UNIVERSITY OF CAPE COAST

EFFECT OF CORPORATE INCOME TAX RATE ON GREENFIELD INVESTMENT: EVIDENCE FROM SELECTED AFRICAN COUNTRIES

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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Candidate's Signature ……..... Date ….....

Supervisors' Declaration

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

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ABSTRACT

The competition to attract greenfield foreign direct investment (FDI) among countries, due to its benefits, has taken the form of a reduction in the corporate tax rate globally over the decade. Aiming to determine the tax effect in attracting new investment into a country, the study focused on three objectives: the trend of corporate income tax and greenfield FDI, the effect of corporate tax rate on greenfield investment and the determinants of greenfield investment. In estimating the objectives of the study, the fixed effect, random effect and system GMM estimation techniques were employed on annual panel data of 19 selected African countries from 2007 to 2016. The results of the study found that corporate income tax rate had a declining trend over the past decade whiles greenfield FDI had a fluctuating trend. Also, a reduction in corporate income tax rate attracts the inflow of greenfield FDI. The last objective showed that market size, purchasing power, inflation, country risk and agglomeration effect were important determinants of greenfield investment. Based on the findings of the study, it is recommended that there is the need for the governments of African countries to reduce corporate income tax rate, institute policies to reduce inflation and promote a sound, violence-free and friendly environment that would attract greenfield investment inflows.

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DEDICATION

To my parents, Elias Siaw Amoako and Diana Somuah.

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LIST OF ABBREVIATIONS

BEATR	Bilateral Effective Average Tax Rate
CEECs	Central and East European Countries
CLRM	Classical Linear Regression Models
COMESA	Common Market for Eastern and Southern Africa
EATR	Effective Average Tax Rate
EMTR	Effective Marginal Tax Rate
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
GNP	Gross National Product
IDP	Investment Development Path
M&As	Cross-border mergers and acquisitions
MNCs	Multinational Corporations
OECD	Organisation for Economic Co-operation and Development
OLI	Ownership-Location-Internalization
OLS	Ordinary Least Squares
PLC	Product Life Cycle Theory

PwC	PriceWaterhouseCoopers
SMEs	Small and Medium Scale Enterprises
SSA	Sub-Sahara African
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development Report
US	United States
VECM	Vector Error Correction Model (VECM).
WAMZ	West African Monetary Zone
WDI	World Development Indicators
WIR	World Investment Report

CHAPTER ONE

INTRODUCTION

The benefits derived from the inflow of FDI has influenced the decision of most host nations to use various policies, that are aimed at attracting FDI inflows. One of these policies is the corporate income tax rate of the host country. Various studies have analysed the effect of corporate income tax rate on FDI inflows, however, researchers have not reached a consensus on the effect of corporate income tax and FDI. Also, most of these studies used highly aggregated FDI inflow and fewer studies have been conducted on the disaggregated FDI inflows; greenfield FDI and cross-border mergers and acquisition. Focusing on greenfield investment and some selected African countries, this study aimed at estimating the effect of corporate income tax rate on greenfield investment using an annual panel dataset for 19 selected African countries over a ten-year period from 2007 to 2016.

Background to the Study

Between the 1970s - 1980s around the world adopted stringent regulatory policies and trade restrictions (trade barriers, tariffs and restrictive investment requirement) in order to protect their infant industries. The emergence of globalization and trade liberalization led to the changes in trade restrictions in the latter years. This favoured foreign investment and prompted countries to open their doors to international trade (Nunnenkamp, Semple & Semple, 1991; Bello, 2005). In the early 2000s, 69 countries changed 150 regulations concerning trade to favour foreign investment and 58 countries adopted at least 124 investment policy

measures to attract foreign investors in 2016 (UNCTAD, 2000; UNCTAD, 2017). Also, Sub-Saharan Africa (SSA) opened its doors to foreign investors in the 1990s by removing barriers to foreign investments.

The change in trade regulations and restrictions led to the inflow of external sources of finance from a foreign or multinational firm to a host country. As a result of that, many nations have relied on external sources of finance such as Foreign Direct Investment (FDI), remittances, financial aids and grants, portfolio investments and other external financial income that would help them to develop their economies (Bello, 2005). In the 2017 World Investment Report (WIR), it was shown that FDI has been the most constant, largest and least volatile source of external financial inflows for most developing nations since 2007 as compared to inflows from development aids and grants, remittances and portfolio investments (Figure 1) and as such, the inflows of FDI have increased the growth and development of these nations.

Foreign Direct Investment (FDI) is defined by the United Nations Conference on Trade and Development (UNCTAD, 2008) as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy or state in an enterprise resident in an economy other than that of the foreign direct investor.

FDI inflows into a country are decomposed into three modes of entry; greenfield FDI, brownfield FDI and cross-border mergers and acquisitions (M&As). Nocke and Yeaple (2007), defined greenfield FDI as new investment that add up to production capacity through the construction of new production facilities

in a foreign country and M&As as investment that changes existing assets and production capacity from a local firm to a foreign firm. Also, Brownfield FDI occurs when multinationals purchase existing production facilities in a host country to begin new production. Nocke and Yeaple (2007) emphasized that FDI modes of entry are assumed to affect market structure of the host nation and also differs according to the motives of the firm that engage in this type of FDI. These motives are dependent on the benefits of FDI to the host country and the location factors to the foreign investor.

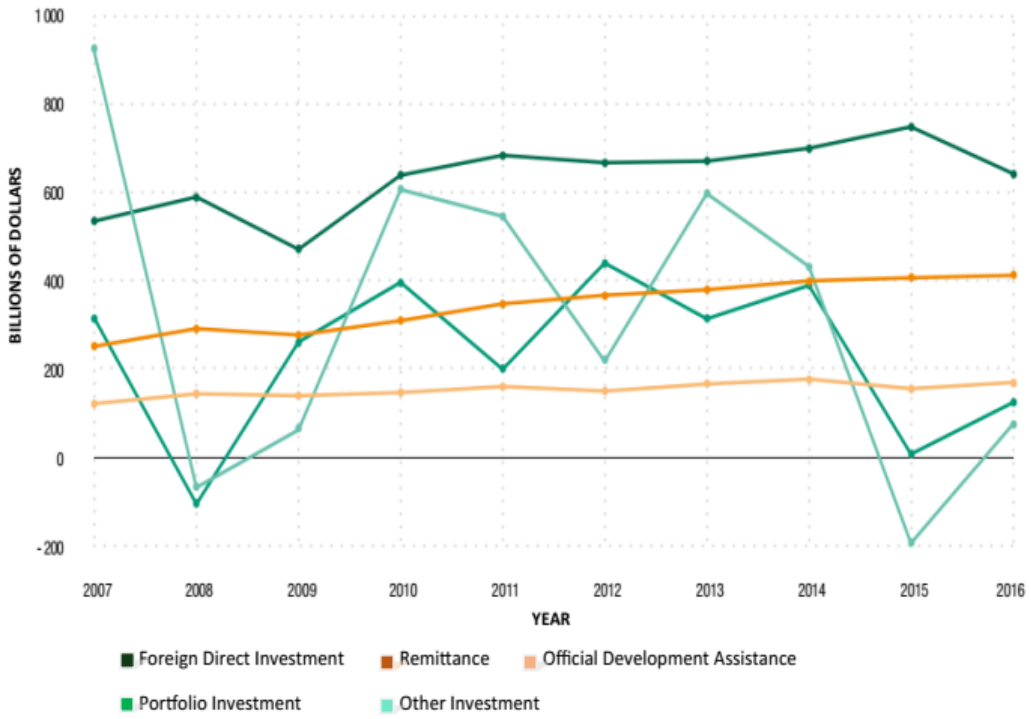


Figure 1: External sources of finance for developing nations in billions of dollars, 2007 - 2016
Source: UNCTAD World Investment Report (2017)

The benefits of FDI to countries has made it an important source of inflows to host countries. This is due to the fact that FDI acts as a catalyst to accelerate economic growth through the inflows of capital in many countries, especially developing economies. (Irandoust, 2001). Another benefit is that, it is a major source of technological transfer from one country to the other and this increases the level of technological development in the host country (Wang & Wong, 2009). Also, the inflow of FDI generates employment opportunities and the transfer of knowledge to the host nation. When foreign investors invest in a host country, it increases economic activities in the country and in turn increase employment opportunities which trains and improve the skills of the human capital in the country through the share of knowledge from the foreign investors (Romer, 2012). These benefits of FDI have motivated countries to provide incentives and policy measures that would attract foreign investors.

In spite of the benefits of FDI, the decision of foreign investors to invest in a particular country are also influenced by a number of factors. Some of these factors include market size, corruption levels, the riskiness of the country, natural resources, and so forth. Studies by Agostini and Tulayasethien (2003), Asiedu (2004) and Demekas, Horvath, Ribakova and Wu (2007) shows that the policies of the host country are also key factors that influence FDI decisions, these includes taxes, labour costs, infrastructure and commercial policies, as well as macroeconomic and institutional stability policies that affect the decision of multinationals (MNCs) to invest in a country and stimulate competition among

countries. These multinationals or foreign firms compare the factors of each host country before deciding on where to invest.

One of the factors that affect FDI locational decision is the tax policy of the host nation (Aseidu, 2004). Most countries measure their success in attracting these foreign investments through the provision of financial and in-kind instruments. However, this depends on the ability and willingness of the government of the host country. The most commonly used instrument is the corporate income tax rate of the host country (Shala, 2013).

The motive of most firms is to maximize profit and as such most multinationals prefer to establish their firms in a country where they will obtain higher profit or lower cost. When the corporate income tax rates of these firms are high or low, it influences their location decisions. This has influenced the decisions of most countries, especially, developing countries to decrease their tax rate to attract FDI in order to create employment and economic development (Mandinga, 2015).

The reduction in the tax rate of host countries has led to competition for FDI inflows among countries. During the past decade, the average corporate income tax rate throughout the world has been declining (Figure 2). This is as a result of tax cuts in various countries to attract foreign investors and also to boost the local industry. In 2003, Europe had the lowest average corporate income tax rate of 28% and this further decreased to 18% in 2016. The average corporate income tax rates for Oceania and South America were both 30% in 2003 but declined to about 18.5% and 27.5% respectively (Figure 2). Africa, which had the largest average corporate

income tax rate of over 35% in 2003, also had a decline in its tax rate to about 27%. Although there is a fall in the corporate income tax rate, some African countries had a constant tax rate, especially in Ghana and Nigeria (Appendix A). Generally, there has been a decline in the corporate income tax rate throughout the globe, especially, Africa in an effort to attract greenfield investment (Mudenda, 2015).

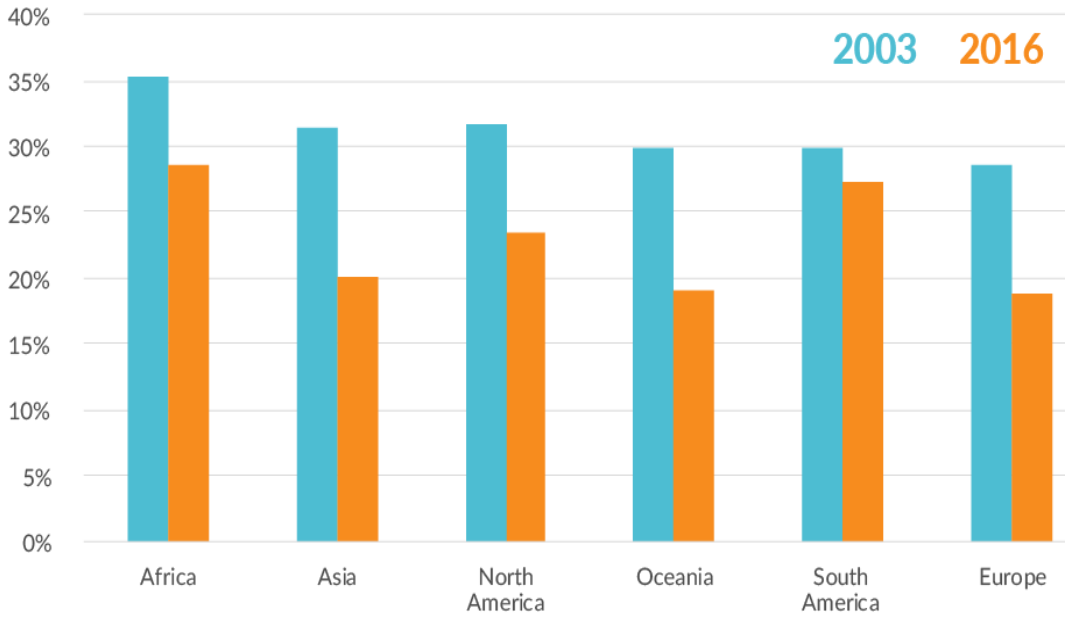


Figure 2: Trend of Average Corporate Income tax rate throughout the world

Source: Tax Foundation.com: simple average calculation based on data from the World Bank, OECD, KPMG, Deloitte and PwC.

Despite the favourable tax policies and the fall in corporate income tax rates within Africa, the region still experiences challenges in attracting high FDI. The inward flow of FDI into Africa, excluding South Africa as compared to America, Asia and Europe shows a low inflow into the region (Figure 3) over the past years from 2006 to 2016. This is due to fluctuations of FDI and the unattractiveness of the Africa region to investors (Asiedu, 2002). The share of Africa in FDI inflows

in 2014 was only 4.4% (UNCTAD, 2015). This decline to 3.4% in 2016, with Ghana, Nigeria, Egypt, Angola and Ethiopia as the host economies with higher inflows of above $3.0 billion.

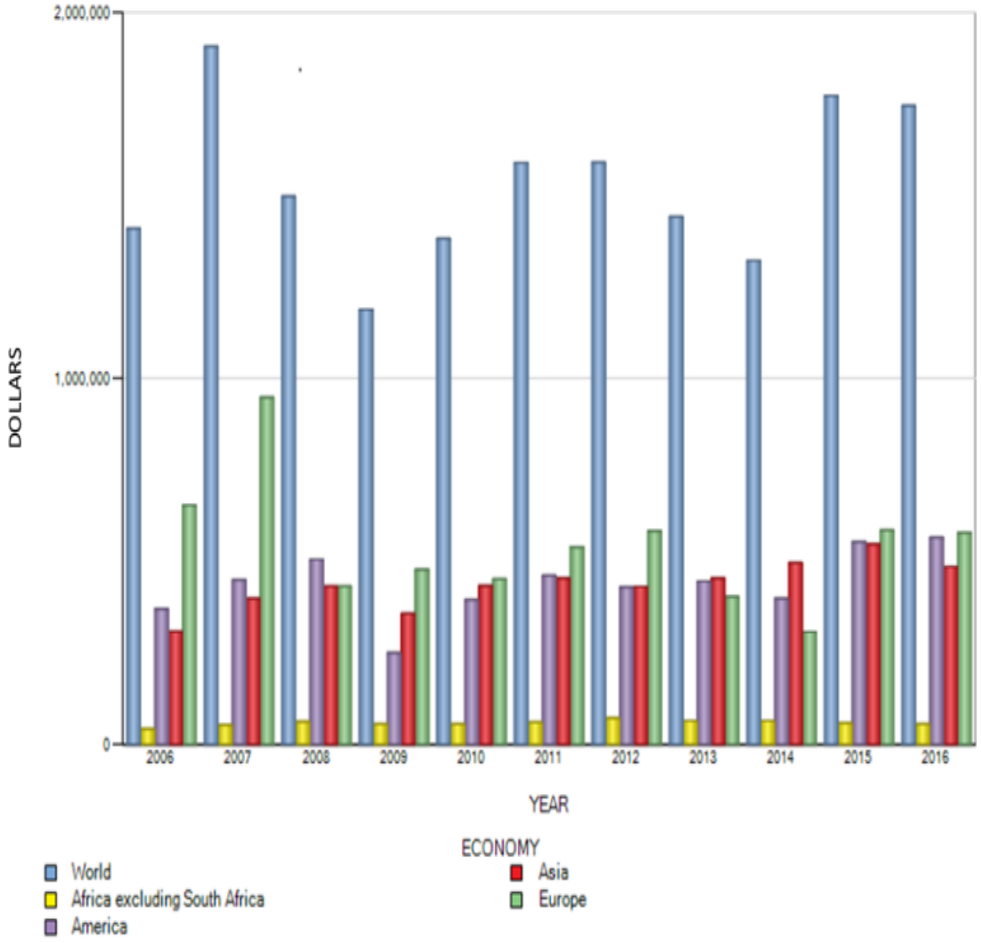


Figure 3: Inward flow of FDI (at current prices in millions of US Dollars), 2006-2016.

Source: UNCTADSTAT (2017)

Statement of the Problem

Most empirical works (Aseidu, 2002; Anyadike, 2004; Wheeler & Mody, 1992) on the determinants of FDI have focused on major factors such as market

size, economic growth, trade openness, human capital and so forth. Taxation as a determinant of FDI has been of interest to most countries over the decade. The use of tax policy to attract FDI raised debates among researchers, policy maker and politicians.

Empirical studies on taxation and FDI by researchers such as Inekwe (2013), Mehic, Silajdzic and Babic-Hodovic. (2013), Obeng (2014), De Mooij and Ederven (2003) and Swenson (2001) have shown that countries tend to reduce their tax rate or give incentives to foreign firms, in order to entice them to invest. Therefore, in an effort to attract FDI inflows, a reduction in the corporate tax rate influences the investment decisions of multinational firms to situate in a country with lower taxes (Mudenda, 2015).

However, studies by Tavares-Lehmann, Coelho, Lehmann (2012), Jensen (2012), Feld and Heckemeyer (2009) found no relationship or effect of corporate tax on FDI. They argue that corporate tax does not play an important role in the determination of FDI and that, there are other factors such as natural resources, agglomeration effect and so on which are key in attracting the inflow of FDI.

Also, most of these studies (Mehic et al, 2013; Obeng, 2014; Jensen, 2012) on corporate income tax and FDI used aggregate FDI inflows data in their analysis and less attention has been paid to the disaggregated FDI inflows (greenfield FDI, brownfield FDI and mergers and acquisition). This creates a gap in the literature concerning taxation and disaggregated FDI inflows. A study by Morisset and Pirnia (2000) suggested that exploration of the effect of taxes on the disaggregated FDI inflows will enable the authorities of a country to know the effect of these taxes in

attracting the different components of FDI inflows. In view of that the study addresses this gap by analysing the effect of corporate income tax on greenfield FDI in a region with low and unsettle fluctuation of FDI inflows, Africa.

Purpose of the Study

This research investigated the effect of corporate income tax on greenfield FDI within the selected 19 African countries. The study also determined if there was a significant effect of corporate income tax rate on greenfield investment from 2007 – 2016 using the system GMM dynamic panel estimator by Blundell-Bond.

Objectives of the Study

The general objective of the study was to investigate the effect of corporate tax on greenfield FDI (investment) in the selected African countries for the period 2007 – 2016.

The specific objectives were to:

1. Examine the trend of corporate income tax rate and greenfield FDI in the selected African countries.
2. Estimate the effect of corporate income tax rate on greenfield FDI in the selected African countries.
3. Examine the effect of the determinants of greenfield FDI in the selected African countries.

Hypothesis of the Study

From the above objectives, the following hypothesis was formulated to guide the study.

H_0: Corporate income tax rate has no significant effect on greenfield FDI in the selected African countries.

H_1: Corporate income tax rate has a significant effect on greenfield FDI in the selected African countries.

H_0: The determinants of greenfield FDI are not significant in the selected African countries.

H_1: The determinants of greenfield FDI are significant in the selected African countries.

Significance of the Study

The results from the study will be significant for policymakers in Africa, especially, the government or authorities that levy taxes on multinational or foreign firms in their countries. This will give policymakers a clear view of the effect that corporate income tax has on greenfield investments, and as to whether the government or the authorities of a country should continue to use tax policy as a means to attract FDI and find ways to reduce the cost implications such policies have on the welfare of its citizens.

Also, the findings from the study will enable multinationals and corporations to know the potential effect of tax policies that the government may impose on them. This will inform multinationals to make appropriate investment

decisions with regard to production capacity, potential employment of labour, corporate social responsibilities as well as the transfer of ownership to foreign investors. Again, the finding of the study will add to existing literature to give a better understanding of the effect that corporate income tax would have on greenfield investment in Africa.

Delimitation

The scope of the study was to examine the effect of corporate income tax rate on greenfield investment in Africa using 10 years' annual panel data for the period 2007-2016. A total of 19 African countries was used for the study. The choice of data coverage was informed by the availability of data on the variables for the study. The study adopts the Blundell-Bond System Generalized Method of Moment (GMM) estimator, which is more consistent and efficient than the static panel estimators; fixed effect and random effect estimators.

Furthermore, the study used greenfield investment as the outcome variable and statutory corporate income tax rate as an explanatory variable of interest that was used to determine the effect of corporate income tax on greenfield investment within the selected African countries. For the purpose of modelling tax-FDI relationship, the study augments the model by including control variables such as trade openness, market size, country risk, purchasing power, inflation, natural resources and infrastructure quality.

Limitations of the Study

There were few limitations in this study, however, these limitations do not affect the quality of the results obtained in the study.

1. The study had to make do with the limited availability of annual data for some key variables used in the study. The difficulty in obtaining statutory corporate income tax rate for most of the African countries was a challenge and only a few had their tax rates published in the annual reports of Ernst and Young, KPMG and PriceWaterhouseCoopers. This led to the selection of 19 African countries that was used in the study.
2. Also, for the dataset on greenfield investment, most of the African countries had no data. For those that had data, there were a lot of missing values in the dataset except those that were used for the study.
3. The study also admits the non-inclusion of human capital in the model as a limitation since it is known in the literature that human capital of the host country is also an important factor for the inflow of FDI.
4. Due to the lack of quality dataset on power outages in Africa, the number of telephone lines per 100 of the population was used as a measure for infrastructure in this study.

Organisation of the Study

The study is organized into five chapters. Chapter One presents the introductory chapter which comprises of background to the study, problem statement, purpose of the study, objectives of the study, research hypothesis,

significance of the study, delimitations, limitations and organisation of the study. Chapter Two presents both the theoretical and empirical review of FDI inflows and taxation in Africa. Chapters Three presents the methodological framework and techniques used in the study. Chapter Four examines and discusses the main finding and results of the study. Chapter Five, which is the final chapter, presents the summary, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

In this chapter, the study reviewed studies on foreign direct investment in the global world and Africa as a whole. The first part of this chapter presented the theories that explain FDI inflows, the motivation behind multinationals decision to invest abroad and the shortcoming of these theories. The second part of this chapter reviewed empirical works by researchers on corporate income tax and foreign direct investment inflows.

Theoretical Literature Review

The theory of FDI can be attributed to the early works of international trade economist such as Smith (1776), Ricardo (1817), Mundell (1957) Vernon (1966) and Kojima and Ozawa (1984). Smith (1776) developed a theory of absolute advantage which explained the flow of trade between countries. His theory was based on the difference in production costs between countries. Smith explained in his theory that if a country has an absolute advantage in one line of production and a disadvantage in another line of production, trade is likely to occur so that the country with a disadvantage will trade with a country with advantages in that particular line of production. Despite the theory by Smith, the theory failed to explain a situation where a country had no particular line of production that was superior over other lines of production.

The weakness of Smith's theory of absolute advantage led to the emergence of Ricardo's (1817) theory of comparative advantage. Ricardo analysed and expanded Smith's theory with a keen interest in international factor movement (Makoni, 2015). The theory assumes that there are two countries who produce two goods using labour as the only factor of production. Also, the model assumes labour to be domestically mobile within a country but internationally immobile. He emphasized that a country specializes and exports a commodity that it has a comparative cost advantage and imports the commodities that it has the least comparative advantage. Despite Ricardo's theory of comparative advantage in explaining FDI, the theory was criticized on the assumption of two countries, two products and a single factor of production. Also, the theory could not justify the international movement of capital and not applicable to the world of perfect competition (Kindleberg, 1969 as cited in Makoni, 2015).

The emergence of globalization after the Second World War brought about the expansion of FDI. This led to the growth of multinational firms and the flow of FDI during the 1950s and 1960s. Many researchers were alarmed by this growth, and delved into examining multinationals (MNCs) and the existence of international production. The interest in a proper explanation of FDI by researchers brought about the establishment of many theories related to FDI (Moosa, 2002). These theories explain why multinational firms decide to invest in one country, rather than the other, the motives behind it and the different factors that facilitate the movement of capital. Some of the theories assumed the motives for FDI inflows were based on the assumptions of market imperfections while others assumed a

perfect market. The study will review the theories of FDI that assumes perfect market as well as the theories that assume an imperfect market

FDI theories assuming perfect market

The earliest research on FDI had limited theoretical framework and the theories that were developed were based on the assumption of perfect market (Kindleberger, 1969 as cited in Liu, 2009). Two hypotheses based on the assumptions of perfect market are covered in this section. They are the differential rate of return hypothesis and the market size hypothesis.

Differential rate of return hypothesis

This hypothesis originated from the traditional theory of investment which assumes that firms maximize profits and equates the expected marginal benefit of capital to the marginal cost of capital. The hypothesis assumed that the most important reason for multinationals to move capital from one country to the other was based on the difference in interest rates between countries. It further stated that when there is no risk or uncertainty in the markets, capital flows into the region or country will yield the highest return. The hypothesis gained popularity in the fifties when American firms that were situated in Western Europe obtained a higher rate of return than those in the U.S.A. (Hufbauer, 1975).

In the sixties, the investments of American firms in Europe faced a setback and the returns earned by U.S.A firms in their home country was greater than those

invested in Europe. However, the FDI growth of American firms in Europe increased and the differential rate of return was unable to explain the situation. Attempts by researchers (Popkin, 1965 as cited in Agarwal, 1980; Blais, 1975 as cited in Agarwal, 1980) to statistically test the differential rate of return hypothesis failed to produce conclusive results. Also, Hymer (1976) exposed the weakness of this hypothesis and claimed that it was inconsistent with several characteristics of international investment. This was due to the assumption of capital flows from a low rate of return country to a high rate of return country.

Market size hypothesis

The market size hypothesis emphasizes that the amount of FDI inflows into a country depends on the market size of the host country. It is based on the assumption of perfect market and the neoclassical theories of domestic investment. Market size is usually measured in most empirical studies as the Gross Domestic Product (GDP) or Gross National Product (GNP) of the host country. The rationale behind this hypothesis is that domestic firms increase their investments in response to their sales and the domestic investment of the country rises as GDP rises (Agarwal, 1980). Empirical studies such as Moosa (2002) and Okafor (2014) have supported the relationship between market size and FDI inflows, in that, FDI flows to countries with bigger markets or high purchasing power, which enables foreign investors to receive a higher return on their investments.

Despite the relationship between FDI and market size, there are few drawbacks. The first is that the market size hypothesis is based on the neoclassical

theories of domestic investment which is based on unrealistic assumptions. Also, the size of the host country's market is likely to influence the production of goods for domestic consumption but not for export as FDI. In addition, a high correlation between FDI and GDP does not say much about the structural relationship between them (Agarwal, 1980; Moosa, 2002).

The drawbacks of the hypotheses under the perfect market assumptions brought about the emergence of studies in imperfect markets. In the perfect market, there were variations in the commodities and endowment that countries possess and this creates some form of market distortion for FDI to be realized. This is due to the fact there is no clear explanation of the amount of capital inflows, the cost of gathering information and the risk and uncertainty involved. This was first pointed out by Hymer (1976) in his doctoral thesis in 1960, which formed the basis for imperfection in the market.

FDI theories assuming imperfect competitive markets

The challenge of the perfect competitive market by Hymer (1976) saw a breakthrough in the explanation of FDI through the means of knowledge transfer as well as intangible firm's asset in order to set up abroad and produce. He pointed out that the movement of capital was not as a result of the chances in interest rate as explained in the differential rate of return hypothesis but the purpose was to finance international operations of multinational firms. This led to the rise in MNCs as a result of the imperfections in the market. Hymer made his analysis based on the industrial approach to FDI. Several theories were developed based on imperfect

markets and this was contrary to the assumption of perfect competitive markets. Some of these theories include the Industrial approach to FDI, Internalization theory of FDI, Oligopolistic theory of FDI and the Dunning's Eclectic Paradigm of FDI.

Industrial approach to FDI

Hymer (1976) earliest works on FDI criticized the neoclassical's view of a perfect competitive markets. He argued that there was the need for the market to be imperfect. This was to enable the success of FDI which was contrary to the assumption of a perfect market. Hymer's 1960 doctoral dissertation which was published in 1976 established a framework for the study of the industrial approach to FDI. Various authors (Kindleberger, 1969 as cited in Agarwal, 1980; Dunning, 1974 as cited in Agarwal, 1980; Cohen, 1957 as cited in Agarwal, 1980) based their works on Hymer's assumption of imperfect markets in the flow of capital from one country to the other.

The concept of Hymer's (1976) theory was that local firms had to compete with foreign firms. However, the local firms are advantageous in terms of culture, language, preferences and other factors that affect the local firms; and foreign firms are exposed to exchange rate risk since they are not operating in their own currency. This causes a hindrance or disadvantage to the foreign firms. Since FDI is beneficial to most countries in terms of the inflow of capital to the host countries, the disadvantages that are likely to occur, are offset by some kind of power market

which is given to the foreign investors, to be able to make their investment profitable (Liu, 2009).

The kind of market power that is either firm-specific or monopolistic are in the form of patents, brand names, economies of scale and cheap source of finance. Hymer (1976) emphasized that having superiority in technology and knowledge in the development of skills brings about new products and features. This was one of the most important advantages that a firm or investing country could have, that would give market power (Nayak & Choudhury, 2014). Caves (1971) also showed that, when this knowledge and technology is used in the firm, it gets to a point that, it is transmitted from one department to the other and eventually spread across the firm which is located in the same country or different countries.

Also, the technological market power that is possessed by these firms are merits that enable them to invest in other countries and these firms enjoy profits when the market is imperfect. A study by Södersten (1970) indicates that most foreign firms invest in other countries because they are willing to make profits in an imperfect market where they have market power over technology. Also, most European firms invested in the United States due to the technological advantages that they had over the United States (Graham & Krugman, 1989 as cited in Nayak & Choudhury, 2014).

Despite the fact that foreign firms with merits enjoy good profit in the host country, it was not a sufficient condition for a foreign firm to undertake operations in another country. A firm could have advantages, yet it could serve the foreign markets through exports (Agarwal, 1980). This could be as a result of factors such

as the size of the market as well as its conditions, the policies of the government, the reaction of its competing firms and the riskiness of the investment (Robock & Simmonds, 1973; Nayak & Choudhury, 2014). Despite the works by Hymer (1976) in explaining FDI through the industrial approach and the assumption of imperfect markets, the theory failed to explain when and where FDI should take place. Dunning's eclectic theory, Vernon's PLC theory and Buckley and Casson internalization theory were the few works that extended the work by Hymer in order give an in-depth explanation of FDI.

Monopolistic approach to FDI

The work of Hymer (1976) was extended by Kindleberger (as cited in Liu, 2009) who on the basis of imperfect markets, placed emphasis on monopolistic power. He emphasized that multinationals enjoy some advantages in the form of patents, the superiority of technology and so forth. These advantages that are enjoyed by the MNCs motivate them to invest in a foreign country in order to fully exploit the resources in the country rather than share with potential competitors in the host market. When the chances of these multinationals to enjoy monopoly profits are great, most firms will be encouraged to invest in the host country. Despite the various advantages that the monopolistic firm enjoys in a foreign country, Kindleberger's analysis failed to explain the advantages that the firm must focus on. Also, monopolistic power or advantages are only given to a firm when the policies of authorities or the government of the host country permit so (Liu, 2009).

Product life cycle theory

In an attempt to explain when and where FDI should take place, Vernon (1966) developed the product life cycle theory which was the most relevant traditional theory related to the study of industrial location. The first researcher to assess the product life cycle in relation to the requirement of technology and labour was Hirsch (1965). Using a case study of the electronic industry in the United States (US) in 1960, Hirsch argued that capital intensive as a processing technology matures from its initial and research developing stage to a mass production and distribution stage.

In Hirsch's analysis, he argued that at the introductory phase, electronic units are manufactured in batches. The manufacturing of new products involves the employment of engineers and scientist which increases the total outlay of production cost. Therefore, manufacturers try to keep their investments in the form of fixed assets. Also, when the products enter the growth phase, mass production and distribution are introduced. Production becomes capital intensive; management ability becomes important and the ratio of labour to capital decreases. At the maturity stage, product specifications are standardized and the cost of unskilled labour matters most (Hirsch, 1965). His study concluded that the US had the most competitive location stage during the initial stage of industrial development in the electronic industry when very highly skilled labour is required for production. As the industry matures from initial stages, the United States loses its competitiveness to other countries that offer a lower cost and low wage for labour which engages in mass production.

Almost similar to Hirsch's (1965) analysis, Vernon (1966) used the existing theory of Hirsch in approaching the process of internationalization. His research explained the shifts in international trade and international investment by proposing the Product Life Cycle Theory (PLC). The PLC theory which was based on the location choices of US producers assumed that firms in advanced economies were identical and could secure access to knowledge. He argued that any location theory of MNCs that does not include the roles of economies of scale, uncertainty and ignorance, as well as innovation, becomes incomplete. In his model, he replaced trade by viewing FDI and also treated trade and FDI as part of the same process of exploiting the markets of foreign countries in his location analysis of new products (Liu, 2009).

His theory suggested that the location choice of MNCs was an integration of the product life cycle and location factors such as market demand, swift and effective communication and flexibility of production which were critical for the formation and development of markets. The PLC theory by Vernon (1966) viewed firms in developing countries as the passive recipient of technology and skills at the maturity stages of the product life cycle. Based on this, MNCs were derived from three possible sources. The first source was the possession of technologies that are very matured, in that, the production stage has been discontinued by developed firms and not yet mastered by countries with lower scale on industrialization. The second source had to do with the advantages that are gained when technologies are downscaled, which makes production more labour intensive.

Finally, the third source deals with the cost advantages that are possessed based on the lowering of wages.

Vernon (1979) extended his study on the product life cycle theory and suggested that the cost of capital and labour are of less importance to producers during the initial stages of production. This was due to the high level of differences in the production by firms and the monopolistic power of production at the early phase. He further argued that at the early stages, the locational decisions of firms were basically based on the factors that contributed to the efficiency of product development and its introduction into the market. The factors include effective communication networks and the availability of necessary technical and managerial skills (Liu, 2009).

However, when there exist standardization of products and competition among firms arise, there is great concern about the cost of capital and labour for the firm. This was one of the shortcomings of the PLC theory by Vernon (1979). Another critique of his theory was that in the late 20th century, mass production had become outdated and there was the need for specialization as the mode of production (Taylor & Thrift, 1982). Also, the PLC theory did not explain all the kinds of FDI and some of the assumptions did not hold anymore (Agarwal, 1980). A study by Dunning (1993) which accounted for market seeking, resource seeking and efficiency seeking FDI were unaddressed in the product life cycle theory, thus weakening the power to explain FDI.

Oligopolistic theory of FDI

The attempt to explain FDI led to the Oligopolistic reaction theory by Knickerbocker (1973). His theory was based on the assumption of an imperfectly competitive market. He identified three motives that would make a firm to invest or start up in a country. The first motive was that firms seek to increase their access in the country they invest in. The second motive was that firms desire to make effective use of the abundant resource factors of the host country and lastly firms invest in a country in order to match strategic moves by their rival (Head, Ries & Mayer, 2002).

In the oligopolistic theory of FDI, Knickerbocker (1973) argued that firms follow each other's location decisions. For instance, if firm A invests in a host country, firm B will follow firm A and invest in that same country, therefore firms imitate each other. This is due to the uncertainty that is associated with the cost of production in the host country. Also, when firms imitate each other, they are able to avoid being under-priced (Altomonte & Pennings, 2003). In the oligopolistic industry, the number of firms are few in number and this makes it possible to recognize the impact of firm's actions on its rivals (Gwynne, 1979).

His study used manufacturing FDI data of 187 MNCs in the United States and he calculated an entry concentration index, in order to show that the entries of American firms into foreign markets clusters over time. He compared his entry concentration index to the US industrial concentration index and found a positive correlation between the two indices (Agarwal, 1980). He also found that FDI was negatively correlated with product diversity. Based on his findings, he concluded

that oligopolistic reactions of firms increase with the level of concentration of entry and decreases when products are diversified.

Knicknerbocker's (1973) proposition holds true for oligopolistic reaction when there exist uncertainties about costs in the host country. Therefore, oligopolistic firms that are sufficiently risk averse and uncertain about investments abroad are likely to set up in a foreign country if one or more of their rivals invest in that foreign country. However, when there is certainty about the cost of investing abroad, firm's decision to invest abroad decreases when their rivals invest in a foreign country (Nayak & Choudhury, 2014). Also, the theory does not fully explain the motivation behind the decision of the leading firm to invest in a foreign country.

Internalization theory of FDI

In the 1970s, the efforts of an economist in trying to explain international production resulted in the internalization theory of FDI. Buckley and Casson (1976) developed the internalization theory of FDI and this was based on the framework of Coase (1937) who emphasized that, due to the number of costs that were involved when using a market, individuals prefer to enter into partnership, companies and other forms of corporations in order to produce internally to reduce or avoid these costs. Buckley and Casson argued that market for intermediate products such as human capital and knowledge are imperfect, therefore linking different activities through these markets are associated with transactional cost and time lags. The theory was based on three assumptions that;

i. Firms maximize their profits in an imperfect market

ii. When markets internalize across the world, it leads to the creation of multinationals

iii. When intermediate products operate in imperfect markets, the activities of firms create an incentive to internalize the markets.

Also, the study by Buckley and Casson (1976) showed that five types of imperfect markets exist to bring about internalization in the economy. Nayak and Choudhury (2014) summarizes these as;

i. The bilateral monopoly which produces unstable bargaining power

ii. Government intervention in international markets that creates incentives for transfer pricing

iii. When there is efficient exploitation of market power that requires discriminatory pricing

iv. When buyers cannot estimate the prices of goods correctly

v. The coordination of resources that requires a long-time lag.

In their analyses, they identified that a firm's new technology or inputs may be difficult to be transferred or sold to other firms because of a high transactional cost that may be involved. In such a situation, the firm may decide to internalize such that the output of one of its branches or subsidiaries may be used as an input in its other subsidiaries. The internalization occurs at a point where the benefits of an additional internalization outweigh the transactional cost (Buckley, 1988). When this occurs in different countries, it creates FDI.

Although the study by Buckley and Casson (1976) was valuable in explaining FDI through its systematic theory of FDI, the theoretical framework that they developed was not applicable in the short run and also to smaller firms that were operating in one or two countries. Also, the theory was unable to explain the different kinds of FDI (Agarwal, 1980). Furthermore, they identified the exposure of government risks in the host country, however, they failed to analyse that there could be differences in the magnitude of risk throughout the various firms. For instance, power generating firms and telecommunication firms are likely to face a high risk of government interventions because of the social consideration that requires firms to balance social objectives as well as private objectives (Nayak & Choudhury, 2014).

Internationalization theory of FDI

The internationalization theory also explains the theory of FDI by studying the factors that affect FDI location as well as the timing of FDI location decision (Liu, 2009). This theory was proposed by Johanson and Wiedersheim – Paul (1975) in their study on internalization strategies of small and medium scale enterprises (SMEs). The theory states that in order for a firm to international develop, it follows four stages. The stages include no regular export activities are carried by the firm; the firm exports its products through independent agents; there is an establishment of overseas subsidiaries; and production and manufacturing plants (Liu, 2009; Johanson & Vahlne, 1990).

According to the proposition of the four stages in international development, the activities of FDI will occur when a firm has accumulated a certain level of market knowledge through its international activities in their early stages, and the increased market knowledge enables the firm to increase its market commitment overseas (Liu, 2009). This market knowledge plays a major role in the internationalization process. The four stages of the model have gained empirical support from some studies such as Luostarinen (1979) but were not supported by other studies such as Millington and Bayliss (1990) and Turnbull (1987). It was further criticized as being deterministic and not capable of explaining why a firm starts its internationalization through the establishment of a subsidiary in a foreign country rather than exporting to that country (Liu, 2009). In addition, Studies on this model has only shown one motivation for FDI, thus the market seeking FDI.

Eclectic paradigm to FDI

The major weakness of the FDI theories that assumed imperfect competition such as the industrialization theory, oligopolistic theory, PLC theory and internalization theory of FDI were their inability to explain why FDI takes place. A study by Dunning (1979) who integrated and extended these theories improved upon the weakness and proposed the eclectic paradigm. This theory was to explain why a firm might decide to invest, operate or open a subsidiary, and, in which foreign country. It was also developed to explain the motivation behind the first firm's decision to invest in a foreign land.

According to Nayak and Choudhury (2014), researchers have applied the eclectic paradigm to determine the factors that affect the firm's decision to undertake FDI. The eclectic paradigm is also known as the OLI paradigm. It is based on three conditions that must be satisfied before a firm could engage in FDI (Dunning, 1993; Wadhwa & Sudhakara, 2011). Lim (2001) emphasized that without these three conditions, foreign markets would be export based. The three conditions are:

i. The firm must have ownership (O) of specific assets that would give him an advantage over other firms.
ii. The firm must be able to internalize (I) these assets rather than sell, lease or transfer them to foreign firms.
iii. There must be location (L) advantages, in that, setting up a firm abroad must be advantageous that export.

If one condition does not hold, then FDI cannot occur because each condition relations with the other for it to be functional. For instance, if a firm has ownership and location advantages only, the firm would be profitable, however, without internalization advantages, the firm might not be able to internalize its transactional or production cost. In the long run, the firm might license its ownership advantages to foreign firms who might have all the three conditions met because it would lose out in the market with a higher cost (Dunning, 1993).

Also, if there are only ownership and internalization advantages without location advantages, the firm will produce at home and export its products to a

foreign firm. Therefore, Dunning (1980) stated that "OLI triad of variables determining FDI and MNCs activities may be likened to a three-legged stool; each leg is supportive of the others and the stool is only functional if the three legs are evenly balanced". The interrelationship of the three conditions that must exist before FDI takes place are the reasons that Dunning (2001) eclectic paradigm suggest why and when multinationals should invest in foreign countries. Also, what might motivate MNCs or the conditions that exist before they decide to invest and why they decide to use FDI instead of the other forms of entry into a country are based on the three conditions.

The ownership advantages that the firm possesses are specific to its assets, both tangible and intangible assets. The firm possesses these advantages over both the local and foreign firms in a host country and also exploit them to earn economic rents. These advantages lead to a reduction in the firm's production cost and also enable it to compete with foreign firms. It includes patents and trademarks, access to factor inputs, access to financial capital and so forth. (Okafor, 2014; Dunning, 2001; Moosa, 2002; Moon & Roehl, 2001).

There are three types of ownership advantages. The first type involves a set of assets that generate income for the firm as well as allows the firm to achieve a higher level of productivity, efficiency and more market power in a foreign firm. These assets include property rights and intangible assets such as human capital, organizational systems, innovatory capacity, technology and information and so forth (Zang, 2013).

The second type of ownership advantages are the advantages that the multinational may enjoy over “de novo” firms (newly established firms) that are producing in a foreign firm. These advantages may be due to the size of the firm, better resource capacity and monopoly power of the firm. For instance, with the established firm, certain resource benefits such as market knowledge, administrative experiences may be accessed from the parent firm at a lower cost, whiles the “de novo” firm may have to bear full cost to attain those resources (Zang, 2013).

The third ownership advantage originates from the multinationalism of the firm which offers access to and better knowledge of the international markets. This enables firms to take advantage of the geographical differences in the factor markets and helps reduce exchange or political risk in producing in a host country (Dunning, 1977; Dunning, 1988, Zang, 2013).

In terms of the internalization advantages, this arises when multinationals or firms produce internally. This makes production profitable since transactions are from within the firm and the firms also maximize their gains rather than being dependent on external markets (Zang, 2013). The incentives that foreign firms derive from internalizing the market are to exploit the advantages of market failure or avoid the disadvantage of market failure.

The market failure that the multinational avoid are mainly in three forms. The first is when both the buyer and seller do not have complete information in the market. Though buyers may be uncertain about the value or quality of the product of the product being sold to them, sellers might want to protect their reputation due

to internalization of the market. The second market failure may be as a result of the exploitation of economies of scale production by the foreign firms. Therefore, when the foreign firm internalizes, it may benefit from internalization practices such as transfer-pricing and arbitraging. Lastly, market failure also occurs when the transactions of a particular product yield cost to the firm and benefit to external authorities. These costs can be avoided when the firm internalizes (Zang, 2013).

Location advantage is also one of the essential conditions and it determines the particular country that would host various multinational to invest in. A firm, when situated in a foreign country, can have location advantages over other firms if investing in the country lowers their cost of transportation, as well as production cost. Also, the amount of inward FDI that the host country receives depends on the location advantages that it has.

These include a politically sound and good legal system, infrastructure and access to the market, natural resources, employment protection legislation, inflation, exchange rate, corporate tax, human capital, trade barriers and openness, corruption and rule of law, agglomeration and a good environment suitable for business growth. If the host country lacks these advantages, firms would serve domestic markets and export to foreign markets (Faeth, 2009; Okafor, 2014; Zang, 2013). These factors are classified according to the motives of the multinational firm, which includes natural resource seeking FDI, marketing seeking FDI and efficiency seeking FDI.

Resource seeking multinationals are motivated to locate in a country in order to secure safe and cheap and scarce sources of raw materials and inputs such

as natural resources, labour and technological capabilities. These firms are prompted to invest abroad to acquire specific resources as a lower cost (Dunning, 1993). Some of the factors that affect natural resources seeking include availability, price and quality of natural resources, the available infrastructure that would enable the exploitation of these natural resources and also investment incentives that would motivate the firms to locate in a host country (Franco, Rentocchini & Marzetti, 2008).

Also, a multinational firm may be motivated to engage in FDI by expanding its markets through exports either to the host country's market or the adjacent countries. This is known as market seeking motive of FDI. The expansion of the multinational firm's market is dependent on many factors such as the size and growth of the domestic market, quality of infrastructure, availability and price of labour, macroeconomic policies by the host governments, presence and competition of related companies (Franco et al., 2008; Sakr & Jordaan, 2016; Michałowski, 2012)

In the case of efficiency-seeking FDI, multinationals seek to improve their cost efficiency by moving their production activities to a lower cost market. With this type of motive, emphasis is placed on production cost of multinationals, the presence of agglomerative economies, investment incentives and human resource development (Sakr & Jordaan, 2016).

Investment development path

Despite the breakthrough by Dunning, the eclectic of OLI paradigm was criticized for ignoring the dynamic process of FDI that occurs due to the reaction between firms in different countries and also testing his theory with many variables. This brought about the Investment Development Cycle or Path (IDP) theory that proposed a link between a country's international investment positions (net outflow of FDI stock per capita) and the level of economic development which is measured in GDP per capita (Dunning, 1982; Nayak & Choudhury, 2014).

Dunning (1982) proposed four stages of the development path and added the fifth stage in 1986. In the first stage, it deals with a period before industrialization where there was no existence of FDI and low level of income in the economy. The only location advantage that the host country possesses is natural resources. There is the lack of some location advantages which may be due to small market size, inadequate infrastructure, poor government policies and so forth. The inflow of FDI to the host country usually occur in the primary good sector and the country does not generate enough ownership advantages to overcome the barriers in the foreign production of good and services. The agricultural and labour-intensive craft industries usually generate the outflow of FDI for the purpose of asset-seeking. At this stage, the government seeks to improve upon infrastructure and human capital using appropriate policies (Dunning, 1993; Dunning, 2001; Zang, 2013)

The second stage explains the rise of government interventions in the economy that created location advantages and the rise of inward FDI flows.

Location advantages are increased as a result of the rise in the expenditure of education, public utilities, communications and transport. The market size grows and encourages foreign firms to exploit economies of scale in the country. The improvement in the location advantages also develops the ownership advantages, this shifts outward flow of FDI from labour-intensive to capital-intensive and standardized consumer goods sector. The inward flow of FDI increases at a faster rate than the outward flow of FDI. At this stage, the government encourages the local firms to develop and acquire advanced technologies so as to improve the ownership advantages of the firms (Dunning, 1988; Dunning, 1993; Dunning & Narula, 1996; Dunning, 2001; Zang, 2013).

In the third stage, local firms are able to gain ownership advantages in terms of specific assets such as skilled labour, managerial skills and innovation capacity which attracts foreign firm. The improvement of the location advantages of the host and the presence of multinationals as well as good policies of the government upgrades the ownership advantages of the local firms. This causes a fall in the inward flow of FDI and a rise in the outward flow of FDI at the same time. The government then aims to attract the inflow of FDI into the sectors with weak ownership advantages and strong location advantages, and at the same time, encourage the outflow of FDI in the sectors with strong ownership advantages and weak location advantages (Dunning & Narula, 1996).

The fourth stage deals with a situation whereby countries experience more outflows of FDI than inflows, thus a net outward investor. The ownership advantages become stronger and firms are able to penetrate the foreign market in

the form of FDI. Firms then move their operations from countries with a lower stage of the development path and maintain competitive advantages as well as seek market and resources. The income level and industrial structure of the host nation at this stage approaches that of a developed country. The local firm's engagement in outward FDI exceeds that of the foreign firm's inflow of FDI to the host nation. The government then plays a role by reducing transaction cost of economic activities in order to maintain an efficient market and resource allocation (Dunning, 1993; Dunning, 2001).

In the last stage, there is a convergence and balancing of the FDI stocks in most of the countries, especially the developed countries. It is the most advanced stage of development where market-seeking and asset-seeking inflow of FDI comes from countries in the lower stages of the development path. In this stage, the ownership advantages that the firm possesses are based on the ability to coordinate different ownership advantages and upgrade existing technologies as well as acquire assets. Both the inflow and outflow of FDI occur in high-value service sectors. Also, the ownership and location advantages are transferable across the boundaries of countries and this leads to the increase in convergence among countries. The government plays a role in maintaining efficient markets, reducing cost and overcoming market failures (Zang, 2013; Dunning & Narula, 1996).

The basic idea of the IDP theory was that, when countries develop gradually, the conditions that the local firms and foreign firms face changes over time. This affects the flow of FDI, both inwardly or outwardly and this has an impact on the economy of the host country. Therefore, there is a dynamic

interaction between the level of economic development in the country and the international investment positions (Nayak & Choudhury, 2014).

Other theories of FDI

Currency area hypothesis

In explaining the location decision of FDI, Aliber (1970) developed a theory on foreign investment based on the strength of a currency. In his theory, he suggested that a firm that belongs to a country with a strong currency would be more willing to invest in a foreign country, and also firms with weaker national currency would desist from investing in a foreign country. This was because of the differences in the strength of currencies between the FDI source country and the host country. Countries with weaker currencies are more likely to attract FDI than countries with a stronger currency.

Aliber's hypothesis drew considerable attention during the fifties and sixties when it was able to explain the trend of US FDI outflow into Europe. Froot and Stein (1991) tested this hypothesis in the mid-1980s when the US dollar depreciated. The hypothesis explained the rise in FDI inflows to the United States. Aliber (1970) also tested his hypothesis on the US, United Kingdom (UK) and Canada and found that his results were valid and consistent with his hypothesis. Majority of the empirical works that tested the hypothesis have concluded that devaluation of currency encourages the inflow of FDI and discourages the outflow of FDI (Agarwal, 1980).

Despite Aliber's (1970) hypothesis, the relevance of his theory was not applied to less developed countries that had imperfect or no capital market with highly regulated exchange rates (Agarwal, 1980). Also, the hypothesis was not able to fully explain investment between developed countries with the same currency strength as well as the investment of developing country's multinational firms in a developed country (such as investment in the US and UK by Indian firms).

New trade theory of FDI

Although the earliest theories attempted to integrate trade and FDI, they failed to account for the different mode of FDI entry, either vertical or horizontal. Aizenman and Marion (2004) defined vertical FDI as a process where MNCs locate each stage of production a country with the least cost and horizontal FDI as a process whereby MNCs undertake the same production activities in different countries. Helpman (1984) combined the ownership and location elements to develop a general equilibrium theory of international trade whereby multinationals produce a single line of product. His model was based on a firm being vertically integrated, in that the firms choose locations that minimize their cost in order for them to maximize their profits. The theory explains intra-firm trade, intra-industry trade as well as inter-sectoral trade.

Also, Helpman, Melitz and Yeaple (2004) analysed what influences a firm to choose between horizontal FDI and exports. They developed a model in which firms decide to serve the local market, export or engage in FDI (Nayak & Choudhury, 2014). They assumed that every industry was heterogeneous and that

production will differ among firms. The firms that are least productive and are unable to make operational profits shut down or sell in the local markets only. The most productive firm engages in FDI and the less productive sell in the foreign markets through exports. Their theory predicted that foreign markets are better served in terms of export than FDI sales when there are high economies of scale. They conducted a study using export and FDI sales of US firms in 38 countries and the results supported their prediction.

Assignment theory of FDI

Also, in explaining the FDI mode of entry to MNCs, Nocke and Yeaple (2004) developed an "assignment theory of FDI" to explain the mode of entry choice of MNCs. In their study, they examined two forms of FDI modes; greenfield FDI and cross-border mergers and acquisition. Both the horizontal and vertical FDI takes these modes of FDI into consideration. Greenfield FDI is the setting up of new business in a foreign market while the cross-border mergers and acquisition (often termed as brownfield FDI) is the purchase or lease of assets and processes of a firm in order to combine them as a new entity or take advantages of complementarities.

In their analysis, they predicted that differences in factor price among countries would lead to greenfield FDI which is from a high-cost country to a low-cost country and cross-border M & As which is between countries, whiles differences in entrepreneurial abilities among countries would lead to cross-border M & As. Also, their model predicted that on the average, greenfield FDI are more

efficient than cross-border M & As and their empirical results supported it (Nayak & Choudhury, 2014).

Empirical Literature Review

During the early 1980s, a rich literature on the determinants of FDI with a special focus on the effect of corporate taxation evolved and attracted a lot of attention. In this section, the study reviewed empirical works of developed and developing economies according to the type of data used (cross-section, time series or panel data) and the type of FDI (aggregated or disaggregated) used. Various studies such as Hartman (1984), Feld and Heckemeyer (2009), De Mooij and Ederven (2003) and Demekas et al. (2007) have provided an in-depth analysis on taxation and FDI with different estimation procedures and this has shown mixed results.

The studies on taxation and FDI evolved from the developed economy, particularly, the United States. Hartman (1984) was one of the earliest researchers to study taxation and FDI inflows using time series data. He investigated the domestic tax policy of FDI using after-tax rates of return on the United States aggregate FDI inflows from investment transfers and reinvested earnings between the period of 1965 to 1979. Hartman found a significant impact of the domestic tax policy on FDI. Also, the elasticity of the after-tax rate of return on investment transfers did not exceed 0.5, whereas the elasticity for retained earnings was around 1.5. Other studies (Newlon, 1988; Young, 1988; Murthy, 1989) modified the model

of Hartman by using longer time period and this did not differ from the results of Hartman.

The modification of Hartman (1984) model led to the study by Slemrod (1990) who studied the bilateral US inbound FDI trade from seven countries between the period of 1953 to 1984 using time series data. Slemrod controlled for home taxes and home country's double taxation relief in his study and had a different result as compared to Hartman. The findings of his study did not yield clear insight of how the host country's tax policy affect the sensitivity of FDI flows. There was no tax effect on the retained earnings, whiles investment transfers showed mixed reactions.

Based on the weak results in the study by Slemrod (1990), Cassou (1997) extended the work by Slemrod on the bilateral US inbound FDI flow from seven countries using both time series and panel data analysis during the period of 1970 and 1989. He obtained more robust results and found a significant impact of US corporate tax rate on the inward flow of FDI. Also, Wijeweera, Dollery and Clark (2007) also extended the work of Slemrod to panel data analysis by examining the effect of corporate tax rate on bilateral US inbound FDI flows from 9 OECD countries between the period of 1982 to 2000. The study used different tax rates, however, the statutory tax rate was more robust in their analysis. They found that US corporate income tax rate exerts negative and significantly impacts on US inbound FDI and investors were more knowledgeable about host country's statutory tax rate than the effective tax rate.

Jensen (2012) also studied the relationship between corporate tax rate and multinational investments in advanced economies using time-series error correction model to explore the impact of corporate tax on FDI for 19 OECD countries between 1980 to 2000. He estimated four models on the relationship between taxes and FDI. The first model tested how changes in statutory tax affect FDI and controlled for level of development, wages, trade, population and world FDI inflows. The second model controlled for country fixed effect using robustness test. The third and fourth model used EMTR as the measure for corporate tax rate. The study found no relationship between corporate tax rate and FDI inflows. Also, using the EMTR and controlling for other factors, the study still does not find any relationship between the corporate tax rate and FDI inflows. His findings were similar to the findings of Slemrod (1990).

The use of panel data analysis by Cassou (1997) led to more empirical works in panel analysis of tax effect on FDI. Most studies on the effect of taxation of inward flow of FDI shifted attention from time series data analysis to panel data analysis studies (Mudenda, 2015). The use of panel analysis was also attributed to the works of Devereux and Freeman (1995) and Jun (1994). The study by Jun (1994) investigated the impact of home and host country's tax policies on inbound FDI to the US from 10 OECD countries between 1980 to 1989 using fixed and random effect estimation. The results found out that, the home country's statutory tax rate plays a significant role in the behaviour of FDI, thus, resulting in a significant negative effect on FDI from other countries.

Devereux and Freeman (1995) also studied the effect of tax burden on bilateral FDI flows from the USA to 7 OECD countries between 1986 to 1983. They introduced a bilateral cost of capital in their analysis to reflect the country-specific effective marginal tax burden on transnational investment (Feld & Heckemeyer, 2009). Their study found that location choice was affected by taxation and that, when tax credits are granted for foreign investors, it may lead to an increase of inbound FDI flows.

Wijeweera and Clark (2006) also found a negative and significant impact of corporate tax rate on inbound FDI in the US when they investigated a long and short-run estimate of corporate tax rate effect on FDI over a 50-year period. Their study found a long run negative and significant effect of corporate tax rate on FDI but with no significant effect in the short run. However, the impact of taxes on aggregate FDI was significantly negative for both long run and short run effect. The results of the study suggested that the use of tax policy to attract FDI was important.

Using a panel data of 22 OECD countries between 1985 to 2010 and 1970 to 2010, Jeong (2013) evaluated existing evidence on the effect of corporate income tax on four different kinds of investment: FDI inflows, FDI outflows, net domestic investment and total investment. The findings of the study showed that a one-year lag corporate tax rate was negative and statistically significant on FDI inflows but had no clear relationship with the other types of investment.

The use of the panel gravity model was adopted by researchers to analyse the effect of taxes on the bilateral flow of FDI. Bénassy-Quéré, Fontagné and Lahrèche-Révil (2005) contributed to literature by analysing the significance of tax

differentials on FDI. They used a panel gravity model to test the effect of taxes on the bilateral aggregate FDI flows of 11 OECD countries within the period of 1984-2000. Their study used four measures of corporate income tax rate: Statutory Tax Rate, Average Effective Tax Rate (EATR), Marginal Effective Tax Rate (EMTR), Apparent Effective Tax Rate. Their studies showed that a high corporate tax rate discourages the flow of FDI, however, it should not lead to zero taxation because other factors such as market potential and agglomeration also matter in FDI determination. Also, they concluded that tax differentials play a major role in driving the flow of FDI.

Also, Bellak and Leibrecht (2009) used the panel gravity model to estimate the role of taxation as a determinant of FDI. The study analysed the bilateral aggregate FDI flows from seven home countries from the European Union (EU) and the United States, and eight Central and East European (CEECs) host countries from 1995 to 2003. The aim of the study was to determine whether a high corporate tax burden deters the flow of FDI in the CEECs. Using the Bilateral Effective Average Tax Rate (BEATR) as the measure of corporate tax, and the results of the study found a robust tax elasticity which suggests that tax policy is relevant for the flow of FDI.

The presence of agglomeration economies led to the dynamic nature of FDI flows. This led to the use of dynamic panel data model in estimating taxation and FDI. Demekas et al. (2007) applied the GMM dynamic panel data model on aggregate FDI flows between 16 home countries and 24 European transitional economies when analysing the role of policies on FDI during 1993 to 2003. Their

study used statutory corporate income tax rate as the measure of tax burden for a company. The findings of the study showed a negative and significant relationship between tax and FDI, thus, a high corporate tax burden discourages FDI inflows, however, the study found the no significant effect between tax holidays and FDI.

The use of cross-sectional studies also paved way in the empirical studies of taxation and FDI. Hebous, Ruf and Weichenrieder (2010) studied the impact of tax differentials on the probability of choosing a location for FDI using logit. Their analyses were based on a cross-sectional focus on firm's entry; either through greenfield FDI or cross-border M&As. The data used for the study was a firm-level dataset on outbound FDI of German which covers the years 2005, 2006 and 2007 and has a total observation of 2321 cross border M&As and 1206 greenfield FDI. The results of the study showed that the location decisions of greenfield FDI were more sensitive to tax differentials that the location decisions of cross-border M&As. Also, the tax elasticity for greenfield FDI was negative and larger in absolute value than cross-border M&As.

Another dimension of study on taxation and FDI is the discrete choice model studies. Bartik (1985) was the first to use the nested conditional logit model which was developed by McFadden (1973). He applied his studies on a US microeconomic company data on plant births in 1972 and 1978. The data on the plant births was from a database that was developed by Schmenner (1982). Bartik (1985) found a negative and significant effect of state taxes on the location patterns of firms. Devereux and Griffith (1998) also used the nested conditional logit model to investigate a company's decision on where to produce. The study used microdata

on the activities of US foreign multinationals that are located in France, Germany and United Kingdom (UK) from 1980 to 1994. The results also showed that Effective Average Tax Rate (EATR) played a significant role in the location decision of FDI rather than the Effective Marginal Tax Rate (EMTR).

Desai, Foley and Hines (2004) also studied the effect of tax policy on the location of multinational investment, with focus on host country's corporate income tax rates and their interaction with the tax rules of the home country. Their studies did not only focus on corporate income taxes, they also focused on local indirect taxes. The study used micro-data US outbound activities in 1982, 1989 and 1994. This was obtained from the Bureau of Economic Activity, US Department of Commerce. The study found out that, taxes other than income taxes appear to influence investment patterns of multinationals.

Hines (1999) [as cited in Becker, Fuest & Hemmelgarn, 2006] emphasized that the earliest studies of taxation and FDI considered the distribution of US FDI abroad or the FDI of foreign firms into the US. This was due to the lack of data and trade restriction of most countries. Most of these studies also focused on aggregate FDI inflow with few studies on greenfield FDI and mergers and acquisition. As globalization emerged, researchers dive into the study of the FDI flows into developing countries, especially Africa.

Very few empirical works on taxation and FDI flows in Africa have been studies and also most of the studies are usually based on time series analysis and a few are on panel data analysis. Babatunde and Adepeju (2012) analysed the effect of corporate tax on the inflow of FDI to Nigeria using times series data from 1990

to 2010. Their study found a negative and significant effect of corporate tax rate on FDI. Also, Saidu (2015) examined the relationship between corporate income tax and FDI in Nigeria using annual time series data from 1970 to 2013. His regression revealed that the relationship between corporate tax rate and FDI inflows was negative and statistically significant. He concluded that the burden of corporate tax influences the volume and location decision of FDI.

Also, Ahiabor and Amoah (2013) used annual time series data from 1970-2010 to investigate whether corporate income taxes are high enough to influence the investment decisions of foreign firms in Ghana. Their study found out that corporate tax rates significantly affect investments in the long run but has no significant impact in the short run. Obeng (2014) also estimated the long run and short run effect of corporate income tax on sector-specific FDI inflows in Ghana using quarterly time series data from 1986 to 2012. His study employed the Johansen Vector Error Correction Model (VECM). The sectors specific FDI inflows were the service sector, the manufacturing sector and the mining sector. The results from the study indicate that corporate tax influences the flow of FDI to manufacturing sector, service sector and mining sector.

Another study on the effect of corporate tax on FDI within Africa that used time series analysis was the doctoral work of Bello (2005). He focused his analyses on four selected African countries: Ghana, Nigeria, Kenya and South Africa. The study used a 23-year period data from 1980 to 2002 and he estimated for the pooled data analysis of the four countries as well as a country by country analysis. For the pooled analysis, the effect of corporate tax rate on FDI was negative and

insignificant. For the country analysis, the effect of corporate tax on the FDI of South Africa, Kenya, and Ghana was negative and statistically significant. He concluded that corporate tax rate was key in determining the flow of FDI into the selected African countries.

As most of the taxation and FDI studies in Africa used time series analysis, very few studies adopted the panel data analysis to determine the effect of corporate tax rate on FDI in Africa. One of the empirical works that employed panel data analysis was the work of Mudenda (2015). He studied the effect of corporate income tax rate on FDI inflows for 12 Southern African economies and applied the fixed, random and GMM in his analysis. He estimated three different models. In the first model, he controlled for unemployment, GDP per capita and Inflation. In the second model and third model, he controlled for inflation and real exchange rate respectively.

Mudenda's (2015) estimated Hausman test indicated that the fixed effect estimator was consistent and efficient for analysis. The fixed effect estimator showed that corporate tax had a negative and significant effect on FDI. He further employed a dynamic GMM estimator to cater for the possible endogeneity in the study. However, the results for the GMM estimator was contrary to the fixed effect estimator. The finding of the GMM showed that corporate income tax rate had no effect on the inflow of FDI for the 12 Southern African countries. He concluded that, although corporate tax rate may be a key determinant of FDI, it was not a robust determinant.

The literature reviewed in this study has revealed that there are so many approaches (time series, panel data, cross-section and discrete choice models) that researchers have adopted to study the effect of corporate income tax rate on FDI. Also, most of the studies (Wijeweera et al., 2007; Hebous et al., 2010; Bellak & Leibrecht, 2009; Obeng, 2014) showed a negative effect of corporate tax rate on FDI. However, other studies (Slemrod, 1990; Jensen, 2012; Mudenda, 2015) have also shown that there was corporate income tax had no clear effect on FDI and was not the only key determinant that influences the flow of FDI. In the analysis for both developed and developing economies, almost all the empirical works reviewed in this study focused on aggregate FDI flows and a few studies (Hebous, et al., 2010) focused on the disaggregated FDI (mode of entry), either greenfield, brownfield or mergers and acquisition.

In Africa, few or no empirical works have studied the effect of corporate income tax on the disaggregated FDI inflows. This creates a gap in the literature concerning corporate tax rate and either greenfield FDI, brownfield FDI or cross-border mergers and acquisition. Empirical works on the sensitivity of tax on either greenfield, brownfield or mergers and acquisition will enable government or authorities of a host country know the effect that corporate tax rate has on each of disaggregated FDI. Due to lack of available data on brownfield FDI and cross-border mergers and acquisition, this study will, therefore, fill the gap in the literature of taxation and FDI in Africa by focusing on the effect of corporate income tax rate on greenfield investment inflows within Africa.

Corporate tax policy and greenfield FDI for selected African countries

The study contextualized the data used in the study by comparing the trends of corporate income tax rate and the inflow of greenfield investment for the 19 selected African countries. Figure 4 below shows the movement of corporate income tax and the inflow of greenfield investment as a percentage of GDP (a data graphed separately for corporate income tax and greenfield investment are shown in Appendix A & B). This trend portrays a mixed effect for some of the countries.

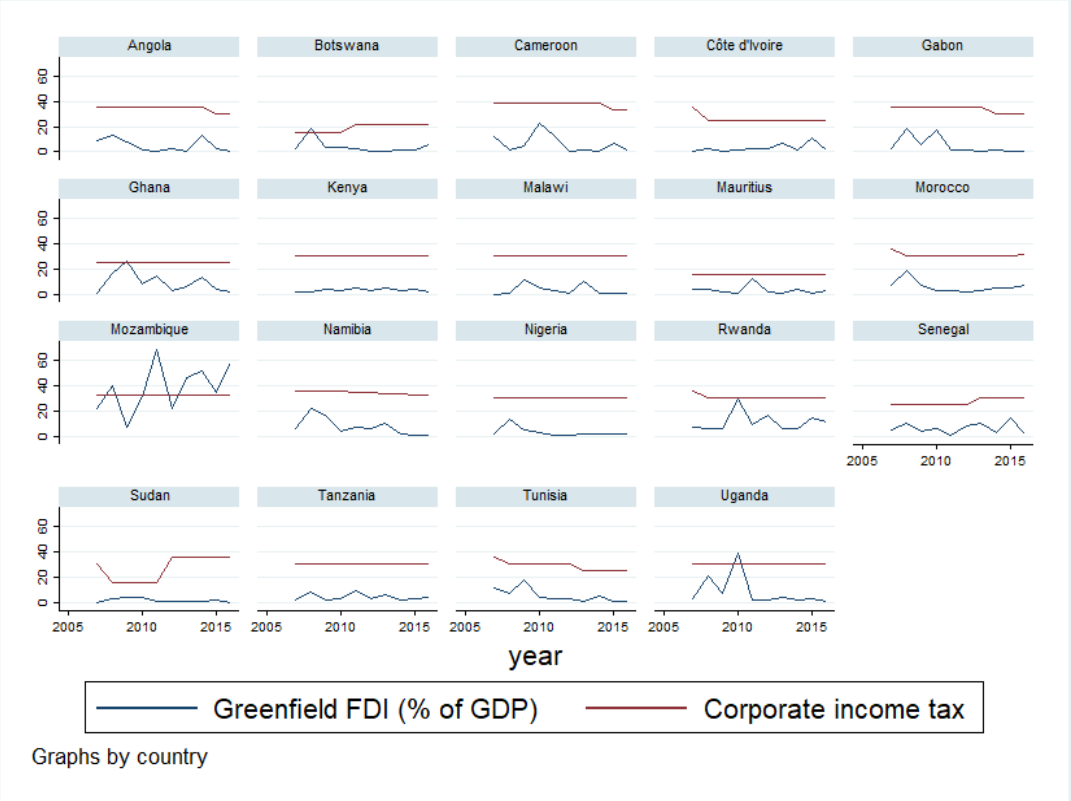


Figure 4: Corporate income tax rates and greenfield investment as a percentage of GDP from 2007 – 2016.

Source: Author's Construct

For instance, the case of Cameroon, the initial decrease in corporate income tax was associated with an increase in the inflow of greenfield investment.

Moreover, for the periods where corporate income tax was relatively stable or fixed, especially, Kenya and Tanzania, the inflow of greenfield investment as a percentage of GDP seems to stabilize, showing a clear link between corporate income tax rate and greenfield investment.

On the other hand, Ghana, Mozambique and Nigeria also recorded fixed corporate income tax rates, yet the inflows of greenfield investment fluctuated within the same period of time from 2007 – 2016. This motivates the study for a thorough investigation into taxation and FDI inflows in order to determine the effect of corporate income tax rate on the inflows of greenfield investment.

Chapter Summary

This chapter reviewed the relevant literature on both the theoretical and empirical works on corporate income tax rate and foreign direct investment flows into a country. Despite the number of theories reviewed in explaining why FDI takes place, most of these theories partially explained FDI. A major breakthrough was the Dunning eclectic theory of FDI which made a promising start to the general theory of FDI. Also, the empirical literature reviewed on corporate tax and FDI inflows for both developed and developing economies had mixed findings. Majority of the empirical work was on developed economies with few studies on developing economies such as Africa. This study adds up to existing works on the effect of corporate income tax rate on greenfield investment, with a focus on African countries.

CHAPTER THREE

RESEARCH METHODS

Introduction

The focus of this chapter is to present the methodological framework and the estimation techniques that were used for this study. The methods and tools that were employed for the study are discussed. A detailed description of the theoretical and empirical specification of the appropriate model for the effect of corporate income tax rate on greenfield FDI of the 19 selected African countries is presented in this chapter. Also, definitions, measurement and justifications of the variables used in the model, data sources and estimation techniques are presented.

Research Design

Research design deals with the type of data required, the methods to use in the collection of the data as well as the analysis of the data, and how it is able to answer the research questions of the study. It elaborates the overall plan that links the conceptual research problems to the empirical research (Yin, 2003). Thyer (1993) described research design as the blueprint of how a research is to be conducted through sample selection, data collection as well as data analysis in order to fulfil research objectives and find solutions to the study. This influences the perspective of the researcher in knowing the appropriate design for the study since different design logics are used for different kinds of studies.

The research design for this study was based on longitudinal research design which follows the same sample over time and at regular intervals to be able to track changes and relate them to variables that might explain why the changes occur. The purpose of this design is to address the changes and variations of the individual unit as well as facilitate the prediction of future outcomes based on previous factors. The research process used in the study was in four phases: problem identification, sample selection, data collection and the analyses of data for inference.

Also, in examining the effect of corporate income tax rate on greenfield investment in 19 selected African countries, the study incorporates quantitative research approach. This falls within the context of the positivist philosophy which is of the view that the only factual knowledge that is gained through observation and measurement are trustworthy and as such, it supports the use of research that is usually observable or quantifiable (Thyer, 1993). Studies that adopt the positivist philosophy are limited in data collection and also interpret results based on the objectives of the study.

The quantifiable observations in the positivist studies lead to statistical analysis and this is in accordance with the empiricist view that knowledge is based on human experience. It also assumes that researchers must be neutral, shows no provision for human interest towards the phenomenon under investigations (Yin, 2003). This is to ensure that researchers are not personally biased and have no influence on the outcome of the study. Hence, enabling the results of the study to be explained for Africa using both internal and external validity.

Theoretical Model Specification

The decision of multinationals to invest in a particular location depends on the returns or profits that they benefit. These returns are largely determined by the location-specific advantages which attract multinationals to invest and convert their investments into returns. In order to derive the theoretical model on the determinants of FDI flows, an appropriate functional form must be defined in order to convert the flow of greenfield investment into returns. Following Griffiths and Webster (2004), the study defined the expected return from investment in country i and at time t in equation (1) as:

$$R_{i,t} = \pi_{i,t}\left[\varphi_{i,t} \ln\left(gfdi_{i,t}\right) + \gamma\right] \qquad (1)$$

Where i represents country and t represents the number of years, $gfdi_{i,t}$ is the amount of greenfield investment inflows in country i and at time t. $\pi_{i,t}$ is the return per unit of realised output from greenfield investment inflows in country i and at time t and $\varphi_{i,t}$ represents country i's location advantages that attract multinationals to invest in that country and convert greenfield investment into profits at time t. Also, γ is the threshold output which is constant across all the selected Africa countries. For multinational firms to know the present value of their expected return from investment in order to determine their returns, equation (1) is converted to equation (2). Therefore, the present value of the expected return from investment ($PVR_{i,t}$) will be:

$$PVR_{i,t} = \frac{\pi_{i,t}\left[\varphi_{i,t} \ln\left(gfdi_{i,t}\right) + \gamma\right]}{\left(z_{i,t} + r\right)} \qquad (2)$$

Where $z_{i,t}$ is the risk of investing in a country i at time t and r is the discount rate which is constant for all the selected African countries. Also, as the multinational firms invest in the host country, they incur some recurring expenses. The present value of the recurring investment expenses by the foreign firm is presented as equation (3):

$$E_{i,t} = \frac{\mu gfdi_{i,t}}{(z_{i,t} + r)} \qquad (3)$$

μ represents the proportional factor, which is assumed to be constant across all the selected countries in Africa. If a multinational firm decides to invest its maximum amount of $gfdi_{i,t}^{0}$, then actual investment of $gfdi_{i,t}$ will be less or equal to $gfdi_{i,t}^{0}$. Thus:

$$gfdi_{i,t}^{0} \geq gfdi_{i,t} \;\; or \;\; gfdi_{i,t}^{0} - gfdi_{i,t} \geq 0$$

Therefore, the multinational firm decides the amount of $gfdi_{i,t}$ to invest so that the net expected return ($NER_{i,t}$) from investment in country i and at time t which is the difference between equation (2) and (3) becomes:

$$NER_{i,t} = \frac{\pi_{i,t}\left[\varphi_{i,t} \ln\left(gfdi_{i,t}\right) + \gamma\right]}{(z_{i,t} + r)} - \frac{\mu gfdi_{i,t}}{\left(z_{i,t} + r\right)} \qquad (4)$$

The multinational firm maximize equation (4) subject to $gfdi_{i,t}^{0} - gfdi_{i,t} \geq 0$ in order to achieve its objectives. Therefore, the optimization problem of the multinational firm can be written as equation (5) using the Lagrange multiplier:

$$L = \frac{\pi_{i,t}\left[\varphi_{i,t}\ln\left(gfdi_{i,t}\right)+\gamma\right]}{\left(z_{i,t}+r\right)} - \frac{\mu gfdi_{i,t}}{\left(z_{i,t}+r\right)} + \lambda\left(gfdi_{i,t}^{0} - gfdi_{i,t}\right) \qquad (5)$$

By applying the Kuhn-Tucker conditions to equation (5), the constrained optimization becomes:

$$gfdi_{i,t} = \frac{\pi_{i,t}\varphi_{i,t}}{\left[\mu+\lambda(z_{i,t}+r)\right]} \qquad (6)$$

If it is assumed that the discount rate r of investment of the multinational firm is constant across all the selected countries in Africa, then equation (6) can be expressed in a functional relationship as equation (7):

$$gfdi_{i,t} = f\left(\pi_{i,t}, \varphi_{i,t}, z_{i,t}\right) \qquad (7)$$

Where $\frac{\partial gfdi_{i,t}}{\partial \pi_{i,t}} > 0, \quad \frac{\partial gfdi_{i,t}}{\partial \varphi_{i,t,}} > 0, \quad \frac{\partial gfdi_{i,t}}{\partial z_{i,t}} < 0$

The optimal investment in each country is directly related to the location advantages of a country, which attracts multinationals to invest in the country and convert the investment into profits. However, the optimal investment is inversely related to the risk of investment in that country. One of the location advantages of the country is the corporate income tax rate of that country. When the tax policy of the host country is relatively high, it influences the decisions of multinational firms and deters them from investing in that particular country.

The tax policy of the host country in this study is captured by $\varphi_{i,t}$ since a favourable tax rate by the host country will serve as a catalyst for attracting greenfield FDI and this will increase the output or growth of the economy. Good infrastructure quality, purchasing power, trade openness, well-developed market

size and the availability of natural resources are also captured by $\varphi_{i,t}$. The study assumes that both inflation and country risks are considered as a risk. Therefore, they were captured in $z_{i,t}$.

Empirical Model Specification

In deriving the empirical model of this study, the locational advantages of the host country which is represented by $\varphi_{i,t}$ comprises of factors that the host country is endowed with and will attract the flow of greenfield FDI. These factors include tax, trade openness, market size, natural resources, infrastructure quality and purchasing power in the host country. Therefore, the $\varphi_{i,t}$ in equation (7) can be written in a functional form as:

$$\varphi_{i,t} = \emptyset(cit_{it}, open_{it}, pp_{it}, msize_{it}, nr_{it}, infras_{it}) \qquad (8)$$

And also, the investment risk, $z_{i,t}$ in equation (7) which captures the inflation rate and the country risk in terms of the political stability of the host country can also be written in a functional form as

$$z_{i,t} = \propto (inf_{it}, cr_{it}) \qquad (9)$$

Substituting equations (8) and (9) into equation (7), a new expression is obtained for greenfield investment in equation (10):

$$gfdi_{it} = f(cit_{it}, inf_{it}, open_{it}, pp_{it}, msize_{it}, nr_{it}, cr_{it}, infras_{it}) \qquad (10)$$

The study logs $gfdi_{it}$, pp_{it} and $msize_{it}$ in order to normalize the variables since it is positively skewed and also to reduce the effect of outliers in the

observation. The first lag of $gfdi_{it}$ is included in the model to capture agglomeration effect. The study rewrites equation (10) in econometric form to include the error term which accounts for unobserved explanatory variables, as well as the parameter for the model, equation (11), is obtained as:

$$lngfdi_{it} = \beta_0 + \beta_1 cit_{it} + \beta_2 inf_{it} + \beta_3 open_{it} + \beta_5 lnpp_{it} + \beta_7 lnmsize_{it} + \beta_8 nr_{it} + \beta_9 cr_{it} + \beta_{10} infras_{it} + \beta_{11} lngfdi_{it-1} + \varepsilon_{it} \quad (11)$$

Where $lngfdi_{it}$ = log of greenfield investment in country i at time t

cit_{it} = statutory corporate income tax rate in country i at time t

inf_{it} = inflation rate in country i at time t

$open_{it}$ = degree of openness in country i at time t

$lnpp_{it}$ = log of purchasing power in country i at time t

$lnmsize_{it}$ = log of market size in country i at time t

nr_{it} = natural resources in country i at time t

cr_{it} = country risk in country i at time t

$infras_{it}$ = infrastructure in country i at time t

Also, ln stands for natural log, ε_{it} represents the random disturbance term and $\beta_0,\ \beta_1,\ \beta_2,\ \beta_3,\ \beta_4,\ \beta_5,\ \beta_6, \beta_7,\ \beta_8,\ \beta_7,\ \beta_9,\ \beta_{10},\ \beta_{11}$ are the slope parameters.

Measurement of Variables

Trade openness

This deals with the restrictiveness of trade pertaining to the host country. In the literature, the ratio of the total value of imports and exports of the host country, which is relative to the GDP of the country is often used as a measure for trade openness. The impact of trade openness on FDI depends on the type of investment being carried out by multinationals (Asiedu, 2002).

Trade restrictions due to barriers, policy and transaction cost can have a positive impact on FDI when investments are market seeking. This is due to the "tariff jumping" hypothesis which enables firms to engage in horizontal FDI by setting up similar plants or subsidiaries in the local markets of the host country if it is unable to import their products into the country (Ali, Ahmad & Muhamad, 2010).

Also, the difference in production cost might enable firms to disintegrate the production process, therefore allocating labour-intensive production in countries with low wages and capital-intensive production in highly industrialized countries. This creates a vertical FDI. Thus, the horizontal FDI may be preferred when there are high trade restrictions (less openness) as most multinational firms would protect their output in the local market.

However, foreign firms may engage in vertical FDI or export-oriented investment when there is greater trade openness in the host country. Since greenfield investment can either be vertical or horizontal FDI, the relationship between greenfield FDI and trade openness is expected to be either positive or negative, therefore there is an ambiguous association.

Market size

One of the key determinants of FDI is the size of the host country's market since it plays a significant role in the FDI decision making. Various literature has emphasized the importance of the market size of the host country that has a positive impact on the inflow of FDI. The study by Byun, Lee and Park (2012) used the log of the total population to measure the market size of the host. They argued that market size has a positive correlation with both greenfield FDI and cross-border mergers and acquisition because when the population is high, it becomes attractive for market seeking and horizontal FDI to take place.

Scaperlanda and Mauer (1969) argued that, when the market size increases, it reaches a threshold level that enables the host country to enjoy economies of scale and efficient utilization of its resources. This study used the log of the total population as a proxy for market size, it is expected to have a positive relationship with greenfield FDI.

Inflation rate

Inflation is generally defined as the persistent and continuous increase in the general price level in a country. It basically implies a rate of change in the general price level in a country and this affects the purchasing power of investors or consumers, hence it is expected that inflation would have an effect on FDI inflows into the country or the country that is experiencing inflation.

Studies by Buckley, Devinney and Louviere (2007) shows that inflation negatively affects the macroeconomic stability of the economy, thus causing a greater instability which makes the market of the host country unstable and unpredictable. Also, when inflation is high, the domestic currency of the host country is devalued and this reduces the real return from an investment, therefore discouraging foreign firms or multinationals from investing and leads to a fall in FDI.

However, a stable inflation in an economy is a measure of macroeconomic stability which promotes FDI inflows. Djokoto and Dzeha (2012) found a positive relationship between total FDI inflows and inflation. This study used the percentage change in consumer price index as a measure of inflation and is expected to have a positive correlation with greenfield investment.

Country risk

In measuring the country risk of the host country, this study uses the estimates of political stability and absence of violence or terrorism as a proxy for country risk. Political stability is interconnected with growth and enables firms to multinationals to invest in countries without fear or threats from the government. However, when there is political instability, it is associated with the degree of change in the political regime of the host country and this portrays threats as well as a potential change in policy (Okafor, 2014).

The degree of political instability in the country determines the investment decisions of most multinationals and as such this is an important variable. The operational risk of a firm is increased when there is political instability since there is a likelihood of disruption in the projects of multinationals. Byun, Lee and Park (2012) study on FDI showed that political stability had a positive impact on both greenfield FDI and M & A. Therefore, the relationship between political stability and greenfield is expected to be positive.

Purchasing power

Generally, purchasing power is defined as the value of goods and services that the currency of a country can buy. When the purchasing power of the resident or multinationals in the host country is high, there are likely to buy more goods and services in the country and this increases the flow of FDI. It also captures the economic conditions of the host country in terms of business cycle (Byun, Lee & Park, 2012). The study measure purchasing power using the log of GDP per capita of the host country and it is expected to have a positive relationship with the inflow of greenfield FDI.

Corporate income tax rate

Higher tax rates in a host country hinder the flow of greenfield FDI since most multinationals will invest in a country with a lower tax rate. FDI positively impacts the growth of an economy and as such countries take policy measures in

attracting the inflow of FDI. One of the measures these countries use to attract FDI inflows is to provide tax incentives or reduce the tax base of the country (Munongo, 2015). As these tax rates are being reduced, it reduces the production cost of multinational and this motivates most foreign firms to invest in a country with a lower tax rate (Mandinga, 2015). This makes the use of tax policy as a means in attracting the flow of FDI.

Literature on the effect of tax rate on the inflow of greenfield investment are very limited, especially in Africa due to the non-availability of data on tax rates in most African countries. This study uses the statutory corporate income tax rate as a measure of the tax rate. A decrease in the corporate income tax rate by countries is likely to cause an increase in the flow of FDI in the region, therefore corporate income tax rate is expected to have a negative effect on the flow of greenfield investment (Obeng, 2014).

Infrastructure quality

The infrastructural quality of a country is a location advantage that stimulates investment and enables foreign firms to locate their firms. A country with good infrastructure increases the productivity of investment in that country. The quality of infrastructure in a country is a key determinant in the flow of FDI (Asiedu, 2004; Anyadike, 2012; Rehman, Ilyas, Alam & Akram, 2011; Hakro & Omezzine, 2011).

The infrastructure of a country could be either social or economic infrastructure. Electricity production, roads, ports, communication and financial institutions are classified under economic infrastructure whiles schools, libraries, cultural and religious facilities could also be classified under social infrastructure.

A good measure of infrastructural development should be able to take into account the availability and reliability of the infrastructure in the host country (Asiedu, 2002). However, when infrastructure is available, but unreliable or poor, it becomes less useful since it is unable to perform its function for the development of the economy. This is because the reliability of the available infrastructure is important to foreign investors as it becomes useful. Wheeler and Mody (1992) examined the impact on infrastructure quality on investment in 42 developing countries and found out that the quality of energy, communication and transport infrastructure had a positive and significant impact on the volume of investment in the countries.

Despite the positive impact of infrastructure quality on investment inflows, Anyadike (2012) examined the extent to which poor infrastructure discourages or repel the inflow of FDI and hinders the growth of the Nigerian economy between 2000-2010. He identified that poor infrastructure due to the deplorable state of roads networks and power outrages discourages or bane the inflow of FDI to the Nigerian economy, depicting a negative relationship between the quality of infrastructure and the inflow of FDI.

Using the frequency of power outrage is an important measure of infrastructure quality since it is crucial for efficiency in the manufacturing sectors

and production firms, but due to data unavailability for most of the countries in the sample, the study used the number of telephone subscribers per 100 of the population in the economy as a proxy for the measure of infrastructure quality which is important in the service sector. The relationship between infrastructural quality and greenfield FDI is expected to be either positive when there is good quality infrastructure or negative when there is poor quality infrastructure.

Natural resources

Natural resources may be defined as the elements or materials in a country, that occur naturally and can be exploited for economic gains. These include land, water bodies, energy sources, minerals as well as forest that a country is endowed with. When a host country has enough or rich in natural resources, it accelerates the flow of FDI into the country. The availability of natural resources is one of the key determinants of FDI which is of great importance to investors (Asiedu, 2013)

A study by Bokpin, Mensah and Asamoah (2015) investigated the impact of natural resources on FDI in Africa by decomposing the measure of natural resources in terms of its contribution to GDP using a panel of 49 countries between 1980-2011. Their study showed that natural resources influence FDI inflows in Africa. Babatunde and Adepeju (2012) indicate that the availability of natural resources attracts more FDI. The measure of natural resources in this study is the total value of natural resources rent as a percentage of GDP. It is expected to have a positive relationship with the inflow of greenfield FDI.

However, Asiedu (2013) found a negative relationship between natural resources and FDI inflow, which indicates the presence of FDI-resource curse. Also, Munongo (2015) found a negative relationship between natural resources and FDI inflows to southern African. In this study, it is expected that natural resources will have either a positive or negative relationship with the inflow of greenfield FDI.

Agglomeration effect

The presence of existing FDI in a country is a motivation for multinationals to invest in that economy. Hence, agglomeration economies exist when multinationals or foreign investors are attracted to countries which are endowed with existing foreign investment. Jordaan (2011) conducted a study on the agglomeration and location choice of FDI from manufacturing firms in Mexico and found out that new FDI firms had concentrated in a selected group of states within Mexico that had incorporated agglomerations of economic activities. Thus, multinationals or foreign-owned firms were influenced in their location behaviour by the presence of agglomeration economies.

A study conducted by Head, Ries and Swenson (1995) also found that industry level agglomeration was beneficial and played a significant role in the location choice of Japanese manufacturing plants in the United States. When the initial flow of FDI into a country gives a positive effect, it attracts further FDI inflows into that particular country since FDI is a long-term capital investment that

is irreversible in the short-run. Anyawu (2012) found a positive relationship between current FDI inflows and previous FDI inflows among Africa countries.

The study captures the agglomeration effect by using the first lag of the dependent variable, greenfield investment as a proxy, and the coefficient of the current and the first lag dependent variable is expected to be positive.

Data Sources

The study uses annual data for all the variables using a 10-year period 2007 to 2016. The data on greenfield investment was derived from the FDI statistics and the World Investment Report of UNCTAD. The corporate income tax data was derived from the PriceWaterhouseCoopers (PWC) paying taxes annual report and Ernst and Young annual report from 2007 to 2016. Also, data on purchasing power, inflation, country risk, trade openness, infrastructure, and natural resources were derived from the World Development Indicator from 2007 to 2016.

Table 1-*List of Countries in the Sample*

Region	Countries
North Africa	Morocco, Sudan, Tunisia
Southern Africa	Angola, Botswana, Malawi, Mozambique, Namibia
West Africa	Ghana, Ivory Coast, Nigeria, Senegal
East Africa	Kenya, Mauritius, Rwanda, Tanzania, Uganda
Central Africa	Cameroon, Gabon

Source: Author's Construct.

Sample Selection

The study used a sample of 19 African countries over a 10-year period from 2007-2016. Table 1 groups the country according to their geological locations within the continent. There are three countries from North Africa, five countries from Southern Africa, four countries from West Africa, five from East Africa and two from Central Africa. The Republic of South Africa was excluded from the sample due to its large economic size and growth, hence, it is likely to bias the results. The selection of the sample was based on data availability of key variables such as corporate income tax rate and greenfield investment. The selection of the time period from 2007-2016 was as a result of the emergence of greenfield FDI for most of the African countries between 2006 and 2007.

Estimation Techniques

In estimating the effect of corporate income tax rate on greenfield investment for the 19 selected African countries over the 10-year period from 2007 to 2016, the study adopted panel data analysis. However, due to missing observations and limited data on some variables, we used an unbalanced panel. The estimation procedures adopted in this study involved a unit root test to determine the stationarity of the time series properties of the dataset by using Fisher's Augmented Dickey-Fuller and the Phillip-Perron test because of their superiority over the other panel unit root test when the panel is unbalanced.

Table 2-*Summary of Variables, Sources and Measurements*

Variable	Measurement	Source	Sign
$lngfdi$	Log of the value of announced greenfield investment as a percentage of GDP	UNCTAD	
cit	Statutory corporate income tax rate	PWC paying tax report, Ernst and Young	-
inf	Percentage change in Consumer Price Index	WDI	-
$open$	Percentage of trade to GDP (sum of imports and exports, divided by GDP)	Author	+/-
$lnpp$	Log of purchasing power	WDI	+
$lnmsize$	Log of total population as a percentage of GDP	WDI	+
nr	Total natural resources rent as a percentage of GDP	WDI	+/-
cr	The value estimates of political stability and absence of violence / terrorism	WDI	-
$infras$	Number of telephone subscribers per 100 population	WDI	+/-
$lngfdi_{-1}$	Log of the first lag of greenfield investment (agglomeration effect)	Author	+

Source: Author's Construct

Also, Fixed and Random effect estimators were used to estimate the effect of corporate income tax rate on greenfield FDI inflows. A Hausman specification test was performed to select the consistent and efficient estimation of either the fixed or random effect model. The presence of agglomeration which could cause endogeneity in the model led us to take a further step of using the Blundell-Bond System Generalized Method of Moments (GMM) to estimate the effect of corporate income tax rate on greenfield investment for the selected 19 Africa countries. A further post-estimation test was conducted to determine the validity and consistency of the System GMM estimator.

Unit root tests

Unit root testing of panel data emerged from time series unit root testing but has differed in terms of the consideration of times series dimension and cross-sectional dimension. Various unit root test such as the Levin-Lin-Chu test, Im-Pesaran-Shin test and the Fisher's test have been proposed for panel data analysis and each test has its distinctive property.

In the Levin, Lin and Chu (2002) test, one feature that it possesses is that the individual unit root test has limited power. That is, when the time series dimension, T is very small, the test is undersized and has a very low power. Also, this test relies on the assumption that the cross-sectional units are independent of each other and the null and alternative hypothesis are very restrictive (Hoang & McNown, 2006)

Also, another panel unit root test is the Im, Pesaran and Shin (2003) test

which allows for heterogeneous coefficients. A Monte Carlo simulation on the cross-sectional correlation and the variance-covariance matrix revealed that the small sample performance of the Im-Pesaran-Shin test was better than the Levin-Lin-Chu. The Im-Pesaran-Shin test assumes that time dimension, T, is the same for all the cross-section units, therefore this test is applied only for a balanced panel.

An appropriate unit root test for this study which considers the shortcomings of both the Im-Pesaran-Shin and Levin-Lin-Chu test is the Fisher's unit root test which tests for each cross-section unit and handles unbalanced panel dataset (Barbieri, 2006). Since the data in this study contains some missing values, Fisher's Augmented Dickey Fuller (ADF) test and the Phillip Perron (PP) is employed in this study to test for the unit root of each cross-sectional dimension. Maddala and Wu (1999) proposed that the Fisher's test is promising for two reasons. The first reason is that it performs any unit root test on a single time series and secondly, it does not require a balanced panel, so the time series dimension, T, can differ over the cross-sectional units.

Also, Choi (2001) noted that the previous tests (Im-Pesaran-Shin and Levin-Lin-Chu test) had inflexibilities in their application. He proposed a simple test which was based on the combination of p-values from a unit root test which was applied to each group in the panel data which made the Fisher's test a better choice. The null hypothesis for the Fisher's test is that all the time series have unit root, thus non-stationary and the alternative hypothesis is that at least one unit is stationary. With the advantages of the Fisher's test, the study adopted it in testing for the stationarity of the unbalanced panel data in this study.

Blundell-Bond system GMM estimator

In this study, agglomeration effect of FDI which is due to the previous success of an FDI in an economy was included in the model and this defined the dynamic relationship in model (11). The dynamic relationship between the variables are characterized by the presence of a lagged dependent variable among the regressors in a model such as the lagged greenfield investment, and this correlates with the current greenfield investment. This model contains one or more lagged dependent variables and allows for the modelling of a partial adjustment mechanism (Baltagi, 2005). The dynamic panel model is presented as;

$$y_{it} = \delta y_{i,t-1} + x'_{it}\beta + \varepsilon_{it} \qquad (12)$$

With $\varepsilon_{it} = \mu_i + \nu_{it}$, $i = 1, \ldots, N;\ t = 1, \ldots, T$

Where $\delta\ is\ a\ scalar$

y_{it} is the series of dependent variable across individuals.

$x'_{it}\ is\ a\ 1 \times K\ \ matrix$ of strictly exogenous regressors.

ε_{it} is the error term.

μ_i is the unobserved individual-specific time-invariant effect.

ν_{it} is the idiosyncratic error term.

$\beta\ is\ a\ K \times 1$ matrix.

A key assumption for this model is that both the unobserved individual-specific time-invariant effect and the disturbance term must be identically and independently distributed among each other, thus $\mu_i \sim IID\left(0, \sigma_\mu^2\right)$ and $\nu_{it} \sim IID(0, \sigma_\nu^2)$. Also, the model assumes the number of individual observations (N) must be large whiles the number of time period available (T) must be small,

therefore (N > T).

The inclusion of the lagged dependent variable as a regressor in the model causes some basic problems which violate the assumptions of the Classical Linear Regression Models (CLRM) and this renders the standard estimators such as ordinary least square (OLS), fixed and random effect inconsistent.

One of the assumptions of the CLRM is that the disturbance term v_{it} must be serially uncorrelated. Since the dependent variable y_{it} is a function of μ_i, it also follows that the regressor $y_{i,t-1}$ is also a function of μ_i, and this renders OLS inconsistent since the explanatory variable $y_{i,t-1}$ is positively correlated with the error term ε_{it} due to the presence of the unobserved individual effect μ_i. This correlation does not vanish as the number of observations in the sample gets larger (Bond, 2002).

For the fixed effect estimator, the within-group estimator eliminates the source of inconsistency by transforming the model to wipe out the μ_i. The transformed lagged dependent variable in the model becomes $y_{i,t-1} - \frac{1}{T-1}\left(y_{i1} + \cdots + y_{it} + \cdots + y_{i,T-1}\right)$ whiles the transformed error term is $v_{it} - \frac{1}{T-1}\left(v_{i2} + \cdots + v_{i,t-1} + \cdots + v_{iT}\right)$. The component $\frac{-y_{it}}{T-1}$ in the transformed dependent variable correlates with v_{it} whiles the component $\frac{-v_{i,t-1}}{T-1}$ in the transformed error term is also correlated with $y_{i,t-1}$. This correlation does not eliminate when the number of individual observations in the sample increases and this renders the fixed effect estimator inconsistent (Bond, 2002).

Also, the random effect estimator is biased in the dynamic panel data model since $(y_{i,t-1} - \theta\bar{y}_{i.,-1})$ is correlated with $(\varepsilon_{i,t-1} - \theta\bar{\varepsilon}_{i.,-1})$ after a quasi-demeaning is performed after using a generalized least square (GLS) method. (Baltagi, 2005). A Hausman specification test was used to choose between the fixed or random effect estimator in order to determine the consistent and efficient estimator among them. The null hypothesis for the Hausman test states that the random effect estimator is preferred whiles the alternate hypothesis states that the fixed effect is at least consistent and preferred.

Inasmuch as the Hausman test would be performed, the inclusion of the lag dependent variable in the model makes either the fixed or random effect inconsistent and biased. The study takes a step further to solve the endogeneity problem through the dynamic panel estimators. In solving the endogeneity in the standard panel estimators, Arellano and Bond (1991) proposed a generalized method of moment (GMM) estimator which provides consistent estimates. This estimator is often known as "Difference" GMM estimator because it differences the data and uses the lagged values of the endogenous variable as instruments (Roodman, 2006). Therefore, the dynamic panel model in equation (12) is transformed and the unobserved individual effect is eliminated. Thus, the model becomes;

$$\Delta y_{it} = \delta\Delta y_{i,t-1} + \Delta x'_{it}\beta + \Delta v_{it} \qquad (13)$$

Where $\Delta y_{it} = y_{it} - y_{i,t-1}$, $\Delta y_{i,t-1} = y_{i,t-1} - y_{i,t-2}$, $\Delta x'_{it} = x'_{it} - x'_{i,t-1}$, and $\Delta v_{it} = v_{it} - v_{i,t-1}$

Despite the consistency of the difference GMM estimator, a potential weakness was identified by Arellano and Bover (1995) and Blundell and Bond (1998). They indicated that the lagged level were poor instruments for first difference variables, especially if the variables were close to a random walk. Also, for unbalanced panel dataset, it magnifies gaps in the dataset by increasing the missing observations in the data after the transformation. A more efficient estimator was proposed by Blundell and Bond and this was referred to as the "System" GMM estimator. This estimator transforms the dynamic panel model by using the first difference of all the exogenous variables as standard instruments and the lags of the endogenous variables to generate GMM-type instruments. It also includes that lagged difference of the endogenous variable as instruments for the level equation.

The system GMM estimator lessens the problem of the poor instruments, by using extra moment conditions which restricts the initial conditions of the process generating the dependent variable and also has efficiency gains over the difference GMM estimator. Another advantage of the system GMM estimator is that, even though it uses more instruments than the difference GMM estimator, the finite sample bias of the system GMM is small and gives good precise estimates than the difference GMM because the system GMM uses a weighted sum of the biases of the difference and the level estimator (Baltagi, 2005; Hayakawa, 2007).

Due to the consistency and efficiency of the Blundell-Bond system GMM estimator, the study adopted this model to estimate the effect of corporate tax on greenfield investment. In estimating this model, the procedure assumes that there is no autocorrelation in the idiosyncratic error term and that the instruments used in

the model are valid, therefore the study tests for autocorrelation using the Arellano-Bond autocorrelation test and the validity of the instruments using the Hansen J test of over-identification restrictions. The study used robust standard errors to control for all kinds of heteroscedasticity in the model.

Testing for autocorrelation

The autocorrelation test is a diagnostic test developed by Arellano and Bond (1991) which is based on the assumption of serial independence in the idiosyncratic error term ν_{it} of the difference equation. This test renders some lags invalid as instruments. For instance, if the idiosyncratic error term ν_{it} is serially correlated of order 1, then the difference error term $\Delta\varepsilon_{it} = \nu_{it} - \nu_{i,t-1}$ becomes potentially invalid when the second lag of the dependent variable $y_{i,t-2}$ is endogenous to $\nu_{i,t-1}$.

The Arellano-Bond test is applied to the difference in the error term and is valid for any GMM estimation on panel data (Roodman, 2006). The null hypothesis for the autocorrelation test indicates no autocorrelation. If a significant result is achieved, then we reject the null hypothesis and conclude that there is a presence of autocorrelation and this would render the endogenous variable to be an inappropriate instrument for the model. To check for the first order serial correlation in levels, we determine the second order correlation in differences. Therefore, the study presents the autocorrelation test for order (1) and order (2) in differences.

Hansen J test of over-identification

An important assumption of the validity of the GMM estimator is that the instruments used in the model are exogenous. When the model is exactly identified, the estimator produces a unique estimate $\hat{\beta}$ so that $E[z\varepsilon] = 0$ is satisfied even if there is a possible correlation between the instrument and the error term $E[z\varepsilon] \neq 0$. Therefore, it is impossible for the instruments used in the model to be invalid. However, if the model is over-identified, the model produces multiple solutions and the joint validity of moment conditions $E[z\varepsilon] = 0$ falls naturally out of the GMM framework, thus it is distributed around zero.

A test of the joint validity of the moment conditions (underlying restrictions) is conducted with a null hypothesis that there is a joint validity of the instrument in the model and that the instruments are exogenous. When GMM is applied, the estimator tries to drive the moment conditions to zero and it test whether the instruments are not correlated with the error term (Roodman, 2006). If a significant result is achieved, then we reject the null hypothesis and concludes that the joint validity of the instrument is invalid. Therefore, for the model estimated, an acceptance of the null hypothesis was required. The study used the Hansen J test to test for the validity of the instruments used in the model.

Chapter Summary

In this chapter, the study presented the theoretical framework that was adopted as well as the empirical model estimated. Also, the measures and sources of the variables used in the empirical model was also presented. The study used a

sample of 19 African countries and this was based on data availability. The estimation procedures employed in the study included a unit root test to determine the stationarity of the time series properties using the Fisher's ADF and PP test. Again, the standard panel estimators (fixed and random effect estimators) were discussed in the estimation of the effect of corporate income tax rate on greenfield investment and the Hausman specification test was used to select the preferred estimator. Discussions were also done on the system GMM estimator which corrects for a possible endogeneity in the model. Post-estimation tests of autocorrelation and Hansen J test of over-identification test were also specified. The next chapter will present and discuss the findings of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The objective of this chapter is to present and discuss the results of the effect of corporate income tax rate on greenfield investment for the selected 19 African countries. In line with the objectives of the study, a trend analysis of corporate income tax and greenfield investment will be presented. Also, the results from the descriptive statistics of the relevant variables as well as the static panel estimators and the Blundell-Bond system GMM estimates will also be presented. Robust standard errors were used in the regression for the system GMM estimator. Post-estimation results such as the autocorrelation test to test the autocorrelation in the difference of the stochastic error term and the Hansen J test of over-identification restrictions to test for the validity of the instruments used in the model will also be presented. These results are discussed in relation to the objectives of the study.

Trend Analysis of Corporate Income Tax Rate and Greenfield Investment

Over the past 10 years, the interest in FDI inflows has enabled countries, especially African countries to use policies such as corporate income tax to attract greenfield investment. These countries reduce their corporate income tax rate in order to attract FDI and reap the benefits associated. As a result of that, there has been a decline in the corporate income tax rate within Africa. Since 2007, the trend of the average corporate income tax rate in Africa declined from 30.3% to about

28.7% in 2016. Despite the decline in the corporate income tax rate, the average inflow of greenfield investment as a percentage of GDP for the 19 selected African countries has been fluctuating over the past years from 2007 to 2016.

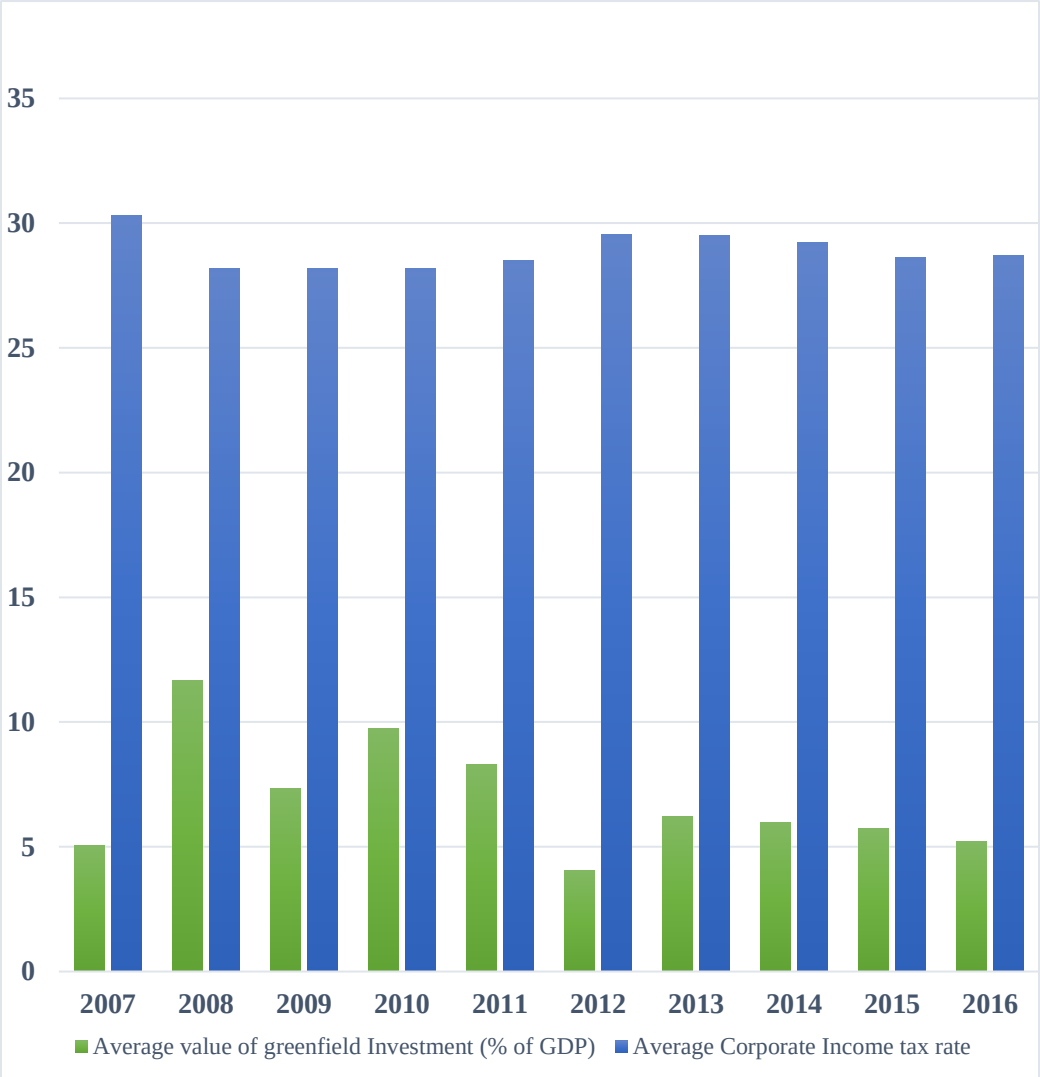


Figure 5: Trend of average corporate income tax rate and greenfield FDI (% of GDP) for 19 selected African countries, 2007 – 2016.

Source: Author's Construct

Between 2007 and 2008, the average corporate income tax rate declined from 30.3% to 28.1% whereas the average inflow of greenfield investment as a percentage of GDP increased from about 5% to 11.7% (Figure 5). The increase in the flow of greenfield investment was followed by a sharp decline between the period 2008 and 2009. This was due to the global financial crisis. A recovery from the financial crisis during late 2009 to 2010 caused an improvement in the flow of greenfield investment, thereby, rising from 7.4% to 9.7%. Despite the decline in the inflow of greenfield investment, the corporate income tax rate remained stable from 2008 to 2010 at a rate of 28%.

Also, the average value of greenfield investment inflows declined from 9.5% to 4% between 2010 to 2012, whereas the average corporate income tax rate increased from 28% to about 29.5%. Between 2013 to 2015, the average inflow of greenfield investment was constant at about 6%, and the corporate income tax rate declined from 29.5% to 28.7%. From the analysis, the trend of the average value greenfield investment inflow for the 19 selected African countries shows a fluctuating movement over the past decade whereas the average corporate income tax rate shows a declining trend. Both Appendix C and D show the trend of average greenfield investment inflows and average corporate income tax rate respectively.

Descriptive Statistics

The summary statistics of all the variables that were used in the study for the 19 selected African countries over the 10-year period is presented in Table 3.

Table 3- *Summary Statistics of the Variables*

Variables	Obs	Mean	SD	Min	Max
$lngfdi$	188	1.11001	1.42892	-3.98340	4.22281
cit	190	28.89474	5.78352	15	38.5
inf	190	7.71900	6.84520	-2.24802	37.39336
$open$	186	73.47301	26.78144	19.10081	127.545
$lnpp$	190	0.475461	0.97072	5.70643	9.27951
$lnmsize$	190	-2.87551	0.97141	-4.67434	-1.10126
cr	190	-0.39263	0.91306	-2.66527	1.200234
nr	171	10.75285	10.60645	0.00114	58.05639
$infras$	190	4.18780	6.91552	0.06311	31.50345
$lngfdi_{-1}$	169	1.21421	1.33791	-2.49312	4.22281

Note: Obs, SD, Min and Max represent Observations, Standard Deviation, Minimum and Maximum respectively. $lngfdi_{-1}$ is a one period lag of the log of greenfield FDI. ln represent log.

Source: Author's construct

The average value of greenfield investment (lngfdi) for the selected 19 African countries was 1.11% whiles the corporate income tax rate (cit) averaged 28.89%. The mean of inflation and trade openness was 7.71% and 73.47% respectively. Market size (lnmsize) as measured by the log of the total population as a percentage of GDP averaged -2.88% while the mean of the purchasing power (lnpp) which was measured by the log of GDP per capita was 0.4. Country risk and natural resources were also averaged -0.39 and 10.75% respectively.

The average quality of infrastructure for the 19 selected African countries over the 10-year period was 4.19 per 100 population. Agglomeration effect that is captured by the lag of greenfield investment also had a mean of 1.21%. The number of observations for the variable was 190, with the exception of greenfield FDI and trade openness, which were 188 and 186 respectively.

Unit Roots Tests

Before the study employed system GMM, a unit root test was conducted in order to investigate the stationarity properties of the time dimension of the data. Various literature such as Choi (2001), Levin et al. (2002), Pesaran and Smith (1995) suggested the check of unit roots in panel data. In this study, nineteen (19) African countries were used as individual units over a ten-year period from 2007 to 2016.

Fisher's Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests were applied to all the variables at levels and in first difference in order to check

the order of integration of these variables. The Fisher test is simple and straightforward to use and also better than the Levin-Lin (LL) and Im-Pesaran-Shin (IPS) test (Maddala & Wu, 1999). It enables testing even when the data is unbalanced.

The use of other stationarity tests such as the Levin-Lin-Chu, Harris-Tzavalis, and Hadri LM stationarity test requires a strongly balanced panel. Due to missing observations in some of the variables, these tests were not applicable. Also, the lm-Pesaran-Shin test was also not applicable due to the required number of observations needed and the requirement of a balanced panel.

The study presents both the ADF and PP results and used the P-values for making the unit root decision. In Appendix E and F, all the variables were stationary at level for both the ADF and the PP tests except trade openness which was stationary at first difference. Using the ADF, the inverse chi-square statistics are reported as the ADF statistics with its associated p-values. The null hypothesis for the test is that all panel contain unit roots. Since the p-value is less than the critical value of 0.05, we reject the null and accept the alternative hypothesis, which states that at least one panel is stationary.

Effect of Corporate Tax Rate on Greenfield Investment

In this section, the findings of the study were presented. For the static panel estimation, the fixed and random effects estimation results are presented in Table 4 and the system GMM by Blundell-Bond on the effect of corporate income tax rate on greenfield investment is also presented in Table 5. For the fixed effect estimator,

the p-value of the F statistics which tests the overall significance of the model was significant at 1% (Table 4). Also, for the random effect (Table 4) and System GMM estimators (Table 5), the p-value of the chi-square test shows significant results of 0.007 and 0.000 respectively. This indicates that the observed distribution of data in the model fits the expected distribution if the variables are independent.

The success of greenfield FDI in a country depends on the previous year's success which enables multinationals to invest in a particular country. Greenfield investment was lagged and included in the model as a regressor. This causes the problem of endogeneity in the model and this renders the static panel (fixed and random) estimator inconsistent. The Blundell-Bond estimator corrects the problem of endogeneity in the model by using the lags of the levels and difference as instruments and also test the validity of the instruments that were used in the model.

In selecting the consistent and efficient estimator between the fixed and random effect model for this study, the Hausman specification test was conducted (Appendix G). The findings of the Hausman test indicated a rejection of the null hypothesis with a p-value of 0.000, therefore, the fixed effects estimator was preferred for analysis. Inasmuch as the standard estimators are biased and inconsistent due to the endogeneity problem, the author presents them to show a comparison between the static panel and the dynamic panel to show the efficiency of the system GMM estimator.

Table 4-*Static Panel Regression of Corporate Income Tax Rate Effect on Greenfield FDI*

Dependent variable = Greenfield investment (lngfdi)		
Explanatory variable	Fixed	Random
Corporate income tax (cit)	0.1034 (0.0632)	0.0115 (0.0223)
Natural resources (nr)	0.0316 (0.0245)	0.0045 (0.0122)
Infrastructure $(infras)$	0.0048 (0.1326)	-0.0045 (0.0239)
Purchasing power $(lnpp)$	-14.8371** (7.1163)	-1.4298 (3.3398)
Trade openness $(open)$	-0.0113 (0.0123)	0.0153*** (0.0050)
Inflation (inf)	-0.0372 (0.0271)	-0.0390** (0.0154)
Country risk (cr)	0.0023 (0.0029)	0.0045 (0.0029)
Market size $(lnmsize)$	-13.1770* (7.1974)	-0.8070 (3.3148)
Agglomeration $(lngfdi_{-1})$	0.0002 (0.0926)	0.2448*** (0.0821)
Intercept	72.1452** (31.5637)	8.1268 (15.1041)
R^2	0.1266	
F	1.966	
chi2		70.525
P	0.007	0.000
N	150	150

Standard errors in parentheses. * p < 0.10, ** p < 0.05, and *** p < 0.01 represents 10%, 5% and 1% level of significance respectively. ln represent log.

Source: Authors' construct

In line with the objectives of the study as well as the hypothesis of the study, the results from the static panel estimators (Table 4) and dynamic estimator (Table 5) showed differences in terms of significance and relationship of the effect of corporate income tax rate on greenfield investment. Based on literature and the aprior expectations, a decrease in the corporate income tax rate will attract greenfield FDI inflows. This is due to the benefits that the country is likely to receive. Therefore, there exists a negative relationship between the corporate income tax rate and greenfield investment.

In estimating the effect of corporate income tax rate on greenfield investment, the fixed effect estimator showed a positive and insignificant relationship between corporate income tax rate and the inflow of greenfield investment into the countries. This was inconsistent with the expectation of the study even though there is a possibility of a positive relationship between the tax rate and inflow of FDI. In that, the increase in the tax rate can increase the tax revenue of the countries and that will enable the countries to develop the other economic sectors that would attract FDI inflow into the countries.

However, an increase in the tax rate deters foreign investors from investing in a particular country within the region, as most firms and multinationals would seek to invest in a country with a low tax rate in order to reduce its cost of production to make enough income. The country with the higher tax tends to lose out in the flow of FDI and is unable to earn enough inflow of investment and thus, it is likely to rely on other sources of inflow such as loans and grants.

For the system GMM estimation, the result (Table 5) on the effect of corporate income tax rate showed a negative and significance relationship on greenfield investment. This indicates that at a 1% significant level, a reduction in the corporate income tax rate of a country will attract the inflow of greenfield investment into that country by 7.1%. This result is in line with various studies such as Babatunde and Adepuja (2012) and Obeng (2014) that found a negative and significant relationship between corporate income tax rate and FDI.

Determinants of greenfield FDI

In as much as the reduction of the corporate income tax rate increases the inflow of greenfield investment, its success also depends on the openness of the country. When countries open their doors to international trade, it promotes the inflows and outflows of both capital and labour. The restriction of a country to open its doors to other countries for the purpose of trade limits the flow of capital as well as production. One of the key factors for the inflows of foreign direct investment is the openness of countries to international trade. If countries reduce their corporate income tax rate and yet restrict the flow of greenfield investment into the country, the inflow of greenfield investment into the country will be low or reduced, and thus may seek for other sources of finance such as loans and grants.

For the fixed effect estimator, the result of trade openness in Table 4 showed a negative and insignificant result. Also, the system GMM showed a positive and insignificant relationship between trade openness and inflow of greenfield investment. Most African trade reforms depend on the balance of payments of the

countries. When the terms of trade are favourable, the authorities tend to liberalize trade, thereby lessening or removing trade restrictions in order to enable a foreign investor to invest in the countries. This makes the foreign investors to increase their investments when there is trade liberalization. Studies by Asiedu (2002) and Anyawu (2011) also found a positive relationship between trade openness and FDI inflows.

The macroeconomic stability of every country is an important factor which determines the flow of greenfield investment in a country. Using the rate of inflation to measure the macroeconomic stability of the countries in the study, a high inflation rate would discourage multinationals and foreign firms to invest in such a country, therefore the rate of inflation has a negative relationship with greenfield investment.

As seen from Table 4, the coefficient for inflation for the fixed effect estimator was negative and insignificant. The system GMM estimator indicates a negative and significant relationship with greenfield investment, thus, when inflation rate increases, it will lead to a fall in the inflow of greenfield investment by 5.4% at a significance level of 10%. A high inflation signifies macroeconomic instability and this affects the real purchasing power of the residents, thereby increasing the cost of living and reducing the spending rate.

Table 5-*System GMM Regression of Corporate Income Tax Rate Effect on Greenfield FDI*

Dependent Variable = Greenfield investment (lngfdi)				
Explanatory variables	Coef	Robust Std. Errors	Z	p-value
Corporate income tax (cit)	- 0.071***	0.027	- 2.62	0.009
Natural resources (nr)	- 0.010	0.033	- 0.31	0.758
Infrastructure $(infras)$	- 0.033	0.159	- 0.21	0.836
Purchasing power $(lnpp)$	1.299***	0.443	2.93	0.003
Trade openness $(open)$	0.015	0.016	0.96	0.338
Inflation (inf)	- 0.054*	0.032	- 1.67	0.096
Country risk (cr)	0.004**	0.002	2.00	0.045
Market size $(lnmsize)$	2.245**	0.982	2.29	0.022
Agglomeration $(lngfdi_{-1})$	-0.273**	0.042	- 6.45	0.000
Wald chi2(9) = 136.46				
Prob > chi2 = 0.000				
Number of obs = 150				
Number of instruments = 19				
Number of cross sectional unit = 19				
Arellano-Bond test for AR (1) in first differences: z = -2.99 Pr > z = 0.000				
Arellano-Bond test for AR (2) in first differences: z = 0.01 Pr > z = 0.994				
Hansen test of overid. restrictions: chi2(10) = 15.78 Prob > chi2 = 0.106				

* $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ represents 10%, 5% and 1% level of significance respectively. Standard errors are robust. ln represent log.

Source: Author's construct.

The inflation results of the system GMM is consistent with the results of the study by Okafor (2014) who studied the determinants of FDI inflows to Africa and also Obeng (2014) who studied the effect of corporate tax on sector-specific FDI in Ghana. Therefore, when an economy targets to attract the establishment of new investment by a foreign firm by reducing its tax base, it has to control its inflation rate in the country since it influences investors location decisions.

Also, the purchasing power (measured by the log of GDP per capita) of every country is one of the factors that enable multinationals to invest. If the citizens of a country have a positive purchasing power, most multinationals would be willing to situate in such a country and this leads to higher growth which attracts FDI into the region. With regard to the fixed effect estimator, the results showed a negative relationship between purchasing power and the inflow of greenfield investment. This was contradictory and inconsistent with the expectations of the study. A reason for the contradiction could be as a result of a inflation, since a high inflation increases consumer prices over time and reduces the purchasing power of consumers. In spite of this, the result from the system GMM showed a positive relationship between purchasing power and the inflow of greenfield investment. At a 5% significance level, a percentage change in the GDP per capita attracts the inflow of greenfield FDI by 1.29. This is consistent with the study by Mandinga (2015) in his study of the effect of corporate income tax rate on FDI in Small Island Developing States.

A large market represents a greater opportunity for multinationals to reap good profits out of the investments that they make. In the location decision of

multinationals, they may be willing to situate in a country with a large market. In this study we used the log of the total population as a percentage of GDP as the measure of the size of the market, thus a higher population indicates a larger market size. The market size of a country is positively related to the inflow of greenfield investment into a country.

From the analysis of the fixed estimator, market size was negatively related with the inflow of greenfield investment. The study found out that the market size was significant for both the fixed effect and system GMM estimator. This negative relationship between market size and greenfield investment for the fixed effect was contradictory and inconsistent with empirical literature and theory because the market seeking motive of the OLI paradigm emphasizes on FDI being driven by large markets. The possible reasons for the contradictory result of the market size could be as a result of insecurity and conflict, government policies that affect international trade and also quality of infrastructure in the country. Despite the results from the static regression, the results of the system GMM showed otherwise.

The market size results for the system GMM (Table 5) showed that at a significance level of 5%, a percentage increase in the size of the market (total population) in the selected African countries would attract the inflow of greenfield FDI into these countries by 2.245. The finding for the market size in this study is in line with Okafor (2014) who also found a significant and positive relationship between the size of the market and FDI inflows into a country.

Natural resources and infrastructure quality were insignificant for all the three estimators. The results of the system GMM estimator showed that both natural

resource and infrastructure quality were negatively related with the inflow of greenfield FDI. The negative relationship between infrastructure quality and inflow of greenfield investment can be related to poor infrastructure quality and regulatory framework in the selected African countries.

Most African countries privatize their state-owned enterprises in the infrastructural sector and this creates private industries in the region. This increases the cost of infrastructure and deters MNCs from investing in a foreign country, therefore, this causes the inflow of greenfield FDI to decline (Munongo, 2015). Also, the availability of certain important and basic infrastructure such as electricity, water and good transportation systems are inadequate in most African countries (Asiedu, 2002). A study by Collier and Gunning (1999) showed that about 78% of firms in Nigeria use generators because of the unreliability of electricity in the country. The negative relationship between infrastructure quality and inflow of greenfield investment supports the findings of Asiedu (2002), Munongo (2015), Deverajan, Swarop and Zou (1996).

With regards to natural resources, the negative relationship with the inflow of greenfield investment might be due to the reason that, when natural resources boom, the local currency appreciates and this makes a country's exports less competitive on the world market because the local currency becomes expensive, and this crowds out investment in non-natural resources trade sectors. When the crowding out is greater, it may lead to a decline in the flow of FDI (Asiedu, 2013).

Also, natural resources such as oil usually experience booms and bust and this increase the volatility of exchange rate which then causes macroeconomic

instability and reduces the flow of FDI (Sachs & Warner, 1995). The negative relationship between natural resources and greenfield investment inflows into the African countries in this study conforms to the study by Asiedu (2013) and Munongo (2015) who also had negative relationship between natural resources and FDI inflows.

Another key factor which will attract multinationals to invest in a country is the riskiness of the country. When a country has a high risk, most firms would not locate there, in order to avoid any form of losses or government takeovers. Foreign investors prefer to locate their subsidiaries in a country where uncertainties of the markets are low (Srinivasan, 2002). Thus, a country with a sound and stable risk would attract greenfield investment.

In the estimation results, the fixed effect showed a positive and insignificant relationship between country risk and greenfield investment whiles the system GMM estimator showed a positive and significant relationship, indicating that a stable political and violence-free country would increase the inflow of greenfield FDI by 0.4%. The positive relationship between country risk and greenfield FDI inflows of this study was consistent with the finding of Mandinga (2015).

The importance of agglomeration effect of greenfield investment enables firms to situate in a host country due to the previous success of the establishment, thus a positive relationship between agglomeration effect and greenfield FDI is expected. Interestingly, the findings from the system GMM regression depicts a negative and significant relationship between agglomeration effect and the inflows

of greenfield investment. This was contrary to the expectations of the study but a possible negative effect can occur in the presence of congestion, pollution, bottlenecks in public goods such as poor infrastructure, corruption and fierce competition between firms for the inflow of greenfield investment.

A study on the effect of agglomeration and competition on the manufacturing sector in Ethiopia found a negative and significant relationship between the effect of agglomeration and competition of firms on the price level, thus, the new entry of firms in the manufacturing sector due to previous success of entry leads to higher competitive pressure in the host market (Bigsten, Gebreeyesus, Siba & Söderbom, 2011).

Also, Naudé and Krugell (2007) found a negative relationship between agglomeration effect and FDI in their study of geography and institutions as a determinant of FDI in Africa using one-step Arellano-Bond GMM estimator. The results of this study conform to the findings from Bigsten et al. (2011) and Naudé and Krugell (2007). Therefore, the attractiveness of greenfield investment inflows into a host country due to previous firm's performance will decline by .027%. This may be due to higher competition and bottleneck in the public sector such as poor infrastructure and so forth. Thus, firms that are unable to survive, exit and the inflow of greenfield investment decreases.

Post-estimation test for the system GMM regression

In testing for the validity of the instruments used in the system GMM estimator, the Hansen J test of overidentifying restrictions had a p-value of 0.106.

This indicates that the test accepts the null hypothesis which states that the instruments are exogenous and valid. The result of the Hansen J test was presented in table 5. Also, the Arellano-Bond autocorrelation test for the first difference indicates that there is autocorrelation in the first lag and no autocorrelation in the second lag.

Hence, the results confirm the absence of autocorrelation and the validity of the instruments. These tests lose power when the number of instruments used is larger than the cross-sectional units, especially when the ratio of the sample size to the number of instruments is less than 1 (Roodman, 2007). In this study, the number of instruments used was 19 and the sample size was also 19. This gives a ratio of 1, which indicate that this test has strong power. Also, the number of instruments count in the study was reduced by limiting the number of lagged levels to be included as instruments (Roodman, 2007; Asiedu, 2013), thus, the study used only the first lag of the dependent variable as an instrument.

Due to the sample of countries in the study, it is likely that there would be a problem of heteroscedasticity in the model used in this study due to the difference in culture, geography and economy of the countries. Therefore, the study used robust standard errors to correct for possible heteroscedasticity in table 5.

Chapter Summary

In this chapter, the findings of the study were presented and this was consistent with the objectives of the study. The first objective was to present a trend analysis of corporate income tax rate and greenfield investment. The trend for the

19 selected African countries showed that corporate income tax rate has been declining over the past decade while the inflow of greenfield investment has been fluctuating. Also, the second objective estimated the effect of corporate income tax rate on greenfield investment. Using the fixed and random effect, the Hausman specification test indicated that the fixed effect was preferred in analysing the effect of corporate income tax rate on greenfield investment. The findings of the fixed effect found the effect of corporate income tax rate on greenfield investment to be insignificant.

Despite the results of the fixed effect, the results of the system GMM showed that corporate income tax rate attracts the inflow of greenfield investment in the 19 selected African countries. In addition, the post-estimation results for the system GMM showed that was no autocorrelation in the model and the instruments used to correct the endogeneity in the model was valid and exogenous. Again, factors such as inflation, market size, purchasing power and country risk were found to be key in attracting greenfield investment inflows.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter summarises the entire study and also presents the conclusions and recommendations based on key findings of the study. In addition, this chapter presents the suggestions that are needed for further research.

Summary

In estimating the effect of corporate income tax rate on greenfield investment for selected African countries between 2007-2016, the study aimed at achieving three (3) objectives. The first objective was to determine the trend of corporate income tax rate and greenfield investment. The second objective was to determine the effect of corporate income tax rate on greenfield investment whiles the third objective was to examine the determinants of greenfield investment in the selected African countries.

For the first objective, the trend analysis of the effect of the corporate income tax rate shows a declining movement, whiles the trend of the greenfield investment shows a fluctuating movement for the 19 selected African countries over the 10-year period. For the second objective, the study used the fixed and random effect estimator to examine the effect of corporate income tax rate on greenfield investment inflows. In deciding the preferred estimator between the fixed and random effect, the Hausman specification test indicates that the fixed effect estimator was the preferred estimator for the study.

However, the presence of agglomeration effects (the lag of greenfield investment as an explanatory variable) causes the problem of endogeneity. The study then adopted the Blundell-Bond system GMM estimation technique to address the endogeneity problem in the corporate tax rate-greenfield investment model in this study.

The findings of the study are presented as follows:

- The fixed effect estimators revealed a positive and insignificant effect of corporate income tax rate on greenfield investment. On the contrary, the system GMM estimator revealed a negative and significant effect of corporate income tax rate on greenfield investment inflows as expected by the study. This shows that a decrease in the corporate income tax rate would attract greenfield investment inflows into the selected African countries. The results for the system GMM estimator was consistent with the expectation of the study.
- Also, the study revealed that the fixed effect results for market size and purchasing power had a negative and significant relationship with greenfield investment. This was contrary to the expectations of the study. Again, natural resources, infrastructure quality, trade openness, inflation, country risk and agglomeration effects were insignificant.
- For the system GMM estimator, the results for purchasing power, country risk and market size showed a positive and significant relationship with greenfield investment, and inflation showed a negative and significant relationship with greenfield investment

- Interestingly, agglomeration effect showed a significant and negative relationship with greenfield investment.

Conclusions

The following conclusions were made based on the findings from the study. For the first objective that sought to analyse the trend of corporate income tax rate and greenfield investment, the study concludes that there is a declining trend in the corporate income tax rate and a fluctuating trend in the inflows of greenfield investment for the 19 selected African countries. This was based on the trend analysis of the study.

In addition, the findings of the second objective which aimed to estimate the effect of corporate income tax rate on greenfield investment inflows showed that corporate income tax rate is a driver of greenfield investment inflows to Africa and that a favourable tax policy (reduction of the tax rate by the host country) is a key factor that would reduce the tax burden of multinationals and attract greenfield investment inflows into the selected African countries.

Finally, for the third objective, the empirical evidence of the study shows that purchasing power, market size, country risk, inflation and agglomeration effect serves as important determinants of greenfield investment inflows. The findings of the study suggest that market size, country risk and purchasing power are critical in attracting greenfield investment inflows into Africa. Also, inflation and a negative agglomeration effect reduce the inflows of greenfield FDI.

Policy Recommendations

Considering the findings and conclusions of this study, the following recommendations are presented:

- Since taxes are potential stimulus for the attraction of greenfield investment inflows, it is recommended that the Revenue Agencies and the Finance Ministry of the African countries should reduce the corporate income tax rate in order to attract the needed FDI inflows to increase the growth of the economy.
- Inasmuch as taxes are important in attracting greenfield investment inflow, it is not the only determinant of greenfield investment. As such, the Ministry of Roads and Transport, Ministry of Energy and the Ministry of Communication in the African region should improve on their infrastructure quality by providing good transport systems and road networks, resolve low power outrage and communication sectors to improve the quality of access for all its citizens.
- Also, the Central banks should institute monetary policies that would help maintain a low inflation rate by introducing a period of higher interest rates to reduce consumer and investment spending. African countries that have instituted inflation targeting policy could also focus on that in order to reduce the inflation rate and maintain a good macroeconomic stability.
- When the activities of the country impose risk to foreign investors, it deters them from investing in the country as they are uncertain about the profits to be realized, therefore, it is recommended that the government or authorities

of the African countries must practice good governance in order to promote a sound, peaceful, violence-free and friendly environment that would minimize the exposure to risk and encourage investors to locate their firms in the African countries.

Direction for Further Studies

Taking into consideration the findings, conclusion and limitations of this study, the following suggestions were made for future studies:

- The study used only one disaggregated FDI inflow, that is, greenfield investment. Therefore, future studies can examine the effect of corporate income tax rate on all disaggregated components of FDI, that is, greenfield FDI and cross-border mergers and acquisition. This will help the government of the host nation to know which FDI components to attract using the corporate income tax rate.
- Researchers who intend to conduct similar studies can improve the number of observations used in this study by including more African countries in the analysis.
- Further studies on corporate income tax rate and FDI can analyse the study per regional zones such as West African Monetary Zone (WAMZ), Common Market for Eastern and Southern Africa (COMESA) and so forth.

REFERENCES

Agarwal, J. P. (1980). Determinants of foreign direct investment: A survey. *Weltwirtschaftliches Archiv*, *116*(4), 739-773.

Agostini, C. A., & Tulayasethien, S. (2003). *Tax Effects on Investment Location: Evidence from Foreign Direct Investment in the US States* (Working Paper No. 2003-01). Michigan, United States: University of Michigan Economics Department. Retrieved from http://dx.doi.org/10.2139/ssrn.387160.

Ahiabor, G., & Amoah, A. (2013). The Effects of Corporate Taxes on the level of Investment in Ghana. *Development Country Studies*, *3*(1), 57-67.

Aizenman, J., & Marion, N. (2004). The merits of horizontal versus vertical FDI in the presence of uncertainty. *Journal of International Economics*, *62*(1), 125-148.

Ali, H., Ahmad, S., & Muhamad, R. (2010). Determinants of foreign direct investment locations in Malaysia. *International Review of Business Research Papers*, *6*(4), 101-117.

Aliber, R. Z. (1970). A theory of direct foreign investment. *The International Corporation,* 12-36.

Altomonte, C. & Pennings, E. (2003). *Oligopolistic reaction to foreign investment in discrete choice panel data models* (IGIER Working Paper No. 243). Milan, Italy: Innocenzo Gasparini Institute for Economic Research.

Anyadike, N. O. (2012). Poor infrastructure: The hindrance to foreign investment and economic development in Nigeria. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(4), 1-15.

Anyanwu, J. C. (2012). Why Does Foreign Direct Investment Go Where It Goes?: New Evidence from African Countries. *Annals of Economics & Finance, 13*(2).

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29-51.

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different?. *World Development, 30*(1), 107-119.

Asiedu, E. (2004). The determinants of employment of affiliates of US multinational enterprises in Africa. *Development Policy Review, 22*(4), 371-379.

Asiedu, E. (2013). Foreign direct investment, natural resources and institutions. *International Growth Centre, Working Paper Series*.

Babatunde, S. A., & Adepeju, S. (2012). The impact of tax incentives on foreign direct investment in the oil and gas sector in Nigeria. *IOSR Journal of Business and Management, 6*(1), 1-15.

Baltagi, B. H. (2005). *Econometric analysis of panel data*. (3rd ed.). Chichester; Hoboken, NJ: J. Wiley & Sons.

Barbieri, L. (2006). Panel unit root tests: a review. *Serie Rossa: Economia-UCSC Piacenza*, (43), 1-53.

Bartik, T. J. (1985). Business location decisions in the United States: Estimates of the effects of unionization, taxes, and other characteristics of states. *Journal of Business & Economic Statistics*, *3*(1), 14-22.

Becker, J., Fuest, C., & Hemmelgarn, T. (2006). *Corporate tax reform and foreign direct investment in Germany-evidence from firm-level data* (CESifo Working Paper No. 1722). Munich, Germany: Center for Economic Studies and Ifo Institute.

Bellak, C., & Leibrecht, M. (2009). Do low corporate income tax rates attract FDI? –Evidence from Central-and East European countries. *Applied Economics*, *41*(21), 2691-2703.

Bello, J. (2005). *Fiscal policy and the growth of foreign direct investment in Sub-Saharan Africa (selected countries: Ghana, Kenya, Nigeria, and South Africa)* (Doctoral dissertation, Auburn University). Retrieved from http://etd.auburn.edu/bitstream/handle/10415/229/BELLO_JOSHUA_7.pdf?sequence=1&isAllowed=y.

Bénassy-Quéré, A., Fontagné, L., & Lahrèche-Révil, A. (2005). How does FDI react to corporate taxation?. *International Tax and Public Finance*, *12*(5), 583-603.

Bigsten, A., Gebreeyesus, M., Siba, E., & Söderbom, M. (2011). *The Effects of Agglomeration and Competition on Prices and Productivity: Evidence for Ethiopia's Manufacturing Sector'* (Working Paper WPS/2011). Oxford, UK: Center for the Study of African Economies.

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

Bokpin, G. A., Mensah, L., & Asamoah, M. E. (2015). Foreign direct investment and natural resources in Africa. *Journal of Economic Studies*, *42*(4), 608-621.

Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese Economic Journal*, *1*(2), 141-162.

Buckley, P. J. (1988). The limits of explanation: Testing the internalization theory of the multinational enterprise. *Journal of International Business Studies*, *19*(2), 181-193.

Buckley, P. J., & Casson, M. (1976). *The future of the multinational enterprise*. London, UK: Macmillan.

Buckley, P. J., Devinney, T. M., & Louviere, J. J. (2007). Do managers behave the way theory suggests? A choice-theoretic examination of foreign direct investment location decision making. *Journal of International Business Studies*, *38*(7), 1069-1094.

Byun, H. S., Lee, H. H., & Park, C. Y. (2012). Assessing factors affecting M&As versus Greenfield FDI in emerging countries (ADB Economics Working Paper No. 293). Manila, Philippines: Asian Development Bank (ADB). Retrieved from http://hdl.handle.net/11540/1267

Cassou, S. P. (1997). The link between tax rates and foreign direct investment. *Applied Economics*, *29*(10), 1295-1301.

Caves, R. E. (1971). International corporations: The industrial economics of foreign investment. *Economica*, *38*(149), 1-27.

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance, 20*(2), 249-272.

Coase, R. H. (1937). The Nature of the firm. *Economica*, *4*(16), 386-405.

Collier, P., & Gunning, J. W. (1999). Explaining African economic performance. *Journal of Economic Literature*, *37*(1), 64-111.

De Mooij, R. A., & Ederven, S. (2003). Taxation and foreign direct investment: a synthesis of empirical research. *International Tax and Public Finance, 10*(6), 673-693.

Demekas, D. G., Horváth, B., Ribakova, E., & Wu, Y. (2007). Foreign direct investment in European transition economies-The role of policies. *Journal of Comparative Economics*, *35*(2), 369-386.

Desai, M. A., Foley, C. F., & Hines Jr, J. R. (2004). Foreign direct investment in a world of multiple taxes. *Journal of Public Economics*, *88*(12), 2727-2744.

Devarajan, S., Swaroop, V., & Zou, H. F. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, *37*(2), 313-344.

Devereux, M. P., & Freeman, H. (1995). The impact of tax on foreign direct investment: empirical evidence and the implications for tax integration schemes. *International Tax and Public Finance, 2*(1), 85-106.

Devereux, M., & Griffith, R. (1998). *The taxation of discrete investment choices* (IFS Working Paper No. W98/16). London, UK: Institute for Fiscal Studies. Retrieved from http://dx.doi.org/10.1920/wp.ifs.1998.9816

Djokoto, J. G., & Dzeha, G. C. (2012). Determinants and Effects of Foreign Direct Investment in Ghana–Review of Literature. *Developing Country Studies, 2*(11/12), 25-35.

Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search of an eclectic approach. In B. Ohlin, P. O. Hesselborn & P. J. Wijkman (Eds.), *The International Allocation of Economic Activity*. (pp. 395-418). London, UK: Palgrave Macmillan.

Dunning, J. H. (1979). Explaining changing patterns of international production: In defence of the eclectic theory. *Oxford Bulletin of Economics and Statistics*, *41*(4), 269-295.

Dunning, J. H. (1980). Toward an eclectic theory of international production: Some empirical tests. *Journal of International Business Studies*, *11*(1), 9-31.

Dunning, J. H. (1982). Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Developmental Approach. In J. Black & J. H. Dunning (Eds.), *International Capital Movements*. (pp. 84-121). London, UK: Palgrave Macmillan.

Dunning, J. H. (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies*, *19*(1), 1-31.

Dunning, J. H. (1993). *The Globalization of Business: The Challenge of the 1990s*. London, UK: Routledge.

Dunning, J. H. (2001). The eclectic (OLI) paradigm of international production: past, present and future. *International Journal of the Economics of Business, 8*(2), 173-190.

Dunning, J. H., & Narula, R. (1996). The investment development path revisited. *Foreign direct investment and governments: Catalysts for economic restructuring*, 1-41.

Faeth, I. (2009). Determinants of foreign direct investment–a tale of nine theoretical models. *Journal of Economic Surveys, 23*(1), 165-196.

Feld, L. P., & Heckemeyer, J. H. (2009). *FDI and Taxation: A Meta-Study* (ZEW Working Paper No. 08-128). Mannheim, Germany: Zentrum für Europäische Wirtschaftsforschung.

Franco, C., Rentocchini, F., & Marzetti, G. V. (2008). *Why do firms invest abroad? An analysis of the motives underlying Foreign Direct Investments* (Working Paper No. 0817). Trento, Italy: Department of Economics, University of Trento.

Froot, K. A., & Stein, J. C. (1991). Exchange rates and foreign direct investment: an imperfect capital markets approach. *The Quarterly Journal of Economics, 106*(4), 1191-1217.

Griffiths, W. E., & Webster, E. M. (2004). *The determinants of research and development and intellectual property usage among Australian companies, 1989 to 2002* (Melbourne Institute Working Paper No. 27/04). Melbourne, Australia: Melbourne Institute of Applied Economic and Social Research.

Gwynne, R. N. (1979). Oligopolistic reaction. *Area*, 315-319.

Hakro, A. N., & Omezzine, A. M. (2011). Governance infrastructure and FDI flows in MENA region countries. *Journal of Middle Eastern Finance and Economics*, *12*, 144-158.

Hartman, G. (1984). Tax policy and foreign direct investment in the United States. *National tax journal, 38*(4), 475-487.

Hayakawa, K. (2007). Small sample bias properties of the system GMM estimator in dynamic panel data models. *Economics Letters*, *95*(1), 32-38.

Head, K., Mayer, T., & Ries, J. (2002). Revisiting oligopolistic reaction: are decisions on foreign direct investment strategic complements?. *Journal of Economics & Management Strategy*, *11*(3), 453-472.

Head, K., Ries, J., & Swenson, D. (1995). Agglomeration benefits and location choice: Evidence from Japanese manufacturing investments in the United States. *Journal of International Economics*, *38*(3-4), 223-247.

Hebous, S., Ruf, M. & Weichenrieder, A. J. (2010). The effects of taxation on the location decision of multinational firms: M&A versus Greenfield investments. *National Tax Journal*, 64(3), 817-838.

Helpman, E. (1984). A simple theory of international trade with multinational corporations. *Journal of Political Economy*, *92*(3), 451-471.

Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export versus FDI with heterogeneous firms. *American Economic Review, 94*(1), 300-316.

Hirsch, S. (1965). The United States electronics industry in international trade. *National Institute Economic Review*, 92-97.

Hoang, N. T., & McNown, R. F. (2006). Panel data unit roots tests using various estimation methods. *University of Colorado Bulletin*, *6*, 33-66.

Hufbauer, G. C. (1975). The multinational corporation and direct investment. *International Trade and Finance: Frontiers for Research*, 253-319.

Hymer, S. H. (1976). *The International Operation of National Firms: A Study of Direct Foreign Investment*. Cambridge, MA, USA: MIT Press.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53-74.

Inekwe, J. N. (2013). FDI, employment and economic growth in Nigeria. *African Development Review*, *25*(4), 421-433.

Irandoust, J. E. M. (2001). On the causality between foreign direct investment and output: a comparative study. *The International Trade Journal*, *15*(1), 1-26.

Jensen, N. M. (2012). Fiscal policy and the firm: do low corporate tax rates attract multinational corporations? *Comparative Political Studies*, *45*(8), 1004-1026.

Jeong, B. (2013). *Corporate income tax and investment: Evidence from panel data in 22 OECD countries* (Master's thesis, Clemson University). Retrieved from https://tigerprints.clemson.edu/all_theses/1620.

Johanson, J., & Vahlne, J. E. (1990). The mechanism of internationalisation. *International marketing review*, *7*(4).

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalisation process of the firms: four Swedish case studies. *Journal of Management Studies*, *12*(3), 305-322.

Jordaan, J. A. (2011). Local sourcing and technology spillovers to Mexican suppliers: How important are FDI and supplier characteristics?. *Growth and Change*, *42*(3), 287-319.

Jun, J. (1994). *How Taxation Affects Foreign Direct Investment: country-specific Evidence* (Vol. 1307). World Bank Publications.

Knickerbocker, F. T. (1973). Oligopolistic reaction and multinational enterprise. *The International Executive*, *15*(2), 7-9.

Kojima, K., & Ozawa, T. (1984). Toward a theory of industrial restructuring and dynamic comparative advantage. *Hitotsubashi Journal of Economics*, 135-145.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1-24.

Lim, M. E. G. (2001). *Determinants of, and the relation between, foreign direct investment and growth: a summary of the recent literature* (IMF Working Paper No. 1-175). International Monetary Fund.

Liu, Y. (2009). *Factors determining location choice of foreign direct investment in China: a perspective from an inland province* (Doctoral dissertation, Massey University). Retrieved from https://mro.massey.ac.nz/bitstream/handle/10179/3811/02_whole.pdf.

Luostarinen, R. (1979). *Internationalization of the firm: an empirical study of the internationalization of firms with small and open domestic markets with special emphasis on lateral rigidity as a behavioural characteristic in strategic decision-making* (Doctoral thesis, Helsinki School of Economics). Retrieved from https://trove.nla.gov.au/work/9825215?selectedversion=NBD1735327.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, *61*(S1), 631-652.

Makoni, P. L. (2015). An extensive exploration of theories of foreign direct investment. *Risk Governance & Control: Financial Markets and Institutions*, *5*(2), 77-83.

Mandinga, C. A. V. C. (2015). *The effect of corporate income tax rate on foreign direct investment in small island developing states* (Master's thesis, University of Porto). Retrieved from https://repositorio-aberto.up.pt/bitstream/10216/79848/2/36093.pdf.

McFadden, D. L. (1973). Conditional Logit Analysis of Qualitative Choice Behavior. In P. Zarembka (Ed.). *Frontiers in Econometrics.* (pp. 105-142). New York, USA: Academic Press.

Mehic, E., Silajdzic, S., & Babic-Hodovic, V. (2013). The impact of FDI on economic growth: Some evidence from southeast Europe. *Emerging Markets Finance and Trade*, 49(1), 5-20.

Michałowski, T. (2012). Foreign direct investment in Sub-Saharan Africa and its effects on economic growth of the region. *Prace i Materiały Instytutu Handlu Zagranicznego Uniwersytetu Gdańskiego, 31(1),* 687-701.

Millington, A. I., & Bayliss, B. T. (1990). The process of internationalisation: UK companies in the EC. *MIR: Management International Review*, 151-161.

Moon, H. C., & Roehl, T. W. (2001). Unconventional foreign direct investment and the imbalance theory. *International Business Review*, *10*(2), 197-215.

Moosa, I. (2002). *Foreign direct investment: theory, evidence and practice*. Basingstoke, UK: Palgrave.

Morisset, J., & Pirnia, N. (2000). *How tax policy and incentives affect foreign direct investment: A review* (Policy Research Working Paper No. 2509). Cambridge, MA, USA: The World Bank and International Finance Corporation Foreign Investment Advisory Service.

Mudenda, L. D. (2015). *Corporate Income Tax Rate and Foreign Direct Investment: The Case of Southern African Economies* (Master's dissertation, Umeå University). Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-106899.

Mundell, R. A. (1957). International trade and factor mobility. *The American Economic Review*, *47*(3), 321-335.

Munongo, S. (2015). *The effectiveness of tax incentives in attracting foreign direct investment: the case of the Southern African Development Community* (Doctoral dissertation, University of South Africa). Retrieved from http://uir.unisa.ac.za/bitstream/handle/10500/21037/thesis_munongo_s.pdf?sequence=1&isAllowed=y.

Murthy, N. V. (1989). The effects of taxes and rates of return on foreign direct investment in the United States: some econometric comments. *National Tax Journal*, *42*(2), 205-207.

Naudé, W. A., & Krugell, W. F. (2007). Investigating geography and institutions as determinants of foreign direct investment in Africa using panel data. *Applied Economics*, *39*(10), 1223-1233.

Nayak, D., & Choudhury, R. N. (2014). *A selective review of foreign direct investment theories* (Working Paper No. 143). Bangkok, Thailand: Asia-Pacific Research and Training Network on Trade.

Newlon, T. S. (1988). *Tax policy and the multinational firm's financial policy and investment decisions* (Doctoral thesis, Princeton University). Retrieved from https://elibrary.ru/item.asp?id=7527722.

Nocke, V., & Yeaple, S. (2004). *Mergers and the composition of international commerce* (NBER Working Paper No. 10405). Cambridge, MA, USA: National Bureau of Economic Research.

Nocke, V., & Yeaple, S. (2007). Cross-border mergers and acquisitions versus greenfield foreign direct investment: The role of firm heterogeneity. *Journal of International Economics*, *72*(2), 336-365.

Nunnenkamp, P., Semple, M., & Semple, M. (1991). Developing Countries' Attractiveness for Foreign Direct Investment-Debt Overhang and Sovereign Risk as Major Impediments? [with Comments]. *The Pakistan Development Review*, *30*(4), 1145-1158.

Obeng, C. K. (2014). *Effect of corporate tax on sector specific foreign direct investment in Ghana* (MPRA Paper No. 58454). Munich, Germany: University Library of Munich. Retrieved from http://mpra.ub.uni-muenchen.de/58454/.

Okafor, G. (2014). *Determinants of foreign direct investment into sub-saharan Africa and its impact on economic growth* (Doctoral dissertation, Bournemouth University). Retrieved from http://eprints.bournemouth.ac.uk/21784/1/GodwinOkaforThesis.pdf

Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, *68*(1), 79-113.

Rehman, C. A., Ilyas, M., Alam, H. M., & Akram, M. (2011). The impact of infrastructure on foreign direct investment: The case of Pakistan. *International Journal of Business and Management*, *6*(5), 268.

Ricardo, D. (1817). *The works and correspondence of David Ricardo Vol. 1: On the principles of political economy and taxation*. London, UK: John Murraym.

Robock, S. H., & Simmonds, K. (1973). International business and multinational enterprises. *Thunderbird International Business Review*, *15*(3), 5-6.

Romer, D. (2012). *Advanced Macroeconomics* (4th ed.). New York, NY: McGraw-Hill.

Roodman, D. (2006). *How to do xtabond2: An introduction to difference and system GMM in Stata* (Working Paper No. 103). Washington, DC, USA: Center for Global Development. Retrieved from http://dx.doi.org/10.2139/ssrn.982943.

Roodman, D. (2007). *A short note on the theme of too many instruments* (Working Paper No. 125). Washington, DC, USA: Center for Global Development. Retrieved from https://ideas.repec.org/p/cgd/wpaper/125.html.

Sachs, J. D., & Warner, A. M. (1995). *Natural resource abundance and economic growth* (NBER Working Paper No. 5398). Cambridge, MA, USA: National Bureau of Economic Research.

Saidu, A. (2015). Corporate taxation and foreign direct investment in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, *3*(8), 17-24.

Sakr, M., & Jordaan, A. (2016). *Emerging multinational corporations: Theoretical and conceptual framework* (ERSA Working Paper No. 574). South Africa: Economic Research South Africa.

Scaperlanda, A. E., & Mauer, L. J. (1969). The determinants of US direct investment in the EEC. *The American Economic Review*, *59*(4), 558-568.

Schmenner, R. W. (1982). Multiplant manufacturing strategies among the fortune 500. *Journal of Operations Management*, *2*(2), 77-86.

Shala, N. (2013). *Tax competition for FDI in Western Balkans.* (Thesis. Rochester Institute of Technology). Retrieved from http://scholarworks.rit.edu/theses/4880.

Slemrod, J. B. (1990). Tax effects on foreign direct investment in the United States: Evidence from a cross-country comparison. In A. Razin, & J. B. Slemrod (Eds.), *Taxation in the Global Economy.* (pp. 79-122). Chicago, USA: University of Chicago Press.

Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London, UK: George Routledge and Sons.

Södersten, B. (Ed.). (1970). *International Economics*. New York, USA: Harper and Row.

Srinivasan, T. G. (2002). Globalization in MENA: A Long-Term Perspective. In R. Safadi (Ed.). *MENA Trade & Investment in the New Economy: The Fourth Mediterranean Development Forum.* (pp. 17-34). New York, USA: The American University in Cairo Press.

Swenson, D. L. (2000). Transaction type and the effect of taxes on the distribution of foreign direct investment in the United States. In J. R. Hines (ed.), *International Taxation and Multinational Activity.* (pp. 89-112). Chicago, USA: University of Chicago Press. Retrieved from http://www.nber.org/books/hine00-1.

Tavares-Lehmann, A. T., Coelho, Â., & Lehmann, F. (2012). Taxes and foreign direct investment attraction: A literature review. In R. Van Tulder, A. Verbeke, & L. Voinea (Eds.), *New Policy Challenges for European Multinationals: Progress in International Business Research.* (pp. 89-117). Bingley, UK: Emerald Group Publishing Limited.

Taylor, M. J., & Thrift, N. J. (1982). Models of corporate development and the multinational corporation. *The geography of multinationals*, 14-32.

Thyer, B. A. (1993). Social work theory and practice research: The approach of logical positivism. *Social Work and Social Sciences Review*, *4*, 5-5.

Turnbull, P. W. (1987). A challenge to the stages theory of the internationalization process. *Managing export entry and expansion*, 21-40.

UNCTAD (2000). *World Investment Report, Cross-border Mergers and Acquisitions and Development.* New York: United Nations.

UNCTAD (2008). *World Investment Report 2008: Transnational Corporations, and the Infrastructure Challenge*. New York: United Nations.

UNCTAD (2015). *World Investment Report 2015: Reforming International Investment Governance*. New York: United Nations.

UNCTAD (2017). *World Investment Report 2017: Investment and the Digital Economy*. New York: United Nations.

Vernon, R. (1966). International Investment and International Trade in the Product Life Cycle. *Quarterly Journal of Economics*, *80*(2), 190-207.

Vernon, R. (1979). The product cycle hypothesis in a new international environment. *Oxford Bulletin of Economics and Statistics*, *41*(4), 255-267.

Wadhwa, K. & Sudhakara, R. S. (2011). Foreign Direct Investment into Developing Asian Countries: The Role of Market Seeking, Resource Seeking an Efficiency Seeking Factors. *International Journal of Business and Management*, 6(11), 219-226.

Wang, M., & Wong, S. (2009). What Drives Economic Growth? The Case of Cross-Border M&A and Greenfield FDI Activities. *Kyklos, 62*(2), 316-330.

Wheeler, D., & Mody, A. (1992). International investment location decisions: The case of US firms. *Journal of International Economics*, *33*(1-2), 57-76.

Wijeweera, A., & Clark, D. P. (2006). Taxation and foreign direct investment inflows: time series evidence from the US. *Global Economic Review*, *35*(2), 135-143.

Wijeweera, A., Dollery, B., & Clark, D. (2007). Corporate tax rates and foreign direct investment in the United States. *Applied Economics*, *39*(1), 109-117.

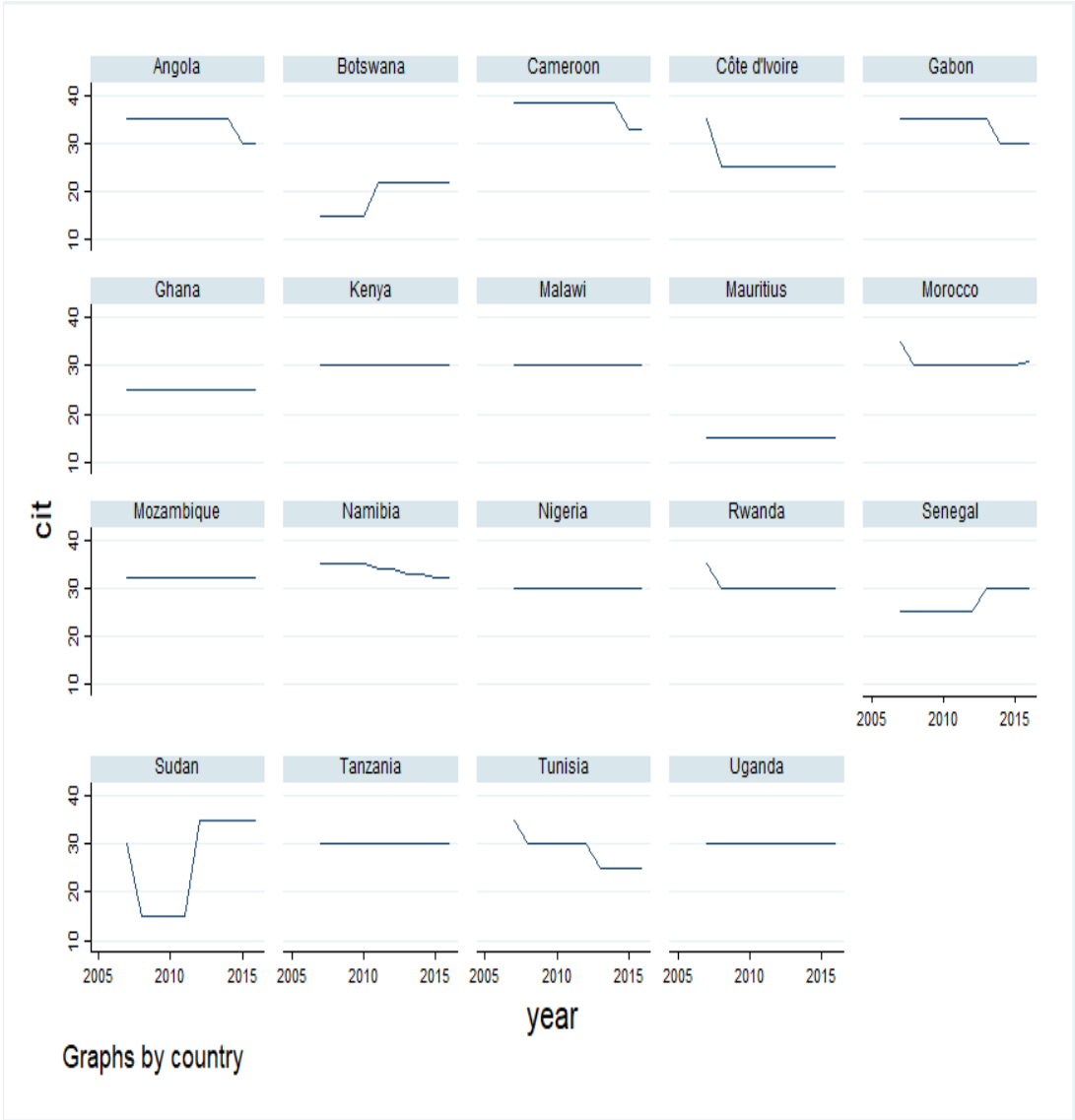
Yin, R. K. Case Study Research: Design and Methods. *SAGE, 2003*(181), 15.

Young, K. H. (1988). The effects of taxes and rates of return on foreign direct investment in the United States. *National Tax Journal, 41(1),* 109-121.

Zang, W. (2013). *Foreign direct investment: causes and consequences. The determinant of inward and outward FDI and their relationship with economic growth* (Doctoral dissertation, University of Bradford). Retrieved from https://bradscholars.brad.ac.uk/bitstream/handle/10454/5690/PhD%20thesis%20Wenyu%20Zang.pdf.

APPENDIX A

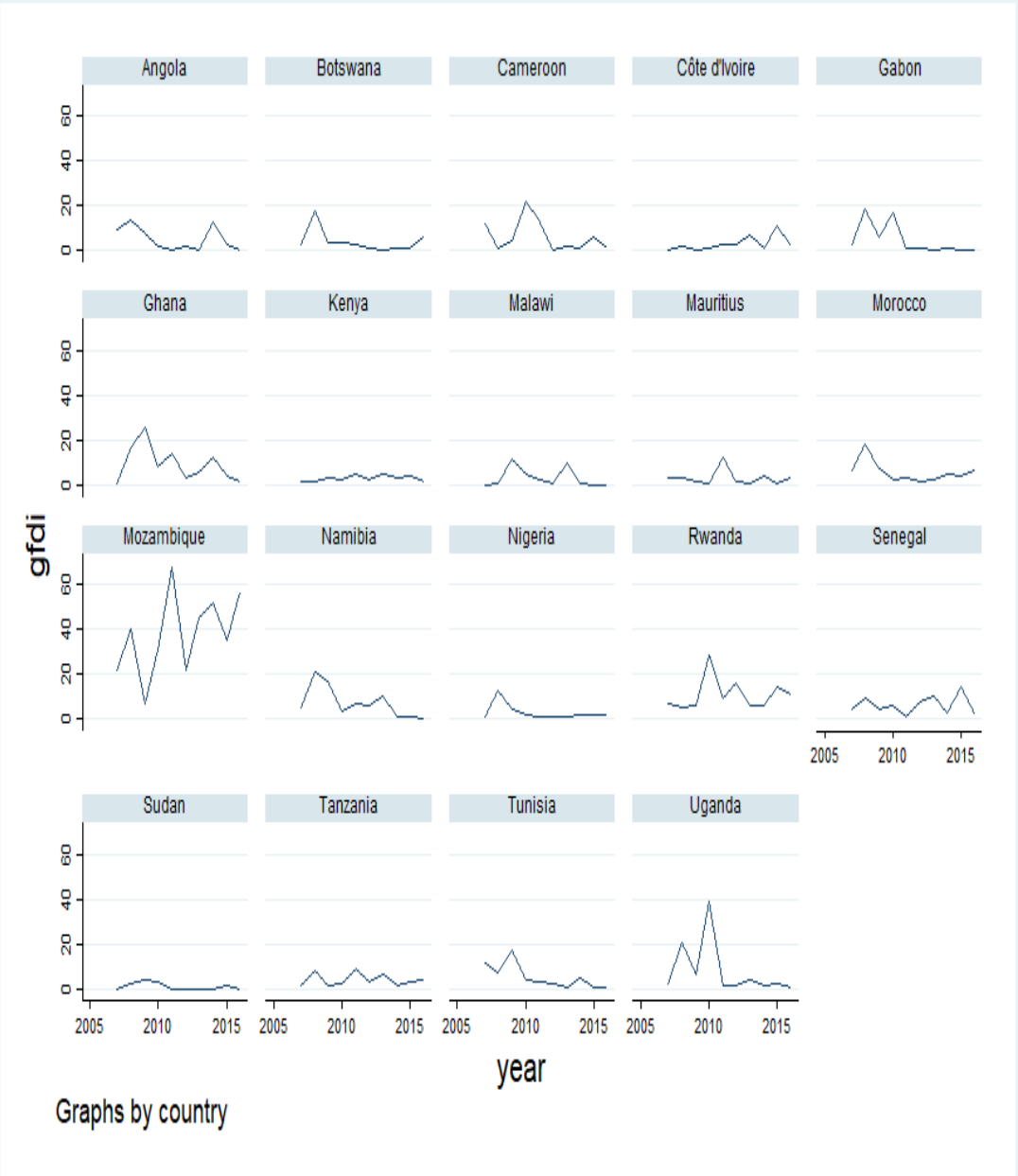
Plot of corporate income tax rate for the 19 selected African countries from 2007-2016



Source: Author's Construct

APPENDIX B

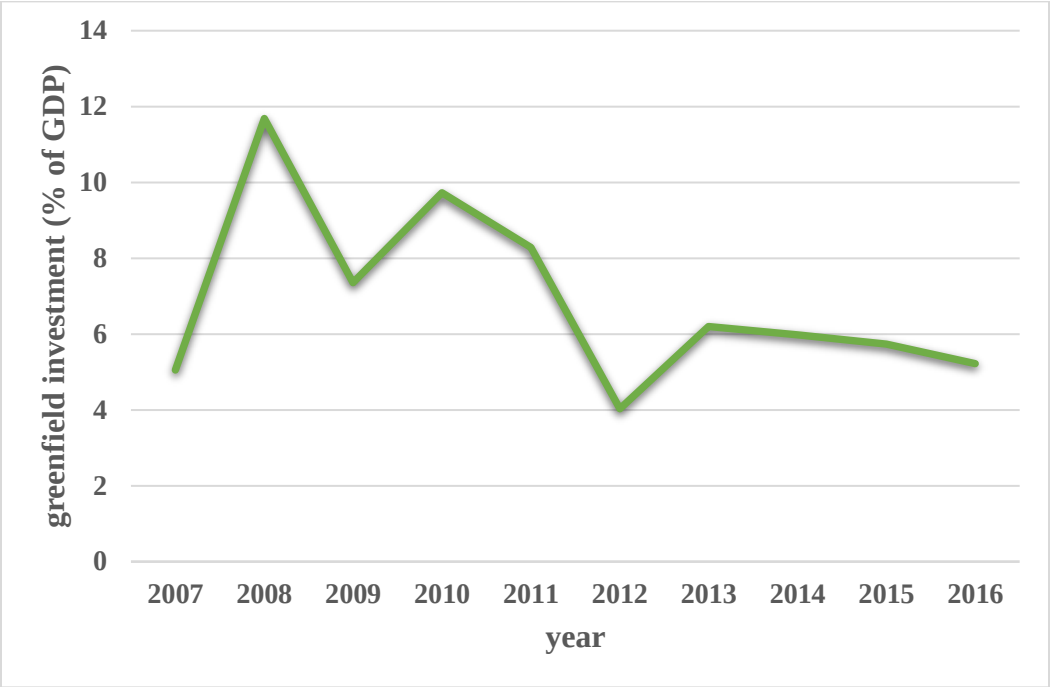
Plot of greenfield investment (% of GDP) for the 19 selected African countries from 2007-2016



Source: Author's Construct

APPENDIX C

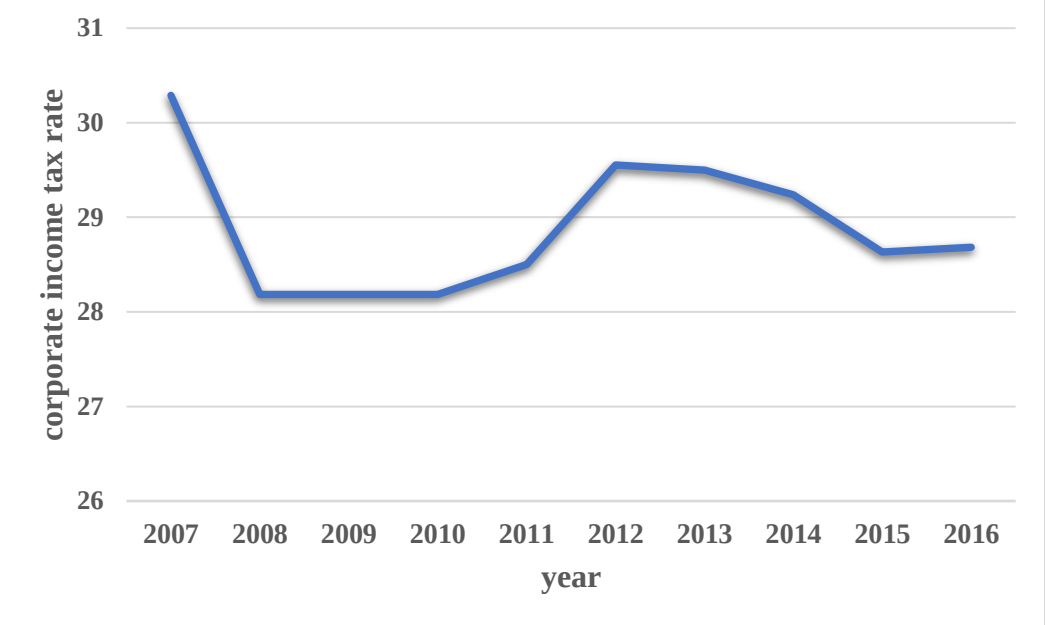
Trend of average value of greenfield investment inflows (% of GDP) for the 19 selected African countries, 2007-2016



Source: Author's construct

APPENDIX D

Trend of average corporate income tax rate for the 19 selected African countries, 2007-2016



Source: Author's construct

APPENDIX E

ADF Unit roots test at level and first difference

Level			First difference		
Variables	ADF stats	P-value	ADF stats	P-value	OI
$lngfdi$	112.8787	0.0000	401.2947	0.0000	I(0)
cit	77.1449	0.0002	142.2635	0.0000	I(0)
inf	75.0134	0.0003	285.2618	0.0000	I(0)
$open$	32.0183	0.7416	167.8011	0.0000	I(1)
$lnpp$	72.8154	0.0006	164.4618	0.0000	I(0)
$lnmsize$	73.1530	0.0005	167.0392	0.0000	I(0)
cr	89.4186	0.0000	244.8908	0.0000	I(0)
nr	113.1046	0.0000	248.9265	0.0000	I(0)
$infras$	81.3636	0.0001	227.9710	0.0000	I(0)

Note: OI is the order of integration. The ADF statistics used was the inverse chi-square (P) and this requires the number of panels to be finite.

Source: Author's construct

APPENDIX F

PP Unit roots test at level and first difference

Level			First difference		
Variables	PP stats	P-value	PP stats	P-value	OI
$lngfdi$	112.8787	0.0000	401.2947	0.0000	I(0)
cit	77.1449	0.0002	142.2635	0.0000	I(0)
inf	75.0134	0.0003	285.2618	0.0000	I(0)
$open$	32.0183	0.7416	167.8011	0.0000	I(1)
$lnpp$	72.8154	0.0006	164.4618	0.0000	I(0)
$lnmsize$	73.1530	0.0005	167.0392	0.0000	I(0)
cr	89.4186	0.0000	244.8908	0.0000	I(0)
nr	113.1046	0.0000	248.9265	0.0000	I(0)
$infras$	81.3636	0.0001	227.9710	0.0000	I(0)

Note: OI is the order of integration. The PP statistics used was the inverse chi-square (P) and this requires the number of panels to be finite.

Source: Author's construct

APPENDIX G

Hausman Specification Test for fixed and random effect

Dependent variable =lngfdi				
Explanatory variables	(b) Fixed	(B) Random	(b-B) difference	sqrt(diag(V_bV_B)) S.E.
cit	0.0786	0.0117	0.0669	0.064304
nr	0.0258	0.0058	0.0199	0.0219883
$infras$	- 0.0115	-0.0114	- 0.0000	0.1299952
$lnpp$	-13.6862	-3.3449	-10.3412	6.22277
$open$	- 0.0077	0.0103	- 0.0180	0.011738
inf	- 0.0395	-0.0412	0.0017	0.0219714
cr	0.5269	0.2647	0.2622	0.5192187
$lnmsize$	-12.0560	-2.7512	- 9.3048	6.317097
$lngfdi_{-1}$	- 0.0159	0.2123	- 0.2283	0.0396265

b = Consistent under Ho and Ha

B = Inconsistent under Ha, efficient under H

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 44.01

Prob>chi2 = 0.0000