UNIVERSITY OF CAPE COAST

FOREIGN DIRECT INVESTMENT, SECTORAL GROWTH AND ECONOMIC GROWTH IN SUB SAHARAN AFRICA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

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Supervisors' Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

There is a widespread belief in transition and growing economies that the relationship between FDI and Growth is symmetrical. On the other hand, the problem of the nonlinear impact of FDI on Growth has remained insufficiently explored. Moreover, previous studies did not account for the transmission process through which FDI transact to economic growth of sub-Saharan economies. Using panel data from 30 sub-Saharan African countries spanning from 1990-2019, this study re-examines the influence of FDI on economic growth. The findings revealed that the influence of FDI on economic growth was negative and significant in the short run when the transmission channel in the industry sector was taken into consideration. However, in the long run the results was significant for all when the conditional sectoral effect was taken into consideration. The growth enhancing effect of FDI was largely seen to be insignificant when the asymmetric effect was taken into consideration. A higher and a lower inflow of FDI was seen to be only significant on economic growth from the transmission in the agricultural and the service sector. This study discusses that much emphasis should be placed on developing the various sectors through which FDI transact into economic growth.

KEY WORDS

Agricultural value addition

Economic growth

Foreign direct investment

Industry value addition

Manufacturing value addition

Pooled mean group

Service value addition

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DEDICATION

To my family

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LIST OF ACRONYMS

AfDB	African Development Bank
FDI	Foreign Direct Investment
FE	Fixed Effect
FPI	Foreign Portfolio Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
GVCs	Global Value Chains
MNCs	Multinational Corporations
MNEs	Multinational Enterprises
OLS	Ordinary Least Square
PMG	Pooled Mean Group
RE	Random Effect
SSA	Sub –Saharan Africa
UNCTAD	United Nation Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNIDO	United Nations Industrial Development Organisation

CHAPTER ONE

INTRODUCTION

African economies are known to have inadequate capital that is needed to enhance economic activities; thus, there is the need for some form of foreign capital to boost the economic activities of these economies (African Economic Outlook, 2016). The impact of foreign direct investment (FDI) on economic growth has been the subject of numerous studies. These studies, on the other hand, failed to recognize the sectoral mechanism by which foreign direct investment inflows affect economic growth, as well as the asymmetric effect of these inflows. In view of this, this study seeks to address these issues.

This chapter offers an introduction to the study as well as an outline that serves as a guide for the study. It presents the background to the study, statement of the problem, purpose of the study, research objectives, research hypotheses, significance of the study, delimitations of the study and finally limitations of the study.

Background to the Study

The advent of globalization has significantly enhanced international finance and capital markets. Through globalization, the world has become more integrated and interconnected. International capital movement between countries is one of the results of this. One form of this capital movement is through foreign direct investment (FDI). A country or a person makes a foreign direct investment through the acquisition of assets in another nation, such as ownership or management of a foreign corporation. One of the most important tactics for most developing countries in achieving rapid economic

growth nowadays is to attract foreign direct investment in various sectors of the economy, Idoko and Taiga (2018).

Foreign direct investment (FDI) has been one of the most visible elements of the global economy. This has piqued the interest of policymakers and academicians in recent years as a critical component of globalization. The capacity of FDI to generate jobs, its impact on productivity growth, and its dynamic link to competitiveness is all factors that contribute to its popularity. Most findings in existing literature highlight the importance of FDI through job creation, accelerating economic growth and assisting in the adaptation of innovative production methods as well as increasing productivity by increasing competition in the economy. FDI is seen as a way for countries to share their knowledge, technology, and skills. As a result, FDI has been recognized as an essential channel for the transfer of international knowledge (Keller, 2010). However, in both international economics and development circles, the potential growth impact of FDI particularly in developing countries has been a contentious issue as other researchers have discovered FDI inflows have a negative impact on growth in developing economies.

Foreign direct investment inflows to Africa are diversified throughout several sectors in African countries; agriculture, services, manufacturing, and industry. Agriculture receives a minor amount of these inflows as compared to other sectors (UNCTAD, 2012). FDI in agriculture affects numerous aspects of the production and marketing chain, from food and cash crop production to the entry of farm input suppliers (agrochemicals) and food distributors (Rakotoarisoa, 2011). The increasing worldwide interest in agricultural FDI has mostly taken the form of land acquisitions, with a focus on Africa.

In the case of FDI inflows to the manufacturing sector, it is primarily market-seeking, with market size and potential as the primary determinants. According to the World Bank report on manufacturing FDI in sub- Saharan Africa; "It is largely undiversified, with a little focus on raw material processing or end-product assembly, both of which are low-value-added activities. FDI has typically been focused in the food and beverage sector in most countries. However, this concentration in low-value-added industries may be appropriate in the short term, as it is likely to be the first step for economies to integrate into Global Value Chains (GVCs) by exploiting their comparative advantages" (World Bank, 2015, P.35)

Between 2012 and 2018, FDI into Africa's service sector increased, making it the largest sector in the continent. However, the rise is not distributed evenly throughout African countries. North Africa and South Africa were seen as having the highest levels of FDI in the service sector. TMT (telecoms, media, and technology) is attracting an increasing amount of FDI. In fact, it was the single most important source of inward investment in 2018. In the long run, however, FDI into Financial Services is diminishing due to a number of factors, including slower GDP growth and the fact that significant historical investments have already been made in this sector, leaving less room for fresh investment. Consumer goods and retail investment is still strong, albeit at a lower level than in 2017. It is one of the sectors that generate the most jobs, accounting for just fewer than 80% of all FDI-related job opportunities. It has recently surpassed Financial services (due to less investment options in the latter), and its proportion of the overall services business category is driven by the need to feed and cloth increasingly

urbanizing populations, as well as rising income levels. In light of the critical role that the services sector has played in Africa's economic transition recently, the United Nations Economic Commission for Africa described the sector as a “as a magnet for attracting FDI." UNECA (2015)

The automobile industry, building and real estate, and renewable energy are among the industries in Africa that have attracted FDI inflows. The automotive sector is concentrated in a few main centers, with continuous brownfields investments in South Africa's long-established automotive sector. Morocco has become more active in recent years, and it continues to seek investment, particularly from French automakers. The country is taking advantage of its proximity to Europe and its relatively lower-paid workforce to expand capacity. For the past five years, the automotive industry has seen an increase in FDI shares based on an average of projects, jobs, and capital, whilst the renewable sector has seen a decrease. The real estate and construction sectors have also seen significant FDI inflows, and it is one of the industrial sectors attracting investors' interest (World Bank, 2017).

According to the African Economic Outlook, FDI accounted for roughly 16% investment in Africa, compared to an average of 11% globally. In recent years, foreign direct investment (FDI) has outperformed other conventional sources of external financing for Africa, such as financial aid and remittances though the extractive industry has accounted for a significant portion of FDI inflows into the region, inflows to the services sector have been exceptional in recent years. A number of measures promoting the private sector, openness, and macroeconomic stability are seen to have contributed to this (World Bank, 2014).

Africa's average FDI inflows increased to roughly US$6.8 billion in the 1990s, up from an average of US$2.2 billion in the preceding decade. Regardless, Africa's contribution to the global and developing economies has decreased by about half from the previous time. Its proportion in developing countries plummeted from 10.7 percent to 5.9 percent as its global share fell from 2.4 percent to 1.74 percent. Africa was a success story at the turn of the millennium, with inflows increasing by approximately a factor of from the previous decade to little over US$30 billion between 2000 and 2019. As a result, its FDI share in the world and emerging countries has expanded significantly during the preceding time. For the time span under consideration, Sub-Saharan Africa had a similar success story. In 2013, and 2014, despite a rising trend of inflows to Africa between 2010 and 2019, inflows dropped. It declined from US$56.44 billion in the preceding period to US$53.97 billion in 2013, and then to US$53.91 billion in 2014. Political upheavals in Northern Africa during the 2013 timeframe and the Ebola epidemic in West Africa, according to analysts, caused the drop in inflows in these years particularly 2014. (Osei, Ibrahim, and Sare, 2018). The rise and fall of these inflows of FDI has different impact on economic growth. There is a widespread belief in transition and growing economies that the relationship between FDI and economic growth is symmetrical. On the other hand, the problem of the nonlinear impact of FDI on economic growth has remained insufficiently explored. This calls for the attention of the non-linearity of FDI to be tested.

According to the World Bank (2012), a number of African countries have established legislation and joined agreements to protect FDI, such as the multilateral investment guarantee agency and the convention on the settlement

of investment disputes. As a result, Africa's FDI policy framework is now comparable to those of other areas of the world. However, the establishment of government-supported investment promotion centers in practically all countries to directly attract foreign investors has been a rather radical approach.

The spotlight is on Sub- Saharan Africa as a result of the massive FDI inflows they have received in recent years. For example, while worldwide FDI inflows have been dropping for some years, FDI inflows to developing nations most especially in Sub- Saharan Africa have been increasing. The question worth asking is, has these inflows yielded the needed benefit to sub-Saharan Africa countries. According to the modernization theory, FDI generally flows as a bundle of resources, according to Kumar (2002), including organisational and management skills, marketing know-how, and market access through multinational enterprises' (MNEs) marketing networks. As a result, FDI serves a dual purpose: it increases total factor return while simultaneously contributing to capital accumulation. "FDI has also become the most reliable source of foreign investment for emerging countries" (Lipsey 1999, P. 307). Countries within Africa, like many other developing countries, lack the indigenous financial resources needed to enhance economic growth hence FDI is considered as a crucial source of funding (Okada & Samreth, 2014).

On the other hand, dependency theory researchers argue that transnational companies (TNC) can prevent economic development by crowding out local entrepreneurs, worsening income distribution, reducing consumer welfare, and introducing inappropriate consumption patterns in host countries. It is also worth noting that the favorable impact of FDI is not a

specific fact, it may largely depend on favorable conditions in the host country, political and macroeconomic stability, institutional capacity, infrastructure, and education system The most common statement of the theory of dependence is that developing countries "suffer" from the negative consequences of foreign capital in the country due to the repatriation of profits, reduce reinvestment, and increase income inequality. For example, Dixon and Boswell (1996) argued that FDI, although positively affecting economic growth at the very beginning, however, in the long run, the dependence of the national economy on FDI has a negative impact on its growth. Similarly, Moran (1978) investigated that foreign investor adversely affect political processes in the host country; and the benefits of FDI are poorly distributed between TNCs and the host country. In general, supporters of the theory of dependence, for example, Alfaro (2003) and others, blamed TNCs for exploiting developing countries until the 90s of the last century and, as a result, the underdevelopment of the "periphery" of the world economy. In support of this, in a study by Kentor et al. (2003) it was proved that countries with a relatively high dependence on foreign capital (measured as accumulated foreign reserves) show slower economic growth than less dependent countries. According to the authors, the concentration of foreign investment has a significant, long-term negative impact on growth, which is the strongest in the first five years and decreases over time.

Moreover, FDI distributed among the various sectors in Sub-Saharan Africa plays a crucial role to the development of the continent. The absorptive capacity of the various sectors in the region is vital. The Absorptive Capacity is required to grasp and transform external knowledge flows in order to

achieve innovation and growth. A receiving country's ability to attract FDI can be immensely beneficial, as entering multinational corporations provide both direct and indirect economic benefits to the host country (Cohen & Levinthal, 1998).

Given the recent surge in FDI inflows to Africa, it is worth considering and investigating if these inflows have aided economic development. There has been a lot of research done on this; however the conclusions are mostly equivocal. Furthermore, the findings of these studies are not precise because they obscure the sectoral channels via which FDI promotes economic growth. A significantly more comprehensive and in-depth analysis is required to determine the extent to which FDI contributes to overall growth through sectoral value addition.

Statement of the Problem

Inflows of foreign direct investment declined globally in 2018, but Africa defied the trend, with flows totaling US$ 46 billion, up 11% from the previous year. (UNCTAD, 2019). FDI into Sub-Saharan Africa climbed by 13% to $32 billion, reclaiming ground lost during the recession of the previous two years. In order to attract investors, several African countries have implemented an open policy in recent decades, one of which is a tax benefit offered to investors. To encourage FDI, African countries are increasingly depending on a number of incentives. Despite evidence of their shortcomings, tax holidays, special tax rates, manufacturing zones, and concessionary tax arrangements are examples of tax incentives designed to attract investment. The paradox is that, despite the fact that tax incentives in most situations do

not result in the essential investment but instead result in revenue loss and other negative consequences, they continue to be granted (Ofori, 2019)

Investor tax incentives cost countries such as Ghana, Nigeria, Senegal, and Cote d'Ivoire up to $5.8 billion per year. A beautiful representation of one aspect of Ghana's losses, vary from 1.8 to 5.4 percent of GDP. The International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OCED), and the World Bank are all increasingly critical of such incentives as wasteful giveaways (West Africa Give Away Report, 2018). In light of these circumstances, we must rethink about the sacrifices our leaders give in order to attract FDI.

Given the large FDI inflows into Africa in recent years, as well as the incentives provided by African countries to attract FDI, it's worth asking and examining if these inflows have had any positive impact on economic advancement. Many empirical research has been conducted on this topic, but the results have been mixed and inconclusive (Adams & Opoku ,2015, Immurana, Yensu, Ibrahim & Adam 2015, Adams (2009), Bengoa & Sanchez-Robles, 2003). Furthermore, the findings of these studies did not take into account the sectoral channel via which FDI affects general GDP. The assumption is that various sectors have varied capacities for absorbing FDI, necessitating the inclusion of this sectoral mechanism in the FDI-Growth nexus. The rate of absorption in various sectors will help policymakers determine which sectors are most suited to take advantage of FDI inflows.

Moreover, few studies have been done on the non-linear effects of FDI on growth. The main question is whether FDI asymmetry helps to increase growth in specific sectors and the economy as a whole. For example, various

stock market and financial crises have characterized the economic and financial arena. The main reason for very continuous fluctuation in the financial market is frequently perceived as instability. It was because of this inconsistency that Richard Gowin, one of the pioneers of non-linear economic models, formulated his reflection, which stems from the observation of ongoing financial market volatility. As a result, the presence of a non-linear relationship between FDI and growth must be tested. This study aims to explain the asymmetry of FDI's impact on sectoral and economic growth by looking at the impact of higher and a lower level of FDI inflows on economic growth.

Furthermore, various data analysis techniques used in previous study on the relationship between FDI and economic growth might have contributed to mixed and inconclusive results (Adams & Opoku , 2015, Immurana, Yensu, Ibrahim & Adam 2015, Adams (2009), Bengoa & Sanchez-Robles, 2003). Ordinary least square (OLS) estimates can produce skewed and inconsistent findings in some cases (Iamsiroj, 2016) hence the pool mean group method of estimation was used to achieve the study's ultimate goal. This study analyses the asymmetry of FDI on sectoral and economic growth using pool mean group estimators (PMG), filling a gap in literature and contributing to it. The use of PMG estimators allows for differences in short-run coefficients, adjustment speed, and error variances between countries while enforcing homogeneity on long-run coefficients, which has not been studied previous literature.

Purpose of the Study

The purpose of this study is to look at the role of sectoral growth in the FDI-Growth nexus. Also, this study seeks to look at the asymmetric effects of these FDI inflows on economic growth.

Research Objectives

1. To examine if the sectoral growth impact on the current level of FDI to improve economic growth
2. To assess if sectoral growth impact on a higher level of FDI inflow to improve economic growth
3. To assess if sectoral growth impact on a lower level of FDI inflow to improve economic growth

Research Hypotheses

1. There is no significant relationship between sectoral growth on the current level of FDI inflow to improve economic growth.
2. There is no significant relationship between sectoral growth on a higher level of FDI inflow to improve economic growth.
3. There is no significant relationship between sectoral growth on a lower level of FDI inflow to improve economic growth.

Significance of the Study

The importance of this study cannot be overstated. To begin with the sectoral analysis of FDI will help us understand which areas of the economy drives economic growth. This would make it easier for policymakers to focus on those sectors when it comes to tax breaks and other incentives, they give for attracting FDI. Also, it will indicate which sectors have the ability to accept and make efficient use of FDI inflows to impact economic growth.

Moreover, the asymmetric analysis will show whether the relationship between FDI and growth is symmetrical or asymmetrical. The decomposition of the flows of FDI into positive and negative changes will accordingly, help us evaluate the effect of the positive and negative changes of FDI on economic growth.

Delimitation of the Study

The study focuses on countries on the sub-Saharan African continent. It analyses the role sectoral value addition adds to FDI-Growth Nexus. This because FDI flows to the various sector before the total impact is seen on economic growth. It also looks at the asymmetric effect of this FDI inflows. The decomposition of the data into positive and negative sum shows the effect of the non-linear flow of FDI. The study employs data for 30 sub-Saharan African countries spanning from 1990-2019.

Limitation of the Study

The limitation of this study is related to the data that is used to proxy for the various sectors in the economy. Actual data on FDI inflow to the various sectors is not available hence the value addition to the various sector as a percentage of GDP will be used. This has also been used by existing literature when researching on sectoral analysis. The study will also be limited to African countries that have data for the year under review and as a result, any generalization to other African economies not included will somewhat be difficult. However, in analytical sense, the results of the study can be generalized to other African countries which have similar characteristics with the examined economies through inferential analysis.

Finally, the study will employ the pool mean group approach, without making use of other panel data estimation techniques such as the ordinary least square (OLS), fixed effect (FE) and random effects (RE) estimation technique which might present varied results.

Organisation of the study

The study is organized in five chapters. The introductory chapter which is Chapter One. presents a background to the study, statement of the problem, purpose of the study, the hypotheses, significance, limitation and delimitation of the study as well as organisation of the study. The review of relevant literature, both theoretical and empirical is presented in Chapter Two. Chapter Three presents the methods employed in achieving the set objectives of the study. With reference to the literature, Chapter Four reviews and discusses the results and key findings. The final chapter presents the summary, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The overall objective of this chapter is to give a review of important literature on the effect of foreign direct investment on economic and sectoral growth in sub-Saharan Africa. The review of related literature is intended to provide the study with supporting theories and empirical evidence. There are three primary sections in this chapter. The first section introduces and explores theoretical literature on foreign direct investment and its relationship to economic and sectoral growth. A review of empirical literature on the relationship between FDI, economic, and sectoral growth is presented in the second portion of this chapter. The study's conceptual framework is presented in the third section.

Theoretical Review

Modernization theory

According to the modernization theory developed by Max Weber (1864–1920), FDI inflows into recipient countries foster economic growth. According to the theory, FDI inflows can help the host country's economic structure develop. The modernization theory was birth from the Neoclassical and endogenous growth theories, which assert that FDI may help poor countries expand economically. The modernization approach is based on the economic assumption that capital investment is required for economic success. According to this theory, technology transfer through FDI is especially important for developing countries because most emerging economies lack the infrastructure and facilities needed to boost growth through innovation, such

as an educated population, liberalized markets, and economic and social stability (Calvo& Sanchez-Robles, 2002). FDI generally flows as a bundle of resources, according to Kumar (2002), including organisational and management skills, marketing know-how, and market access through multinational enterprises' (MNEs) marketing networks. As a result, FDI serves a dual purpose: it increases total factor return while simultaneously contributing to capital accumulation.

According to modernization theories, capital accumulation and investment boost economic growth, and this causation is a fundamental assumption in economics because developing countries lack the requisite productive foundation in terms of well-informed and skilled human capital, free markets, social and economic steadiness to propel creativity, innovation and advance growth, technology spillover from FDI is essential for economic growth Calvo and Sanchez-Robles (2002). In addition to growth in technology and capital, FDI stimulates the flow of a collection of resources containing skilled abilities in management, organisation, and marketing, as well as access to marketing channels available to multinational firms as well as access to marketing channels available to multinational firms Holtbrügge and Kreppel (2012).

Dependency theory

Raul Prebisch, the Director of the United Nations Economic Commission for Latin America, developed dependency theory. According to him economic improvement in rich industrialized countries does not always translate to growth in poorer countries. Indeed, their research discovered that wealthy countries' economic activities frequently resulted in serious economic

problems in poorer countries. The phenomenon of this theory is straightforward to explain: developed countries exports primary commodities to wealthy countries, which then manufactured and marketed things made from those commodities to poorer countries. FDI inflows, according to the dependency theory, are employed by developed economies to exploit emerging economies (Prebisch, 1950).

Dependency theories predict that foreign investment will have a negative impact on economic growth and income distribution. Foreign investment promotes a monopolistic industrial structure, with underutilization of productive forces as a result. Outsiders will manage the local economy, which will not lead to original progress, because the multiplier effect, which causes demand in one section of a country to generate demand in another, is weak in developing countries, delaying growth Chase-Dunn and Bornschier (1985).

Absorptive capacity theory

The concept of absorptive capacity is one of the most important in management literature. It was coined by Cohen and Levinthal (1989) and further developed by Zahra and George (2002), and it has now become a catchphrase for a number of techniques, routines, and learning processes that influence the ability to utilize external knowledge in order to construct other organisational capacities. Absorptive Capacity is required to grasp and transform external knowledge flows in order to achieve innovation and growth. A receiving country's ability to attract FDI can be immensely beneficial, as entering multinational corporations provide both direct and indirect economic benefits to the host country (Cohen & Levinthal, 1998).

Specifically, there are two stages of absorbability. One is to bring FDI proposal projects into practices and the next one is to convert FDI benefits into host countries' competencies. In another sense, Cohen and Levinthal (1990) point out that organisation need prior related knowledge in order to be able to assimilate and use new knowledge. Succinctly put, in order to absorb new knowledge and optimally utilize FDI benefits, host countries need to have a certain degree of development of related knowledge and capacities. The capacity mentioned most frequently in previous studies is technology factors at both national and domestic firm levels, proxies for technological gaps between host and home countries' FDI (Anwar and Nguyen, 2011; Farole and Deborah, 2012). The larger the technological gap, the smaller is the impact of FDI on economic growth (De Mello, 1997).

The second most often mentioned factor are labor forces described in terms of human capital and education, which are found to be essential for absorbing and adapting foreign technology, and to generate sustainable long-run growth (Blomström & Kokko, 2003). The third capacity is the R&D factor, which are firms' ability to exploit external knowledge (e.g., Cohen & Levithal, 1990; Lee, Lee, and Kim, 2011; Sánchez-Sellero, Rosell-Martínez, and García-Vázquez, 2014). These three factors work through FDI transfer channels, presented earlier. In order to fully benefit from FDI inflows host countries most likely require more factors for benefit absorption. Finally, institutional and sectoral development seems to play a role. Kalotay (2000) defines institutions as an investment-friendly policy and administrative friamework, while Durham (2004) uses the regulation of business, the protection of property rights and anti-corruption measures as institutional

indices. Separately, Kurtishi–Kastrati (2013), and Khordagui and Saleh (2013) argue that more open to trade, more benefit from FDI as FDI and openness are complementary for economic growth

Absorptive Capacity, according to Miguelez and Moreno (2015), is a crucial element for regions to make the most of the information and knowledge flows that come their way, allowing them to gain productivity and competitive advantage. Direct benefits from foreign direct investment might include new investments, productive capacity, labor demand, demand for intermediate goods, and, in some situations, exports that improve national income or economic growth (Takii, 2005). Given this context, it is assumed that FDI has an effect on the productivity of sectors that receive FDI directly, and that FDI is thus a determining factor in increasing productivity and efficiency.

The use of the absorptive capacity theory in this study looks at the level of development in the various sectors under study and how they contribute to FDI-Growth nexus. This is because FDI naturally contains some benefits. However, these benefits need to go through a conversion process before becoming host country spillover. This process requires sufficient absorptive capacity at host country levels. “Absorption” in FDI context means assimilation of FDI in a given host economy. Thus, absorptive capacity denotes maximum amounts of FDI that host economies can assimilate or integrate into their economies in a meaningful manner (Kalotay, 2000).

Empirical Review

Evidence in support of positive impact of foreign direct investment on economic growth

Using a sample of 124 nations over the period 1971-2010, Iamsiroj (2016) concluded that FDI has a positive impact on economic growth in general. The findings showed that foreign direct investment (FDI) is linked to greater rates of economic growth and vice versa hence most countries are always in favor of attracting FDI because it brings major benefits to the host country. The existence of a virtuous cycle implies that FDI leads to economic growth, which attracts FDI inflows, which boosts growth even more. This is an important conclusion because it emphasizes the importance of foreign investment flows and the efforts that should be made to increase FDI levels. The findings of this study have some evident and significant policy consequences. Policymakers in the host country should strive to accelerate the country's economic growth, which will result in more FDI inflows. The investment authority should also ensure that the flow of FDI into the country is stable, since it has the potential to affect economic growth and stabilize it from severe oscillations. The goal of the FDI policy is to boost host nation growth while reducing economic volatility. Other important factors of FDI include the labor force, trade openness, and economic freedom.

Abekah (2008) using the ordinary least squares (OLSs) model for a sample of 47 African countries from 1990 to 2003, indicated that FDI has a positive influence on GDP growth in African countries. Furthermore, Loots and Kabundi (2012) used cross-section regression to examine 46 African nations from 2000 to 2007 and found that FDI has a positive impact on

economic growth, and that natural resource availability and market size attract FDI. In a similar vein, Lumbila (2005) examines the impact of FDI on economic growth and the characteristics that allow FDI to play a positive role in growth using macro data on FDI flows from 47 African economies for the period 1980-2000. His research showed that FDI helps to promote growth in Africa, and that a stable and predictable investment climate, as well as the availability of a well-educated labor force, helps to boost FDI's impact on the continent's growth.

Macias and Massa (2009) used panel co-integration analysis to investigate the long-run relationship between economic growth and four types of international investment: foreign portfolio investment (FPI), foreign direct investment (FDI), cross-border bank lending, and bond flows, on a sample of 45 African economies from 1980 to 2007. Their findings showed that FDI and cross-border bank lending boost economic growth in Africa, while bonds and foreign direct investment have little effect. Durham (2004) investigated the impact of FPI and FDI on saving rates and economic growth in five African and four Southern Asian nations using time-series data. His findings demonstrated that there is no clear link between international capital flows and economic growth or savings rates, and the impact of FDI or FPI in the sample nations is mostly equivocal. He goes on to say that the negative impact of FDI or FPI in some nations is owing to a lack of absorptive ability, such as human capital, well-developed financial markets, or per capita income, to attract foreign investment.

Osei, Ibrahim, and Sare (2018), in their study on foreign direct investment (FDI) and sectoral growth in Africa, found that FDI positively and

unconditionally drives economic growth in 38 African countries from 1960 to 2014. Value additions in the manufacturing, agricultural, service, and industrial sectors are often favorable and statistically significant, according to their findings. While manufacturing value additions have a favorable influence, it is statistically insignificant. Interestingly, while the FDI effect is substantially positive and significant in the earlier finding, after the transmission channels are controlled for, the impact of FDI on economic growth remains positive but small. They discovered that the pass–through effect of FDI is only significant for the agriculture and service sectors, and that the manufacturing sector is mostly negative, but statistically insignificant. However, this study did not take into consideration the impact of the asymmetric effect of FDI inflows, moreover, the mode of data analysis does not provide results for both the short run and the long run effect. In this study these gaps are going to be looked at.

The impact of FDI on economic growth is boosted by the trade policy framework, according to Balasubramanyam, Salisu and Sapsford (1996). Using the ordinary least squares (OLS) and extended instrumental variable estimate on a sample of 46 developing nations from 1970 to 1985, the authors discovered that nations that pursued an outward focused trade policy regime (export promotion) had a higher impact on economic growth than countries that pursued an internally focused trade policy regime (import substitution). Borensztein et al. (1998) use the Ordinary least square regression method to analyse data for 69 developing countries from 1970 to 1989 and find that, while FDI contributes more positively to economic growth than domestic

investment, the FDI and growth impact is largely dependent on the human capital stock in the host countries.

Gui-Diby and Loris (2014) used data from 50 African countries from 1980 to 2009 to determine the impact of FDI on economic growth. The results of their GMM framework analysis revealed a discrepancy in the influence of FDI on growth throughout the sample. According to the findings of their research, FDI inflows into African countries have had a major impact on economic growth during the last 30 years. This effect, however, was not really consistent across the study periods. From 1980 to 1994, FDI had a negative influence on economic growth; however from 1995 to 2009, it had a favorable impact. This suggests that the negative impact of FDI between 1980 and 1994 may be linked to the implementation of structural adjustment programs in many African countries, such as privatization, the orientation of FDI in resource-seeking activities, weak economic links between multinational enterprises and local firms, and local enterprises' low capacity to mobilize adequate resources. The favorable impact between 1995 and 2009 can be explained in part by the improved business environment and the contribution of resource-based sectors to economic growth through commodity exports.

Bengoa and Sanchez-Robles (2003) used 7 data for 18 Latin American nations from 1970 to 1999 and concluded that FDI is positively connected to economic growth, but that long-term FDI requires sufficient human capital, economic stability, and market liberalization. Alfaro et al. (2004) used data from 71 developing and developed countries from 1975 to 1995 and found that, while FDI has an ambiguous effect on economic growth, it has a huge

growth-enhancing effect in countries with well-developed financial markets compared to countries with underdeveloped financial markets.

According to De Mello (1999), FDI can be viewed as a stimulant for domestic investment. Multinational Corporations (MNCs) have more access to international and host-country finance due to their extensive networks and worldwide market exposure. Thirlwall (1999) goes on to say that this can be a spur for domestic investment, particularly in the same or related area. When compared to local enterprises, MNCs are praised for responding rapidly to investment possibilities and incentives (Caves, 1996). MNCs can also take on larger projects that domestic enterprises may not be able to take on or projects that are regarded too hazardous for local firms. UNCTAD (1999). Dupasquier and Osakwe (2005) claim that FDI helps to supplement domestic savings by bringing in foreign savings.

In their work Domestic and foreign direct investment in Ghanaian agriculture, Srofenyah, Djokoto, and Gidiglo (2013) discovered that FDI has little effect on domestic investment in the short run. Although FDI has a favorable long-term impact, the coefficient for agricultural growth is negligible and statistically indistinguishable from zero. As a result, agricultural growth in Ghana does not stimulate domestic investment.

Evidence against positive impact of FDI on Economic growth

In their study FDI, economic growth, and service sector value addition in Ghana, Immurana, Yensu, Ibrahim and Adam (2015), discovered that FDI did not demonstrate a significant influence of FDI on economic growth when countries with sophisticated financial markets were excluded, although there was evidence of a favorable effect of institutions on economic growth.

Furthermore, they discovered that strengthening the quality of institutions has a positive impact on the effect of FDI on economic growth since it allows these nations to overcome some of the shortcomings associated with an underdeveloped financial system.

Adams & Opoku (2015) found that FDI had a negative impact on growth in 22 SSA countries using the GMM estimate technique and data from 1980 to 2011. However, when they combined FDI with the regulatory variables, they discovered that FDI and growth have a positive and highly significant association. This means that FDI increases growth in the context of efficient rules. Effective rules reflect market efficiency and, as a result, ensure that resources are allocated efficiently in the domestic economy. The findings of their analysis also suggest that FDI and factor markets are significant in identifying the channels through which FDI influences economic performance, which aids in identifying policy levers that can be used to boost FDI advantages to the host country. Effective business, credit market, and labor rules are all crucial in maximizing the benefits from FDI, according to the report. In order to foster economic development, African governments are advised to embrace a long-term institutional development strategy.

Adams (2009) investigated the impact of FDI on regional economic growth using pooled panel data analysis for 42 African nations from 1990 to 2003. According to his findings, increased FDI flows into Africa did not result in a proportionately good impact on economic growth. Similarly, Ng (2007) uses the Toda and Yamamoto (1995) test for Granger causality in a panel data framework to investigate the relationships between FDI and productivity for 14 Sub-Saharan African nations from 1970 to 2000. Falki (2009) investigated

the influence of FDI, domestic capital, foreign capital, and labor force on Pakistan GDP over the period 1980–2006 using the Ordinary Least Square approach. According to the findings, FDI has a negative relationship with GDP.

Sen (1998) suggested that FDI can cause negative technology spillovers by MNCs by transferring incorrect know-how with the goal of retaining local firms' technological advantages. Thirlwall (1999) criticized FDI, claiming that it can bring in incompatible technology, preventing the development of the host country's capital-goods industry. Furthermore, local enterprises may become dependent on MNCs as a result of adapting to their technology, which could stifle their long-term development (Vissak and Roolaht, 2005). FDI, according to Thirlwall (1999) and Todaro (1985), can hinder local business.

In a study of the links between FDI and domestic investment in the Economic Community of West African States (ECOWAS) countries, Eragha (2011) discovered that FDI inflows replace domestic investment. Another disadvantage is that MNCs' large investments, which are made with new money from outside and retained earnings, might work against host governments' contractionary fiscal and monetary policies (UNCTAD, 1999). Finally, when MNCs repatriate profits, there is a risk that the host country's balance of payments would deteriorate (Ndoricimpa, 2009). Finally, according to (UNCTAD, 1999), FDI appears to be a more expensive source of foreign capital than other sources, as MNC profit margins typically exceed the rate of interest on government and other types of loans. According to Ram and Zhang

(2002), repatriated profits outweigh the positive impact of the original investment in the long run.

Carkovic and Levine (2002) found that the exogenous element of FDI has no positive effect on growth and that there is no evidence to support the assertion that FDI, on its own, can influence the host country's economic growth. Their study covered 72 countries from 1960 to 1995 and found no evidence to support the assertion that FDI, on its own, can influence the host country's economic growth.

Evidence on the asymmetric effect of foreign direct investment

Kurtović, Maxhuni, Halili & Krasniqi (2021) in their study The Asymmetric Effect of Foreign Direct Investment on the Net Average Wages of Southeastern and European countries found out there is an asymmetric impact of FDI stock on the net average wages of Bulgaria and Slovenia. In addition, we found that the symmetric effect is stronger compared to the asymmetric effect that the FDI stock has on the net average wages of Bulgaria, N. Macedonia, Montenegro, Serbia and Slovenia. Finally, we found that productivity, employment and education significantly affect solely Slovenia's net average wages. However, due to lack of data, they were unable to examine the asymmetric effect of inward FDI stock on the net average wages of the industrial sectors of the SEE economies.

According to Saif Ur, Imran, Muhammad, Salman & Sadia (2021), cointegration exists between the variables in the occurrence of asymmetries. The asymmetric causality outcomes of their study confirm that only positive changes in FDI have bidirectional causality to life expectancy while negative shocks have unidirectional that runs from FDI to life expectancy. The

government expenditure and foreign direct investment also provided evidence of social sector health welfare in Pakistan. The output shows that increasing government expenditure can cause an increase in life expectancy while decreasing government expenditure can cause a decrease in life expectancy. The study found that investment in health care medical services is paramount to better results as far as government assistance (welfare) gains. The outcomes of the study have given numerous policy suggestions to boost life expectancy in the general public of Pakistan.

Kashif and Mehwish (2021), analysed the long run as well as short run linear and nonlinear impact of foreign direct investment (FDI) and exchange rate on tourism in South Asian countries. The study uses annual panel data of five South Asian countries that is Bangladesh, India, Nepal, Pakistan, and Sri Lanka from 1995 to 2019 and applies panel linear autoregressive distributive lag (ARDL) and nonlinear autoregressive distributive lag (NARDL) methodology to analyse the long run and short run relationship among the variables. Results of their study showed that an increase in FDI and appreciation of exchange rate contracts tourism, while a decrease in FDI and depreciation of exchange rate expands tourism in the long run. Both FDI and exchange rate shows asymmetric behavior with tourism in the long run in South Asian countries. Results of individual countries show that FDI has asymmetric impact on tourism in Bangladesh, India, Pakistan, and Sri Lanka in the short run, while exchange rate has asymmetric impact on tourism in Bangladesh, India, Nepal, and Pakistan in the short run. Moreover, unidirectional causality exits from FDI, exchange rate, partial negative sum of FDI, and partial positive sum of exchange rate to tourism as well as from

tourism to partial positive sum of FDI and partial negative sum of exchange rate. Therefore, there is a need to expand tourism sector through attracting FDI in tourism sector, while FDI attraction and tourism development must be well coordinated among different departments as well as maintain exchange rate at a reasonable level to encourage international tourism.

Sheikh, Asad, & Mukhtar, (2020), employed both linear panel autoregressive distributive lag model (Linear PARDL) and Non-linear panel autoregressive distributive lag model (Nonlinear-PARDL) by utilizing panel data from 1971 to 2014 to study the asymmetric effect of Foreign direct investment inflows (FDI), Carbon emission and Economic growth on energy consumption of South Asian Region. This study also employed asymmetric granger casualty test in order to examine asymmetrical bidirectional casualty between energy consumption, carbon emission, foreign direct investment inflows and economic growth of Pakistan, India, Nepal, Sri-Lanka, and Bangladesh. Main purpose of utilizing both linear and nonlinear model was to investigate that either impact of carbon emission, economic growth and foreign direct investment on energy consumption is linear or non-linear. Their results showed that the symmetrical ARDL model fails to establish long-term co-integration between variables. In long run asymmetric association exist between energy utilization, economic development, FDI inflows and carbon emission. Positive shocks associated with independent variables didn't effect energy consumption the same way as negative shocks are affecting. Interestingly only positive shocks to economic growth, FDI inflows and carbon emission are having an effect on energy consumption and negative shocks to independent variables didn't effect energy utilization in short run.

Nonetheless Symmetrical panel based ARDL model unable to estimate a long-term co-integration between EC and EG.

The research that has been reviewed has yielded conflicting results. While information abounds on the significance of FDI in the growth process, our understanding of the transmission routes through which FDI affects growth, as well as the asymmetric effect of these flows, is lacking. More importantly, FDI has an impact on overall growth through affecting various sectors of the economy. This study looks into the transmission routes via which FDI affects economic growth, using various sectors of the economy as a conduit and incorporating the asymmetric effect of FDI inflows.

Conceptual Framework

This framework shows the concept that underpins the study. It illustrates the relationship between foreign direct investment, economic growth and sectoral growth.

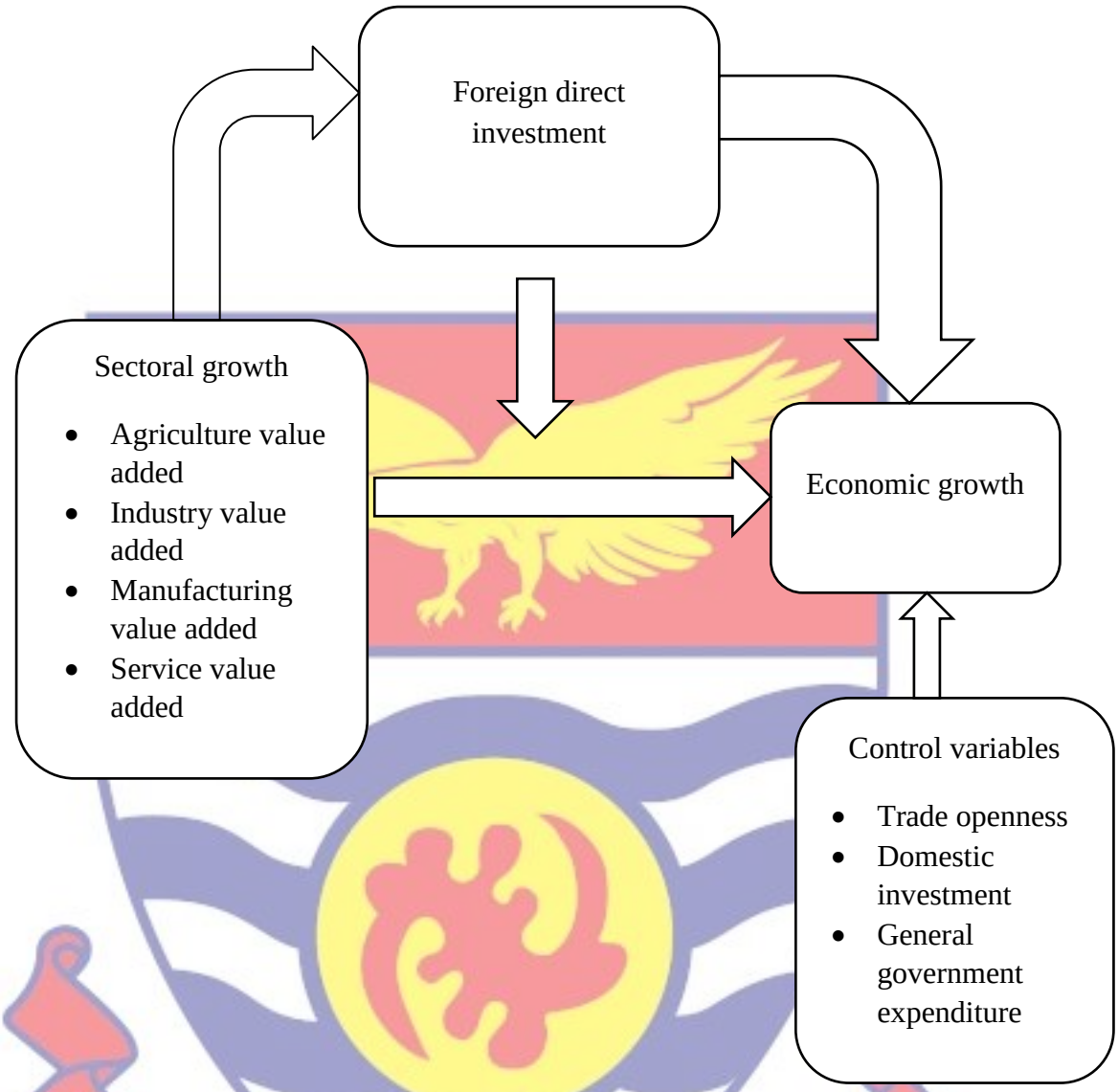

Figure 1: Conceptual framework
Source: Efiinu (2021).

From the conceptual framework, the arrow from foreign direct investment to economic growth shows the relationship between the two. Empirically, several research works have posited that there is a relationship between economic growth and foreign direct investment. The arrow shows that the interacting variable sectoral growth is viewed as an influencer of the relationship between foreign direct investment and economic growth. Also, Sectoral growth has a relationship with FDI. In addition, other variables

namely trade openness, general government expenditure, capital stock as displayed are influencers of economic growth.

Chapter Summary

From the above, theories were reviewed to support the study. The study also realized that few studies conducted on the nonlinear effect of FDI and economic growth. Moreover, the sectoral transmission channel through which FDI impact on growth has not been thoroughly explored. The assumption is that various sectors have varied capacities for absorbing FDI, necessitating the inclusion of this sectoral mechanism in the FDI-Growth nexus. The rate of absorption in various sectors will help policymakers determine which sectors are most suited to take advantage of FDI inflows.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter discusses the basic methods that were used to address the problem identified in chapter one. It reports on the data collection, measurement and the analysis of the data obtained for the study. It tackles the research design, population of the study and the sampling adopted for the study. Among other things, the chapter as well discusses the preliminary tests conducted on the data to check its validity to address the problem identified.

Research Design

The approach taken by researchers can have an impact on the study's design. A research design establishes the conceptual framework for the study and serves as a road map for data collection, measurement, and analysis (Kothari, 2004). The explanatory research design used in this study aims to determine the relationship between the variables of interest. It collects data for its analysis; it also emphasizes the importance of analyzing circumstances in order to explain the link between variables (Gill &Johnson, 2010).

According Saunders (2012), empirical studies that seeks to establish cause and effect may be termed as explanatory. This research design was chosen because it fit the objectives of the study. The explanatory research design was used in identifying the role sectoral value additions adds to the FDI-Growth nexus. The study formulated and tested hypotheses before arriving at the stated result in line with the quantitative approach which allows for the formulation and testing of research hypothesis for further generalization and inferential analysis of results. It as well involves both

descriptive and inferential statistics. Descriptive statistics such as graphs, tables, equations and charts were used in the analysis of results of this study. In that domain, this study developed and tested theories as well in order to generalize the outcome.

Sample Selection Criterion

The number and type of participants for the study are critical since they have the potential to influence the study's outcomes and consequently the generalizability of the findings. With reference to the purpose of the study, the study employed all African economies which have a full data for the period under observation (1990-2019). This however forms the criterion for selecting the sample and sample size of the study. Out of this criterion stated, thirty (30) out of the 48 sub- Saharan African countries were selected for the study.

Data Collection Procedure

The study adopts a criterion-based technique to successfully select economies that represent the entire 48 countries represent sub-Saharan African economies. In brief, the sample is guided by the availability of data from world development index. With reference to the purpose of the study, secondary data is best suited. Based on the premise, data was obtained from the world development indicators of the World Bank. Data on foreign direct investment, economic growth, agriculture value added, industry value added, manufacturing value added, service value added, trade openness, gross fixed capital formation and government expenditure were sorted from the world development indicators.

Model Specification

Following (Bassanini &Scarpetta, 2001) on the basis of pooled cross-country time series data, a standard growth equation corresponding to the economic growth, FDI and sectoral growth was developed. The primary advantage of panel data for growth equation analysis is the ability to control country-specific influences. However, using other panel data estimation techniques such as the GMM often requires that all slope coefficients be homogeneous, leaving just the intercepts to differ across countries. These results, according to Pesaran and Smith (1995), are influenced by a potentially significant heterogeneity bias under slope heterogeneity, particularly in small nation samples. They proposed pooled mean group (PMG) estimators, which enable short-run coefficients, adjustment speeds, and error variances to vary between countries while requiring long-run coefficients to be homogeneous. With the PMG procedure, the researcher estimated the following restricted version of the growth equation on annual data for 30 Sub-Saharan African countries from, mainly, 1990-2019.

Model Specification for objectives 1

This model examined the role of FDI on economic growth when it interacts with the various sectoral channels. The sectoral channels serve as an interacting variable of FDI on economic growth. This model was formulated to approve or disapprove whether FDI interacting with the various sectoral channels will have a positive impact on growth. The Model stated below has two sides; one side accounting for the short run dynamics of FDI effect on sectoral growth and the other the long run dynamics of FDI effect on sectoral growth. The Δlog denote short-run coefficients. The significance of these

coefficients shows that the related explanatory variable has a short-run causal relationship with the dependent variable. Long-run coefficients are denoted by ys. The ϕs represent error correction terms (ECTs). The inverse of the absolute value of these coefficients provides a speed of adjustment estimate, if the coefficient of the error correction term is negative and significant, the associated variable has a long-run relationship with the dependent variable".

$$GRO_{it} = \phi_{it} [\, y_1\ FDI_{it} + y_2 SEC_{it} + y_3 X_{it} + \eta(\ FDI_{it}\ x\ SECit)] + b_{1,i}\ \Delta log FDI_{it} + b_{2,i}\Delta log SEC_{it} + b_{3,i}\Delta log X_{it} + \eta_2(\, FDI_{it}\ x\, SECit) + \varepsilon it \ldots\ldots\ldots$$

equation 1

GRO_{it}	denotes economic growth
FDI	denotes foreign direct investment
SEC_{it}	denotes sectoral growth
X_{it}	denotes control variables
η	indirect effect of FDI on growth via the four sectors
$y_{i,t}$	denotes the coefficients for the long run variables
$b_{i,t}$	denotes coefficients for the short run variables
εit	denotes the error term

Justification for model 1

The direct effect of the transmission mechanism on economic growth is accounted for by including the various sectors. The indirect effect of this transmission mechanism is accounted for by the interaction term between FDI and sectoral value additions. Other common controls are also included. This study includes gross fixed capital formation to proxy for domestic investments to investigate the exogenous influence of FDI on growth while controlling for the effect of the domestic investment rate on growth. Incorporating domestic

capital will also allow for a comparison of the relative effects of foreign and domestic investment on the growth process. As a result, we include domestic capital accumulation, as measured by gross fixed capital creation as a percentage of GDP, in this analysis. Government expenditure is measured as a percentage of GDP. It is expressed as a percentage of GDP. This is used as a proxy for government size. The ratio of imports and exports to GDP is used to proxy a country's integration with the rest of the world and is used to gauge trade openness".

Model Specification for objective 2 and 3

The model as shown in equation 1 disregards the asymmetric relationship between the variables. It starts from the assumption that the positive and negative changes of the explanatory variables have the same effect on the dependent variable. The application of the nonlinear model measures the asymmetric short term and long-term relationship between the variables (Kurtović, Maxhuni, Halili, & Talović, 2020):

$FDI_{it} = y_1 FDI_{it}^{+} + y_1 FDI_{it}^{-} + \varepsilon_{it}$ ..... ***equation 2***

Equation (2) represents equilibrium between the dependent variable FDI and the independent variable, divided into a positive negative effect (Kurtović et al. 2020). The NARDL model requires a decomposition of the FDI logarithm (Kurtović et al. 2020):

$FDI_{it}^{+} = \sum_{i=1}^{t} FDI_{it}^{+} = \sum_{i=1}^{t} \max(\Delta FDI_i = 0)$ ..... **equation 3**

$FDI_{it}^{-} = \sum_{i=1}^{t} FDI_{it}^{-} = \sum_{i=1}^{t} \min(\Delta FDI_i = 0)$..... **equation 4**

The partial decomposition process efficiently divides the FDI stock into positive (FDI_{it}^{+}) and negative (FDI_{it}^{-}) (Kurtović et al. 2020b). By

incorporating equations 3 and 4 in equation 1, the non-linear model is presented as follows (Kurtović et al. 2020b)

$$GRO_{it} = \phi_{it}\ [y_1 FDI_{it}^{+-} + y_2 SEC_{it} + y_3 X_{it} + \eta(\ FDI_{it}^{+-}\ x\ SECit)] + b_{1,i}\ \Delta log FDI_{it}^{+-}$$

$$+ b_{2,i}\Delta log SEC_{it} + b_{3,i}\Delta log X_{it} + \Delta log \eta_2(\ FDI_{it}^{+-}\ x\ SECit) + \varepsilon it$$ ***..... equation 5***

The Model stated above has two sides; one side accounting for the short run dynamics of FDI effect on sectoral growth and the other the long run dynamics of FDI effect on sectoral growth. "The Δlog denote short-run coefficients. The significance of these coefficients shows that the related explanatory variable has a short-run causal relationship with the dependent variable. Long-run coefficients are denoted by ys. The ϕs represent error correction terms (ECTs). If the coefficient of the ECT is both negative and significant, the associated variable has a long-run relationship with the dependent variable; the inverse of the absolute value of these coefficients provides a speed of adjustment estimate".

GRO_{it} denotes economic growth

FDI_{it}^{+-} denotes Positive and negative shocks of foreign direct investment

SEC_{it} denotes sectoral growth

X_{it} denotes control variables

η indirect effect of FDI on growth via the four sectors

$y_{i,t}$ denotes the coefficients for the long run variables

$b_{i,t}$ denotes coefficients for the short run variables

εit denotes the error term

Justification for model 2

To begin, asymmetry is noticed in the sign and magnitude of positive and negative partial sums of FDI, according to Bahmani-Oskoee and Ghodsi (2017). The direct effect of the transmission mechanism on economic growth is accounted for by including the various sectors. The indirect effect of this transmission mechanism is accounted for by the interaction term between FDI and sectoral value creation. Other common controls are also included. The inclusion domestic investments to investigate the exogenous influence of FDI on growth while controlling for the effect of the domestic investment rate on growth. Incorporating domestic capital will also allow for a comparison of the relative effects of foreign and domestic investment on the growth process. As a result, we include domestic capital accumulation, as measured by gross fixed capital creation as a percentage of GDP, in this analysis. Government expenditure is measured as a percentage of GDP. It is expressed as a percentage of GDP. This is used as a proxy for government size. The ratio of imports and exports to GDP is used to proxy a country's integration with the rest of the world and is used to gauge trade openness.

Data analysis technique

The study employed a panel data which is a type of data that includes a cross-sectional as well as time series data, to adequately assess the impact of foreign direct inflow on sectoral growth to improve economic growth. This allows for the testing of economic questions that cannot be done using either time series or cross sectional and allows the researcher to control for variables that cannot be observed under the study. Panel data is employed due to its overriding advantages over the time series and cross section data, that is, its

ability to give more informative data, variability, efficiency as well as less collinearity among the variables (Baltagi, 2008; Qian & Jiao 2014).

Panel data models are frequently estimated using two methods. The first (mean group estimator) involves averaging individual estimates for each of the panel groups. This estimator, according to Pesaran and Smith (1995), produces consistent estimations of the parameters' averages. Pirotte (1999) further shows that for a high sample size, the mean group estimator yields efficient long-run estimators. It permits the parameters to be freely independent among groups and ignores the possibility of group homogeneity. The traditional panel approach is the second option (random or fixed effects and GMM methods). These models require the parameters to be the same across countries, which could result in inconsistency and misinformation in long-term coefficients, a problem that is amplified when the time is long.

Pesaran et al. proposed the pooled mean group estimator, which is used in this work (1999). This method allows for varied intercepts but requires that all cross-section slope values be the same, which can be very limiting assumption methods). By combining the benefits of both strategies, the PMG estimator attempts to strike a balance between these two conflicting approaches. Short-run coefficients can differ between nations (similar to the MG estimator), but long-run coefficients must be homogeneous across all cross sections (akin to the fixed effects estimator). In comparison to other approaches, the PMG estimator has significant advantages.

Ordinary least square (OLS) estimates can produce skewed and inconsistent findings in some cases; hence the pool mean group strategy used in the model helps to achieve the study's ultimate goal. The dynamic

generalized method of moments (GMM) provides an answer to the endogeneity dilemma. These techniques, on the other hand, often require homogeneity of all slope coefficients, with only the intercepts varying among countries. According to Pesaran and Smith (1995), these results are impacted by a potentially substantial heterogeneity bias under slope heterogeneity, especially in small nation samples. Short-run coefficients, adjustment speed, and error variances can differ among countries, but long-run coefficients must be homogeneous.

Unit Root Test

To determine the order of integration, a series of panel unit root tests must be run before any estimation are made. This accomplishes two goals: first, it avoids the erroneous effects of non-stationarity, and second, it investigates the possibility of cointegration relationships. Due to its superior power when compared to conventional unit root tests, a wide range of panel unit root tests have been established in the literature. The extent to which these tests compensate for cross-sectional dependency and whether they allow for common or individual roots differs significantly. Individual roots are allowed in tests proposed by Im et al. (2003) (hereinafter IPS) and Pesaran (2007). Bai and Ng (2001, 2004), Pesaran (2007), Phillips and Sul (2003), and Moon and Perron (2003) are examples of tests that adjust for cross-sectional dependence (2004). Given the heterogeneity for the 30 countries observed in this research, only unit root tests that assumed individual roots were considered.

Data Source and Measurement of Variables

The current study obtained an extensive of data from the World Development Indicators. The world development indicator (WDI) is the World Bank's most comprehensive collection of cross-country development data. The World Development Index (WDI) is a collection of relevant, high-quality, and internationally comparable statistics on global development and poverty reduction. The study looked at economic growth as the dependent variable and sectoral value addition as well as FDI as the independent variables to properly assess the role of FDI on sectoral and economic growth. Certain control variables that have an impact on the link between FDI and growth were also used in the study. The variables and their sources are summarized in Table 1.

Table 1: Variable Source and Description

VARIABLE	EXPLANATION	SOURCE
Foreign direct investment **(FDI)**	FDI is the net inflows of investment and taken as the sum of equity capital, reinvestment of earnings, other long-and short-term capital	World bank world development indicators 1990-2019
Agricultural value added **(SEC)**	It captures forestry, hunting and fishing as well as cultivation of crops as a percentage of GDP.	World bank world development indicators 1990-2019
Industry value added **(SEC)**	It comprises value added in mining, construction, electricity, water and gas as a percentage of GDP	World bank world development indicators 1990-2019
Manufacturing value added **(SEC)**	It comprises value added to physical and chemical transformation of materials of components into new products, whether the work is performed by power driven machines or by hands	World bank world development indicators 1990-2019

Table 1 continued

Service sector value added **(SEC)**	It captures value added in wholesale and retail trade, transport and government, financial, professional and personal services.	World bank world development indicators 1990-2019
Trade openness **(X)**	It captures the summation of exports and imports as a percentage of GDP	World bank world development indicators 1990-2019
General government expenditure **(X)**	It captures all government expenditures for purchases of goods and services, including compensation of employees	World bank world development indicators 1990-2019
Gross fixed capital formation **(X)**	This measures domestic investments to permit the investigation of exogenous impact of FDI on growth while controlling for domestic investment rate effect on growth	World bank world development indicators 1990-2019
Economic growth **(GRO)**	This is the sum of gross values added by all resident producers in the economy plus any product taxes and minus any subsidies not include in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World bank world development indicators 1990-2019

Source: World Bank (2021**)**

Chapter Summary

This chapter discussed the method used to conduct this study. It discussed among others the research approach used for the study, which is quantitative method of research. If further discussed the research design which is explanatory research design. The chapter further focused on the population and sampling technique used for the study. It explained the variables and the sources of data used for the study as well as the model specification and justification and then an elaboration of the estimation technique used for the study. It is worth to recap that the set of data obtained for the study in this chapter were obtained from the world development indicators.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results of the study as well as the discussion of the results. It first of all presents the descriptive statistics of the variables employed for the study. From the descriptive statistics, this chapter presents the correlation statistics for the variables as well as the unit root test. It further presents the empirical results and discussion for the various hypothesis formulated for this study.

Descriptive Statistics

Table 2: Descriptive statistics of the dependent and independent variable

Variable	Mean (%)	Median (%)	Maximum (%)	Minimum (%)	Std. Deviation (%)	Observation
GDPC	1.46	1.71	37.53	-47.50	4.95	861
FDI	3.24	1.84	57.8	-8.70	5.50	861
FD1>0	13.39	8.36	129.70	0.00	16.37	861
FDI<0	-11.11	-6.38	0.00	-103.07	13.99	861
TRADE	67.41	59.08	225.02	11.08	35.57	861
AGRIC	23.72	24.12	61.41	1.82	14.34	861
INDUSTRY	24.79	23.04	72.15	4.55	11.16	861
MANUFACT	11.04	9.81	40.06	0.23	6.08	861
SERVICE	44.79	45.07	70.34	12.45	9.82	861
GOVEXP	14.48	13.84	39.45	0.91	6.01	861
GFCF	20.74	19.9	93.55	-2.42	9.62	861

Source: Efiinu (2021)

Note: This table presents descriptive statistics for the sample used in the analysis. This sample includes 30 Sub–Saharan African countries for the period of 1990-2019. These countries are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Congo Republic, Cote D'ivoire, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, Zimbabwe. GDP represents Economic growth, FDI represent foreign direct net inflows into African countries, TRADE represent trade openess, AGRIC represents agricultural value added, INDUSTRY represents industry value added, MANUFACT represents manufacturing value added SERVICE represents service value added, GOVEXP represents Government expenditure, GFCF represents gross fixed capital formation

Table 2 represents the descriptive statistic for the relevant variables employed in the study. It represents the mean, median, standard deviation, minimum and maximum values as well as the observation for the variables of the study. From the table, economic growth recorded a mean of 1.46% with minimum and maximum values of -47.50% and 37.53% respectively. The economic growth of Sub-Saharan African economies for the median was 1.71% while the measure of spread or variation measured by the standard deviation was 5.16%. Foreign direct investment inflow into sub-Saharan African countries recorded a median of 1.84% and on the average, the net FDI inflows as a percentage of GDP was 3.24%, with the maximum inflow been 57.8% and minimum net inflow as -8.70%. The measure of spread of variation measured by the standard deviation for FDI recorded was 5.50%. Taking into consideration the nonlinear effect of Foreign direct investment inflow into Sub-Saharan African countries, a higher inflow of FDI recorded a median of 8.36% and a lower inflow recorded a median of -6.38%. On the average, the higher FDI inflows as a percentage of GDP was 13.39%, with the maximum inflow been 129.70% and minimum net inflow as 0.00% whilst that of a lower inflow recorded a mean of -11.11%, with maximum inflow as 0.00% and minimum inflow as 103.07% The measure of spread of variation measured by the standard deviation for a higher FDI inflow was 16.37% and that of the lower was 13.99%.

Over the period under review agricultural value added, manufacturing value added, industry value added and service value added recorded median values of 24.12%, 9.81%, 23.04%, 45.07% respectively. On the average, the value added in agriculture is 23.72% with a range of 1.82% to 61.41%. The

measure of variation measured by the standard deviation for agriculture value added was 23.72%. Manufacturing value added within the period under review recorded a mean of 9.81 with a range of 0.23% to 40.06%. The standard deviation recorded by this sector was 6.08%. The service sector on the average recorded value addition of 44.79% with a range of 12.45% to 70.34%. The measure of variation for the service sector was 9.82%. On the other hand, the industry sector recorded a mean of 24.79% within a range of 4.55% to 72.15%. The standard deviation for the value addition in this sector was 11.16%. For the four sectors, average value addition in the service sector is higher relative to the other three sectors, with the manufacturing sector recording the least value additions.

Furthermore, government expenditure on the average was 14.48% with the maximum value as 39.45% and minimum value as 0.91%. The median for government expenditure was 13.84% and the standard deviation was 6.01%. Trade openness and domestic capital which was proxied by gross fixed capital formation recorded median values of 59.08% and 19.9% respectively

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Correlation Analysis

Table 3: Correlation Matrix for the current Level of FDI Inflow on sectoral growth to impact economic growth

	FDI	AGRIC	GDPC	GE	GFCF	IND	MAN	SERV	TRADE
FDI	1.000								
AGRIC	-0.115	1.000							
GDPC	0.070	-0.049	1.000						
GE	0.147	-0.451	-0.031	1.000					
GFCF	0.387	-0.302	0.070	0.096	1.000				
IND	0.052	-0.647	-0.053	0.160	0.368	1.000			
MAN	-0.087	-0.357	-0.024	0.146	-0.097	0.224	1.000		
SERV	0.069	-0.576	0.059	0.299	-0.045	-0.151	0.191	1.000	
TRADE	0.37	-0.523	0.027	0.380	0.348	0.432	0.194	0.174	1.000

Source: Efiinu (2021)

Note: This table presents descriptive statistics for the sample used in the analysis. This sample includes 30 Sub Saharan African countries for the period of 1990-2019. These countries are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Congo Republic, Cote D'ivoire, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, Zimbabwe. GDP represents Economic growth, FDI represent foreign direct net inflows into African countries, trade represent trade openness, AGRIC represents agricultural value added, IND represents industry value added, MAN represents manufacturing value added SERV represents service value added, GE represents Government expenditure, GFCF represents gross fixed capital formation, TRADE represent trade openness.

Table 3 represents a pairwise correlational matrix between the variables employed for the study; Foreign direct investment (FDI), Economic growth (GDPC), Government expenditure (GE), Domestic investment (GFCF), Trade openness (TRADE), Service sector value addition (SERV), Manufacturing Value addition (MAN), Agriculture value addition (AGRIC) AND Industry value addition (IND). Using Cohen (1988) the interpretation of the matrix was based on the strength and the direction. The absolute values depict the strength of the relationship and the sign of the coefficient determines the direction.

From the matrix FDI is negatively correlated with Agriculture and manufacturing sector whilst it shows a positive correlation with the other variables. However, the correlation between FDI and government expenditure showed a weak correlation whilst that with the other variables showed a very weak correlation. With the proxy for economic growth (GDPC), it showed a positive and very weak correlation with domestic investment (GFCF), service value added and trade openness on the other hand showed a negative and very weak relationship with government expenditure, industry value added and manufacturing value added. A close examination of the correlation matrix reveals no multicollinearity in the empirical specification because the variables do not exhibit correlation coefficients of more than 0.90 (Adam 2015).

Table 4: Correlation Matrix for a Lower Level of FDI Inflow

	FDI_NEG	GDPC	GE	GFCF	AGRIC	IND	MAN	SERV	TRADE
FDI_NEG	1.000								
GDPC	0.045	1.000							
GE	-0.033	-0.029	1.000						
GFCF	-0.323	0.058	0.097	1.000					
AGRIC	0.141	-0.042	-0.450	-0.303	1.000				
IND	-0.281	-0.061	0.156	0.368	-0.646	1.000			
MAN	0.104	-0.036	0.152	-0.100	-0.361	0.225	1.000		
SERV	0.120	0.066	0.302	-0.044	-0.574	-0.156	0.198	1.000	
TRADE	-0.436	0.011	0.383	0.351	-0.522	0.436	0.199	0.169	1.000

Source: Efiinu (2021)

Note: This table presents descriptive statistics for the sample used in the analysis. This sample includes 30 Sub Saharan African countries for the period of 1990-2019. These countries are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Congo Republic, Cote D'ivoire, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, and Zimbabwe. GDP represents Economic growth, FDI_NEG represent lower level of foreign direct net inflows into African countries, trade represent trade openness, AGRIC represents agricultural value added, IND represents industry value added, MAN represents manufacturing value added SERV represents service value added, GE represents Government expenditure, GFCF represents gross fixed capital formation, TRADE represents trade openness.

Table 4 represents a pairwise correlational matrix between the variables employed for the study; Foreign direct investment (FDI), Economic growth (GDPC), Government expenditure (GE), Domestic investment (GFCF), Trade openness (TRADE), service sector value addition (SERV), Manufacturing Value addition (MAN), Agriculture value addition (AGRIC) AND Industry value addition (IND). Using Cohen (1988) the interpretation of the matrix was based on the strength and the direction. The absolute values depict the strength of the relationship and the sign of the coefficient determines the direction.

From the matrix a lower level of FDI negatively correlated with government expenditure, domestic expenditure, industry sector and trade openness whilst it shows a positive correlation with the other variables A close examination of the correlation matrix reveals no multicollinearity in the empirical specification because the variables do not exhibit correlation coefficients of more than 0.90 (Adam 2015).

Table 5: Correlation Matrix for a higher Level of FDI Inflow on sectoral growth to impact economic growth

	FDI_POS	GDPC	GE	GFCF	MAN	AGRIC	IND	SERV	TRADE
FDI_POS	1.000								
GDPC	-0.014	1.000							
GE	0.061	-0.029	1.000						
GFCF	0.412	0.058	0.097	1.000					
MAN	-0.112	-0.036	0.152	-0.100	1.000				
AGRIC	-0.153	-0.042	-0.450	-0.303	-0.361	1.000			
IND	0.260	-0.060	0.156	0.368	0.225	-0.646	1.000		
SERV	-0.087	0.066	0.302	-0.044	0.198	-0.574	-0.156	1.000	
TRADE	0.471	0.010	0.384	0.351	0.199	-0.522	0.436	0.169	1.000

Source: Efiinu (2021)

Note: This table presents descriptive statistics for the sample used in the analysis. This sample includes 30 Sub Saharan African countries for the period of 1990-2019. These countries are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Congo Republic, Cote D'ivoire, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, and Zimbabwe. GDP represents Economic growth, FDI-POS represent higher level of foreign direct net inflows into African countries, trade represent trade openness, AGRIC represents agricultural value added, IND represents industry value added, MAN represents manufacturing value added SERV represents service value added, GE represents Government expenditure, GFCF represents gross fixed capital formation, TRADE represents trade openness.

Table 5 represents a pairwise correlational matrix between the variables employed for the study; Foreign direct investment (FDI), Economic growth (GDPC), Government expenditure (GE), Domestic investment (GFCF), Trade openness (Trade), Service sector value addition (SERV), Manufacturing Value addition (MAN), Agriculture value addition (AGRIC) AND Industry value addition (IND). Using Cohen (1988) we interpret the matrix based on the strength and the direction. Using Cohen (1988) the interpretation of the matrix was based on the strength and the direction. The absolute values depict the strength of the relationship and the sign of the coefficient determines the direction.

From the matrix a higher level of FDI inflow negatively correlated with economic growth, agriculture, service and manufacturing sector whilst it showed a positive correlation with the other variables. A close examination of the correlation matrix reveals no multicollinearity in the empirical specification because the variables do not exhibit correlation coefficients of more than 0.90 (Adam 2015).

Table 6: Unit Root Test

		At Level										
		FDI	FDI_NEG	FDI_POS	AGRIC	GDPC	GE	GFCF	IND	MAN	SERV	TRADE
With Constant	t-Statistic	0.0820	0.9979	0.9986	0.7784	0.0001	0.4326	0.2654	0.4574	0.7414	0.1669	0.6817
	Prob.	***0.0338***	***0.9328***	***0.8967***	***0.9540***	***0.0259***	***0.3920***	***0.3749***	***0.5597***	***0.0564***	***0.7573***	***0.3326***
		**	n0	n0	n0	**	n0	n0	n0	*	n0	n0
With Constant & Trend	t-Statistic	0.0528	0.9898	0.9303	0.0598	0.0003	0.7972	0.5706	0.0721	0.4947	0.4325	0.6660
	Prob.	***0.0961***	***0.6332***	***0.4925***	***0.0023***	***0.0740***	***0.2254***	***0.4868***	***0.3779***	***0.1964***	***0.2216***	***0.4837***
		*	n0	n0	***	*	n0	n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	0.0830	0.9713	0.9999	0.3067	0.1638	0.4812	0.6426	0.7846	0.2607	0.5336	0.8775
	Prob.	***0.0049***	***0.9931***	***0.8494***	***0.0125***	***0.0047***	***0.8854***	***0.3418***	***0.2845***	***0.4003***	***0.9600***	***0.6061***
		***	n0	n0	**	***	n0	n0	n0	n0	n0	n0
		d(FDI)	d(FDI_NEG)	d(FDI_POS)	d(AGRIC)	d(GDPC)	d(GE)	d(GFCF)	d(IND)	d(MAN)	d(SERV)	d(TRADE)
With Constant	t-Statistic	0.0000	0.9572	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0003	0.0078
	Prob.	***0.0000***	***0.0241***	***0.0002***	***0.0000***	***0.0000***	***0.0000***	***0.0003***	***0.0001***	***0.0000***	***0.0000***	***0.0000***
		***	**	***	***	***	***	***	***	***	***	***
With Constant & Trend	t-Statistic	0000	0.9637	0.0002	0.0000	0.0018	0.0005	0.0003	0.0002	0.0000	0.0021	0.0408
	Prob.	***0.0002***	***0.0686***	***0.0009***	***0.0000***	***0.0047***	***0.0000***	***0.0019***	***0.0006***	***0.0002***	***0.0004***	***0.0003***
		***	*	***	***	***	***	***	***	***	***	***
Without Constant & Trend	t-Statistic	0.0000	0.9094	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005
	Prob.	***0.0000***	***0.0048***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors

Table shows 6 the unit root test for the various variables employed for the study. The Augmented Dickey Fuller (ADF) test showed only FDI and economic growth was stationary at level, all the other variables were not stationary. Testing for the first difference all the variables employed showed stationary. This indicates that the Pool mean group approach can be used for estimation. This study confirmed the stationarity of these variables by employing the Philip Perron unit root test which is shown in appendix 1. The test also confirmed that only FDI and GDPC were stationary at level but at first difference all the variables were stationary. Testing for the non-linearity of FDI, both higher and lower inflow were not stationarity at level but at first difference they were stationary.

Analysis for Study Objectives

This subsection presents and discusses the empirical results on the objectives of the study. The study formulated three objectives in the first chapter. The various hypotheses formulated were:

1. There is no significant relationship between sectoral growth on the current level of FDI inflow to improve economic growth.
2. There is no significant relationship between sectoral growth on a higher level of FDI inflow to improve economic growth.
3. There is no signific ant relationship between sectoral growth on a lower level of FDI inflow to improve economic growth.

This section presents the empirical results based on the hypothesis formulated. A Hausman test was done to choose the best method of estimation which was between the mean group and the pool mean group approach. The null hypothesis of this test is the preferred model is the pool

mean group and the alternate hypothesis is that the model is mean group. Hence the analysis which has p-value less than 0.05, the null hypothesis is rejected. The results of this test showed that the pool mean group is the best method of estimation. This is presented in appendix 2,3 and 4.

Table 7: Short Run Estimation on the relationship between the current level of FDI inflow sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
COINTE	-0.806***	-0.812***	-0.798***	-0.789***	-0.797***	-0.812***	-0.774***	-0.794***	-0.803***
	(0.056)	(0.082)	(0.054)	(0.058)	(0.058)	(0.046)	(0.053)	(0.056)	(0.058)
CONSTANT	-0.402	-0.839***	-0.464**	-0.940***	-0.288	4.136***	-0.525**	-0.562**	-0.124***
	(0.254)	(0.316)	(0.176)	(0.063)	(0.255)	(0.374)	(0.260)	(0.249)	(0.264)
FDI	-0.079	-0.087	-0.082	-0.101	-0.121**	-0.118	-1.054	-0.368	-0.984
	(0.064)	(0.066)	(0.059)	(0.060)	(0.062)	(0.768)	(0.823)	(1.294)	(0.897)
GE	-0.281**	-0.247**	-0.326***	-0.237	-0.279**	-0.154	-0.320**	-0.262	-0.223
	(0.142)	(0.121)	(0.132)	(0.134)	(0.144)	(0.126)	(0.135)	(0.144)	(0.138)
GFCF	0.015	-0.008	0.037	0.032	0.037	0.053	0.082	0.071	0.036
	(0.065)	(0.073)	(0.065)	(0.066)	(0.068)	(0.066)	(0.079)	(0.071)	(0.066)
TRADE	-0.018	-0.011	-0.021	-0.032	-0.019	-0.021	-0.020	-0.039	-0.036
	(0.042)	(0.024)	(0.041)	(0.039)	(0.039)	(0.044)	(0.040)	(0.039)	(0.039)
AGRIC		0.259				0.326**			
		(0.188)				(0.140)			
MAN			-0.343				-0.366		
			(0.263)				(0.191)		
SERV				-0.233***					-0.262***
				(0.258)					(0.067)
IND					-0.033			-0.075	
					(0.086)			(0.121)	

Table 7 continued

FDI*AGRIC						-0.030 (0.028) **23.452**			
FDI*MAN							0.093 (0.261) **2.077**		
FDI*IND								0.042 (0.249) **1.408**	
FDI*SERV									0.017 (0.020) **1.747**
Diagnostics: Wald test	10.954***	11.925***	10.048***	10.955***	9.797***	10.599***	14.717***	7.871***	5.499***
Jarque-bera test	1932.5***	2056.305***	1237.445***	2423.010	2455.147***	2257.716***	974.581***	999.427***	1653.194***

Source: Efiinu (2021)
Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the sector involved. This is given by (coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)

Table 7 presents the results of PMG estimation of the short-run coefficients of the relationship between the FDI, sectoral value additions and economic growth. The ECT is the rate of change which shows how speedily variables are adjusted towards the long run equilibrium and the negative sign reflects the short-term convergence. The cointegration adjustment coefficient for the analysis has the excepted sign that is negative and is significant at the 1% level for all the equations estimated.

In the short run, the results showed that the impact of FDI on economic growth was negative albeit statistically insignificant. However, when the sectoral transmission was taken into consideration, the results revealed that FDI had a negative impact on economic growth in the presence of the industry sector. This is statistically significant at 5%. This shows that FDI in the presence of the industrial sector does not drive economic growth in sub-Saharan Africa in the short run. The negative coefficient 0.121 means that an increase in FDI to this sector will lead to a 0.121 decrease on economic growth. Evidently, the level of development in the various sectors hold back or either support the benefits of FDI. Succinctly, in order to absorb and get the benefit of FDI host countries need to ascertain a level of development in the various sectors that receive these FDI inflows. This is in line with the absorptive capacity theory and also the finding of Anwar and Nguyen (2011) and Farole and Deborah 2012.

Equation 2-10 shows the impact of sectoral value additions on economic growth. It also presents the results of the sectoral value additions when they interact with FDI. Focusing on the impact of sectoral value additions the results showed that service sector value additions had a negative

impact on economic growth. This is the case as their coefficient is negative and statistically significant at 1% for the service sector. Agricultural value addition was seen to have a positive impact on growth once the interactive effect was introduced as seen in equation 6. Focusing on the interaction between FDI and the various sectors, the result revealed that none of the sectors had a significant impact on economic growth when they interact with FDI in the short run.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

Table 8: Long Run Estimation on relationship between the current level of FDI inflow sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
FDI	0.170***	0.176***	0.174***	0.144***	0.173***	-0.205***	0.361***	0.321***	0.334***
	(0.038)	(0.036)	(0.038)	(0.039)	(0.038)	(0.069)	(0.069)	(0.195)	(0.109)
GE	-0.018	-0.032	-0.015	-0.009	-0.021	-0.145***	-0.032	-0.011	-0.022
	(0.034)	(0.031)	(0.034)	(0.032)	(0.035)	(0.034)	(0.033)	(0.031)	(0.033)
GFCF	0.096***	0.092***	0.086***	0.104***	0.096***	0.047**	0.087***	0.094***	0.093***
	(0.023)	(0.018)	(0.023)	(0.226)	(0.023)	(0.019)	(0.024)	(0.022)	(0.023)
TRADE	-0.002	0.016**	0.001	0.006	-0.001	0.002	0.001	0.008	0.002
	(0.007)	(0.007)	(0.00 7)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
AGRIC		-0.017				-0.116***			
		(0.024)				(0.021)			
MAN			-0.005				0.017		
			(0.030)				(0.033)		
SERV				-0.001				0.010	
				(0.016)				(0.019)	

Table 8 continue

IND					-0.002				0.000
					(0.025)				(0.026)
FDI*AGRIC						0.013***			
						(0.003)			
						0.101			
FDI*MAN							-0.016***		
							(0.005)		
							0.185		
FDI*SERV								-0.003	
								(0.004)	
								25.078	
FDI*IND									-0.005
									(0.004)
									45.199
Diagnostics: Wald test	10.954***	11.925***	10.048***	10.955***	9.797***	10.599	14.717***	7.871***	5.499***
Jarque-bera test	1932.5***	2056.305***	1237.445***	2423.010	2455.147****	2257.716***	974.581***	999.427***	1653.194***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the various sectors. This is given by (coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)

Table 8 presents the results of PMG estimation of the long-run coefficients of the relationship between FDI, sectoral value additions and economic growth in sub- Saharan Africa. The results in the long run reveals interesting results as many of the variables gained significance and altered their signs. To begin with FDI had a statistically significant impact on growth at 1% level in all the estimated models. However, with this relationship the results for equation 6 showed a negative impact on growth. This is so as when the multiplicative interactive effect between FDI and the agricultural sector was introduced. This finding is in line with Djokoto (2013), who found no causal link between FDI in agriculture and economic growth. Also, the underdevelopment of the agricultural sector in sub-Saharan Africa may account for it poor intervening effect. On the other hand, the result for the other equations indicates that increase in the inflows of FDI can boost economic growth in Africa. This is not surprising as FDI is noted to come along with lots of value additions in the form of capital and technology transfer, employment and boosting of exports among others which are expected to improve growth in developing countries. While the finding is consistent with Balasubramanyam et al., (1996) who argue that FDI remain the doorway to acquire the needed technologies necessary to propel growth, our evidence also contrasts Adams & Opoku (2015) and Agbloyor et al., (2014). It is also consistent with the modernization theory which posits that FDI is important for developing countries because most emerging economies lack the infrastructure and facilities needed to boost growth.

The results also showed that agricultural value addition interacting with FDI was the only sector which had a positive impact on economic

growth. According to these findings, which is robust to model design, higher agricultural value addition boosts the influence of FDI on growth. As a result, the agriculture sector is being viewed as a potential channel for FDI to aid Africa's economic development. For a long time, foreign direct investment (FDI) has been strong in the natural resource (agricultural) sector, where Africa has an evident economic advantage. The results show a co-efficient of 0.101; this is positive and statistically significant at 1%. The positive sign indicates that the agricultural sector complements FDI inflows to boost economic growth. Natural resource-rich African countries contributed for up to 95% of total inflows into the region in 2013 (African Economic Outlook, 2014). The results from the conditional effect interaction with the manufacturing also showed a statistically significant result of 0.185. Overall, the results depict manufacturing value added having the greatest impact reflected in its relatively larger significant coefficient as compared to the other sectors. This suggests that a boost in the manufacturing sector can have a greater impact on the economy relative to the other sectors of the economy. This corroborates Kaldorís growth hypothesis that manufacturing is a great enhancer of economic growth, given its coefficients and as the greater sectoral spillover effects. This is consistent with Hansen & Zhang (1996), Haraguchi et al. (2017) and McCausland & Theodossiou (2012) among others drives economic growth through the manufacturing sector.

In terms of the controls, given the negative and significant coefficients, government spending does not boost economic growth in the long or short run. As is the situation in most African countries, uncontrolled public spending means higher future tax rates. In fact, Ibrahim & Alagidede (2018) claim,

based on data from 29 SSA nations that increased government spending does not always help economic growth and that the quality of spending is more important. When we look at gross fixed capital creation, we can see that all of the coefficients are positive, implying that capital investment boosts economic growth. Although the impact of domestic investment is beneficial in the short run, it is statistically insignificant. This explains why, because investment is a long-term undertaking, it has a greater impact on economic growth in the long run than in the short run. Although statistically insignificant, trade openness has a detrimental influence on the economy in the short run. Trade Openness can be seen in boosting economic growth in a number of ways including technology transfer, bait for FDI, source of foreign exchange, and means of getting access to capital equipment to enhance developments. However, the results of this study shows that in the long run, trade openness was only significant in the transmission from the agricultural sector as shown in equation 2. The results for the other sectors showed an insignificant result.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

Table 9: Short run estimation on the relationship between a lower inflow of FDI, sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
COINTE	-0.793***	-0.788***	-0.782***	-0.793***	-0.782***	-0.789***	0.787***	-0.789**	-0.774***
	(0.055)	(0.050)	(0.057)	(0.053)	(0.055)	(0.049)	(0.051)	(0.052)	(0.050)
CONSTANT	1.469***	4.627***	1.339***	1.665***	1.459***	5.009***	2.098***	2.778***	-0.614
	(0.329)	(0.480)	(0.327)	(0.342)	(0.335)	(0.487)	(0.349)	(0.389)	(0.342)
FDI_NEG	-0.104	-0.142	-0.150	-0.034	-0.223	-0.337	0.479	0.294	0.918
	(0.215)	(0.180)	(0.122)	(0.229)	(0.203)	(0.488)	(0.592)	(0.493)	(0.772)
GE	-0.232**	-0.152	-0.239	-0.282**	-0.133	-0.161	-0.170	-0.209	-0.084
	(0.120)	(0.113)	(0.122)	(0.124)	(0.119)	(0.107)	(0.146)	(0.124)	(0.121)
GFCF	0.019	0.001	0.051	0.044	0.051	0.001	0.078	0.076	0.041
	(0.065)	(0.068)	(0.068)	(0.062)	(0.069)	(0.064)	(0.067)	(0.066)	(0.067)
TRADE	-0.010	0.000	-0.016	-0.014	-0.020	0.007	-0.019	-0.023	-0.007
	(0.042)	(0.044)	(0.041)	(0.042)	(0.039)	(0.044)	(0.042)	(0.038)	(0.040)
AGRIC		0.226				0.291			
		(0.149)				(0.160)			

Table 9 continued

IND			-0.015 (0.092)				-0.103 (0.196)		
MAN				-0.368 (0.199)				-0.304 (0.390)	
SERV					-0.234 (0.066)				-0.421*** (0.141)
FDI_NEG*AGRIC						0.016 (0.024) **0.041**			
FDI_NEG*IND							0.033 (0.030) **0.116**		
FDI_NEG*MAN								0.003 (0.062) **0.368**	
FDI_NEG*SERV									0.019 (0.016) **-0.020**
Diagnostics: Wald test	7.327***	25.307***	7.245***	5.603***	24.032***	18.318***	7.011***	9.400***	26.218***
Jarque bera test	1813.835***	3249.636***	2265.615***	1244.516***	2279.27***	2674.370***	2166.218	716.132***	1451.78***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the various sectors. This is given by (*coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)*

Table 10 presents the results of PMG estimation of the short-run coefficients of the relationship between lower level of FDI, sectoral value additions and economic growth. To begin, asymmetry is noticed in the sign and magnitude of positive and negative partial sums of FDI, according to Bahmani-Oskoee and Ghodsi (2016). Table 11 shows the impact of lower level FDI inflows on economic growth in both the long and short run. The COINTE representing the error correction term is the rate of change which shows how speedily variables are adjusted towards the long run equilibrium and the negative sign reflects the short-term convergence. The cointegration adjustment coefficient for the analysis has the excepted sign that is negative and is significant at the 1% level for all the equations estimated.

In the short run, the results showed that the impact of a lower level of FDI on economic growth was negative albeit statistically insignificant. When the sectoral transmission was taken into consideration, the results revealed that a lower level of FDI had an insignificant impact on economic growth in the short run. Equation 2-10 also shows the impact of sectoral value additions on economic growth and the results of the sectoral value additions when they interact with FDI. Focusing on the impact of sectoral value additions the results showed that service sector value additions had a negative impact on economic growth. This is the case as their coefficient is negative and statistically significant at 1% for the service sector. Focusing on the interaction between FDI and the various sectors, the result revealed that none of the sectors had a significant impact on economic growth when they interact with FDI in the short run.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

Table 9: Long run estimation on relationship between a lower inflow of FDI, sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
FDI_NEG	0.011	0.045***	0.004	0.006	0.042***	0.079***	0.038	0.041	-0.248***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.021)	(0.038)	(0.024)	(0.070)
GE	-0.117***	-0.204***	-0.115***	-0.114***	-0.251***	-0.194***	-0.136***	-0.185***	-0.183***
	(0.039)	(0.039)	(0.039)	(0.040)	(0.038)	(0.038)	(0.039)	(0.042)	(0.037)
GFCF	0.084***	0.075***	0.086***	0.065***	0.082***	0.067***	0.075***	0.064***	0.084***
	(0.023)	(0.020)	(0.024)	(0.023)	(0.019)	(0.019)	(0.025)	(0.023)	(0.019)
TRADE	-0.006	-0.001	-0.006	-0.004	-0.003	-0.004	-0.000	-0.005	-0.012
	(0.008)	(0.001)	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)
AGRIC		-0.102***				-0.119***			
		(0.025)				(0.023)			
IND			0.001				-0.033		
			(0.028)				(0.037)		
MAN				0.006				-0.034	
				(0.034)				(0.044)	
SERV					0.048***				0.092***
					(0.017)				(0.022)
FDI_NEG*AGRIC						**23.519**			
						-0.002**			
						(0.001)			

Table 9 continued

FDI_NEG*IND							**0.027** -0.001 (0.001)		
FDI_NEG*MAN								**-0.008** -0.002 (0.001)	
FDI_NEG*SERV									**0.020** 0.006*** (0001)
Diagnostics: Wald test	7.327***	25.307***	7.245***	5.603***	24.032***	18.318***	7.011***	9.400***	26.218***
Jarque bera test	1813.835***	3249.636***	2265.615***	1244.516***	2279.27***	2674.370***	2166.218	716.132***	1451.78***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the various sectors. This is given by (*coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)*

Table 10 presents the results of PMG estimation of the long-run coefficients of the relationship between a lower level of FDI, sectoral Value additions and economic growth in sub- Saharan Africa. The results in the long run showed that there was no significant relationship between FDI on growth when the asymmetry effect was taken into consideration. The results revealed in equation 1 showed that a lower level of FDI inflows does not propel economic growth in the long run. However, when the transmission channel was taken into account the results showed that lower level of FDI had a positive and significant relationship on economic growth in the presence of the agricultural and the service sector value addition. This is seen in equation 2 and equation 5 respectively. The agricultural sector and the service sector is seen to be a good intervening variable in the relationship between FDI and growth.

The results when the interactive multiplicative term was introduced showed that, a lower level of FDI inflow still had a positive relationship on economic growth in the agricultural sector however that of the service sector showed a negative and significant relationship. This indicates that with the introduction of the multiplication interactive effect, lower level of FDI inflows does not propel growth in the service sector. This finding contradicts the result in EQ 9 as shown in table that is when the asymmetric effect was not taken into consideration. Indeed, the economy reacts differently when there is a lower and a higher level of FDI inflow. Hence the need to test for the non-linearity effect of FDI inflows.

Furthermore, the contribution of agricultural value addition had a negative effect on economic growth in the long run. This is akin to the result of the

multiplicative interactive term between lower level of FDI and the agriculture sector on economic growth. This indicates that with lower level of FDI inflows FDI does not propel economic growth in the agricultural sector. Indeed, the underdevelopment of the agricultural sector in the region may account for it weak transmission effect. The service sector on the other hand showed a positive and significant relationship on economic growth. Further results show positive and statistically significant coefficient of the interactive term of service value additions and FDI. This portrays the service sector as a potent area for FDI to impact economic growth in Africa. While the indirect effects of agricultural and service sectors are both positive, the latter effect is large. This is not surprising since in recent decades; there have been enormous inflows of FDI in the service sector in Africa, particularly in areas of banking, insurance and telecommunication. The service sector is currently the driving force of economic growth in Africa. In fact, since 1990, the contribution of the sector to economic growth has average about 50%. This explains why UNECA described the service sector as a magnet for attracting FDI.

The results of the control variables are akin to that of existing literature the coefficients of gross fixed capital formation are positive, implying that capital investment boosts economic growth. Although the impact of domestic investment is beneficial in the short run, it is statistically insignificant. This explains why, because investment is a long-term undertaking, it has a greater impact on economic growth in the long run than in the short run. Furthermore, we find government expenditure to be statistically significant form the transmission in the agriculture sector whilst the others were statistically insignificant. This piqued the interest of the researcher to analyse if this could

account for the negative impact of foreign direct on growth in the long run. Per the analysis the exclusion of government expenditure from the equation resulted in a positive result of FDI on economic growth however the impact of this relationship is statistically insignificant.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

Table 11: Short run estimation on the relationship between a higher inflow of FDI, sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
COINTE	-0.774***	-0.768***	-0.759***	-0.773***	-0.759***	-0.777***	-0.759***	-0.774***	-0.773***
	(0.054)	(0.048)	(0.056)	(0.051)	(0.052)	(0.044)	(0.053)	(0.051)	(0.049)
CONSTANT	0.989***	4.342***	1.001***	0.772***	1.538***	4.792***	2.696***	0.351	-0.486
	(0.285)	(0.455)	(0.276)	(0.290)	(0.329)	(0.416)	(0.338)	(0.274)	(0.319)
FDI_POS	0.002	-0.026	-0.108	-0.068	-0.018	0.565	-0.775	-0.414	-1.138**
	(0.110)	(0.123)	(0.122)	(0.131)	(0.114)	(0.341)	(0.436)	(0.299)	(0.561)
GE	-0.281	-0.199	-0.288	-0.323**	-0.174	-0.210	-0.238	-0.279**	-0.161
	(0.149)	(0.137)	(0.156)	(0.139)	(0.140)	(0.134)	(0.168)	(0.131)	(0.119)
GFCF	0.0004	-0.023	0.026	0.028	0.024	0.005	0.039	0.035	0.027
	(0.066)	(0.069)	(0.067)	(0.065)	(0.066)	(0.061)	(0.067)	(0.065)	(0.064)
TRADE	-0.018	-0.009	-0.024	-0.016	-0.028	-0.011	-0.027	-0.024	-0.027
	(0.043)	(0.043)	(0.041)	(0.043)	(0.041)	(0.043)	(0.042)	(0.041)	(0.039)
AGRIC		0.146			-	0.435**			
		(0.187)				(0.201)			
IND			0.063				-0.115		
			(0.104)				(0.153)		
MAN				-0.304				-0.319	
				(0.213)				(0.292)	
SERV					-0.237***				-0.442***
					(0.069)				(0.134)

Table 11 continued

FDI_POS*AGRIC						-0.037**			
						(0.018)			
						-0.308			
FDI_POS*IND							0.007		
							(0.197)		
							-0.698		
FDI_POS*MAN								0.009	
								(0.032)	
								-0.191	
FDI_POS*SERV									0.021**
									(0.011)
									-0.195
Diagnostics: Wald test	9.773***	20.266***	9.811***	7.464***	24.699***	15.473***	13.959***	8.177***	21.125***
Jarque bera test	2754.440***	3692.174***	2308.193	1370.024***	3052.828***	2452.872***	1498.420***	1067.932***	1875.727***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the various sectors. This is given by (*coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)*

Table 11 presents the results of PMG estimation of the short-run coefficients of the relationship between higher level of FDI, sectoral value additions and economic growth. To begin, asymmetry is noticed in the sign and magnitude of positive and negative partial sums of FDI, according to Bahmani-Oskoee and Ghodsi (2016). Table 12 shows the impact of lower level FDI inflows on economic growth in both the long and short run. The COINTE representing the error correction term is the rate of change which shows how speedily variables are adjusted towards the long run equilibrium and the negative sign reflects the short-term convergence. The cointegration adjustment coefficient for the analysis has the excepted sign that is negative and is significant at the 1% level for all the equations estimated.

In the short run, the results showed that the impact of a higher level of FDI on economic growth was positive albeit statistically insignificant. When the sectoral transmission was taken into consideration, the results revealed that a higher level of FDI had an insignificant impact on economic growth in the short run. This is shown in Equation 2-8. However, the result for equation 9 showed that a higher level of FDI inflow in the presence of the service sector value addition and it interaction effect with FDI had a negative and significant effect on economic growth. This indicates that in the short run, the service sector does not serve as a good intervening variable for FDI to impact growth. These findings are in line with Vo and Nguyen (2019) findings, which revealed that FDI can stifle a country's economic growth in the short run but boost it in the long run

Focusing on the impact of sectoral value additions the results showed that service sector value additions had a negative impact on economic growth.

This is the case as their coefficient is negative and statistically significant at 1% for the service sector. However agricultural value addition was seen to have a positive impact on economic growth in the short run. This finding is robust to model specification suggesting that higher agricultural value additions magnify the impact of FDI on growth. The agricultural sector is therefore seen as a promising channel through which FDI can impact economic growth in Africa in the short run.

The results for the interaction between FDI and the various sectors, revealed that the service sector was the only sector that had a positive impact on growth when it interacted with FDI. This is seen from the positive coefficient of the interaction. The service sector serves as a good transmission channel through which FDI impact growth in the short. The Agricultural sector on the other hand showed otherwise as the results from the interaction was negative and statistically significant. Though Africa is endowed with much agricultural resources yet this has not yielded the desired impact on growth. This finding is consistent with the absorptive capacity theory which highlights that in order to absorb new knowledge and optimally utilize FDI benefits, host countries need to have a certain degree of development of related knowledge and capacities.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

Table 12: long run estimation on the relationship between a higher inflow of FDI, sectoral growth and economic growth

VARIABLES	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9
FDI_POS	0.002	-0.029**	0.011	0.009	-0.027**	-0.053***	-0.060	-0.012	0.174***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.019)	(0.037)	(0.023)	(0.061)
GE	-0.111***	-0.206***	-0.104***	-0.095***	-0.251***	-0.178***	-0.147***	-0.096***	-0.156***
	(0.038)	(0.040)	(0.038)	(0.038)	(0.039)	(0.037)	(0.037)	(0.038)	(0.037)
GFCF	0.115***	0.113***	0.123***	0.101***	0.109***	0.072***	0.139***	0.113***	0.094***
	(0.024)	(0.022)	(0.025)	(0.024)	(0.022)	(0.021)	(0.025)	(0.025)	(0.021)
TRADE	-0.007	-0.007	-0.004	-0.002	-0.008	-0.012	-0.003	0.00x6	-0.011
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
AGRIC		-0.105***				-0.105***			
		(0.028)				(0.024)			
IND			-0.022				-0.104***		
			(0.030)				(0.040)		
MAN				-0.019				-0.041	
				(0.033)				(0.042)	
SERV					0.044**				0.075***
					(0.020)				(0.024)
FDI_POS*AGRIC						0.002			
						(0.001)			
						-0.0058			

Table 12 continued

FDI_POS*IND							0.002**		
							(0.001)		
							-0.038		
FDI_POS*MAN								0.002	
								(0.001)	
								0.037	
FDI_POS*SERV									-0.004***
									(0.001)
									-0.005
Diagnostics:	9.773***	20.266***	9.811***	7.464***	24.699***	15.473***	13.959***	8.177***	21.125***
Wald test									
Jarque bera test	2754.440***	3692.174***	2308.193	1370.024***	3052.828***	2452.872***	1498.420***	1067.932***	1875.727***

Source: Efiinu (2021)

Note: ** and *** denote 5% and 1% significance level, () denote standard errors. The bolded values represent the results of the interaction between FDI and the various sectors. This is given by (*coefficient of FDI + mean of the sector * coefficient of the interaction from the regression output)*

Table 12 presents the results of PMG estimation of the long-run coefficients of the relationship between a higher level of FDI, sectoral value additions and economic growth in sub- Saharan Africa. The results in the long run showed that there was no significant relationship between FDI on growth when the asymmetry effect was taken into consideration. The results revealed in equation 1 showed that a higher level of FDI inflows does not have significant impact on economic growth in the long run. However, when the transmission channel was taken into account the results showed that higher level of FDI had a negative and significant relationship on economic growth in the presence of the agricultural and the service sector value addition. This is seen in equation 2, equation 5 and equation 6 respectively. Most importantly, it is worth mentioning that the agriculture sector intervening in both EQ2 and EQ5, showed a greater negative effect on growth. Specifically, when the multiplicative interactive term was introduced in EQ6, the effect of a higher level of FDI inflow on growth was -0.053. this shows an increase in FDI in the agricultural actor leads to a 0.053 decrease in economic growth. This is in line with the dependency theory which asserts that wealthy countries' economic activities frequently resulted in serious economic problems in poorer countries. FDI inflows, according to the dependency theory, are employed by developed economies to exploit emerging economies (Prebisch, 1950).

On the other hand, the service sector intervening in EQ5, FDI had a negative effect on economic growth, however, with the introduction of the multiplicative interactive term in EQ 9 FDI shows a positive and significant relationship on economic growth. It is seen to be the only sector that a higher level of FDI inflow had a positive and significant effect on growth. This is not

surprising since in recent decades; there have been enormous inflows of FDI in the service sector in Africa, particularly in areas of banking, insurance and telecommunication. The service sector is currently the driving force of economic growth in Africa. In fact, since 1990, the contribution of the sector to economic growth has average about 50%.

The result of the value additions showed that service sector value addition had a positive and significant effect on economic growth. In light of the critical role that the services sector has played in Africa's economic transition recently, UNECA (2015) described the sector "as a magnet for attracting FDI." The agricultural sector on the other hand showed a negative effect on growth. Our evidence is not surprising as the agricultural sector in the region has lacked the needed development and industrialization. This indicates that the abundance of resources is not enough much development is needed in this sector for African economies to get the right benefit from the agricultural sector.

Further results showed that, the pass-through effect of a higher level of FDI was positive and significant for the industrial sector. This shows that the industrial sector serves as a good channel through which FDI propels economic growth. However, the computation for the conditional effect of this interaction shows that the FDI and industry value additions are substitutes. This finding is line with Sare, Ibrahim and Evans (2018), who found out that rather than complementarity, what is vivid is substitutability of the direct and indirect effect of FDI. However, the results for the interactive term between FDI and the service sector showed otherwise. The results showed a negative

and statistically significant coefficient between the interactive effect of the service sector and a higher level of FDI inflows.

With regard to the controls, government expenditure does not promote economic growth both in the long or short run. In fact, Ibrahim & Alagidede (2018) claim, based on data from 29 SSA nations that increased government spending does not always help economic growth and that the quality of spending is more important. Although the impact of domestic investment is beneficial in the short run, it is statistically insignificant. This explains why, because investment is a long-term project, it has a greater impact on economic growth in the long run than in the short run. The result of this study shows that in the short and long run, trade openness has a negative impact on economic growth. The findings of this study is inconsistent with that of Osei, Ibrahim, and Sare (2018), who found that trade openness positively affect economic growth in Sub-Saharan Africa.

The diagnostic for the results sows that the various equations are not normally distributed however the results for the wald test which was used to test the significance of the explanatory variables for the model were all significant. This means that the coefficient of the explanatory variables is fit for the estimated equation.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the major findings obtained from conducting the entire study. The chapter also presents a summary of the findings, conclusions, recommendations as well as suggestions for further research.

Summary of the Research

Chapter four of this study presented the discussion of the results of the study within the context of the study's objectives whiles making reference to existing literature reviewed in chapter 2. The study presented the descriptive results for the variable employed for the study. The descriptive results presented included the nonlinear effect of FDI. This was followed by Pearson correlation matrix for the variables. A unit root test was also done since it is a criterion to use the PMG estimator. This was then followed by the discussion of the regression analyses for the two models used in testing the three hypotheses developed in chapter 3 as shown in table 7,8,9,10,11 and 12.

With reference to the objectives formulated for this study, the following findings were obtained. The first objective of this study was to assess the relationship between the current level of FDI inflow on sectoral growth to improve economic growth. The findings showed that the impact of FDI on economic growth in the short run remains negative and statistically insignificant once we control for the transmission mechanism. The value additions of the various sectors were only significant for the service sector and the agricultural sector. The dynamic has a twist in the long run, as FDI had a positive effect on economic growth when the transmission effect was taken

into consideration with the exception of the transmission from the agricultural sector. This was so when the multiplicative interactive effect was introduced. The result also showed that the pass through effect of FDI interacting with the various sectors showed was negative on economic growth from the manufacturing sector whilst it was positive for the agricultural sector.

The second objective of the study sought to assess the impact of a lower level of FDI inflow on sectoral growth to impact economic growth. In the short run the findings of this study showed that direct impact of a lower level of FDI inflows on economic growth was insignificant. In the long run the results further showed that a lower level of FDI inflows does not propel economic growth. However, when the transmission channel was taken into account the results showed that lower level of FDI had a positive and significant relationship on economic growth in the presence of the agricultural and the service sector value addition. The agricultural sector and the service sector is seen to be a good intervening variables in the relationship between FDI and growth. Furthermore, the contribution of agricultural value addition had a negative effect on economic growth in the long run. This is akin to the result of the multiplicative interactive term between lower level of FDI and the agriculture sector on economic growth. Further results show positive and statistically significant coefficient of the interactive term of service value additions and FDI.

The last objective of this study sought to assess the role of a higher level of FDI inflow on sectoral growth to impact on economic growth. In the short run the findings of this study showed that a higher level of FDI inflows was insignificant however, when the sectoral transmission was taken into

account, the results was significant for the transmission through the service sector. The results in the long run showed that there was no significant relationship between FDI on growth when the asymmetry effect was taken into consideration. The results revealed in equation 1 showed that a higher level of FDI inflows does not have significant impact on economic growth in the long run. However, when the transmission channel was taken into account the results showed that higher level of FDI had a negative and significant relationship on economic growth in the presence of the agricultural and the service sector value addition. However, with the introduction of the multiplicative interactive term in the service sector, it showed a positive and significant relationship on economic growth.

Conclusions

Undoubtedly, FDI as a significant foreign capital inflow, provides countries with additional financial and technological resources to increase their economic chances. Existing work on the precise impact of FDI on economic growth, on the other hand, has been inconclusive due to a failure to investigate the channels via which FDI influences overall growth. To put it another way, while FDI is thought to influence growth, little is understood about the transmission mechanisms that relate FDI to growth. Aside from the direct impact of FDI, this study contends that FDI has a significant impact on growth via its effects on numerous sectors of the economy. This study reexamined the influence of FDI economic growth in SSA relying on panel data from 30 African countries over the period 1990-2019.

The study concluded that the impact of FDI on growth on the various sectors is not only dependent on the size of the FDI inflow but also the type of

the structural composition most especially the absorptive capacity of the various sectors. The findings indicated that the agricultural and the service sector are the sectors that are able to impact FDI. The findings also showed that the overall prediction of an asymmetric model is much better than that of a symmetric model as the economy react differently with the when there is a higher level of FDI inflow and a lower level of inflows.

Recommendations

The following recommendations were made based on the study's results and conclusions to assist improve the link between FDI, sectoral growth, and economic growth. To begin with, FDI helps countries with well-developed agricultural, manufacturing, industrial, and service sectors. Indeed, a variety of positive spill-overs are important indirect effects of FDI since they augment the current contributions of recipient nations' economic growth via sectoral value additions. Therefore, to get the best out of this investment much effort must be put in place to develop the various sectors in sub-Saharan Africa. From the findings of the study the results showed that the pass-through effect for FDI was mostly significant for the agricultural and the service sector and for most part insignificant for the manufacturing and the industry sector. This indicates that much has to be done for the growth of the manufacturing and the industry sector in Sub-Saharan Africa region. A lot of evidence can be seen for that of the agricultural and the service sector. The service sector most especially has grown and UNECA describe this region as a magnet for attracting FDI.

Moreover, FDI potentially has no direct effect on growth once the asymmetric effect is taken into consideration. In addition, when the sectoral

channels are controlled for it only has as significant effect in the agricultural and industry sector. This is worthy to note because the economy reacts differently when there are lower and higher inflows of FDI. It is worth emphasizing that these African economies should reassess the incentive packages they offer in order to attract investors. Sub-Saharan African countries, through their numerous investment promotion centers, should reassess their tactics for attracting foreign direct investment. The findings of the study suggest that incentive packages given to investors to attract FDI should be prioritize for the service sector and the agricultural sector.

Suggestions for Further Research

The study only concentrated on African economies, by sampling 30 African economies. Therefore, further studies should concentrate on other geographical areas. In addition, future studies can look at the country specific effect of these inflows as the pool mean group approach provides that option. Another analysis can be done on the asymmetric effect of FDI on sectoral growth. Also future studies can employ the individual data of FDI inflow to the various sectors rather than employing the value additions of it, as it might offer different results. Finally, further studies could employ other estimation techniques than the one employed in this study.

REFERENCES

Abbot, A. J., & De Vita, G. (2011). Evidence on the impact of exchange rate regimes on bilateral FDI flows. *Journal of Economic Studies*, 38 (3), 253–274

Abekah, J. (2008). Foreign direct investment and Economic growth of Africa. *Atlantic Economic Journal*, 36 (1), 117-118.

Adam, A.N., & Tweneboah, G., (2009). Foreign direct investment and stock market development: Ghana's evidence. *International Research Journal of Finance and Economics*, 26 (6), 178–185.

Adam, I. O. Musah, A., & Ibrahim, M. (2017). Re-examining the relationship between domestic savings and economic growth in selected sub-Saharan 15 African Countries. *Journal of African Business*, 18(1) , 11-19.

Adams, S., & Opoku, E. E. O. (2015). Foreign direct investment, regulations and growth in sub-Saharan Africa, *Economic Analysis and Policy*, 47(3), 48-56.

African Development Bank (2016). *African Development Bank accelerates pace with High priorities*. (Working Paper 3). African Development Bank Group.

African Economic Outlook. (2014). Global value chains and Africa's industrialization In External financial flows and tax revenues for Africa. *Journal of African Business*, 18 (3), 435-456.

Agbloyor, E. K., Abor, J. Y., Adjasi, C. K. D., & Yawson, A. (2014). Private capital flows and economic growth in Africa: The role of domestic financial markets. *Journal of International Financial Markets, Institutions and Money*, 30(1), 137-152.

Ajayi, S. I. (2006). *Foreign direct investment in Sub Saharan Africa: Origins, targets, impact and potential*. African Economic Research Consortium.

Alam, A., & Shah, S. Z. A. (2013). Determinants of foreign direct investment in OECD member countries. *Journal of Economic Studies*, 40 (4), 515–527.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics*, 64(1), 89-112.

Anderson, M.R., B. R., Kett & Uexkull, E. (2017). *Corporate tax incentives and FDI in Developing countries in Global investment competiveness Report 2017/2018*: Foreign direct investor perspective on policy implications, Washington DC, World Bank.

Azman-Saini, W. N. W., Baharumshah, A. Z., & Law, S. H. (2010). Foreign direct investment, economic freedom and economic growth: *International evidence. Economic Modelling*, 27(5), 1079-1089

Bahaman-Oskooee, M., & Ghodsi, H. (2016). Do changes in the fundamentals have symmetric or asymmetric effects on house prices? Evidence from 52 states of the United States of America. *Applied Economics*, 48(5), 1-25

Balasubramanyam, V. N., Salisu, M., & Sapsford, D. (1996). Foreign direct investment and growth in EP and IS countries. *The Economic Jour*nal, 106(434), 92-105.

Bengoa, M., & Sanchez-Robles, B. (2003). Foreign direct investment, economic freedom and growth: new evidence from Latin America. *European Journal of Political Economy*, 19(3), 529-545.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.

Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1), 115-135.

Bornschier, V. and Chase-Dunn, C. (1985). Transnational Corporations and Underdevelopment. *Annual Review of Sociology*, 21(1), 387-417.

Calvo, M.B & Sanchez-Robles, B. (2002). *Foreign direct investment, economic freedom and economic growth: new evidence from Latin America. Universidad de Cantabria*, Economics working paper 4(3).

Carkovic, M & Levine, R. (2003). Does foreign direct investment accelerate economic growth? *University of Minnesota*, 16(3), 23-45.

Caves, R.E. (1996). *Multinational enterprise and economic analysis*. Cambridge: Cambridge university press

Cohen, W.M. & Levinthal, D.A. (1990). Absorptive Capacity: A new perspective on learning and innovation. *Special Issue Technology, Organisation an Innovation*, 35(1), 128-152.

De Mello Jr, L. R. (1997). Foreign direct investment in developing countries and growth: A selective survey. *The Journal of Development Studies*, 34(1), 1-34.

De Mello Jr. L.R. (1999). Foreign direct investment-led growth: evidence from times series and panel data. *Oxford Economic Papers*, 51(1),133-151.

Devarajan, S., Swaroop, V. & Zou, H. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(1), 313-244.

Deininger , K., Byerlee, D., Lindsay, J., Norton, A., Selod, H., & Stickler, M, (2011). *Rising Global Interest in Farmland. Can it yield sustainable and equitable benefits*? Washington, DC: World Bank.

Dupasquier, C., & Osakwe, P. (2005). *Foreign direct investment in Africa: Performance, challenges and responsibilities*. African Trade Policy Centre Working Paper No. 25.

Durham, J.B. (2004). Absorptive capacity and the effects of foreign direct invest and equity foreign portfolio investment on economic growth. *European Economic Review* 48(2), 285-306.

Dutta, N., & Roy, S. (2008). *Foreign Direct Investment, Financial Development and Political Risks*. Working Paper, West Virginia University, United States of America.

Eragha, P.B. (2011). *The dynamic linkages between foreign direct investment and domestic investment in ECOWAS countries: A panel cointegration analysis. Paper Presented at the 2011 Conference of the Centre for the*

Study of African Economies. Oxford University, Oxford, UK between 20th-22nd March.

GATF (2017). *Can Trade Facilitation Drive Manufacturing FDI*: Global Alliance for Trade Facilitation.

Greene, W. H. (2003). Econometric Analysis, 6th edition, Pearson, New Jersey, USA.

Gui-Diby, S. L. (2014). Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analysis. *Research in Economics*, 60(1), 248-256.

Gui-Diby, S. L., & Renard, M. F. (2015). Foreign Direct Investment Inflows and the Industrialization of African Countries. *World Development*, 74(1), 43-57.

Hansen, J., & Zhang, J. (1996). A Kaldorian approach to regional economic growth in China. *Applied Economics*,7(1) 679-685.

Haraguchi, N., Cheng, C. F. C., & Smeets, E. (2017). *The Importance of Manufacturing in Economic Development: Has This Changed*? World Development.

Hausman, J.A (1978). Specification test in econometrics. *Econometrics Journal* 46(6), 1251-1272

Hermes, N., & Lensink, R. (2003). Foreign direct investment, financial development and economic growth. *The Journal of Development Studies*, 40(1), 142-163.

Hofmann, P. (2013). *The Impact of International Trade and FDI on Economic Growth and Technological Change*. Springer Science & Business Media.

Holtbrügge. Kreppel, H. (2012). Determinants of outward foreign direct investment from BRIC countries: an explorative study. *International Journal of Emerging Markets*, 7(1), 4-30.

Iamsiroj, S. (2016). The foreign direct investment economic growth nexus. *International Review of Economics & Finance*, 42(1), 116-133

Ibrahim, M., & Alagidede, P., (2018). Effect of Financial Development on Economic Growth in sub-Saharan Africa. *Journal of Policy Modeling*, 6(7), 52-65

Ibrahim, M. & Alagidede, P. (2017). Financial Sector Development, Economic Volatility and Shocks in sub-Saharan Africa, *Physical A*, 484(4), 66-81.

Immurana, M., Yensu, J., Ibrahim, S. & Adam, B. (2015). FDI, economic growth and service sector value additions in Ghana. *International Journal of Academic Research in Business and Social Sciences*, 5(12), 167-184.

Idoko, C.U., & Taiga, U.U. (2018). Effects of Foreign direct investment on Nigeria. *Advances in Social Sciences Research Journal*, 5(5), 221-236

Javorcik, B.S. (2013). *International Technology Transfer and Foreign Direct Investment, In Caprio, G.(ed*). The Evidence and Impact of Financial Globalization, Elsevier

Keller, W. (2010). International trade, foreign direct investment and technology spillovers. *Handbook of Economics of Innovation*. 3(1), 608-631.

Kemeny, T. (2010). Does foreign direct investment drive technological upgrading? *World Development*, 38(11), 234-256.

Kholdy, S., & Sohrabian, A., (2008). Foreign direct investment, financial markets and political corruption. *Journal of Economic Studies*, 35(2), 486–500.

Kholdy, S., & Sohrabian, A., (2005). *Financial Markets, FDI, and Economic Growth: Granger Causality Tests in Panel Data Model*. Working Paper, California State Polytechnic University, United States of America.

Kosova, R. (2010). Do foreign firms crowd out domestic firms? Evidence from the Czech Republic. *The Review of Economics and Statistics*, 92, 861-881.

King, R. G. & Levine, R. (1993). Finance and growth: Schumpeter might be right, *The Quarterly Journal of Economics*, 108(3), 717-37.

Kumar, N. (2002). Globalization and quality of foreign direct investment. *Economic and Political Weekly*, 36(1), 3151-3158.

Kumi, E. Ibrahim, M. and Yeboah, T. (2017). Aid, Aid Volatility and Sectoral Growth in sub-Saharan Africa, *Journal of African Business*, 18(4), 435-456.

Kurtović, S., Maxhuni, N., Halili, B., & Talović, S. (2020). Asymmetric exchange rate pass-through into import prices of Slovenia's manufacturing sector. *International Journal of Finance and Economics*, 30(3),1-25

Kurtović, S., Maxhuni, N., Halili, B., Krasniqi, B. (2021). The Asymmetric Effect of Foreign Direct Investment on the Net Average Wages of Southeastern and European Countries. *Global Economic Review, 15(5),* 4–12

Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), 688-726.

Levine, R. (2005). *Finance and growth: theory and evidence*. (NBER Working Paper 10766).

Levine, R. Loayza, N. & Beck, T. (2000). Financial intermediation and growth: causality and causes. *Journal of Monetary Economics*, 46(1), 31- 77.

Li, X., & Liu, X. (2005). Foreign direct investment and economic growth: an increasingly endogenous relationship. *World Development*, 33(3), 393-407.

Lipsey, R. E., Feenstra, R. C., Hahn, C. H., & Hatsopoulos, G. N. (1999). *The role of foreign direct investment in international capital flows*. University of Chicago Press.

Liu, X., Luo, Y., Qiu, Z., & Zhang, R. (2014). FDI and Economic Development: Evidence from China's Regional Growth. *Emerging Markets Finance and Trade*, 50(6), 87-10

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22 (2), 3-42.

Marcias, J.B. & Massa, I. (2009). *The global financial crisis and sub-Saharan Africa*. Working paper 304.

McCausland, W. D., & Theodossiou, I. (2012). Is manufacturing still the engine of growth? *Journal of Post Keynesian Economics*, 35(1), 79-92.

Miguelez, E. & Moreno, R. (2015). Knowledge flows and the absorptive capacity of regions. *Research policy*, 44(4), 833-848.

Moir, B. (2011). *Foreign investment and Australian Agriculture. Rural Industries*. Research and Development Corporation, Canberra.

Munir, K., & Iftikhar, M. (2021). Asymmetric Impact of FDI and Exchange Rate on Tourism: Evidence from Panel Linear and Nonlinear ARDL Model. *European Academic Research*, 4(2), 4091–4106.

Okada, K., & Samreth, S. (2014). How does corruption influence the effect of foreign direct investment on economic growth? *Global Economic Review*, 43, 207-220.

Pesaran, M. H. (1997). The Role of Economic Theory in Modelling the Long-Run, *The Economic Journal*, 107(3), 178-191.

Pesaran, M. H., & Smith, R. P. (1995). Estimating Long-Run Relationships from Dynamic Heterogeneous *Panels, Journal of Econometrics*, 68(1),79-114

Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). *Pooled Estimation of Long-Run Relationships in Dynamic Heterogeneous Panels* (DAE Working Papers Amalgamated Series 9721) University of Cambridge.

Pesaran, M. H., Shin, Y, & Smith, R. J. (1999*). Bounds Testing Approaches to the Analysis of Long Run Relationships,*" Unpublished manuscript, University of Cambridge.

Pigato, M.A. (2000). *Foreign Direct investment in Africa: old tales and new evidence*. World bank Africa region (Working Paper Series No. 8).

Rakotoarisoa, Manitra A., (2011). The impact of agricultural policy distortions on the productivity gap: Evidence from rice production, *Food Policy, Elsevier, 36(1)*, 147-157

Ram, R. & Zhang, K. (2002). Foreign direct investment and economic growth: evidence from cross-country data for the 1990s. *Economic Development and Cultural Change*, 51(1), 205–215.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, 94(5), 1002-1037.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5), 71-102.

Roodman, D. (2009). Practitionersí corner: A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, 71(1), 135-158.

Saif, U. R., Imran, S. C., Muhammad S. M., Salman , M. S., & Sadia, I., (2021). Asymmetric effect of FDI and public expenditure on population health: new evidence from Pakistan based on non-linear ARDL. *World Health Population*, 15(1), 4–12

Sare, Y. A, Aboagye, A.Q.Q., Mensah, L., & Bokpin, G.A., (2018). Effect of financial development on international trade in Africa: Does measure of finance matter? *Journal of International Trade Economic Development*, 27(8), 917-936.

Seetanah, B. (2009). Is Foreign Direct Investment Growth Conducive? New Evidences from Sub-Saharan African Countries, 1980-2005. *Applied Econometrics and International Development*, 9, 185-201.

Sen, H. (1998). Different arguments for and against the role and impact of foreign direct investment on the development potentials of developing countries: an overview. *Journal of Economics and Administrative Sciences*, 13, 181 – 190.

Seyoum, M., Wu, R., & Yang, L. (2015). Technology spillovers from Chinese outward direct investment: *The Case of Ethiopia. China Economic Review*, 33, 35-49.

Srofenyoh, F., Djokoto, J., & Gidiglo, F.K. (2016). The impact of oil palm processing industry: A case study of Assin Fosu in the central, region of Ghana. *Imperial journal of interdisciplinary research*, 2, 64-85.

Takii, S. (2002). Productivity spillovers and characteristics of foreign multinational plants in Indonesian manufacturing. *Journal of Development Economics* 76(2), 521-542.

Tang, C. F., & Tan, E. C. (2017). Does the Source of Foreign Direct Investment Matter to Economic Growth in Malaysia? *Global Economic Review*, 6, 1-8.

Thirlwall, A.P. (1999). *Growth and development. 6th edition, London*: Macmillan press ltd.

Tiwari, A. K., & Mutascu, M. (2011). Economic growth and FDI in Asia: A panel-data approach. *Economic Analysis and Policy*, 41, 173-187.

Todaro, M. P. (1985). *Economic development in the third world. 3rd edition*. New York & London: Longman.

UNCTAD. (1996). *Proceedings of the United Nations Conference on Trade and Development, ninth session*. Midrand, Republic of South Africa.

UNCTAD. (2013). *World investment report: foreign direct investment and the challenge of 53*. Development. New York and Geneva: United Nations

UNCTAD (2015). *Capital Flows to Developing Countries: When Are They Good for Development?* United Nations: Geneva.

UNCTAD (2019). *World investment report: Reforming International Investment Governance*. United Nations.: New York and Geneva.

UNECA (2013). *Africa-BRICS Cooperation: Implications for Growth, Employment and Structural Transformation in Africa*. United Nations Economic Commission for Africa.

UNECA (2015). *Economic report on Africa 2015*: Industrializing through trade. United Nations Economic Commission for Africa.

Vissak, T. & Roolaht, T. (2005). The negative impact of foreign direct investment on the Estonian economy. *Problems of Economic Transition*, 48(2), 43 – 66.

Vo, D., &Nguyen T. (2019). Foreign direct investment and economic growth in the short run and long run: empirical evidence from developing countries. *Journal of Risk Management and Financial Management*, 12(2) 1-11.

World Bank. (2012). *Global economic prospects. Sub-Saharan Africa Region*. The World Bank

World Bank (2015). *Foreign direct investment inflows into sub-Saharan Africa*. The World Bank: Washington DC. 20

World Bank (2017). *World Development Indicators (Data). World Bank*. Retrieved from http://databank.worldbank.org/data/reports.aspx?source=worlddevelopment-indicators

Yao, S., & Wei, K. (2007). Economic growth in the presence of FDI: The perspective of newly industrializing economies. *Journal of Comparative Economics*, 35(1), 211-234.

Zahara, S. A & George, G. (2002). Absorptive Capacity: A review, Reconceptualization and Extension. *Academy and Management Review*. 27, 185-203.

Zakaria, Z., (2007). The causality relationship between financial development and foreign direct investment. *Journal Kemanusiaan* ,10, 1–23

APPENDICES

Appendix 1: Unit root test Philip Perron

		GDPC	FDI	FDI_NEG	FDI_POS	AGRIC	MAN	IND	SERV	GE	GFCF	TRADE
At Level												
With Constant	t-Statistic	0.0000	0.0820	0.9998	1.0000	0.6445	0.8146	0.5600	0.1464	0.4306	0.2120	0.8526
	Prob.	***0.0259***	***0.0417***	***0.9816***	***0.9087***	***0.6169***	***0.0564***	***0.6423***	***0.8030***	***0.4392***	***0.3506***	***0.3242***
		**	**	n0	n0	n0	*	n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	0.0000	0.0489	0.9460	0.9682	0.0598	0.4947	0.1011	0.4325	0.7784	0.4917	0.7195
	Prob.	***0.0777***	***0.1786***	***0.8697***	***0.4811***	***0.0022***	***0.1964***	***0.3569***	***0.2216***	***0.2079***	***0.4718***	***0.4901***
		*	n0	n0	n0	***	n0	n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	0.0012	0.1084	1.0000	1.0000	0.3662	0.1677	0.9693	0.5336	0.4812	0.6546	0.8496
	Prob.	***0.0047***	***0.0050***	***0.9785***	***0.8691***	***0.0396***	***0.3738***	***0.0932***	***0.9883***	***0.9407***	***0.3418***	***0.6226***
		***	***	n0	n0	**	n0	*	n0	n0	n0	n0
At First Difference												
		d(GDPC)	d(FDI)	d(FDI_NEG)	d(FDI_POS)	d(AGRIC)	d(MAN)	d(IND)	d(SERV)	d(GE)	d(GFCF)	d(TRADE)

With Constant	t-Statistic	0.0001	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0003	0.0001	0.0000	0.0092
	Prob.	***0.0000***	***0.0000***	***0.0246***	***0.0002***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0001***	***0.0003***	***0.0000***
		***	***	**	***	***	***	***	***	***	***	***
With Constant & Trend	t-Statistic	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0021	0.0005	0.0003	0.0481
	Prob.	***0.0000***	***0.0000***	***0.0674***	***0.0009***	***0.0000***	***0.0002***	***0.0000***	***0.0002***	***0.0005***	***0.0019***	***0.0003***
		***	***	*	***	***	***	***	***	***	***	***
Without Constant & Trend	t-Statistic	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006
	Prob.	***0.0000***	***0.0000***	***0.0042***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***
		***	***	***	***	***	***	***	***	***	***	***

Appendix 2: HAUSMAN TEST RESULTS (ONE)

H0: There is no significant relationship between FDI, sectoral growth and economic growth.

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-0.0782363	0.1703798	-0.2486162	0.1736471
GE	-0.1312694	-0.0178388	-0.1134306	0.0983278
GFCF	0.0833449	0.0962938	-0.0129489	0.0808017
TRADE	0.0293032	-0.0017919	0.0310951	0.0260425

Source: Author's Construction

Test: Ho: difference in coefficients not systematic
chi2(4) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 3.96
Prob>chi2 = 0.4112

MANFACTRING SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-0.0167368	0.1741632	-0.1909	0.2015975
GE	-0.0181721	-0.0150413	-0.0031308	0.1336992
GFCF	0.0953685	0.08553	0.0098384	0.0906575
TRADE	0.0165622	0.0010988	0.0154633	0.0190178
MAN	-0.2194069	-0.0054441	-0.2139628	0.1657676

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 3.04
Prob>chi2 = 0.6938

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	0.1720001	0.3613101	-0.1893099	1.406746
GE	-0.0887346	-0.0320947	-0.0566399	0.1744012
GFCF	0.0761672	0.0878664	-0.0116991	0.089043
TRADE	0.0433663	0.0019277	0.0414386	0.0286073
MAN	-0.0005164	0.0170769	-0.0175933	0.3041337
FDI*MAN	0.0508516	-0.0167925	0.0676441	0.1361404

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 5.07
Prob>chi2 = 0.5346

AGRICULTURAL SECTOR TRANSMISSSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-0.1717085	0.1240551	-0.2957636	0.1514636
GE	-0.2263302	-0.036737	-0.1895932	0.0956543
GFCF	0.1370125	0.1262575	0.010755	0.0755478
TRADE	0.0176233	0.0031916	0.0144317	0.0259047
AGRIC	0.2085401	-0.0629013	0.2714414	0.3475351

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 8.79
Prob>chi2 = 0.1179

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-0.4740208	-0.2053687	-0.2686521	1.958679
GE	-0.1190772	-0.1459236	0.0268464	0.1081429
GFCF	0.1504949	0.0476709	0.102824	0.0922544
TRADE	0.0077556	0.0023941	0.0053615	0.0285516
AGRIC	0.5254302	-0.1169093	0.6423395	0.4383003
FDI*AGRIC	-0.0449937	0.013652	-0.0586458	0.0989774

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 4.84
Prob>chi2 = 0.5651

INDUSTRIAL SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-0.1512956	0.1730655	-0.3243611	0.190678
GE	-0.152856	-0.0219246	-0.1309314	0.1023659
GFCF	0.1006365	0.09594	0.0046965	0.0724708
TRADE	0.0077792	-0.0013749	0.0091541	0.0197732
IND	-0.2146929	-0.0026264	-0.2120665	0.1655047

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 5.38
Prob>chi2 = 0.3718

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	0.403953	0.3342529	0.0697001	1.855316
GE	-0.2257596	-0.0215132	-0.2042463	0.0964599
GFCF	0.1687134	0.0929173	0.0757961	0.0796996
TRADE	-0.0039509	0.0020579	-0.0060088	0.0180189
IND	-0.1551823	0.0000704	-0.1552526	0.1706044
FDI*IND	0.003923	-0.0051836	0.0091066	0.1121874

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 7.70
Prob>chi2 = 0.2612

SERVICE SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-2.484284	0.1443334	-2.628617	2.827699
GE	-0.1445549	-0.0091302	-0.1354247	0.1339753
GFCF	0.103318	0.1049898	-0.0016717	0.0868784
TRADE	0.0313966	0.0067378	0.0246588	0.0300912
SERV	-0.0332498	-0.000772	-0.0324778	0.1589591

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
= 2.41
Prob>chi2 = 0.7894

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI	-2.484284	0.3206166	-2.8049	2.821237
GE	-0.1445549	-0.0109504	-0.1336045	0.1342025
GFCF	0.103318	0.0942891	0.0090289	0.0870216
TRADE	0.0313966	0.0082162	0.0231803	0.0300793
SERV	-0.0332498	0.0102329	-0.0434826	0.1586096
FDI*SERV	0.0396909	-0.0036688	0.0433597	0.0582253

Source: Author's Construction

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 6.49
Prob>chi2 = 0.3706

APPENDIX 3: HAUSMAN TEST RESULTS (TWO)

H0: there is no significant relationship between a lower level of FDI, sectoral growth and economic growth

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.1139759	0.0105436	-0.1245194	0.0871537
GE	-0.1860034	-0.1174169	-0.0685865	0.1093441
GFCF	0.1174454	0.0835967	0.0338488	0.0907984
TRADE	0.0333782	-0.0057582	0.0391364	0.0293593

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 5.02

Prob>chi2 = 0.2856

AGRICULTURAL SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.0773216	0.0450269	-0.1223485	0.1250168
GE	-0.0980917	-0.2044852	0.1063935	0.137478
GFCF	0.0950038	0.0752308	0.019773	0.0835317
TRADE	0.0029903	-0.0005453	0.0035356	0.0331549
AGRIC	0.0701835	-0.1024961	0.1726795	0.1841818

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 2.17

Prob>chi2 = 0.8259

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	0.5232472	0.0798851	0.4433621	0.4505301
GE	0.0238272	-0.1940053	0.2178325	0.1577624
GFCF	0.0683829	0.0671553	0.0012277	0.0580946
TRADE	0.0405792	-0.0042664	0.0448456	0.0283235
AGRIC	0.1051438	-0.1194615	0.2246054	0.2444895
FDI_NEG*AGRIC	-0.0780669	-0.0020798	-0.0759871	0.0496357

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 12.14

Prob>chi2 = 0.0590

INDUSTRIAL SECTOR TRANMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.083861	0.003765	-0.087626	0.1350575
GE	-0.1781081	-0.1146219	-0.0634863	0.1970098
GFCF	0.1688051	0.0857969	0.0830082	0.1432441
TRADE	0.0266171	-0.0060872	0.0327043	0.0372753
IND	-0.1724774	0.0013527	-0.1738301	0.2130746

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 4.26

Prob>chi2 = 0.5126

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.7921695	0.0378153	-0.8299848	0.9595301
GE	-0.2384551	-0.1356527	-0.1028023	0.1604256
GFCF	0.1268521	0.0746111	0.052241	0.0782419
TRADE	-0.0225884	-0.0009006	-0.0216878	0.0258429
IND	0.2034397	-0.0332796	0.2367193	0.1930387
FDI_NEG*IND	0.0365717	-0.0012255	0.0377972	0.0474147

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 3.66
Prob>chi2 = 0.7230

MANUFACTURING SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	0.0542783	0.0059793	0.048299	0.0708721
GE	-0.1801319	-0.1141867	-0.0659452	0.1492712
GFCF	0.1113694	0.0655238	0.0458456	0.0919248
TRADE	0.0074308	-0.0043763	0.0118071	0.0263448
MAN	-0.1483805	-0.0097767	-0.1386038	0.1660627

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 2.39
Prob>chi2 = 0.7922

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.8109499	0.0410832	-0.8520331	0.71109
GE	-0.1433826	-0.1852531	0.0418705	0.1407994
GFCF	-0.002163	0.0644334	-0.0665964	0.0972411
TRADE	0.011395	-0.0048256	0.0162206	0.0430453
MAN	-0.0143608	-0.0339659	0.0196052	0.6369804
FDI_NEG*MAN	0.0686808	-0.0020146	0.0706953	0.1180733

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 3.16
Prob>chi2 = 0.7885

SERVICE SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-0.117689	0.0420809	-0.1597699	0.1368009
GE	-0.1284516	-0.251308	0.1228564	0.1124246
GFCF	0.1152755	0.082446	0.0328295	0.0902446
TRADE	0.021325	-0.0027029	0.0240279	0.0270872
SERV	0.0469705	0.0483268	-0.0013564	0.0729084

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 2.87

Prob>chi2 = 0.7204

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_NEG	-1.711388	-0.2476372	-1.46375	1.20507
GE	-0.0349043	-0.182925	0.1480207	0.1609181
GFCF	0.0875054	0.0839956	0.0035099	0.1121625
TRADE	0.0053563	0.0124335	0.0177898	0.0233183
SERV	0.1679325	0.0915435	0.076389	0.1609584
FDI_NEG*SERV	0.0343931	0.0059132	0.0284799	0.0227297

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 3.97

Prob>chi2 = 0.6806

APPENDIX 4: HAUSMAN TEST RESULTS (THREE)

H0: There is no significant relationship between a higher level of FDI inflow, sectoral growth and economic growth

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.1198101	0.0026173	0.1171928	0.0817408
GE	-0.1493258	-0.11121	-0.0381158	0.1057996
GFCF	0.1259725	0.1150477	0.0109249	0.0974604
TRADE	0.0193046	-0.0075749	0.0268794	0.0295432

Test: Ho: difference in coefficients not systematic
chi2(4) = (b-B)'[(V_b-V_B) ^(-1)](b-B)
= 4.23
Prob>chi2 = 0.3761

AGRICULTURAL SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.1164917	-0.0288379	0.1453295	0.0990625
GE	-0.1681657	-0.206478	0.0383123	0.1198551
GFCF	0.1534717	0.1135593	0.0399125	0.1095763
TRADE	0.001141	-0.0068634	0.0080044	0.0309245
AGRIC	0.6473684	-0.1054704	0.7528388	0.7677094

Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 2.63
Prob>chi2 = 0.7568

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	-0.1777811	-0.0525723	-0.1252088	0.5000076
GE	0.0355705	-0.1780236	0.2135941	0.1826402
GFCF	0.0618354	0.0723268	-0.0104914	0.0791167
TRADE	0.0242134	-0.0118231	0.0360365	0.0272851
AGRIC	0.7331716	-0.1053929	0.8385645	0.7915312
FDI_POS* AGRIC	-0.0023161	0.0015723	-0.0038884	0.039846

Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 7.94
Prob>chi2 = 0.2425

INDUSTRY SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.0673157	0.0107406	0.0565751	0.0738609
GE	-0.1033481	-0.1041981	0.00085	0.1216056
GFCF	0.1563837	0.1227497	0.033634	0.0874504
TRADE	0.0127986	-0.0040342	0.0168329	0.0288363
IND	-0.2306578	-0.0220435	-0.2086143	0.162294

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 4.99

Prob>chi2 = 0.4171

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.3245984	-0.0603762	0.3849747	0.7032012
GE	-0.1148905	-0.1472294	0.0323389	0.1170522
GFCF	0.1601218	0.1387764	0.0213454	0.1039515
TRADE	-0.0026573	-0.0025011	-0.0001562	0.0334861
IND	-0.2020348	-0.1046387	-0.097396	0.2127951
FDI_POS*IND	-0.0114501	0.0025351	-0.0139852	0.0347467

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 1.28

Prob>chi2 = 0.9729

MANUFACTURING SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.0057773	0.0090868	-0.0033096	0.124868
GE	-0.1404631	-0.0950784	-0.0453846	0.150312
GFCF	0.1388741	0.1006425	0.0382316	0.0975077
TRADE	0.0017534	-0.0019364	0.0036897	0.0346779
MAN	-0.0561088	-0.0194714	-0.0366373	0.1741786

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 0.50

Prob>chi2 = 0.9921

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	-0.0859653	-0.0122518	-0.0737135	0.4692224
GE	-0.0819401	-0.0962664	0.0143264	0.1489388
GFCF	0.0342176	0.1128105	-0.0785929	0.0813848
TRADE	-0.013252	0.0060027	-0.0192547	0.0404048
MAN	0.155458	-0.0406254	0.1960835	0.3592583
FDI_POS*MAN	0.0001493	0.0016875	-0.0015382	0.038089

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 3.53

Prob>chi2 = 0.7402

SERVICE SECTOR TRANSMISSION

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	0.0999694	-0.0268902	0.1268596	0.0943025
GE	-0.1307621	-0.250697	0.1199349	0.1168004
GFCF	0.1111857	0.1091088	0.0020769	0.0914009
TRADE	0.0110635	-0.0084314	0.0194949	0.0281888
SERV	0.0346364	0.0437338	-0.0090974	0.0731023

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 2.45

Prob>chi2 = 0.7840

VARIABLES	MG	PMG	DIFFERENCE	S.E
FDI_POS	1.738528	0.1736212	1.564907	1.133686
GE	-0.0454856	-0.1564201	0.1109344	0.1690721
GFCF	0.1424327	0.0945843	0.0478484	0.1127073
TRADE	-0.0115846	-0.0112029	-0.0003817	0.023424
SERV	0.0826458	0.0745049	0.0081409	0.1604206
FDI_POS*SERV	-0.03694	-0.0040405	-0.0328995	0.0221489

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B) ^(-1)](b-B)

= 6.90

Prob>chi2 = 0.3299