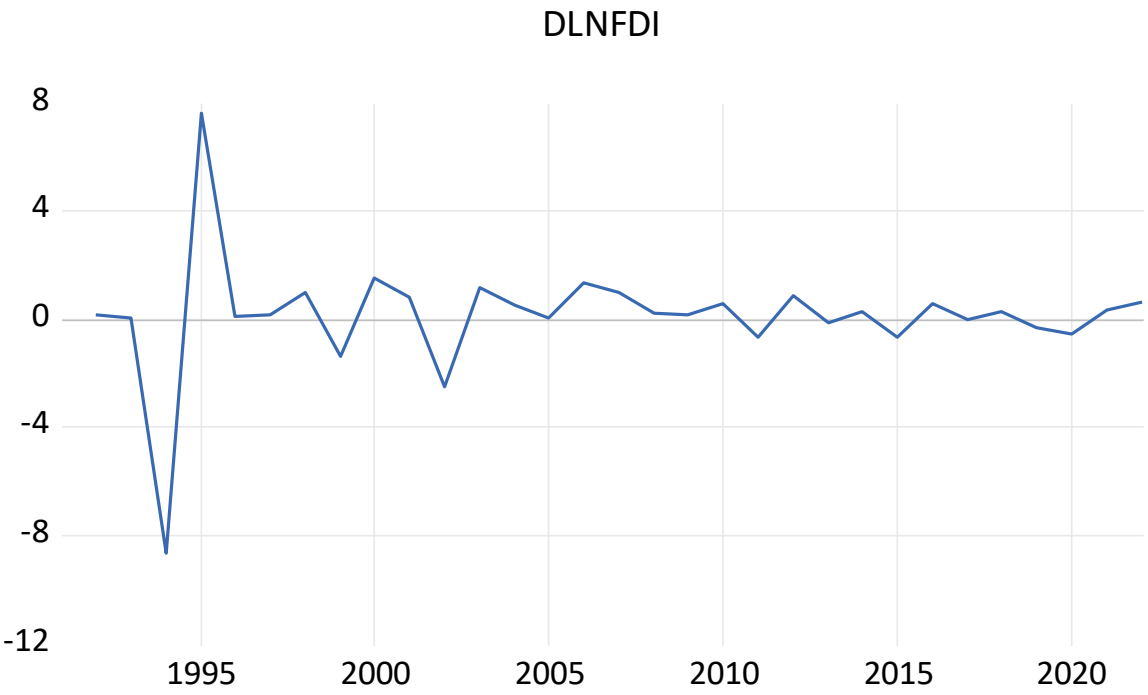

Figure 4. 8: Graphical representation of stationarity of FDI at first difference

[Source: Researcher's plot using EViews 12, 2023]

From the above graph, it can be realized that process/ DlnFDI series fluctuates around its constant mean value. The variable has no predictable patterns in the long-term and seems to be roughly horizontal. With these characteristics, the lnFDI series is stationary at its first difference.

Order of integration for GCF: Since the t-statistic is more negative than critical value at 5% and p-value is less than 0.05, this means that DlnGCF is stationary. Since lnGCF becomes stationary at its first difference, it is an I (1), that is, the order of integration is one. The same result on stationarity is demonstrated graphically as presented below:

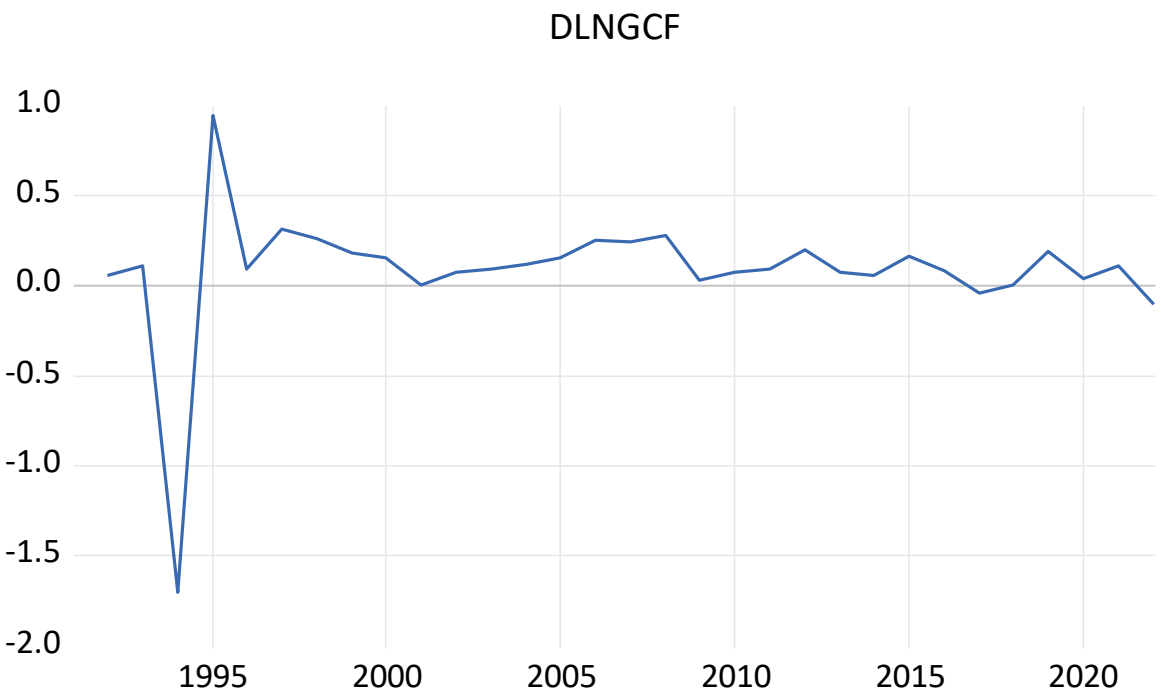

Figure 4. 9 : Graphical representation of stationarity of GCF at first difference

[Source: Researcher's plot using EViews 12, 2023]

From the above graph, it can be realized that process/ DlnGCF series fluctuates around its constant mean value. The variable has no predictable patterns in the long-term and seems to be roughly horizontal. With these characteristics, the lnGCF series is stationary at its first difference.

Order of integration for EXP: Since the t-statistic is more negative than critical value at 5% and p-value is less than 0.05, this means that DlnEXP is stationary. Since lnEXP becomes stationary at its first difference, it is an I (1), that is, the order of integration is one. The same result on stationarity is demonstrated graphically as presented below:

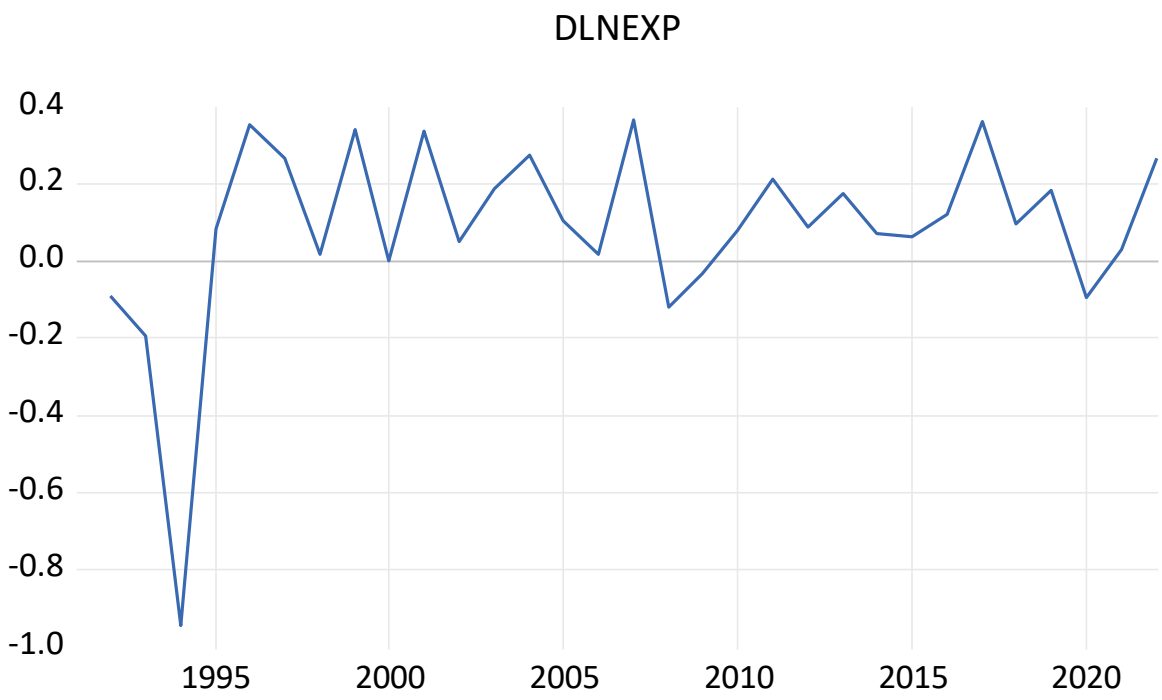

Figure 4. 10: Graphical representation of stationarity of exports at first difference

[Source: Researcher's plot using EViews 12, 2023]

From the above graph, it can be realized that process/ DlnEXP series fluctuates around its constant mean value. The variable has no predictable patterns in the long-term and seems to be roughly horizontal. With these characteristics, the lnEXP series is stationary at its first difference.

4.3. Test for cointegration by Johansen cointegration test

This approach is going to show us how many cointegrating relationships we have among lnGDP, lnFDI, lnGCF and lnEXP series. For that, trace and max-eigenvalue tests were conducted and results are presented in tables below:

Trace test

Table 4. 3: Trace test

No of Cointegrating Equations	Trace Statistic	Critical value at 5%	P-value
None*	69.843	47.856	0.000
At most 1	16.491	29.797	0.677
At most 2	7.105	15.494	0.565
At most 3	0.557	3.841	0.455

[Source: Researcher's computation using EViews 12, 2023

Max-eigenvalue test

Table 4. 4: Max-eigenvalue test

No of Cointegrating Equations	Max-Eigenvalue Statistic	Critical value at 5%	P-value
None*	53.351	27.584	0.000
At most 1	9.386	21.131	0.800
At most 2	6.547	14.264	0.544
At most 3	0.557	3.841	0.455

[Source: Researcher's computation using EViews 12, 2023]

From the two tables above, it is shown that there is one cointegrating equation. This means that there is a long-run relationship among series: ln GDP, ln FDI, ln GCF and ln EXP. They move together, as presented on the graph below:

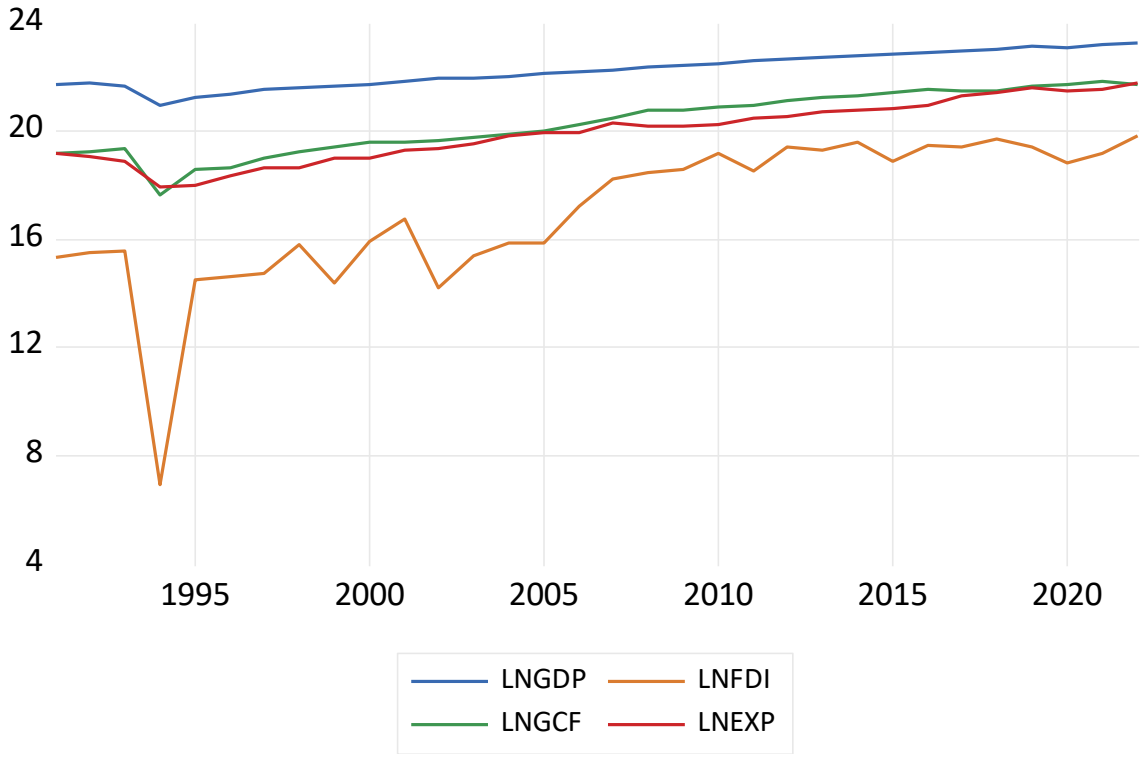

Figure 4. 11: Graphical representation of cointegration among variables

[Source: Researcher's plot using EViews 12, 2023]

From the graph above, all series move together and this relationship holds for long-run and any deviation from the equilibrium is adjusted itself at the speed calculated through the short-run relationship model: Error Correction Model (ECM). This means that even if the individual variable is not stationary at level, the linear combination (the residuals) of all variables is stationary. This is graphically shown by the plot of their residuals below:

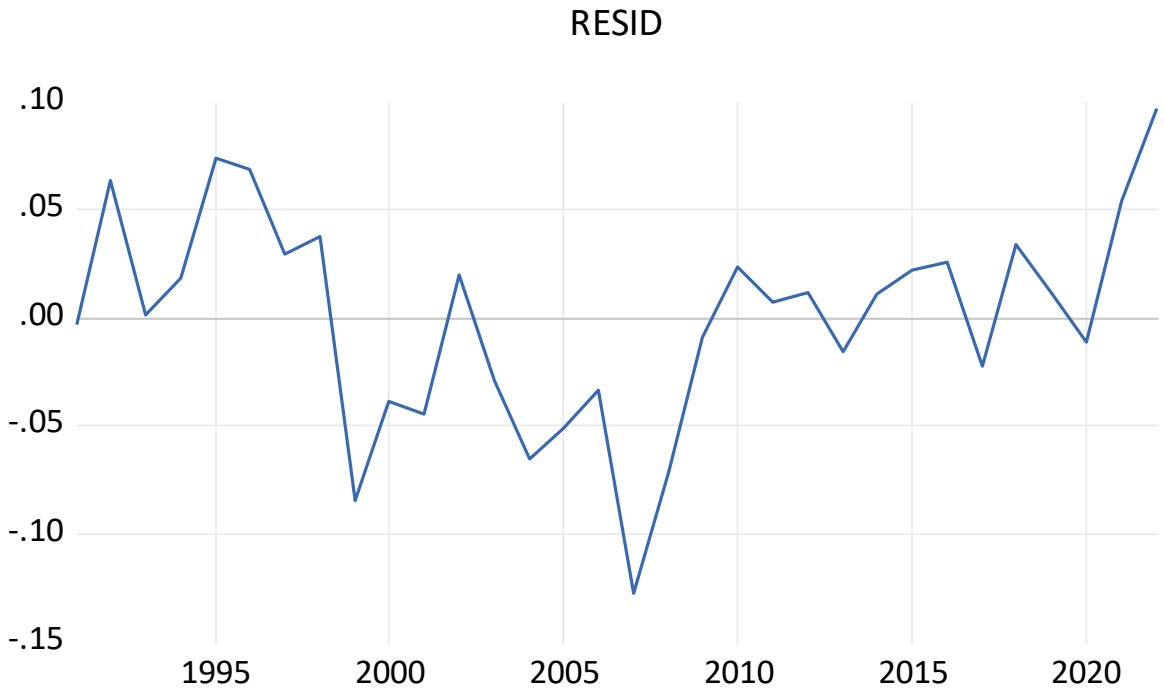

Figure 4. 12: Plot of linear combination of all variables

[Source: Researcher's plot using EViews 12, 2023]

From the above graph, it can be realized that process/ RESID (residuals) series fluctuates around its constant mean value. It seems to be roughly horizontal. With these characteristics, the residuals series is stationary at level and this confirms the cointegration of the variables of interest in this study.

4.4. Long run relationship

The long run relationship among series was determined by regressing lnGDP on lnFDI, lnGCF and lnEXP.

The model to be estimated is presented as

$$lnGDP_t = \beta_0 + \beta_1 lnFDI_t + \beta_2 lnGCF_t + \beta_3 lnEXP_t + U_t \quad (4.10)$$

The results are presented in table below:

Table 4. 5: Long-run relationship

Variable	Coefficient	t-Statistic	P-value
$lnFDI_t$	-0.009	-0.886	0.383
$lnGCF_t$	0.310	5.284	0.000
$lnEXP_t$	0.280	6.225	0.000
C	10.515	33.382	0.000
R-squared = 0.994			

[Source: Researcher's computation using EViews 12, 2023]

The resulting model can be written as

$$lnGDP_t = 10.515 - 0.009 lnFDI_t + 0.310 lnGCF_t + 0.280 lnEXP_t \quad (4.11)$$

The entire coefficients' calculated probability is less than the 5% critical value, this indicates that there is a significant long run relationship between explanatory variables (FDI, GCF & EXP) and the dependent variable (GDP). The coefficients 0.009, 0.310 and 0.280 for lnFDI, lnGCF and lnEXP respectively indicate the long-run relationship with lnGDP. FDI has a negative and insignificant effect on GDP whereas both GCF and EXP have positive and significant effect on GDP. Holding other factors constant (GCF, EXP…), the increase of 1% in FDI decreases the GDP

about 0.009% in long run and this is insignificant at 5%. The increase of 1% in GCF contributes, significantly at 5%, about 0.310% to the GDP in long run, holding other factors constant (FDI, EXP…). Finally, the increase of 1% in EXP contributes about 0.280% to the GDP in long run, holding other factors constant (FDI, GCF…) and this is significant at 5%. This relationship among FDI, GCF and EXP with GDP will hold for long term since these variables are cointegrated. From these results, it could be concluded that GCF contributes more than FDI and EXP to the GDP in long-run. R-square, the overall measure of goodness of fit indicates that the explanatory variables included in the above model explain 99.4% of the variation of the dependent variable (GDP).

4.5. Error Correction Model

The short-run model coefficients measure the dynamics of the model, the ECM measures the speed of adjustment to the long run equilibrium which is taking place. It was indicated that series are cointegrated and the long run relationship was established previously. The Error Correction Model was estimated in order to maintain the long-term equilibrium established between GDP, FDI, GCF and EXP. The Error Correction Model (ECM) should have the following form:

$$\Delta lnGDP_t = \beta_1 \Delta lnFDI_t + \beta_2 \Delta lnGCF_t + \beta_3 \Delta lnEXP_t + \beta_4 U_{t-1} + U_t \quad (4.12)$$

Where

$$U_{t-1} = lnGDP_{t-1} - vlnFDI_{t-1} - wlnGCF_{t-1} - zlnEXP_{t-1} \text{ (Error correction term)} \quad (4.13)$$

β_1, β_2 and β3 are short term relationship coefficients and β4 being the speed at which the equilibrium adjusts itself within a period of time.

Results are presented below.

Table 4. 6: Short-run and long-run relationship, ECM

Variable	Coefficient	t-Statistic	P-value
$\Delta lnFDI_t$	0.002	0.287	0.776
$\Delta lnGCF_t$	0.287	5.985	0.000
$\Delta lnEXP_t$	0.189	4.442	0.000
U_{t-1}	-0.362	-2.184	0.038
C	0.010	1.272	0.214
R-squared = 0.938			

[Source: Researcher's computation using EViews 12, 2023]

The resulting model can be written as

$$\Delta lnGDP_t = 0.010 + 0.002\Delta lnFDI_t + 0.287\Delta lnGCF_t + 0.189\Delta lnEXP_t - 0.362U_{t-1} \quad (4.14)$$

The coefficients of $\Delta lnFDI_t$, $\Delta lnGCF_t$ and $\Delta lnEXP_t$ show the short run relationship that each variable has on $\Delta lnGDP_t$. For both GCF and EXP, the short run relationship has a positive and significant impact on GDP, whereas for FDI, the short run relationship has a positive and insignificant effect on GDP. Holding other factors constant (GCF, EXP…), the increase of 1% in FDI increases the GDP about 0.002% in short-run. The increase of 1% in GCF contributes about 0.287% to the GDP in short-run, holding other factors constant (FDI, EXP…). Finally, the increase of 1% in EXP contributes about 0.189% to the GDP in short-run, holding other factors constant (FDI, GCF…). From these results, it could be concluded that GCF contributes more than FDI and EXP to the GDP in short-run.

The Ut-1 is the error correction term and it should be negative and significant. For the current research, the negative coefficient of the error correction term (−0.362.) is significant at level of 5%, assuring that the co integration relationship between the included variables is valid. This indicates that, when chocks happen now, in one year ahead it will be reduced by 36.2%. In other words, 0.362 suggests that about 36.2% of deviation between short-term and long-term GDP is corrected within one year. The error correction model demonstrates that this previous disequilibrium is progressively corrected in order to re-establish the long-run equilibrium situation among co integrating variables.

ECM presents the convergence of the model towards equilibrium by its negative sign and the value, 0.002, 0.287 and 0.189 for foreign direct investment (FDI), gross capital formation (GCF) and export (EXP) respectively, show that aggregate income adjusts to restore 36.2 percent of disequilibrium from the previous year to the current year. R-squared = 0.938 and showing that the total variation of dependent variable is explained by explanatory variables at 93.8%.

Given the objective of this study to analysis the impact of FDI on Rwandan economic growth, the literature states that this impact can be positive or negative to the host country. From the results of the current study, it was revealed that the FDI inflow in Rwanda from 1991 to 2022 has a positive but insignificant impact on economic growth. Some theories explain these results, especially in terms of social capabilities and absorptive capacities of the host country.

According to Verspagen (1991), technology spillovers from multinational corporations tend to occur more frequently when the social capabilities of the host country and the absorptive capacity of the firms in the economy are high. While relatively backward countries have a certain scope for catching up, it is often difficult for the country to build the necessary social capabilities and absorptive capacities that allow firms to take advantage of the technology spillovers that are

potentially available to the economy. Countries (and firms) without the capability to assimilate new technology tend to attract mainly market-seeking or resource-seeking foreign investment, while countries with this capability tend to attract more efficiency-seeking and asset-seeking foreign investment. Closing the technology gap will be difficult without the relevant capabilities. As a result, there appears to be a certain threshold of development that countries must cross before the potential for technological spillovers can be realized.

Negative economic effects can be both direct and indirect. Direct negative effects, from a purely economic perspective, can arise from the market power of the multinational corporation and its ability to use this power to generate supernormal profits and transfer these to its shareholders, who presumably are not residents of the host country. In addition to negative economic effects, the multinational corporation might be capable of indirectly creating negative economic effects for the host country. For example, multinational corporations might be able to influence the local political process to the economic detriment of the host country ' s economy (for example, by inducing politicians to grant to the multinational corporation direct or indirect subsidies, such as investment incentives or protection from imports in the local market). Similarly, despite the efforts made by the Government of Rwanda to promoted a series of reforms to improve the investment climate and encourage private investment, especially FDI, the results show that these efforts were not translated into a positive effect on the economic growth.

According to Borensztein et al. (1998), in his study found that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Therefore, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy. This may the case for Rwanda, probably, the foreign investors do not find the sufficient local capacities to work with.

4.6. Diagnostic Tests

Diagnostic tests in econometric modelling are essential tools used to assess the validity of statistical assumptions and the reliability of the estimated econometric models. These tests help econometricians and researchers evaluate whether a particular model is suitable for the data at hand and whether the underlying assumptions of the model are met. Here are some commonly used diagnostic tests in econometric modelling: Stability test (Cumulative Sum Test) normality test (Jarque-Bera Test), autocorrelation tests (Durbin-Watson Test), heteroscedasticity test (Breusch-Pagan Test), multicollinearity test (Variance Inflation Factor).

It's important to note that the choice of diagnostic tests depends on the specific econometric model and the nature of the data being analysed. It often requires the use of combination of these tests to thoroughly diagnose the regression model before drawing conclusions from the estimated coefficients. Additionally, the interpretation of these tests requires a deep understanding of econometric theory and the context of the research.

4.6.1. Test for model stability

The Cumulative Sum (CUSUM) test is a statistical technique used for detecting abrupt and persistent shifts in a time series data. It's commonly employed in quality control and signal processing but also finds applications in econometrics, especially for testing structural stability in regression models. The CUSUM test is particularly useful for identifying changes in the relationship between variables over time. In practice, the significance of CUSUM values is assessed using critical lines or intervals on the CUSUM plot. If the CUSUM values cross these critical lines, it suggests a structural change.

To perform this test, cumulative sum (CUSUM) of recursive residuals test was used to determine whether there is a structural break. Under the null hypothesis, the cumulative sum of residuals should have mean zero. This means that by fitting time-series regression, the coefficients are assumed to be stable over time and not abruptly change in ways not predicted by the model. Said more technically, it tests for structural breaks in the residuals. For both long-run and short-run regression in ECM, the plot and results are presented in figure below:

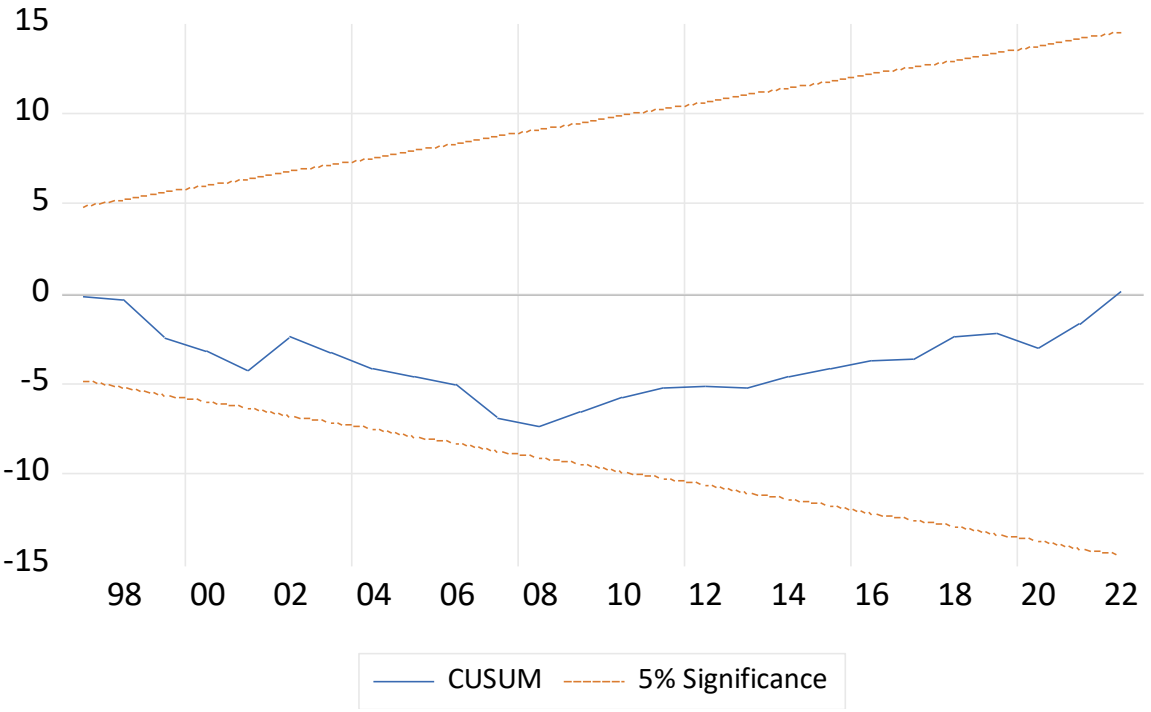

Figure 4. 13 :Stability test for ECM

[Source: Researcher's plot using EViews 12, 2023]

According to figure 4.12, the model is stable, as shown by the fact that the values for the cumulative sum of recursive residuals (CUSUM) series are within the relevant constraints at 5% of significance level. Based on this diagnostic test, the employed model is good for this study. Hence, the null hypothesis fails to be rejected that coefficients are stable.

4.6.2. Normality test

Normality tests are used in econometric modelling to assess whether a set of data follows a normal distribution. The normality assumption is crucial for many statistical techniques, including hypothesis testing and confidence interval estimation. When conducting a normality test, it's essential to consider the sample size. Some tests are more appropriate for small sample sizes, while others are suitable for larger datasets. For this study, Jarque-Bera test was used. It examines whether the sample data has the skewness and kurtosis matching a normal distribution. Large values of the Jarque-Bera statistic indicate that the data does not have a normal distribution.

The normality test was carried under the null hypothesis of the presence of normal distribution residuals from ECM:

Ho: Residuals are normally distributed

The results for the normality test are displayed in the figure below:

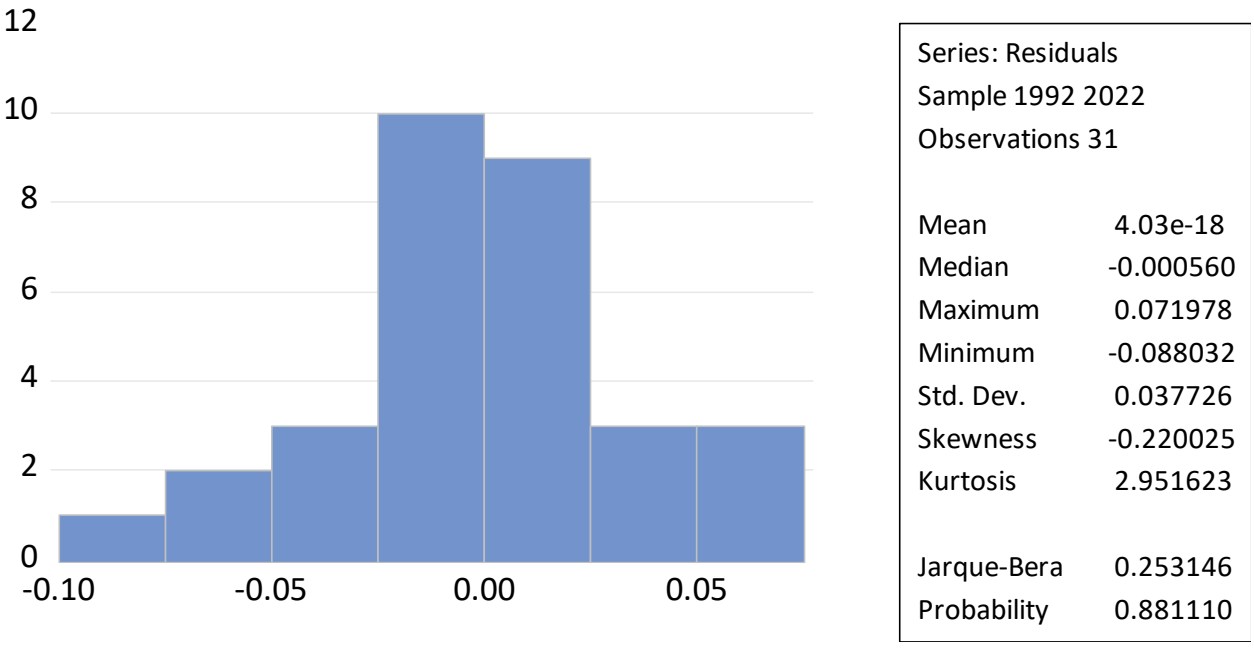

Figure 4. 14: Normality test

[Source: Researcher's plot using EViews, 2023]

Since the p-value is greater than 0.05, the null hypothesis could not be rejected and hence residuals are normally distributed.

4.6.3. Heteroscedasticity test

Heteroscedasticity refers to the situation in econometrics where the variability of the errors (or residuals) in a regression model is not constant across all levels of the independent variables. In simpler terms, the spread or dispersion of the residuals changes as the values of the independent variables change. Heteroscedasticity can lead to inefficient estimates and affect the results of hypothesis tests. White's test is a more general test that evaluates the null hypothesis that the residual variance is constant against the alternative hypothesis that it is a function of certain observed variables.

For this study, the heteroscedasticity test was carried out under the null hypothesis of the presence of homoskedasticity:

Ho: residuals are homoskedastic

The results for the heteroscedasticity tests are displayed in the table below:

Table 4. 7: Heteroscedasticity test

Test	Description	F-Statistic	P-value
White's test	For homoskedasticity test	0.7326	0.5780

[Source: Research computation using EViews, 2023]

From the table above, since the p-value is greater than 0.05, we failed to reject the null hypothesis and hence residuals have the same variance. Also, these results are plotted below:

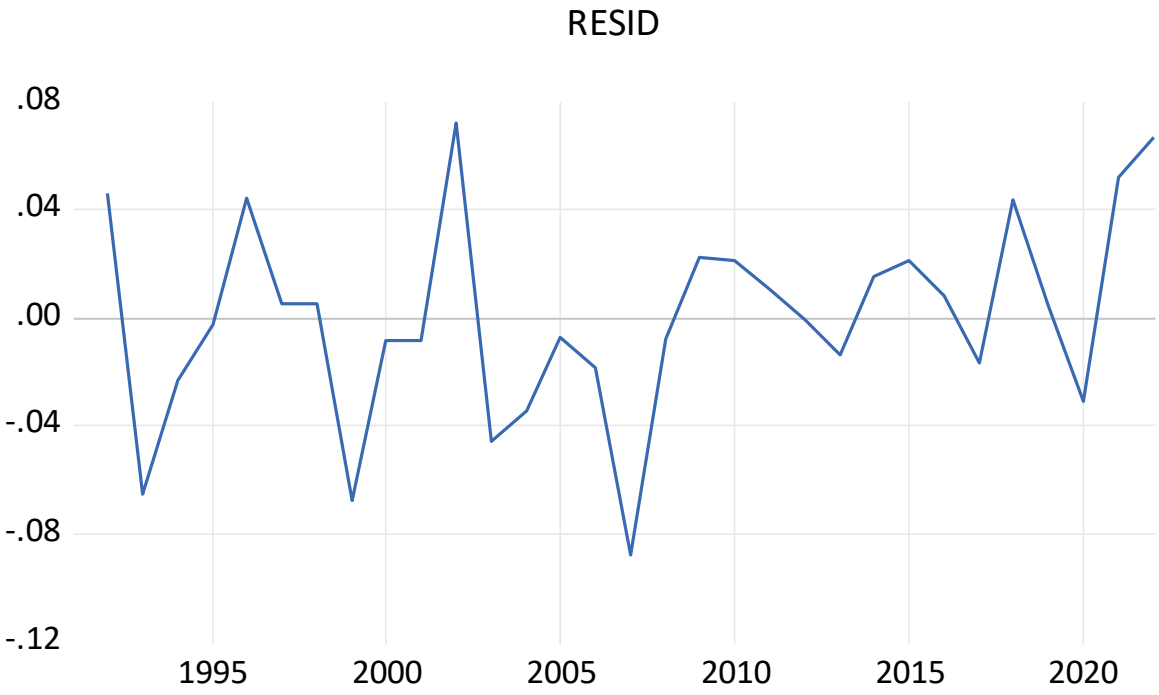

Figure 4. 15: Graphical representation of residuals

[Source: Researcher's plot using EViews, 2023]

From the above graph, it can be realized that residuals fluctuate around their constant mean value and seem to be roughly horizontal.

4.6.4. Multicollinearity test

Multicollinearity refers to a situation in which two or more independent variables in a regression model are highly correlated, making it difficult to determine their individual effects on the dependent variable. Multicollinearity can lead to unstable coefficients and inflated standard errors, which can affect the interpretability and reliability of the regression results. To detect multicollinearity, several methods and tests can be employed and for this study, variance inflation factor (VIF) method was used. VIF measures how much the variance of an estimated regression coefficient increases if your predictors are correlated. High VIF values (usually greater than 10) indicate problematic levels of multicollinearity.

The multicollinearity test was performed by using the variance inflation factor (VIF) method. The results are displayed below:

Table 4. 8: Multicollinearity test

Variable	$DlnFDI_t$	$DlnGCF_t$	$DlnEXP_t$	U_{t-1}	Mean
VIF	4.7	6.2	2.2	1.1	3.55

[Source: Research computation using EViews, 2023]

Since the value VIF for all variables of and its mean is less than 10, there is no significant problem of multicollinearity among variables/predictors.

4.6.5. Serial correlation LM test

The Serial Correlation LM (Lagrange Multiplier) Test, also known as the Breusch-Godfrey Test, is a statistical test used in econometrics to detect serial correlation (autocorrelation) in the residuals of a regression model, particularly in time series data. Serial correlation occurs when the error terms in a time series regression are correlated with each other over time, violating one of the assumptions of classical linear regression. The Serial Correlation LM Test is crucial in time series econometrics to ensure that the regression model's residuals do not exhibit patterns or trends over time that can lead to inefficient coefficient estimates and biased hypothesis testing. The residuals correlation was tested by using Breusch-Godfrey Serial Correlation LM Test under the null hypothesis of no residuals correlation:

Ho: residuals are not correlated

The results are displayed in the table below:

Table 4. 9: LM test

Test	Description	F-Statistic	P-value
LM test	Checking serial correlation	0.7118	0.5008

[Source: Research computation using EViews, 2023]

From the table above, since p-value is greater than 0.05, we failed to reject the null hypothesis, meaning that residuals are not correlated. It also means that the estimated variances of the regression coefficients are unbiased and consistent, and therefore hypothesis testing is valid and R-square was not overestimated.

Given that the model has passed the relevant diagnostic tests, the following conclusions could be drawn:

- The chosen econometric model is valid since the assumptions of the model are met, such as linearity, independence, homoscedasticity, and normality;
- The model is well-fitted and hence this enhances the trustworthiness of predictions and policy simulations;
- The successful of diagnostic tests, such as tests for autocorrelation and heteroscedasticity, ensure that estimates are efficient. Therefore, the forecasts are likely to be more reliable, aiding businesses and policymakers in making informed decisions about the future;
- Lastly, the successful diagnostic tests could enhance the credibility of the research.

In summary, successful diagnostic tests in econometric modelling are vital for ensuring the reliability, accuracy, and validity of the model. They provide a foundation upon which meaningful analysis, informed decision-making, and policy formulation can occur.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary

The objective of this study was to analyse the impact of foreign direct investment net inflows on economic growth in Rwanda. The variables of interest were Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Gross Capital Formation (GCF) and Exports (EXP) for the period of 1991-2022. Since data for these variables are time series, stationarity test was performed. It was realized that all series are non-stationary at their level, that is, they are not I (0). Therefore, further treatments were required to determine order of integration and eventually, test for cointegration was carried out. Order of integration of each and every series required that we correct non-stationarity of each series in its log form to become stationary and observe at what difference it becomes stationary to determine the order of integration. It was found that all variables' data are stationary at first difference, I (1). With this result, it was further required to perform the Johansen test for ultimate confirmation of the appropriate model for analysis.

After realizing that all variables are non-stationary at level, it was necessary to test if their linear combination is stationary or they are cointegrated. After the test, it was found that there is only one cointegrating equation, that is, variables are cointegrated and there is long run relationship between them. From this result, Error Correction Model (ECM) was appropriate for the analysis. The ECM is a statistical model used in econometrics to analyse and correct for deviations from a long-run equilibrium or relationship between variables. It is often applied to time series data and is particularly useful for studying relationships among variables that are non-stationary, meaning they exhibit trends or have a unit root.

The long-run relationship among variables was determined and found that the entire coefficients calculated probability is less than the 5% critical value. This indicates that there is a significant long run relationship between explanatory variables (FDI, GCF & EXP) and the dependent variable (GDP). The coefficients 0.009, 0.310 and 0.280 for lnFDI, lnGCF and lnEXP respectively indicate the long-run relationship with lnGDP. FDI has a negative and insignificant effect on GDP whereas both GCF and EXP have positive and significant effect on GDP. Holding other factors constant (GCF, EXP…), the increase of 1% in FDI decreases the GDP about 0.009% in long run and this is insignificant at 5%. The increase of 1% in GCF contributes, significantly at 5%, about 0.310% to the GDP in long run, holding other factors constant (FDI, EXP…). Finally, the increase of 1% in EXP contributes about 0.280% to the GDP in long run, holding other factors constant (FDI, GCF…) and this is significant at 5%. This relationship among FDI, GCF and EXP with GDP will hold for long term since these variables are cointegrated. From these results, it could be concluded that GCF contributes more than FDI and EXP to the GDP in long-run. R-square, the overall measure of goodness of fit indicates that the explanatory variables included in the above model explain 99.4% of the variation of the dependent variable (GDP).

Furthermore, the Error Correction Model was estimated in order to maintain the long-term equilibrium established between GDP, FDI, GCF and EXP. For that, the coefficients of $\Delta lnFDI_t$, $\Delta lnGCF_t$ and $\Delta lnEXP_t$ were estimated to show the short run relationship that each variable has on $\Delta lnGDP_t$. For both GCF and EXP, the short run relationship has a positive and significant impact on GDP, whereas for FDI, the short run relationship has a positive and insignificant effect on GDP. Holding other factors constant (GCF, EXP…), the increase of 1% in FDI increases the GDP about 0.002% in short-run. The increase of 1% in GCF contributes about 0.287% to the GDP in short-run, holding other factors constant (FDI, EXP…). Finally, the increase of 1% in EXP contributes about 0.189% to the GDP in short-run, holding other factors constant (FDI, GCF…). From these

results, it could be concluded that GCF contributes more than FDI and EXP to the GDP in short-run.

The error correction term was found to be negative and significant as the theory suggests. This assures that the co integration relationship between the included variables is valid. The estimated coefficient of the error correction term is 0.362 and this suggests that about 36.2% of deviation between short-term and long-term GDP is corrected within one year. The error correction model demonstrates that this previous disequilibrium is progressively corrected in order to re-establish the long-run equilibrium situation among co integrating variables.

ECM presents the convergence of the model towards equilibrium by its negative sign and the value, 0.002, 0.287 and 0.189 for foreign direct investment (FDI), gross capital formation (GCF) and export (EXP) respectively, show that aggregate income adjusts to restore 36.2 percent of disequilibrium from the previous year to the current year.

For model stability, the cumulative sum (CUSUM) of recursive residuals test was used to determine whether there is a structural break. Under the null hypothesis, the cumulative sum of residuals should have mean zero. It was found that the model is stable, as shown by the fact that the values for the cumulative sum of recursive residuals (CUSUM) series are within the relevant constraints at 5% of significance level and based on this diagnostic test, the employed model is good for this study.

In addition to CUSUM test, other tests such as multicollinearity, autocorrelation and heteroscedasticity were performed and were successful. This ensures that estimates are efficient and hence the forecasts are likely to be more reliable, aiding businesses and policymakers in making informed decisions about the future.

5.2. Conclusion

This study provided a review of theoretical and empirical literature of FDI in general, FDI theories and the relationships with economic growth (measured as GDP). It aimed to assess the impact of foreign direct investment on economic growth of Rwanda by using ECM for the period of 1991 to 2022. Dependent variable is GDP while FDI, Foreign Direct Investment (FDI), Gross Capital Formation (GCF) and Exports (EXP) are independent variables. The results showed a long-term, favourable association among variables. The study revealed that there is a negative and insignificant effect of FDI on GDP in long-run and positive but insignificant in short-run regardless the effort that has been made by the government of Rwanda to attract foreign investors. However, the government should keep on improving the policies to fascinate more foreign direct investments in the country. This means that the government needs to enact and implement appropriate policies towards public investment and export sector to ensure sustainable and inclusive economic growth.

Furthermore, the findings have revealed that GCF has a strong positive and significant effect on GDP growth rate. This positive GCF impact for Rwanda is a good economic indicator that measures the total value of new physical assets (like buildings, machinery, equipment, and infrastructure) that have been produced in the country economy over 32 years. In simpler terms, it represents the net increase in physical assets within Rwandan economy for that period of time and this could serve to assess how well the investment levels in Rwanda has performed. GCF includes both private and public sector investment in fixed assets and it is an essential component of the calculation of a nation's Gross Domestic Product (GDP). For that reason, GCF is crucial for economic growth because it signifies the economy's ability to produce more goods and services in the future. Higher levels of GCF generally indicate increased investments in productive assets, which can lead to higher productivity, employment, and overall economic growth. Conversely,

lower levels of GCF may indicate a slowdown in economic activity and potential challenges for future growth.

Eventually, the exports found to have a positive and significant effect on GDP growth. This is in accordance with the fact that Rwanda has experienced significant economic growth over the past few decades, and exports have played a crucial role in this growth. This results in fact that the country has implemented various economic reforms and policies to promote exports and enhance economic development.

In all, Foreign Direct Investment (FDI) plays a pivotal role in shaping the economic landscape of countries worldwide. FDI serves as a catalyst for economic development by facilitating the flow of capital, technology, and managerial expertise across borders. Through a comprehensive analysis, this study explored the multifaceted effects of FDI on economic growth, encompassing factors such as employment generation, technological advancements, infrastructure development, and trade expansion. Furthermore, it went into the challenges associated with FDI, including income inequality, environmental concerns, and the potential displacement of domestic industries. The study revealed the need to emphasize the significance of well-formulated policies and regulatory frameworks that maximize the benefits of FDI while mitigating its negative consequences. By fostering a conducive environment for foreign investors and strategically integrating FDI into national development strategies, country can harness its potential to drive sustainable economic growth and enhance overall societal well-being.

5.3. Recommendation

Foreign Direct Investment, when managed prudently, serves as a catalyst for economic growth, technological advancement, and employment generation. By embracing FDI with a keen focus on sustainable practices, inclusive growth, and strategic planning, nations can harness its transformative potential, driving robust and resilient economic development. Despite the efforts made by the government of Rwanda to promote a series of reforms to improve the investment climate and encourage private investment, especially FDI, this study revealed an insignificant negative impact in long run and an insignificant positive impact in short run on Rwanda economic growth.

Given the findings in this study, the researcher recommends to the decision-makers the following actions:

1) To attract FDI strategically, focusing on sectors aligned with national development goals, technology transfer, sustainable practices and those that promise positive spillover effects;
2) To implement transparent and investor-friendly regulations that safeguard national interests and domestic industries while providing a conducive environment for foreign investors;
3) To develop a skilled workforce, which enhances capacity to absorb and innovate upon FDI technologies, through investments in education, vocational training and research to enhance local skills and innovation capacity, reducing dependency on foreign expertise and enforce labour standards;
4) To establish robust monitoring mechanisms to evaluate the impact of FDI through regular assessments to enable policymakers to adapt strategies, ensuring that FDI aligns with evolving national priorities.

The implementation of the above actions may help to achieve and harness the positive impacts of FDI while mitigating potential negatives.

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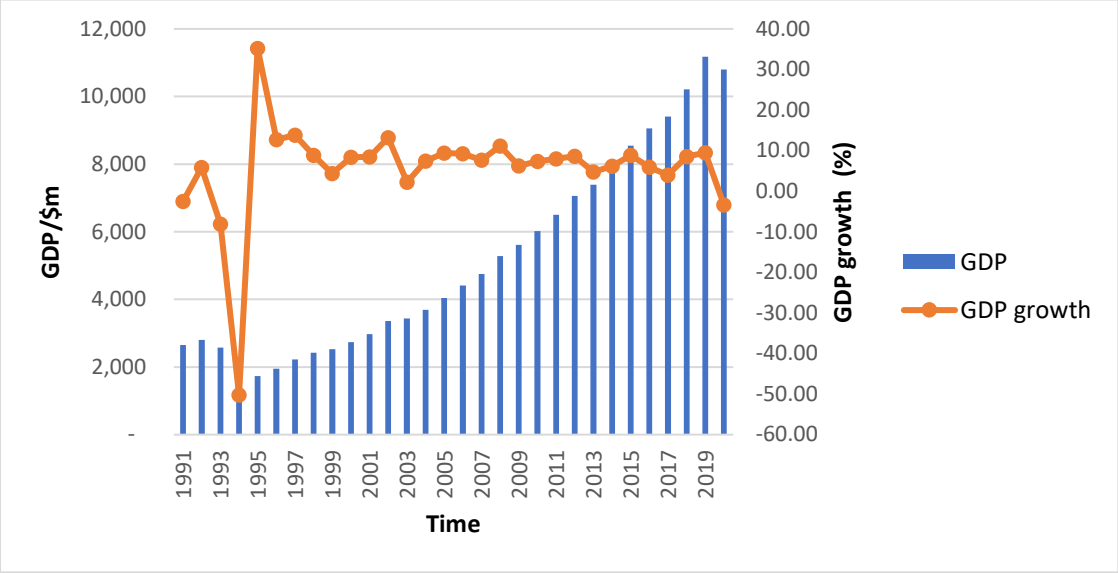
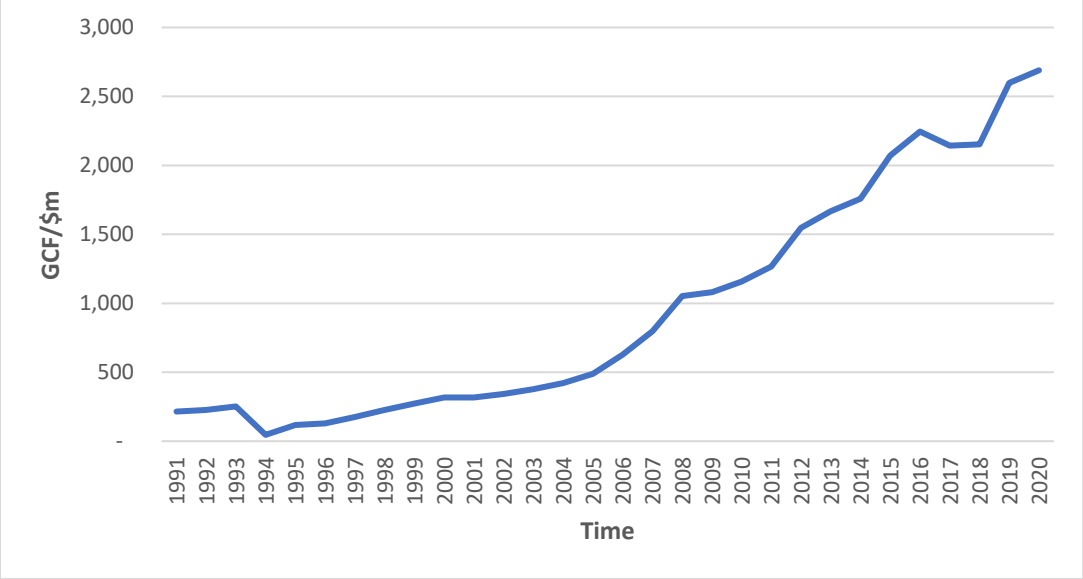
APPENDICES

Appendix 1: Trend analysis of Gross Domestic Product (GDP)



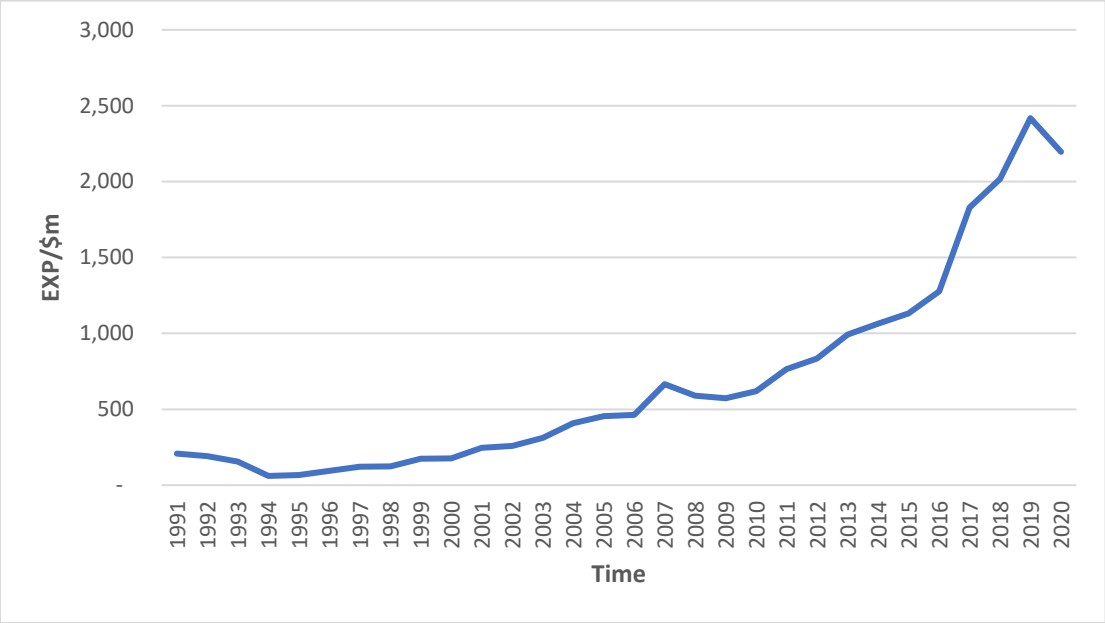
[Source: Researcher's plot using Excel, 2023]

Appendix 2: Trend analysis of Gross Capital Formation (GCF)



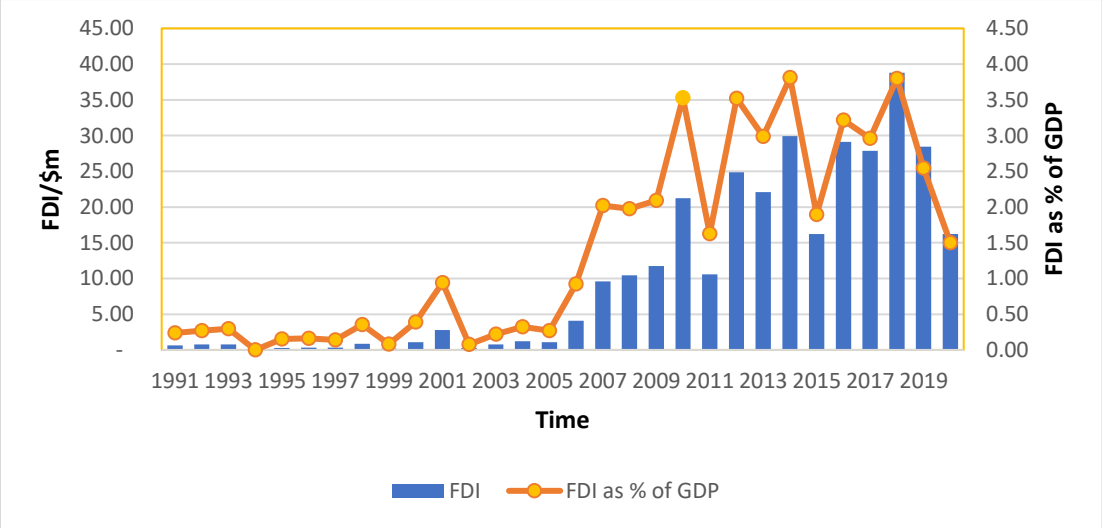
[Source: Researcher's plot using Excel, 2023]

Appendix 3: Trend analysis of Exports



[Source: Researcher's plot using Excel, 2023]

Appendix 4: Trend analysis of Foreign Direct Investment (FDI)



[Source: Researcher's plot using Excel, 2023]

Appendix 5: Time series data used for research

Year	GDP	FDI	GCF	EXP
1991	2,647,482,396	4,580,000	214,385,631	207,743,031
1992	2,802,961,762	5,500,000	226,662,007	190,084,878
1993	2,575,678,230	5,840,000	251,921,871	156,258,648
1994	1,281,449,704	1,000	45,919,732	60,841,832
1995	1,732,828,552	2,000,000	117,455,751	66,056,631
1996	1,953,689,607	2,220,000	128,404,271	93,847,459
1997	2,224,270,782	2,590,000	174,894,803	122,387,035
1998	2,421,311,579	7,100,000	226,589,708	124,712,706
1999	2,526,684,355	1,740,000	272,070,627	175,175,979
2000	2,738,191,082	8,100,000	317,589,538	175,524,610
2001	2,970,514,100	18,500,000	317,935,591	245,504,427
2002	3,362,386,285	1,500,000	342,487,862	258,016,915
2003	3,436,439,446	4,700,000	376,363,705	310,641,635
2004	3,692,374,645	7,700,000	421,156,605	409,250,876
2005	4,038,641,784	7,960,000	488,753,970	454,930,778
2006	4,411,290,087	30,643,966	628,511,698	462,799,873
2007	4,748,016,223	82,283,166	797,369,496	666,202,208
2008	5,277,954,721	102,290,000	1,052,337,358	590,135,829
2009	5,607,735,163	118,670,000	1,081,369,620	571,742,948
2010	6,019,042,816	216,192,557	1,158,048,554	618,906,558
2011	6,498,060,900	112,127,536	1,265,356,741	765,536,507
2012	7,059,591,972	269,615,550	1,546,927,475	834,523,711
2013	7,392,794,504	233,763,794	1,666,353,384	992,108,313
2014	7,848,720,203	313,997,163	1,756,895,508	1,063,943,633
2015	8,543,869,360	162,083,821	2,070,890,063	1,130,492,738
2016	9,054,003,029	279,747,328	2,246,036,450	1,276,683,714
2017	9,410,423,920	274,025,991	2,144,039,484	1,829,445,394
2018	10,214,058,732	366,192,316	2,152,070,032	2,016,616,126
2019	11,180,719,839	263,172,335	2,597,901,663	2,418,124,155
2020	10,803,483,880	152,614,121	2,689,531,049	2,196,616,183
2021	11,978,550,062	211,896,129	2,996,045,702	2,259,267,804
2022	12,955,698,812	398,599,355	2,694,900,725	2,939,958,459

[Source: World Bank, 2023: https://datatopics.worldbank.org/world-development-indicators/themes/economy.html , Accessed on 19/08/2023]