

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
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EFFECT OF FOREIGN DIRECT INVESTMENT (FDI) ON ECONOMIC
GROWTH IN GHANA.

By

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A Thesis submitted to the Department of Accounting and Finance
College of Humanities and Social Sciences in partial
fulfillment of the requirements for the degree of

MSC. ACCOUNTING AND FINANCE

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DECLARATION

I hereby declare that this submission is my own work towards the award of the MSc
and that, to the best of my knowledge, it contains no material previously published by

another person or any material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This study is dedicated to my lovely family for the love, care and support throughout my life and period of education.

ACKNOWLEDGEMENT

My sincere gratitude goes to the Almighty God for the life and strength given me throughout the period of studies. I am most grateful to my supervisor for his tireless support and guidance throughout this work. Thanks to my colleagues and friends who provided a helping hand to me in one way or the other, though time will not permit me to mention your names, I am much grateful to you all for the support.



ABSTRACT

The study's primary objective was to determine the effect Foreign Direct Investment (FDI) on economic growth in Ghana. The study focuses on analysing the trends in foreign direct investment and economic growth in Ghana, determine the relationship between foreign direct investment and economic growth in Ghana and examine if any other factors influence economic growth in Ghana. The study adopted a quantitative research design. Indicators of world development were used to gather data for the variables under investigation. Additionally, secondary data from yearly reports on different amounts of FDI for the time span 1990–2022 is used. Due to the availability of data for the selected variables, this time was chosen, and it will be sufficient for the study. The study determined the trend in the data and pearson pairwise correlation was used to establish the relationship between the variables of the study. Again, the study adopted linear regression to determine the effect of FDI on economic growth. R-console was used to analyse the data. The study concluded that the relationship between FDI and economic growth is deterministic and that there has been an inconsistent rise or amount of FDI inflows into Ghana between 1990 and 2022. The study also demonstrates that Foreign Direct Investment (FDI) has a favourable impact on Ghana's economic expansion. The study found that capital and government expenditure all have an impact on economic growth. The study recommended that, since FDI has a positive impact on economic growth, policies and regulations to redirect resources to sectors and institution that will lead to a positive impact on economic growth. Also, in order to attract foreign direct investment, the Ghanaian government should spend money on the most important sectors of the economy.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Investment plays a crucial role in the economy's growth and ability to survive (Ayenew, 2022). The ownership investments, or stock, are the most lucrative and explosive type of investing. According to Abdul-Karim and Karim (2018), foreign direct investment (FDI) creates a variety of investment groupings (portfolios) into which an investor can direct his or her resources in order to lower opportunity cost and also lower returns from them. According to Anarfo, Agoba, and Abebrese (2017), the financial sector has changed as a result of an increase in the elimination of interest rates on the free flow of products and market access between nations. In order to spur economic growth, this change has been accelerated by increased market competition, which has sparked the development of a new financial instrument with broad market appeal and low transaction costs (Ahmeti & Kukaj, 2016). This has also captured the interest of numerous investors from various backgrounds.

According to balance of payments, FDI is the total of equity capital, other long-term, and short-term capital. A enduring managerial interest (10% or above of voting stock) in a company that operates in a nation other than the investor's is expound as the net inflows of investment. According to Akpalu, Agbenyo, Sarr, and Letete (2017), management engagement, collaborative ventures, the transfer of technology, and experience are frequently involved. Employee training can aid in the growth of the nation's skills, while the infusion of foreign cash into the host economy may assist to the construction of physical capital. In other words, FDI can support a nation's

development efforts by enhancing the total factor productivity or by accumulating physical and human capital (Abbes, Mostéfa, Seghir & Zakarya, 2015). However, empirical research demonstrates that neither of these advantages may be taken for granted.

According to a study on capital consumption, when acquiring control of a foreign firm, investors frequently fail to transfer all of their capital; rather, they typically finance a significant portion of their incitement in the capital market (Ayenew, 2022; Baiashvili & Gattini, 2020). Instead of bringing in scarce cash from overseas, foreign businesses that borrow extensively from local banks run the risk of further restricting domestic businesses' access to capital markets (Bulus & Koc, 2021). The role and significance of foreign direct investment have been at the center of a discussion over the best public policies aimed at transforming the impoverished state-owned economies of former socialist countries into vibrant market systems (Cristina & Babe, 2014). According to some academics, privatizing state-owned assets to foreign investors allowed for efficiency gains, facilitated technology transfers, and improved access to global markets, which helped these nations more easily overcome the difficulties of rapid economic reform.

While numerous case studies and small country comparisons support the notion that FDI positively affects economic growth (Dellis, Sondermann & Vansteenkiste, 2017; Eren, Onda & Unel, 2019). According to some scholars, FDI primarily has negative effects on nations, such as the dismantling of existing production networks, the encouragement of low-wage, low-value manufacturing, and the country's continued reliance on foreign economic players (Hayat, 2016). Because of this conundrum, it is

therefore reasonable to wonder how FDI will affect the development of an economy with a lower middle class, like Ghana. On the other hand, this study used a time series data to established the contribution of Foreign Direct Investment (FDI) to economic growth in Ghana.

1.2 STATEMENT OF THE PROBLEM

According to a world bank study from 2023, Ghana's net FDI outflows as of 2021 were \$2,612,789.79. In addition, according to Index Mundi's 2018 report, Ghana's 2016 FDI net outflows were \$14,665,000. The value of this indicator has varied over the previous 26 years, ranging from 233,000,000 in 1994 to \$221,426,800 in 2015. Over the years, the flow of foreign direct investments (FDI) into an economy has served as a major pillar for the majority of development in the sub-Saharan economies of Africa, particularly in Ghana (Ayenew, 2022). While numerous case studies and small country comparisons support the notion that FDI positively affects economic growth (Dellis, Sondermann & Vansteenkiste, 2017; Eren, Onda & Unel, 2019). According to some scholars such as Ayenew, (2022) and Baiashvili and Gattini (2020), FDI primarily has negative effects on nations, such as the dismantling of existing production networks, the encouragement of low-wage, low-value manufacturing, and the country's continued reliance on foreign economic players (Hayat, 2016). Additionally, there has been inequality in the flow of resources into the economy (Baiashvili & Gattini, 2020) as a result of the fact that these inflows have not been of the same size in all of the regional economies. All of these industries have benefited from FDI in developing nations like Ghana and have advanced and contributed to the nation's economic growth. The question at hand is, how has FDI effected economic growth in Ghana? Therefore, this

study seeks to evaluate contribution of Foreign Direct Investment (FDI) to economic growth in Ghana.

1.3 OBJECTIVES OF THE STUDY

This study's primary objective is to determine the effect of FDI on economic growth in Ghana. The following particular objectives of the study were created to direct it based on its purpose.

- i. To analyses the trends of FDI and economic growth.
- ii. To determine the relationship between FDI and economic growth.
- iii. To examine if any other factors influence economic growth in Ghana.

1.4 RESEARCH QUESTIONS

- i. What are the trends in FDI and economic growth in Ghana?
- ii. What is the relationship between FDI and economic growth in Ghana?
- iii. Are there other factors that influence economic growth in Ghana

1.5 SIGNIFICANCE OF THE STUDY

In order for policy makers to decide whether to encourage FDI expansion in the country, they will need to know the degree of FDI's influence on the nation. Once more, this study will assist different industries in positioning themselves favorably for FDI, which will increase their industrial activities and, in the long term, may enhance their corporate social responsibility as well as socioeconomic and environmental innovation. The results of this study can help policy makers understand the efficacy of existing FDI policies and direct them in developing policies that draw the kind of FDI that is in line

with Ghana's objectives for economic development. This study can offer insights that can be applied to other similar circumstances and help the world understand the impact that FDI plays in developing economies like Ghana. Positive results on FDI's role in economic growth may increase investor confidence and maybe draw more FDI to Ghana. In order to achieve economic growth that is sustainable and takes into account environmental and social factors, there is the need to evaluate environmental and social effect of FDI. The study may contribute to existing academic and scientific understanding of the connection between economic growth and FDI and may inspire additional investigation in this area.

1.6 OVERVIEW OF METHODOLOGY

The study adopted a quantitative research design. Indicators of world development were used to gather data for the variables under investigation. Additionally, secondary data from yearly reports on different amounts of FDI for the time span 2000–2022 is used. Due to the accessibility of data for the selected variables, timeframe was chosen, and it will be sufficient for the study. The study determined the trend in the data and Pearson pairwise correlation was deployed to establish the correlation between variables. Again, linear regression to determine the effect of FDI to economic growth was adopted. Rconsole was used to analyse the data.

1.7 SCOPE AND LIMITATIONS

The aim of the study is to evaluate how foreign direct investment has affected Ghana's economic expansion. The investigation will span the years 2000 to 2022. On account of the accessibility of data for the relevant variables, the timeframe was chosen. The study was limited to these variables such as FDI, economic growth, GDP per capital income, inflation, exchange rate and government expenditure.

1.8 ORGANISATION OF THE STUDY

The work is organized in five chapters. The study context, statement of problem, research objectives, and significance of the investigation are all covered in Chapter one. The study's boundaries and scope, and its structure, a review of the essential theories, concepts, and empirical data on FDI and economic growth are all presented in chapter two. Methodology of the study is outlines in Chapter three. The results of analysis and discussion of the findings are presented in Chapter. Chapter five deals with discussions, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION

An overview of related literature is presented in this chapter. To be more specific, it initially covers the idea and terminology of FDI before moving on to the theories of FDI. The section concludes with discussions of empirical literature.

2.1 CONCEPTUAL REVIEW

2.1.1 Concept of FDI.

In their research paper, Makiela and Ouattara (2018) proposed a definition for FDI as an institutional unit (enterprise) of financial corporations and non-financial sectors of the country where more of the institutions' votes are cast or where they have an equal ownership in the operation of the enterprise under another legal agreement. According to the International Monetary Fund, FDI is when a citizen entity from one country invests in the commercial activities of a citizen entity from another country with the intention of the business enduring for a very long time or forever (Landry, 2015). The United Nations Conference on Trade and Development clarifies the definition of FDI as a business that consists of a long-standing relationship and exhibits ongoing control and interest by a resident of a particular country (parent entity or foreign investor), excluding the country of the foreign direct investor (Kurul & Yalta, 2017).

According to Mahembe and Odhiambo's (2014) research paper, FDI refers to investments made to gain a permanent controlling interest and ten percent or more of the rights to vote for an entity starting operations in an economy outside of the investor's home country. According to Makiela and Ouattara (2018), FDI is also an upturn of a

book charge of the full venture that is well-ordered by stakeholders from a different economy and apprehended within a specific economy. We can infer from the descriptions above that FDI includes manufacturing first-hand facilities, mergers and acquisitions, reinvesting profits from international activities, and intra-firm advances. Simply put, FDI is the creation of new facilities and a long-term controlling interest (10% or more of the total shareholdings) in an organization that works in a country outside of the financier's (Makoni, 2015).

When compared to the balance of payments over time, FDI then represents total shareholders' funds and short-term funds (Mamingi & Martin, 2018). According to Meierrieks and Renner (2017), FDI typically includes participation in management, the transfer of technological know-how and expertise, and joint ventures. An investor in terms of FDI is defined as the government, an individual, or a corporate body that engages in FDI by channeling finances and resources into a company in a country other than their resident nation (Mellanen, 2021). Therefore, FDI involves both the parent company and foreign investment, which join forces to form a multinational company. Since an investor who is interested in portfolio investments does not pursue control or a long-lasting concern, the concepts of "long-term," "control," and "controlling interest" distinguish FDI from portfolio investments.

2.1.2 FDI inflows in Ghana

Following financial and political transition, FDI in developing economies has increased quickly. Most nations have loosened FDI regulations, improved macroeconomic stability, privatised state-owned businesses, implemented domestic financial reforms, liberalised the capital account, and provided tax breaks as well as subsidies to attract

more FDI. For instance, to attract foreign investors as well as foster conditions which are suitable for their operations, Ghana has included provisions for investor protection and tax benefits in the Ghana Investment Promotion Act of 1994 as well as the Free Zones Act of 1995 (Razzaq, An, & Delpachitra, 2021). With the support of this initiative and strategy, Ghana has seen a rise in foreign direct investment as well as economic growth (Rehman, 2016).

Economic reforms of Ghana as well as open-door policies are aimed at attracting FDI. The World Bank's Doing Business team claims that numerous Ghanaian governments have enacted a number of recently developed legislation to improve the business environment as well as the investment environment in order to attract FDI, positioning Ghana for the second year in a row among the top ten reformers internationally. As per the 2008 World Investment Report (WIR), Ghana's contribution of FDI doubled from \$2005 to 636M in 2006 and accounts for 19.4% of gross fixed capital creation. Due to hosting the 2008 Africa Cup, UNCTAD XII, as well as World Association of Investments Promotion Agencies (WAIPA) sessions, Ghana continued to garner more prominence on the international stage in 2008. This focus comes at a moment when FDI inflows have notably increased and the country's GDP has grown well.

2.1.3 Economic Growth in Ghana

According to estimates from Mellanen (2023), GDP growth declined from 5.4% in 2021 to 3.2% in 2022. The upturn in export of gold boosted extractives growth, hence the slowdown primarily hit non-extractive industries (Kulu, Mensah & Sena, 2021).

The agriculture as well as services enterprises grow more unhurriedly in 2022 in comparison with the year before. Interest rates as well as high inflation have a negative

influence on investment as well as personal consumption. Demand of the Government was lowered by a lack of access to credit markets and substantial debt servicing obligations. The fiscal deficit for 2022 was far larger than anticipated. On a cash basis, the all-inclusive fiscal deficit was 9.9% of GDP compared to the 6.7% target.

All year, annual rate of inflation grew. Mellanen (2023) estimates that average CPI inflation was 31.5% in 2022 (up from 10% in 2021) and was 54.1 percent in December. In response, over the course of a year, the Bank of Ghana (BOG) increased the rate of interest for monetary policy from 14.5 to 28%. These initiatives were impeded, however, by the government's excessive use of its overdraft capacity with BOG (estimated at 6.7% of GDP in 2022) (Osei, & Kim, 2020). Generally, the balance of payments was in deficit by 5% of GDP, down from an excess of 1.9% in 2021. Consequently, the number of international reserves fell from \$9.1 billion (4.2 months of imports) in December 2021 to \$5.6 billion (2.5 months of imports) in December 2022. After being stable in 2021, the Cedi lost more than 40% of its value in terms of the US dollar in 2022 (Okwu, Oseni & Obiakor, 2020).

The banking industry is now more susceptible as a result of the reduction of the value of the cedi as well as the implications of a domestic debt exchange (DDE) that was finished in February 2023. The execution of DDE will have an impact on the financial sector of Ghana because of the large amount of public debt that banks, insurance companies, and pension funds are exposed to. According to Quaicoe, Aboagye, and Bokpin (2017), these companies are considered to hold 42.1% of the domestic government debt. The "international poverty" rate is expected to be 20.5% in 2022. Due reduction in currency, rising power as well as cost of water, and VAT increment, living expenses have increased, particularly for

food (Qureshi, Qureshi, Vo, & Junejo, 2021). This has a huge negative impact on a family's financial situation, particularly if they spend the majority of their earnings on food. Farmers in rural regions were also impacted by the rising costs of fertiliser and other supplies.

2.2 THEORY

2.2.1 Institutional FDI Fitness Theory

The concept of FDI fitness is used to describe a country's ability to draw in, absorb, and retain FDI. A country is in a better position to attract FDI inflows if it has the ability to adapt to or meet the expectations of its investors, both internal and external. This theory attempts to explain the unequal distribution of FDI among the various nations. Wilhems and Witter (1998) offered this theory as a hypothesis, and Makoni (2015) revealed it in a research project. The four fundamental elements of Wilhem's Institutional FDI Fitness theory are sociocultural, educational, market, and governmental fitness. The authors refer to the socio-cultural variables as being at the base of the pyramid because they are thought to be the most ancient and complicated among the pillars. The authors feel that education is essential to creating a favorable environment for FDI because human capital improves information processing ability and creativity in research and development.

Education is positioned above sociocultural fitness on the pyramid. Since diverse requirements are required for the various venture types to be undertaken, the exact standard or grade of education is not really an issue for FDI. However, the most important assurance is the fundamental education, which may have an impact on the productivity and efficiency of FDI operations, assuring formative education such as the

capacity to understand, vocalize, hear, interpret, and carry out orders, which is essential to draw FDI.

Market, another important pillar that reflects the financial and economic section of the institutional FDI preparedness and is established in the form of credit (financial capital) and machinery in the form of physical capital, comes next in the pyramid after education. Therefore, a healthy and well-rated financial market is a crucial component of MNCs' investment decision-making process. Wilhelms positioned the Government as the uppermost and last pillar of institutional FDI fitness theory at the top of the pyramid. The political climate of a country plays a significant part in FDI endeavors. Government fitness makes ensuring that a nation enacts laws that are sufficiently protective of the market fitness pillar.

Makoni (2015) claims that Popovici and Calin (2014) contributed to this hypothesis by stating that the Government Fitness Pillar is thought to consist of less trade and exchange rate interference, improved transparency, and less dishonesty. MNCs will avoid nations that exhibit such behavior, according to Wilhelms & Witter (1998), who also noted that politically unstable environments expose investors to increased risk on the investments they make if regulations are stringent and hostile to them. The writers came to the conclusion that although the pyramid's several pillars are positioned in a specific sequence, they are actually interconnected and function in unison in different ways. For instance, sociocultural activities, education, and markets are impacted by government policies, while sociocultural activities, education, and government are also impacted by market forces. Naturally, education influences human resources, which in turn influences markets, the government, and sociocultural practices and norms. The

sources of markets, the government, and education are, respectively, sociocultural structures (Wilhelms & Witter, 1998).

2.3 EMPIRICAL REVIEW

2.3.1 The effect of FDI on Economic Growth

Over time, FDI generates a large number of benefits that are the majority of enterprises are unable to use as a share of their own revenue but which is accessible to the entire economy. They include the dissemination of general knowledge as well as specialized manufacturing and distribution technologies, as are industrial upgrading, work experience for the workforce, as well as the adoption of contemporary management and accounting techniques. Additionally, the development of trading and finance-related networks as well as the improvement of telecommunications services may take place. By improving on capital productivity and enabling the host country to attract fresh capital on advantageous terms, FDI in services has an impact on the competitiveness of the host nation. Additionally, it produces services that can be employed strategically.

Srivastava and Talwar (2020) conducted an empirical investigation into the connection between FDI and economic growth in emerging nations. They include the dissemination of general knowledge as well as specialized manufacturing and distribution technologies. Their findings indicate that FDI has a greater effect on economic growth by improving technology than by increasing total capital accumulation in the host country. They used the average yearly rate of real GDP per person throughout each decade as the measure of economic growth. Gross FDI, which exclusively relates to inflows, is recorded in the "International Financial Statistics". Their study shows that

FDI generally has a progressive direct effect on growth, with the exception of host countries with relatively little in the way of human capital.

In a different study, Tee, Larbi, and Johnson (2017) use panel data on 22 African countries between 1984 and 2000 to empirically study the effects of different factors on FDI flows, as well as the accessibility of natural resources, macroeconomic uncertainty, regulatory environment for FDI, corruption, effectiveness of the legal system, as well as political instability. The study disproves the idea that foreign direct investment (FDI) in Africa is wholly fueled by the availability of natural resources and comes to the conclusion that, while the abundance of natural resources encourages FDI, macroeconomic instability, political instability, corruption, as well as investment restrictions discourage investment flows.

The findings imply that governments can play important roles in stimulating FDI by means of proper policy frameworks and that FDI to Africa is influenced by a variety of factors in addition to its natural resource endowment. The government may boost FDI in the short and medium term by streamlining its investment regulatory environment, enacting laws that support macroeconomic stability, as well as enhancing infrastructure. In the long run, increasing FDI can be accomplished through lowering political instability, reducing corruption, and creating a more effective judicial system (Tsatsaridis, 2017).

Wajid and Zhang (2017) examined in related works how Pakistan's GDP changed from 2006 to 2010 as a result of FDI. In their research, the growth of the GDP was also quantified. To determine the relationship between gross domestic product (GDP), foreign direct investment, and inflation, the study used a multiple regression model.

The findings indicated that GDP was the dependent variable, while FDI and inflation (CPI) were independent variables. They came to the conclusion that there is a positive and important association between GDP and FDI, yet there is a negative and notable correlation between GDP and inflation.

Wakyereza (2017) determined the role of FDI inflows in Pakistan's economic expansion in another study. From 1990 to 2015, time series data were used by Wakyereza (2017). The results of the study are based on the Unit Root Test, which provides evidence that the data was stationary, the Johansen Co-integration Test, which offers compelling evidence for the long-term correlation between variables, and the VECM Model, which served as the regression model used to complete this process. According to Wakyereza (2017), FDI inflows have a strong long-term impact on economic growth, and the labour force is highly connected with FDI to increase economic growth if given the right skills and training in terms of contemporary technology. The findings of the study showed that while FDI and labour force are significant over the long term, they are not as important in the short term. This is due to the unpredictability of political policies that makes it hard for investors to predict their investment's return.

Using time-series data from global development indicators, Wakyereza (2017) conducted a study on the effects of FDI on economic growth, employment, and poverty reduction in Uganda over a sample period of 1985–2014. He was a pioneer in Ugandan economic analysis, combining dependent and explanatory factors. The causality test among variables is the estimate approach for the impact of explanatory variables on economic growth, employment, as well as poverty. According to the results, even if FDI significantly affects economic growth, the coefficient was negative. Additionally, the

results showed that Uganda's domestic resources, including labour employment and human capital, greatly contribute to economic growth and poverty reduction.

Time series data were used in Tee, Larbi, and Rebecca's (2017) evidence-based analysis on the impact of FDI on Ghana's economic growth, which covered the years 1980 to 2012. The World Bank and World Development Indicators provided the secondary data for the study, which included real value GDP growth and FDI net inflows as a percentage of GDP (FDI ratio). Linear regression was used to analyse the data. The study's findings demonstrated that foreign direct investment (FDI) significantly influences Ghana's economic development and that FDI inflows to the country are on the rise. As a result, FDI inflows to Ghana significantly contribute to the country's economic growth and development. They do not increase capital formation, but rather the quality of its capital stock.

According to Wajid and Zhang (2017), the majority of nations have effectively attained some level of the human capital index, which measures the impact of FDI on better economic growth. FDI does not always have a positive effect on economic growth (Zhang, Qu, Zhang, Li, & Miao, 2019). Additionally, Carkovic and Levine (2002) noted that the development of human capital, global trade, and other factors all play a role to the beneficial of FDI on economic growth. FDI now affects growth rates in a country with a strong financial system (Alfaro et al., 2004). The influence of FDI on economic growth varies across established and developing economies, and as a result, it is dependent on the size of domestically competitive enterprises (Yakubu, 2020).

2.4 CONCEPTUAL FRAMEWORK

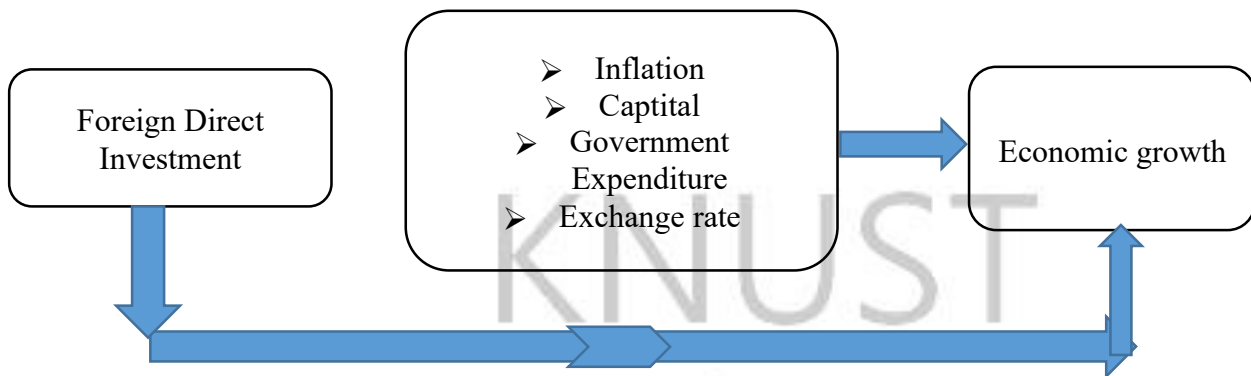


Figure. 2.1 The study's logical structure

Source: Authors own design (2023)

As seen in the image, the dependent variable is economic growth and the independent variable is FDI. However, the study has inflation, GDP per capital income, government expenditure and exchange rate as other independent variables that could affect economic growth.

2.5 SUMMARY

Foreign Direct Investment is basically owning and running a business in a host nation while the owner is located elsewhere. The transfer of technologies, the training of labour, the creation of competition, and the improvement of standards and quality are all directly impacted by FDI. Additionally, they participate in management and joint ventures and add to the deficit in the host nation's balance of payments (Rehman, 2016). According to Seth and Kalyanaraman (2017) and Tsatsaridis (2017), there is a lot of potential for multinational firms in Africa and its sub-region. According to Wajid and Zhang's research from 2017, the country saw a low FDI inflow in 1983 following the adoption of the Economic Recovery Programme. These events were brought on by the

political unrest of the time, and Ghana saw a significant increase in investment following the implementation of the Economic Recovery.

Before the 1980s, meanwhile, it was believed that the private sector was too tiny to drive Ghana's industrialization forward therefore there was the need to boost it by the intervention of FDI. A smaller total of US\$20 million in FDI inflows were made to Ghana over the years of 1970 and 1989. The level of political turmoil in the nation and poor macroeconomic mismanagement were the causes of this dismal performance. These events in the 1970s and 1980s damaged Ghana's reputation and reduced FDI inflows, but good governance and sectoral reforms helped to rebuild confidence. According to the study's conclusions, a rise in FDI would result in rapid economic expansion. According to the study, FDI increased large-scale manufacturing, necessitating an increase in labour force in order to sustain the high production. These literatures have a void since other factors influencing economic growth are not included.

CHAPTER THREE

RESEARCH METHODS

3.0 INTRODUCTION

This chapter of the research addresses numerous strategies, tactics, or plans used to gather the required data in order to meet the predetermined study objectives. It also covers a discussion of the various statistical techniques applied to the data collection and analysis.

3.1 RESEARCH DESIGN

The study adopted a quantitative research design. In order to address research questions on the study's subject, this approach entails the methodical collection of data about individuals (Zikmund, 2015). It established and reported the state of affairs. When information is required about conditions or relationships, prevalent practices, held beliefs, points of view, or attitudes, or processes that were in progress, Saunders, Lewis, and Thornhill (2014) believe that this approach is appropriate. They added that the design provides a more precise and insightful representation of the phenomenon. A descriptive study has the advantage of aiding the researcher in data collection so that he may evaluate the data and draw conclusions about the relationship between variables. As a scenario develops spontaneously, it is helpful to watch, describe, and record some parts of it (Saunders et al., 2014).

3.2 POPULATION OF THE STUDY

As indicated by Creswell (2014), the population is the entire set of units (things or people) from which a sample is drawn. It can be the quantity of the circumstance under study that is present in the study region (Cohen, Manion, & Morrison, 2014). Indicators of world development were used to gather data for the variables under investigation. Secondary data is also used, covering the years 1990 to 2022, from time series annual reports on different levels of FDI. Due to the accessibility of data for the selected variables, this time was chosen, and it will be sufficient for the study.

3.3 SAMPLE SIZE AND SAMPLING TECHNIQUE(S)

There is a need for an effective way of figuring out the appropriate sample size for a particular population. In order to accomplish this, researchers like Creswell (2014),

Cohen, Manion and Morrison (2014), and Malhota and Birks (2012) are with the opinion that most widely accepted method for figuring out the sample size in a descriptive survey is to first specify the level of estimation precision you want, after which you can figure out how many people you need to make sure you get that level of precision. The study employed a sample size of 32 observations which is 1990 to 2022. According to Cohen et al. (2014), a sample is a smaller portion of a unit selected to represent the pertinent characteristics of the population as a whole. Additionally, the study selected the dataset using purposive sampling technique. Choosing the instances to be included in the sample by hand based on judgement and specific knowledge of the topic under investigation is known as purposive sampling or the judgmental technique of sampling (Best & Kahn, 2012).

3.4 DATA COLLECTION

The World Development Indicators (WDI) dataset served as the source for both the dependent and independent variables used in the study. Also, secondary data was used, covering the years 2000 to 2022, from time series annual reports on different levels of FDI. Economic growth served as the study's dependent variable. The annual growth rate (%) was used to measure economic growth. The researcher took the log of the economic growth variable for the study's purposes. Foreign Direct Investments (FDI), GDP per capital income, exchange rate, inflation, and government spending are the study's independent variables. FDI was calculated as a proportion of net FDI inflows in current US dollars. Inflation was calculated using the annual inflation rate (%), government expenditure was calculated using the government's final consumption expenditure as a

percentage of GDP, and exchange rates were calculated using the official exchange rate (Ghana to US dollar). Except for the capital variable, which has negative values, all independent variables were logarithmic.

Table 3.1 Variables and Measurements

Variables	Measurements
Dependent Variable Economic growth	Annual growth rate (%)
Independent Variables FDI	FDI net inflows as a percentage of GDP
Inflation	Annual inflation rate (%)
Capital	Gross domestic savings as a percentage of GDP
Government expenditure	Government final consumption expenditure as a percentage of GDP
Exchange rate	Official exchange rate (Ghana to US dollar)

The regression model is $Economic\ growth = \beta_1 FDI + \beta_2 Capital + \beta_3 Gov. Exp + \beta_4 Ex. Rate$

3.5 DATA ANALYSIS

Regression is the statistical method utilized for the analysis of this study, and this part uses both descriptive statistics and inferential statistics. Descriptive statistics are used to describe the primary attributes of the study's data. Through the use of tables and graphs, they are utilized to convey quantitative description in an understandable format.

The study employed a linear regression to ascertain how FDI affected economic growth. The association between the study's variables was established using a Pearson pairwise correlation. Version 4.3.0 of R-console was used to analyse the data.

3.6 VALIDITY AND RELIABILITY

The Augmented Dickey-Fuller Unit Root Test was used to measure multicollinearity in the regression model since multicollinearity misleadingly inflates the standard errors. Thus, it makes some variables statistically insignificant while they should be otherwise significant. The Augmented Dickey-Fuller Unit Root Test was used to measure how much the variance of the estimated coefficients increases over the case of no correlation among the independent and mediating variables.

None was greater than five (5), which means there was no collinearity associated with the variables. The Augmented Dickey-Fuller Unit Root Test values were also used to determine the stationarity of the data or the variables. According to Pallant (2010), large Augmented Dickey-Fuller Unit Root Test values (a usual threshold is 0.05 and above, which corresponds to a tolerance of .10) indicate a high degree of collinearity or multicollinearity among the independent variables. In addition, under the collinearity diagnostics table, condition index values were all less than 0.05 indicating no problem with collinearity. According to Creswell (2014), a condition index greater than 0.05 and above indicates a possible problem while an index greater than 0.05 suggests a serious problem with collinearity.

The study uses additional diagnostic tests to assess the validity of the model used. This comprises the autocorrelation tests, the White (heteroscedasticity) test, and the residuals' normality test (Serial correlation). To do this, compare the residual values to

the expected values and plot the residual value to find the autocorrelation in the data. The null hypothesis is rejected and it is determined that there is heteroscedasticity in the model if the probability value exhibits statistical significance in relation to the calculated F-statistics.

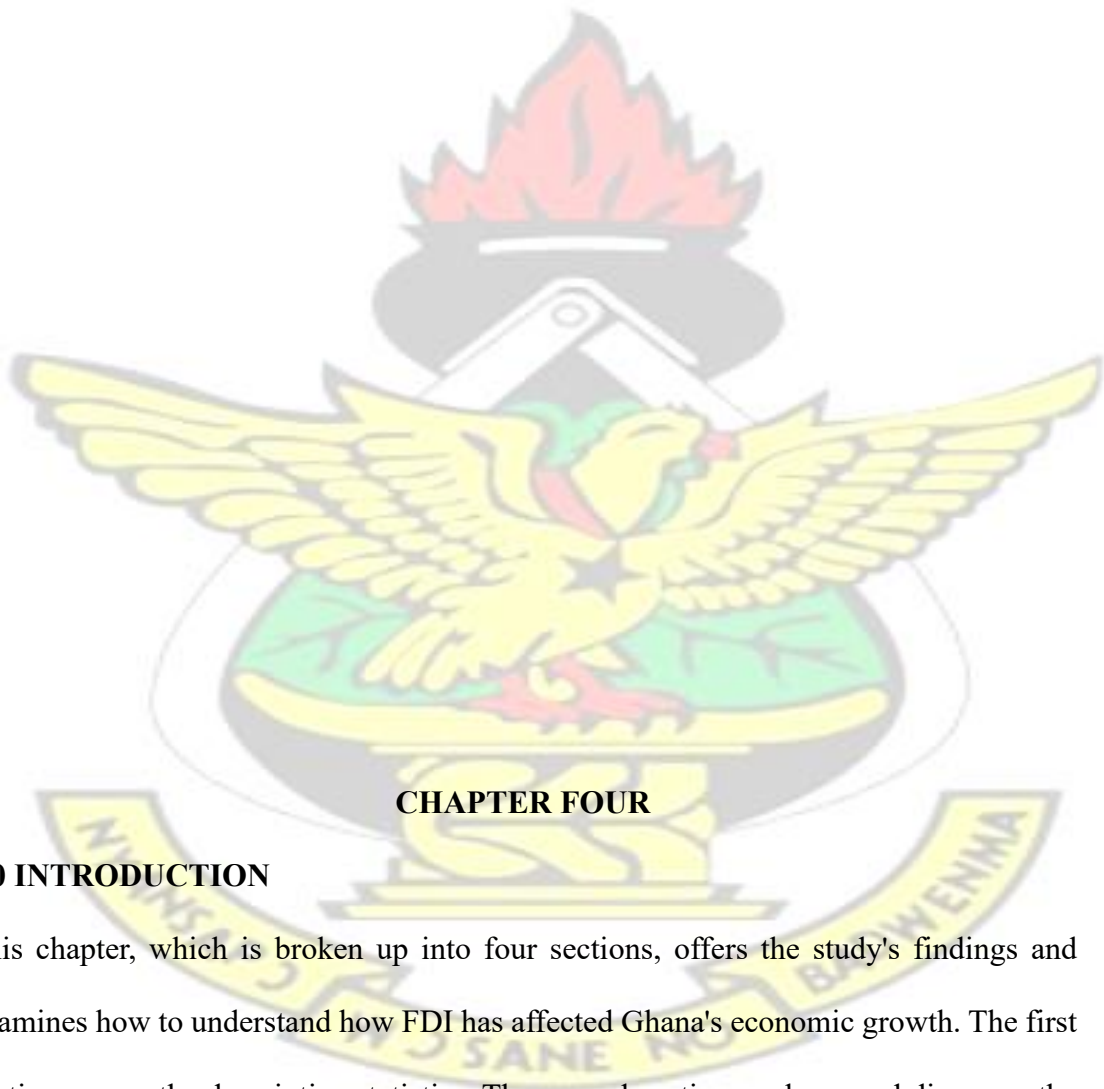
The measurement equipment will be put through validity and reliability testing to make sure they adhere to the minimum standards for acceptability. According to Messick (2006), validity refers to how much empirical data as well as theoretical justifications contribute to the sufficiency and suitability of explanations and actions based on test results. If a test can be used by numerous researchers in consistent settings and yields dependable outcomes, it is said to be reliable.

3.7 ETHICAL CONSIDERATION

Ethics is a critical consideration in research with human participants. It covers how researchers ought to conduct themselves in line with socially acceptable norms (Best & Kahn, 2012). Adhering to specified processes and standards of research ethics, the researcher, research subjects, and study clients were protected against any negative effects. Several ethical factors were considered in the study. This study took into account a number of ethical issues, including the right to privacy, informed consent, anonymity and confidentiality, deceit, and misconduct in science. According to university regulations, the researcher made sure all ethical conditions, such as

plagiarism, academic honesty, as well as recognising the use of any copyrighted sources, were followed.

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CHAPTER FOUR

4.0 INTRODUCTION

This chapter, which is broken up into four sections, offers the study's findings and examines how to understand how FDI has affected Ghana's economic growth. The first section covers the descriptive statistics. The second portion explores and discusses the trend of the variables, the third section examines the data's stationarity, and the last section examines the correlation matrix, regression analysis, diagnostic test, and

trustworthy test of the data or results. Nevertheless, the presentation was made in line with the goals of the study.

4.1 DESCRIPTIVE ANALYSIS

Foreign Direct Investments (FDI), government spending, inflation, and exchange rate were analysed using their natural logarithmic forms, while economic growth and capital (GDP) were analysed using their raw values without any transformation because they contained negative values. Table 4.1 summarises the descriptive statistics of the variables used. It makes use of the mean (average value) and standard deviation. All the variables in the table, with the exception of government expenditure and inflation, have respective means and standard deviations of (mean=10.899, Std. Dev.=2.00948; and mean=23.035, Std. Dev=13.59842), respectively, which show that they are not significantly different from the mean (average value). The average value with a standard deviation of economic growth in Ghana are (mean=5.328, Std. Dev.=2.266) and the average value of foreign direct investment of Ghana (mean=3.9150, Std. Dev.=3.082379).

Table 4.1: Summary of Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Eco. Grow. (Y)	32	5.328	2.265529	3.300	14.047124
FDI (Log)	32	3.9150	3.082379	0.2513	9.5170
Capital (GDP)	32	6.236	4.324777	-2.963369	13.219417
Govt.Exp. (log)	32	10.899	2.00948	7.069499	15.308165
Inflation (Log)	32	23.035	13.59842	8.726837	59.461554
Exch.Rate (log)	32	1.01882	1.247736	0.03262	4.72000

Notes- Eco.Grow=Economic growth, FDI=Foreign Direct Investment, Exch.Rate=Exchange Rate

Source: Analysis of Data (WDI, 2023)

4.2 The trends in foreign direct investment and economic growth in Ghana

Rationale for the first research objective was to examine the trends in foreign direct investment and economic growth in Ghana. Data was collected from World Development Indicators (WDI) dataset and figures were plotted using R-console. The dataset for the study was from 1990 to 2022 and it is yearly data.

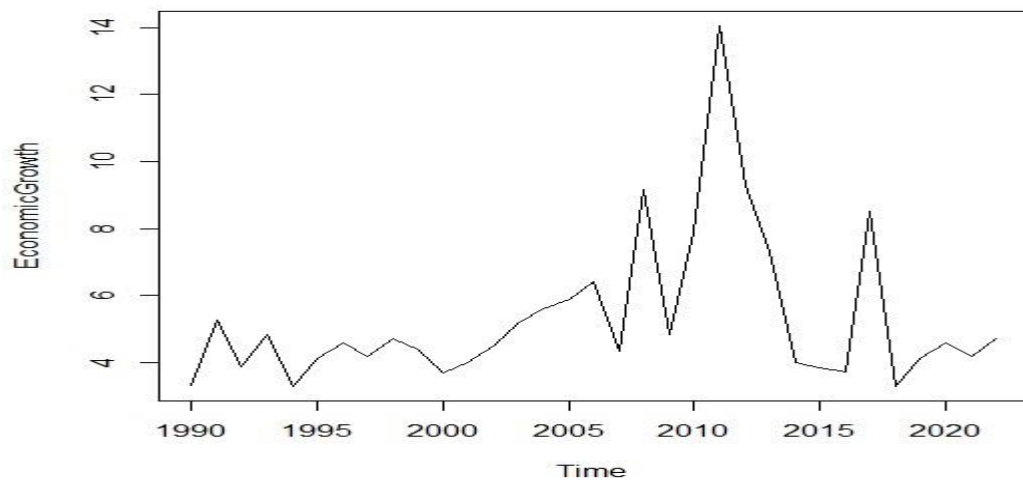


Figure 4.1: Trend of Economic Growth in Ghana (1990-2022)

Source: Analysis of Data (WDI, 2023)

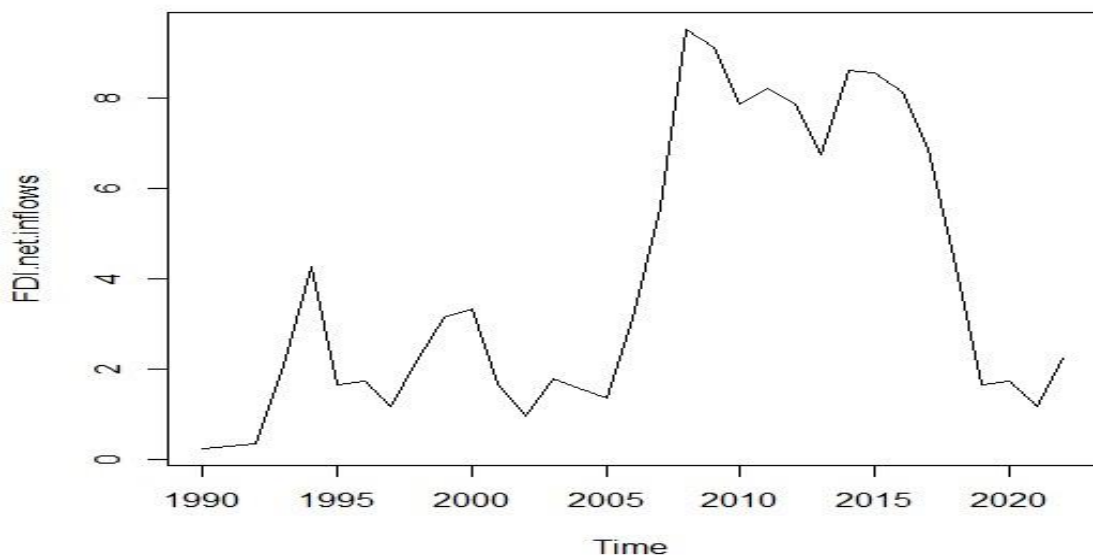


Figure 4.2: Trend of the Log of Foreign Direct Investment in Ghana (1990-2022)

Source: Source: Analysis of Data (WDI, 2023)

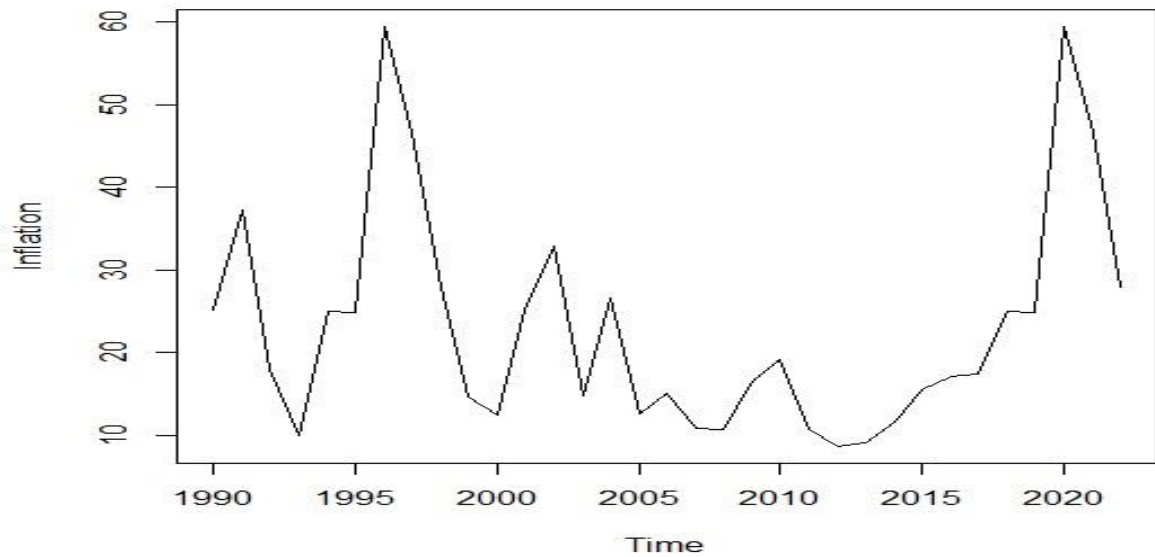
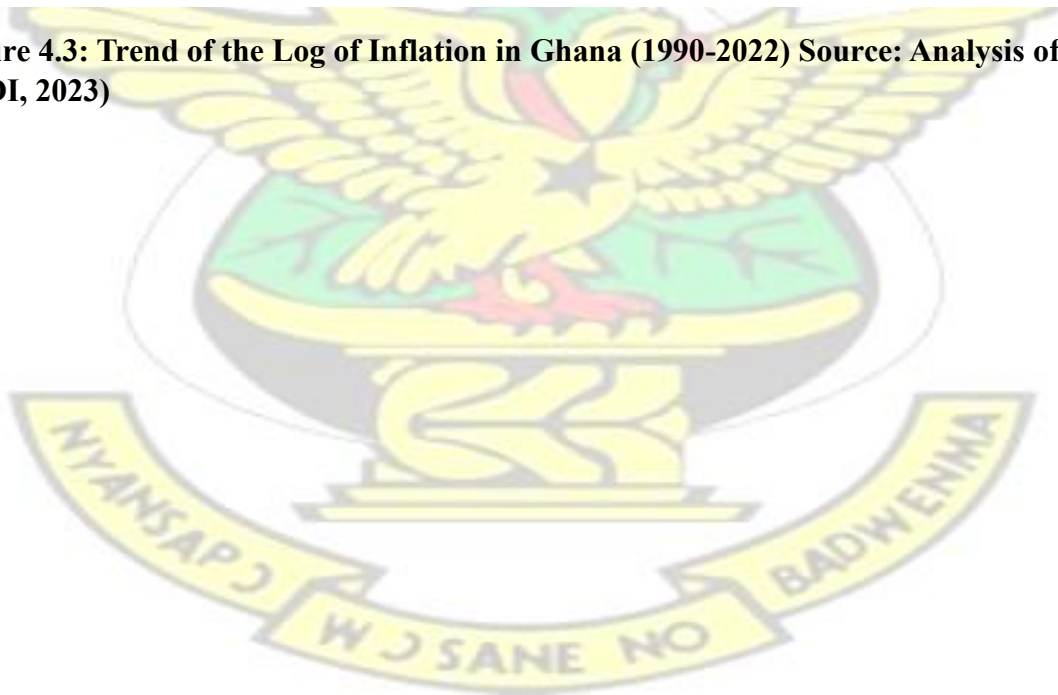


Figure 4.3: Trend of the Log of Inflation in Ghana (1990-2022) Source: Analysis of Data (WDI, 2023)



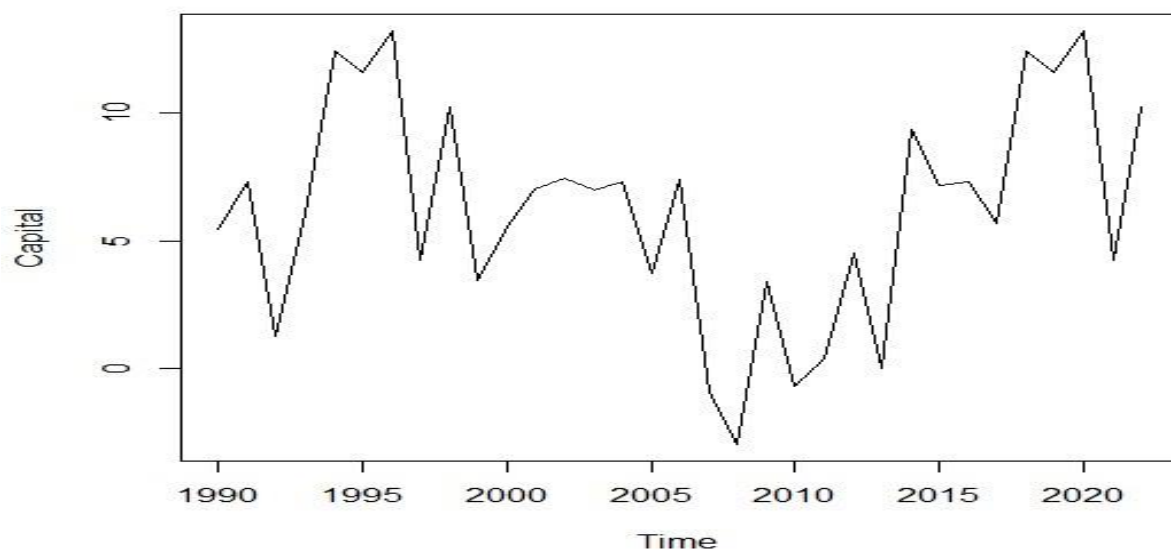


Figure 4.4: Trend of Capital in Ghana (1990-2022)

Source: Analysis of Data (WDI, 2023)

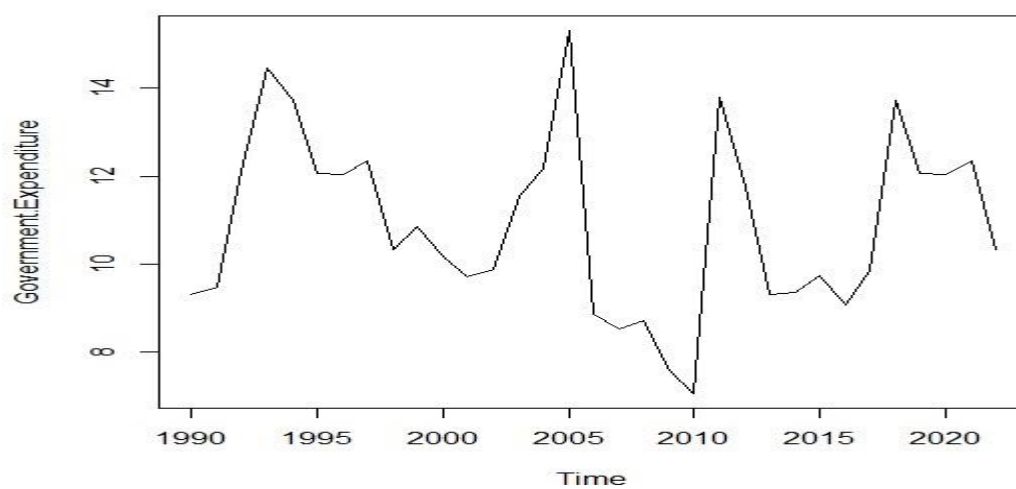


Figure 4.5: Trend of the Log of Government Expenditure in Ghana (1990-2022) Source: Analysis of Data (WDI, 2023)

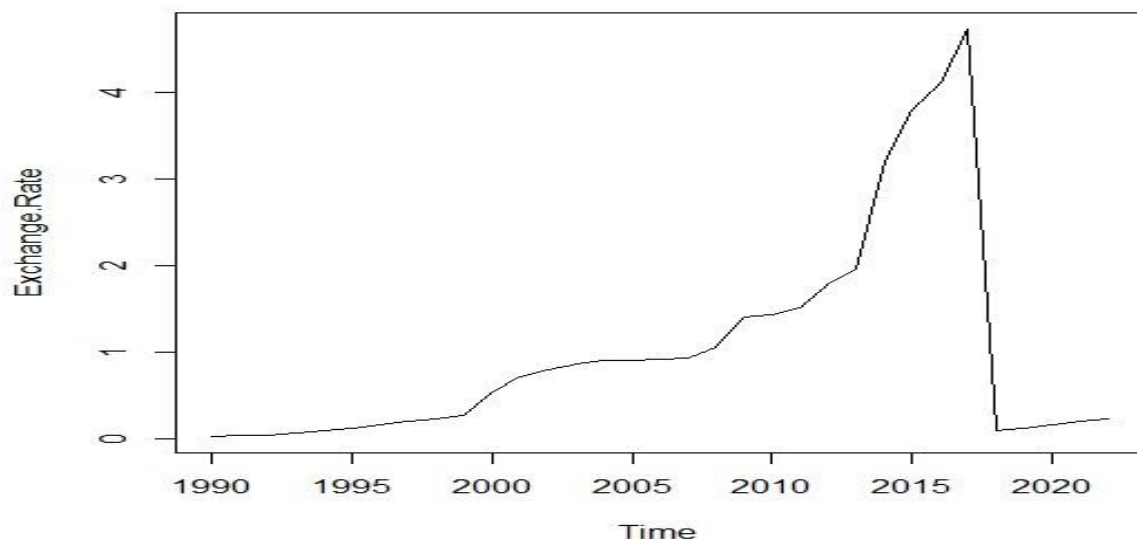


Figure 4.6: Trend of the Log of Exchange Rate in Ghana (1990-2022)

Source: Analysis of Data (WDI, 2023)

With the exception of the exchange rate, all of the variables' trends (figures 4.1 through 4.6) show a predictable tendency through time. Figure 4.2, which depicts the pattern of FDI, shows that it increased from 1990 to 1995 and also from 2005 to 2010 and fell from 2014 to 2020. This has a substantial contribution to the growth of Ghana's economy. In other words, economic growth in Ghana grows as FDI increases and decreases as FDI decreases. Additionally, a drop and an increase in FDI inflows into Ghana between 1990 and 2022 can be inferred from data on economic growth, indicating a lack of consistency. When the impact of the other variables is taken into account, it also clearly shows that there is an impact on economic growth. The findings is in line with a study by Rehman, (2016) which He stated that Ghana has seen a rise in foreign direct investment as well as economic growth. Estimates from Mellanen (2023), showed that GDP growth reduced from 5.4% in 2021 to 3.2% in 2022. The upturn in gold exports boosted extractives growth, hence the slowdown primarily hit nonextractive industries (Kulu, Mensah & Sena, 2021). The rate of inflation increased

all year. Mellanen (2023) estimates that average CPI inflation was 31.5% in 2022 (up from 10% during 2021) and was 54.1 percent in December. In response, over the course of a year, the Bank of Ghana (BOG) increased the interest rate on its monetary policy from 14.5 to 28%. These initiatives were impeded, however, by the country's immoderate use of its overdraft capacity with BOG (estimated at 6.7 percent of GDP in 2022) (Osei, & Kim, 2020).

Therefore there was an decrease in the growth of the economic from 2021 to 2022, making the establsiment of new FDI very expensive and also the ability to sustain the already established FDI companies is very high.

Table 4.2: Result of Augmented Dickey-Fuller Unit Root Test (1990-2022)

Variable	ADF	P-Value	Variable	ADF	P-Value	No. of Differencing.
Economic Growth	-2.0354	0.5592	Δ Economic Growth	-3.9462	0.02383	(1)
FDI (Log)	-1.5716	0.7385	Δ FDI	-3.7709	0.03596	(2)
Inflation (Log)	-2.0765	0.5434	Δ Inflation	-5.2034	0.01	(1)
Capital	-1.8025	0.6493	Δ Capital	-4.6619	0.01	(2)
Government Expenditure	-3.1711	0.1202	Δ Gov.Exp.	-3.5834	0.04945	(1)
Exchange Rate (Log)	-2.4825	0.3864	Δ Exchange Rate	-5.2758	0.01	(2)

Source: Analysis of Data (WDI, 2023)

The outcomes of the stationarity test using the Augmented Dickey-Fuller unit root are shown in Table 4.2. Additionally, it displays the variables' probabilities as well as the number of differences between them. The p-value was measured against the 0.05 significant value. The symbol Δ indicates that the variable has been altered. According

to the table, none of the variables were stationary at their initial or real values. As a result, the regression model will give what is known as false regression (spurious regression) when these variables are employed. Now, economic growth, inflation, FDI, GDP (capital), exchange rate and government expenditure need to be transformed by differencing these variables, hence FDI, capital and exchange rate with probability values of (0.03596, 0.01 and 0.01) respectively were stationary after their second difference. Moreover, economic growth, inflation and government expenditure with probability values of 0.02383, 0.01 and 0.04945 was stationary after their first difference. That is, the values of the variables were used for the regression analysis or the regression equation.

4.3 LINEAR REGRESSION AND PEARSON PAIRWISE CORRELATION ANALYSIS

4.3.1 The relationship of foreign direct investment and other factors that influence economic growth in Ghana

The second and third research question of the study centered on investigating the effect of foreign direct investment and any other factors that influence economic growth in Ghana. In tackling this research questions, the study first examined the relationships between the variables using Pearson product moment correlation matrix before using the linear regression analysis to analyse the data. This was done in order to check for multicollinearity.

Table 4.3 Correlation Analysis of the study

	Economic Growth	FDI	Inflation	GDP (Capital Income)	Government Expenditure	Exchange Rate
Economic Growth	1.000					
FDI	0.485**	1.000				
Inflation	-0.332	-0.538**	1.000			
GDP (Capital Income)	-0.517**	-0.391*	0.517**	1.000		
Government Expenditure	0.001	-0.425*	0.186	0.338	1.000	
Exchange Rate	0.282	0.715**	-0.403*	-0.174	-0.385*	1.000

Note- Eco.Grow=Economic growth, FDI=Foreign Direct Investment, Exch.Rate=Exchange Rate

Source: Analysis of Data (WDI, 2023)

Pearson Pairwise correlation matrix of the variables which was computed to determine the degree of relationship or linear relationship among the variables used in the estimations. From the table 4.3, there is a positive and significant correlation between economic growth and foreign direct investment ($r=0.485$, $p < 0.05$). However, economic growth has no relationship with exchange rate, inflation and government expenditure. Despite there is no correlation between the economic growth and other independent variables, there exist the negative correlation between economic growth and capital income (GDP), ($r= -0.517$, $p < 0.05$), all other independent variables have a positive correlation with the economic growth. The findings of the study also indicate that there is no multicollinearity in the data. According to Wakyereza (2017), FDI inflows have a strong long-term impact on economic growth, and the labour force is highly connected with FDI to increase economic growth if given the right skills and training in terms of contemporary technology. Wajid and Zhang (2017) determine the relationship between gross domestic product (GDP), foreign direct investment, and inflation. The findings indicated that GDP was the dependent variable, while FDI and inflation (CPI) were independent variables. They came to the conclusion that there is a positive and significant association between GDP and FDI, but that there is a negative and significant

relationship between GDP and inflation. According to Popovici & Calin (2014) there is a negative correlation between FDI's three-year lag and economic growth.

Table 4.4: The F-statistics

Model Summary	Statistics
R	0.705
R-Square	0.653
Adjusted R-Square	0.3606
P-value (ANOVA table)	0.003612

Source: Analysis of Data (WDI, 2023)

Table 4.4 present the statistics of the results. The value of R-square (65.3%) which implies that about 65.3 percent of the variation in dependent variable (economic growth) has been explained by independent variables (FDI, inflation, GDP, government expenditure and exchange rate). The variation is statistically significant from the above coefficient output since a significant “F-value” was obtained.

Table 4.5: The Coefficient of the Variables

Variable	Hypothesis	Coefficient	P-value
Economic Growth (Y)			
Intercept	$H_0: \beta_0 = 0,$ $H_1: \beta_0 \neq 0$	0.64443	0.7914
FDI	$H_0: \beta_1 = 0,$ $H_1: \beta_1 \neq 0$	0.35745	0.0446
Inflation	$H_0: \beta_2 = 0,$ $H_1: \beta_2 \neq 0$	0.02303	0.4643
Capital	$H_0: \beta_3 = 0,$ $H_1: \beta_3 \neq 0$	-0.26394	0.0082
Gov. Exp.	$H_0: \beta_4 = 0,$ $H_1: \beta_4 \neq 0$	0.39849	0.0385

Exch. Rate	$H_0: \beta_5 = 0,$ $H_1: \beta_5 \neq 0$	0.05474	0.8868
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Source: Analysis of Data (WDI, 2023)

Table 4.5 also shows the coefficient, hypothesis and the probability value of the variables. From the table, the null hypothesis of the FDI, Capital, and government expenditure was rejected, which means that these variables are significant with probability values of (0.0446, 0.0082, and 0.0385) respectively.

From the Table, FDI has a positive impact on economic growth. A unit change in the FDI will positively affect the economic growth by 35.754 percent. Taken other various into consideration, capital (GDP) also has a negative impact on economic growth, which means that, a change in capital (GDP) will affect the economic growth by 26.394%. But government expenditure as well as exchange rate have a positive impact on economic growth. For instance, a unit change in the government expenditure, will positively affect the economic growth by 39.849%. In conclusion although FDI has a significant impact on economic growth.

This finding is in line with the study by Tee, Larbi, and Rebecca's (2017) of which they revealed that FDI inflows to Ghana significantly contribute to the economic growth and development of the country. Chabe (2015) indicated that FDI has a major effect and made a clear commitment to Cameroon's economic growth between 1977 and 2010. Osakonor (2011) studied the impact of FDI on productivity growth in the Ghanaian manufacturing sector from 1979 to 2009. The study found that while FDI has an effect on productivity growth, it has a detrimental effect. This detrimental effect of FDI has also caused resources to be redirected towards the manufacturing sector, improving productivity there. Again, FDI now affects growth rates in a country with a strong

financial system (Alfaro et al., 2004). The influence of FDI on economic growth varies across established and developing economies, and as a result, it is

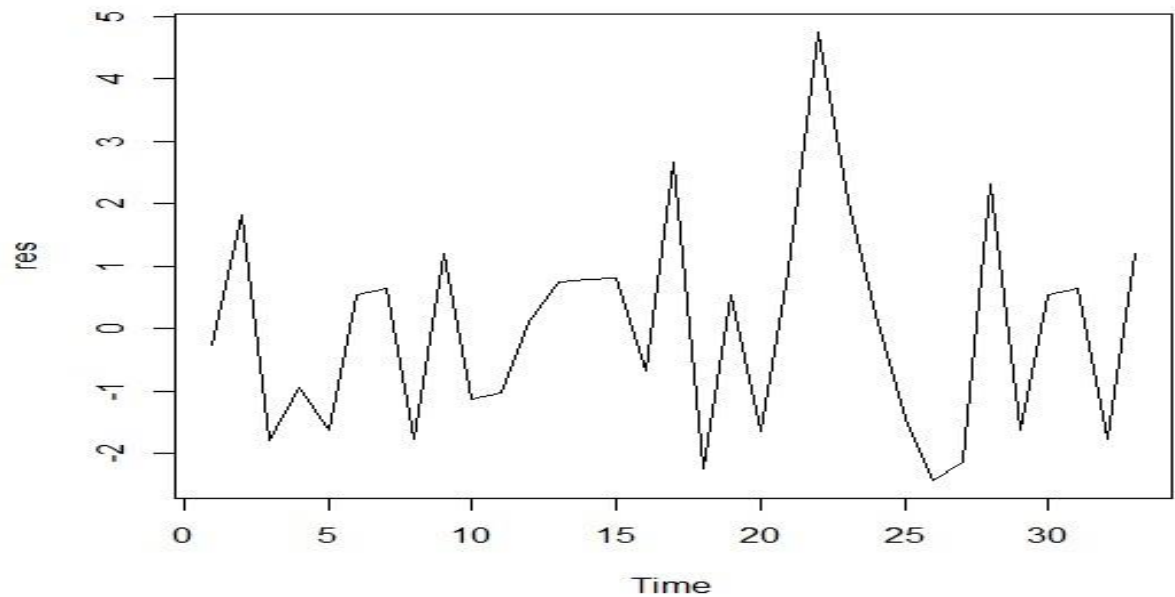
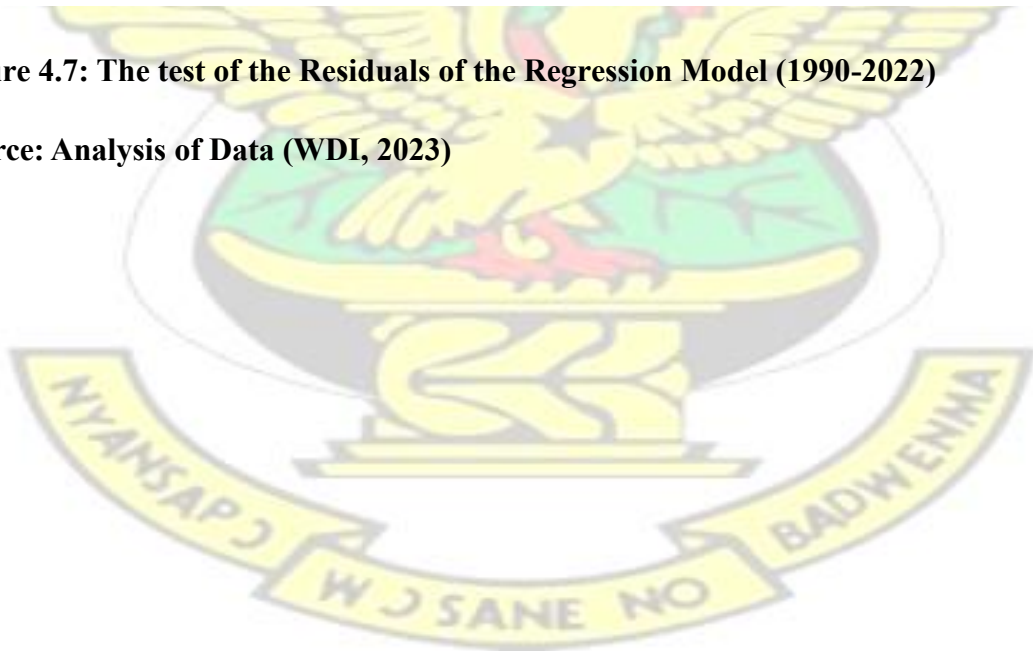


Figure 4.7: The test of the Residuals of the Regression Model (1990-2022)

Source: Analysis of Data (WDI, 2023)



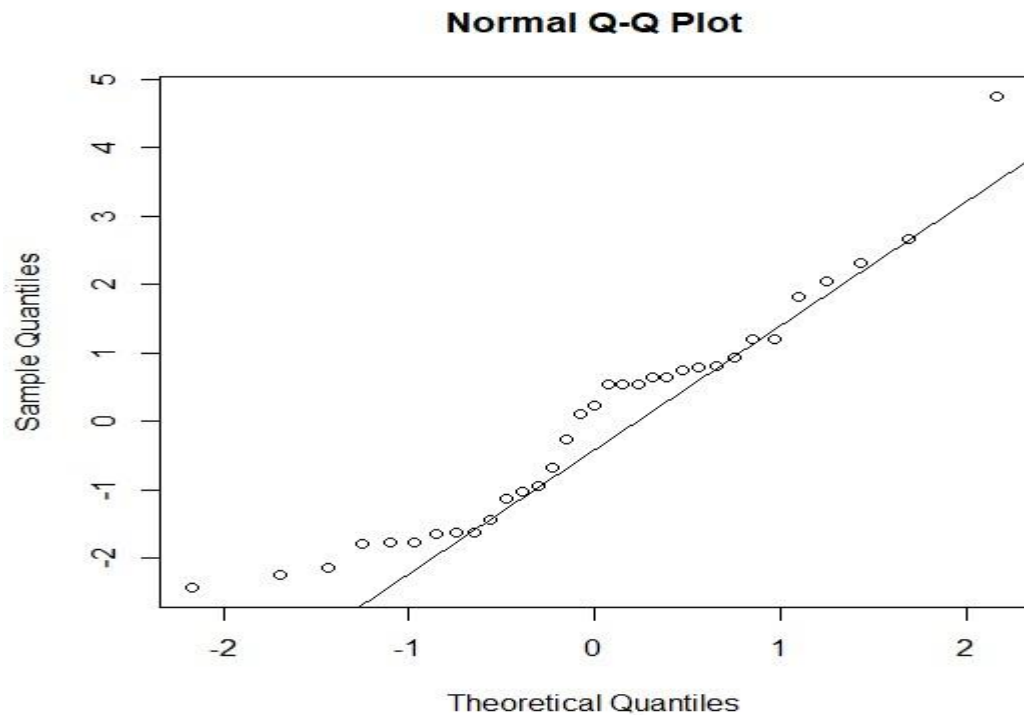


Figure 4.8: The normality test of the Residuals

Source: Analysis of Data (WDI, 2023)

With respect to the diagnostic test QQ-plot was used to test the normality of the residuals, from the output (Figure 4.8), the data is normally distributed. Residuals values was also plotted against the predicted values to check whether the data follow a pattern, and from figure 4.7 it is observed that, the pattern in the data cannot be determined and lastly residuals values was also plotted and the output indicated that, the data does not follow a pattern, hence the autocorrelation is determined.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 INTRODUCTION

A summary of the findings, conclusions, and recommendations are provided in this chapter. It has been divided into three portions. The first section's major subject is an overview of the findings that are pertinent to the study's objectives. The second half of the study, which explains the main objective, describes the methodology, and provides interpretations of the data, deals with the study's conclusion. The third portion includes the timetables for more research and the recommendations based on the study's findings.

5.1 SUMMARY OF FINDINGS

This study established the trend in the data. From the findings which depicts the pattern of FDI, shows that it increased from 2005 to 2010 and fell from 2014 to 2020. Additionally, a drop and an increase in FDI inflows into Ghana between 1990 and 2022 can be inferred from data on economic growth, indicating a lack of consistency. With the correlation matrix, it was also observed that, although there is a positive correlation between the FDI and economic growth, the correlation was weak with respect value of 43.1%.

From the regression model, FDI has a positive effect on economic growth. A unit change in the FDI will positively affect the economic growth by 35.745 percent. Taken other various into consideration, capital (GDP) also has a negative impact on economic growth, which means that, a change in capital (GDP) will affect the economic growth by 26.394%. But government expenditure as well as exchange rate have a positive impact on economic growth. For instance, a unit change in the government expenditure,

will positively affect the economic growth by 39.849%. In conclusion FDI has a significant impact on economic growth.

5.2 CONCLUSION

The study's primary objective was to determine the effect Foreign Direct Investment (FDI) on economic growth in Ghana. The study adopted a quantitative research design. Indicators of world development were used to gather data for the variables under investigation. Additionally, secondary data from yearly reports on different amounts of FDI for the time span 1990–2022 is used. Due to the availability of data for the selected variables, this time was chosen, and it will be sufficient for the study. The study determined the trend in the data and pearson pairwise correlation was used to establish the relationship between the variables of the study. Again, the study adopted linear regression to determine the effect of FDI on economic growth. R-console was used to analyse the data.

According to the findings, it was determined that the relationship between FDI and economic growth is deterministic and that there has been an inconsistent rise or amount of FDI inflows into Ghana between 2000 and 2022. The study also demonstrates that Foreign Direct Investment (FDI) has a favourable impact on Ghana's economic expansion. As for other variables influencing economic growth, the study found that capital, and government expenditure all have an impact. In other words, capital has a beneficial impact on economic growth in Ghana, along with government spending and the exchange rate.

5.3 RECOMMENDATIONS

Since there is an inconsistent flow of FDI into the country, the Ghanaian government should encourage increased local investment rather than relying on it as the primary engine of the economy. The Ghanaian government should invest money in the most crucial areas of the economy in order to draw foreign direct investment.

Since FDI has a positive impact on economic growth, there should be policies and regulations to redirect resources to sectors and institution that will lead to a positive impact on economic growth. This initiative will help in the determination of the true impact of FDI on economic growth in Ghana.

Again, since capital, government expenditure and exchange rate have a significant impact on economic growth, taken capital into consideration, more resource such as education should be channeled to minimize the impact and also considering the government expenditure and exchange rate which have a positive impact on economic, such variables should be also well managed and controlled to bring the greatest impact.

5.4 RECOMMENDATIONS FOR FURTHER STUDIES

Further studies should consider other factors that could influence or determine FDI and economic growth for the transition economies. Additionally, since FDI is a method for the acceptance and deployment of new technologies, training will be necessary to equip the labour force to deal with the new technologies. Future research can look into how FDI affects the level of human capital.

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APPENDIX

year	ecogrowth	fdi(%gdp)	inflation	capital	gov exp	exch rate
1990	3.328817883	0.251308552	25.22369203	5.471652043	9.311528428	0.032615622
1991	5.28182629	0.303188963	37.25906649	7.317729263	9.483141087	0.036763307
1992	3.879419253	0.350800517	18.03143901	1.258315123	12.10756812	0.043685167
1993	4.850000564	2.095116345	10.05611674	6.0488882	14.44936856	0.064871188
1994	3.299999591	4.27950048	24.95984247	12.45385207	13.72334294	0.095568239
1995	4.11241904	1.647296722	24.87025544	11.59119935	12.07348066	0.119913873
1996	4.602461045	1.730357096	59.4615537	13.21941669	12.04370871	0.163547168
1997	4.196357576	1.187002423	46.56101968	4.22496351	12.35563365	0.204796278
1998	4.700390779	2.237678076	27.88520864	10.25254972	10.32416166	0.231165901
1999	4.39999686	3.156999582	14.62416667	3.452108378	10.84334639	0.266642972
2000	3.700000115	3.329303379	12.40866891	5.554685572	10.17161587	0.544919176
2001	4	1.680555283	25.19321937	7.019600375	9.722363918	0.716305158
2002	4.499999699	0.955673775	32.9054089	7.443260612	9.872770251	0.792417084
2003	5.199999984	1.791715353	14.81624006	7.007867565	11.53320324	0.866764327

2004	5.59999999	1.568114186	26.67494973	7.313823831	12.17281188	0.899494854
2005	5.900003953	1.350866032	12.62457406	3.72900079	15.30816526	0.90627897
2006	6.399912419	3.116219155	15.11818572	7.416917365	8.870722204	0.916451773
2007	4.346819153	5.586606897	10.91516997	-0.919596089	8.524940361	0.935247846
2008	9.149799094	9.517042508	10.73272807	-2.96336861	8.731659768	1.057858333
2009	4.844486889	9.132935172	16.52214331	3.420839273	7.574243956	1.4088
2010	7.899711912	7.855067085	19.25071443	-0.683193858	7.069499421	1.431025
2011	14.04712365	8.207966429	10.70756812	0.387756379	13.78859812	1.51185
2012	9.292789414	7.855367882	8.726836831	4.518123342	11.76434631	1.795816667
2013	7.312525021	6.75033011	9.160778311	0.005797943	9.306667896	1.95405
2014	3.985865624	8.604962551	11.60833333	9.353299838	9.357635777	3.1974
2015	3.837040864	8.549691232	15.49316807	7.159062384	9.7496408	3.7948
2016	3.721902905	8.142620601	17.1450737	7.317702253	9.067815931	4.0969
2017	8.507156219	6.877221374	17.47392384	5.670797154	9.849221346	4.72
2018	3.299999591	4.27950048	24.95984247	12.45385207	13.72334294	0.095568239
2019	4.11241904	1.647296722	24.87025544	11.59119935	12.07348066	0.119913873
2020	4.602461045	1.730357096	59.4615537	13.21941669	12.04370871	0.163547168
2021	4.196357576	1.187002423	46.56101968	4.22496351	12.35563365	0.204796278
2022	4.700390779	2.237678076	27.88520864	10.25254972	10.32416166	0.231165901

R-CODES FOR THE DATA ANALYSIS

```
doreen=read.csv("dataa.csv",header=TRUE,sep=",")
doreen names(doreen)
summary(doreen)
```

```
##### plot of variables #####
```

```
EcoGrow = doreen$ecogrowth
Eco.ts = ts(EcoGrow, start = c(1990,1), frequency = 1) is.ts(Eco.ts)
EconomicGrowth = Eco.ts plot(EconomicGrowth)
sd(EconomicGrowth)
```

```
FDI= doreen$fdi..gdp.
```

```
FDI.ts = ts(FDI, start = c(1990,1), frequency = 1) is.ts(FDI.ts)
FDI.net.inflows = FDI.ts
plot(FDI.net.inflows) library(tseries)
adf.test(FDI.net.inflows)
sd(FDI.net.inflows)
```

```
Inflation = doreen$inflation
Inflation.ts = ts(Inflation, start = c(1990,1), frequency = 1)
is.ts(Inflation.ts) Inflation = Inflation.ts
plot.ts(Inflation)
sd(Inflation)
```

```
Capital = doreen$capital
Capital.ts = ts(Capital, start = c(1990,1), frequency = 1)
is.ts(Capital.ts) Capital = Capital.ts plot.ts(Capital)
sd(Capital)
```

```
Government.Expenditure = doreen$gov.exp
Government.Expenditure.ts = ts(Government.Expenditure, start = c(1990,1), frequency = 1)
is.ts(Government.Expenditure.ts)
Government.Expenditure = Government.Expenditure.ts
plot.ts(Government.Expenditure)
sd(Government.Expenditure)
```

```
Exchange.Rate = doreen$exch.rate
Exchange.Rate.ts = ts(Exchange.Rate, start = c(1990,1), frequency = 1)
is.ts(Exchange.Rate.ts) Exchange.Rate = Exchange.Rate.ts
plot.ts(Exchange.Rate)
sd(Exchange.Rate)
```

stationarity test

```
library(tseries) adf.test(EcoGrow)
dEcoGrow = diff(EcoGrow)
adf.test(dEcoGrow)
dEcoGrow
```

```
adf.test(FDI) library(lmtest)
dFDI = diff(FDI)
adf.test(dFDI)
ddFDI = diff(dFDI)
```

```
adf.test(ddFDI)
ddFDI
```

```
adf.test(Inflation) dInflation=diff(Inflation)
adf.test(dInflation)
dInflation
```

```
adf.test(Capital) dCapital=diff(Capital)
adf.test(dCapital)
ddCapital=diff(dCapital)
adf.test(ddCapital)
ddCapital
```

```
adf.test(Government.Expenditure) dGov.Exp=diff(Government.Expenditure)
adf.test(dGov.Exp)
dGov.Exp
```

```
adf.test(Exchange.Rate)
dEx.Rate=diff(Exchange.Rate)
adf.test(dEx.Rate) ddEx.Rate=diff(dEx.Rate)
adf.test(ddEx.Rate)
ddEx.Rate
```

```
##### Regression Equation #####
```

```
doreene=read.csv("dataaa.csv",header=TRUE,sep=",")
doreene names(doreene) names(doreen)
summary(doreen)
```

```
reg=lm(ecogrowth~fdi..gdp.+inflation+capital+gov.exp+exch.rate,data=doreen)
summary(reg)
```

```
res=resid(reg)
adf.test(res)
```

```
cl=cor(doreen)
cl
reg1=lm(dEcoGrow~ddFDI+dInflation+ddCapital+dGov.Exp+ddEx.Rate,data=doreene)
summary(reg1)
```

```
cl=cor(doreene) cl
```

```
res=resid(reg1)  
plot.ts(res)
```

```
write.csv(blav2,file='blav2.csv',row.names=F)##### want to export a data to excel
```

```
qqnorm(res) qqline(res)
```

KNUST

