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**The impact of sector Foreign Direct Investment on economic growth in
developing countries**

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UP13380479

**A research project submitted to the Gordon Institute of Business Science,
University of Pretoria, in partial fulfilment of the requirements for the degree
of Masters of Business Administration.**

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Abstract

One of the key priorities of developing countries governments and policymakers is to improve national welfare and address poverty alleviation. Foreign Direct Investments (FDI) are regarded as important external sources of financing economic growth around the world and are a more stable and beneficial capital injection substitute to financial aid in developing countries (Adam, 2009; Özkan-Günay, 2011). More recently, there has been a surge in foreign investments into developing countries as investors seek to diversify their investments in order to receive better returns which have become difficult to attain in the developed countries due to market saturation and the effects of the 2008 global financial crisis. The challenge that developing governments are faced with is how to ensure that the FDI inflows into their countries result in accelerated economic growth. Contemporary literature suggests that one of the reasons why FDI has produced contradictory results in various countries and economies is that FDI in various economic sectors impacts economic growth differently (Madem, Cudla & Rao, 2012).

The main objective of this study was to evaluate the impact of sectorial FDI on economic growth in developing countries. Panel data estimation techniques were employed to estimate the impact of various economic sectors on economic growth as measured by Gross Domestic Product (GDP). Further, an analysis was performed to estimate whether there is a better form of FDI which is preferable to enhance FDI driven economic growth. The sample data used for this study was for South Africa as convenience sampling technique was employed.

The study established that there is statistically significant evidence that sectorial FDI has variable impact on economic growth and as such priority should be directed to investments in economic sectors with the greatest impact on economic development. Further, it was established that greenfield as a form of foreign investment does not have statistically significant impact on economic sectors' ability to impact economic growth. As such there is no preferred form of FDI to enhance economic growth as measured by GDP.

Keywords: Sectorial FDI, economic growth, developing countries

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Simbarashe Makwembere

Signature:

Date: 10 November 2014

Dedication

This thesis is dedicated to my family, Angela and Tafadzwa who have given up so much by giving me the time and space needed to complete this thesis and the MBA as a whole. Thanks guys, I am looking forward to spending more time with you all.

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I would like to express my profound gratitude to my supervisor Mr. Solomon Moyo for his excellent supervision and insight throughout the whole research project. To Nyasha Mugadza, thank you very much for your input and hard work in ensuring that this thesis was actually written in English. A special word of thanks to Guardrisk Insurance, a company that graciously provided financial assistance for this MBA. To Zodwa Banda and my fellow MBA students, thank you for your support and advice during the last two years. You all made getting to the end a great experience and I have grown personally through meeting and getting to know you all. Finally and most importantly, I would like to gracefully thank my Almighty God who gave me the strength and wisdom to write this research.

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CHAPTER 1:

INTRODUCTION TO RESEARCH PROBLEM

1.0 Introduction

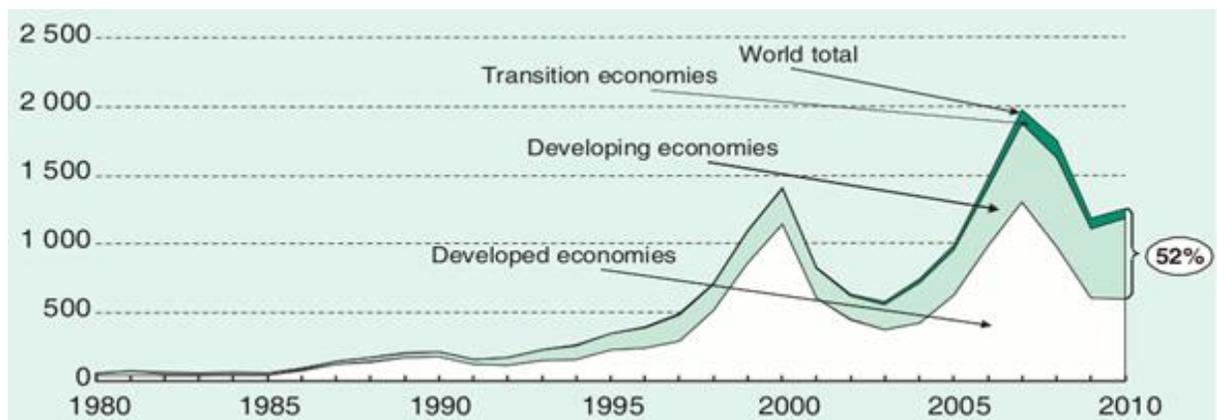
Inekwe (2013) argues that although policymakers promote Foreign Direct Investment (FDI) in accelerating economic development in developing countries, the links between economic development, FDI and human development remain uncertain and thus further research is required to understand the relationships. Understanding of the impact of FDI in developing countries is generally limited and or rather confusing as different researchers such as Moyo (2009), Chaudhuri & Banerjee (2010) and Imoudu (2012) have produced contradictory results. Madem, Cudla & Rao (2012) argued that if FDI is to result in accelerated economic growth, priority should be given to investment in industries with the greatest impact on economic development. This means that research on sectorial FDI in developing countries is needed to inform policymakers on which economic sectors to promote FDI into in order to have the greatest impact on economic growth, human development and poverty alleviation. In addition to sectorial FDI's varying impact on economic growth, Wang & Wong (2009) also argue that various forms of FDI that is 'brownfield' and 'greenfield' investment in different economic sectors tend to have different impacts on economic growth. This also suggests that understanding of which sectorial FDI has the greatest impact on economic development should be sort in the context of which economic sector has a greater absorptive capacity to a particular form of FDI.

FDI inflows into developing countries have been on the rise and by 2010 the developing economies and transition economies together were receiving more than half of the world's FDI inflows. The major reasons for increased FDI inflows into developing countries can be attributed to improved democracy and political stability in developing countries, globalization and increased degree of financial integration of the world economies. Further, the increased need for resources by the developed countries from developing countries as well as the need to access new less competitive markets by multinational

companies originating from developed countries have also been instrumental in driving inflows (Mottaleb & Kalirajan, 2010; Alam & Shah, 2013; Goswami & Haider, 2014).

Figure 1 below shows a 30 year time series development of FDI inflows worldwide since 1980. The diagram demonstrates that developing countries share of FDI inflows has been on the rise and by 2010, the developing economies and transition economies together were receiving about 52% of the world's FDI inflows.

Figure 1 Global Foreign Direct Investment Inflows (1980-2010) Billions of Dollars



Source: Adapted from UNCTAD (World Investment Report, 2011)

Although FDI inflows into developing countries have been on a steady rise, there has been no proportionate economic growth in most developing countries (Oladipo, 2013). This observation is worrying because the main motivation for developing government's need for attracting FDI inflows is based on the neo-liberal school of thought which gained prominence in the 1980's which asserts that there is an almost automatic link on the inflow of FDI to economic development due to capital accumulation (Carlos, 2009). The challenge therefore that developing countries are faced with is how to ensure that the increased FDI inflows result in accelerated economic growth which will result in poverty alleviation and human development. This research seeks to contribute to this noted challenge by providing insight on which economic sectors and forms of FDI that developing governments should attract in order to realise accelerated FDI driven economic growth.

FDI inflows into developing countries and more specifically into African developing countries are expected to increase even further. Investors around the world are constantly seeking politically stable developing country conditions to spread their investments into in order to receive better returns which have become difficult to attain in the developed countries due to the effects of the 2008/ 2009 financial crisis which hit the world markets in recent history (Business Guide Africa, 2013). In addition, themes such as Rising Africa, Lions on the Move, Africa's Future: Darkness to Destiny, Africa's \$2.6 Trillion Business Opportunities, BRICS and Africa: Partnership for Development, Integration and Industrialisation (Games, 2012) that are published through various media including journals, magazines and text books as well as conferences hosted by renowned global organisations such as the (Brazil, Russia, India, China, South Africa) BRICs countries, International Monetary Fund (IMF) and Harvard Business School have created investor excitement and interest towards Africa. This escalating appetite by investors generates an urgent need for African developing countries as recipients to understand the sectors' in which the FDI inflows should be directed into as well as the forms of FDI that should be attracted in order to maximise economic growth in developing countries.

1.1 Research Problem

As has been discussed in the introduction, FDI inflows into developing countries have been on a steady rise and the trend is expected to continue into the foreseeable future. Although developing countries have received an increasing share of FDI inflows, various researches including that of Moyo (2009), Oladipo (2013) and Imodu (2012) have shown that the increased FDI inflows have not achieved an acceleration of economic growth. This is despite theoretical assertions including the neo-liberal school of thought which automatically links the inflow of FDI to economic growth due to capital accumulation (Carlos, 2009). The challenge that developing governments are faced with is how to ensure that the FDI inflows into their countries result in accelerated economic growth.

1.2 Research Objectives

This research project has two main objectives. Firstly, the research seeks to investigate the impact of FDI inflows in a more disaggregated approach by focusing on sector specific FDI and economic growth to measure how foreign capital can be a valuable tool to enhance economic growth in developing economies. The knowledge of which sectorial FDI has the greatest impact on economic growth is valuable as it gives an understanding on which economic sector priority should be given to in order for developing countries to achieve accelerated benefits of FDI inflows.

Secondly, the research project also seeks to investigate the impact that different forms of FDI inflows have in different economic sectors to inform policy on which FDI form is best in a specific sector. Literature has revealed that different forms of FDI inflows have different impact on FDI led economic growth and as such it is important to understand which FDI form should be promoted in a specific economic sector in order to enhance the sector's economic growth which ultimately contributes to the economy's overall growth.

1.3 Research Motivation

Ultimately, the results of this research project are envisaged to provide developing countries policymakers with a better understanding of which economic sectors and forms of FDI inflows have the ability to drive accelerated economic growth that will ultimately lead to improvement of national welfare and poverty alleviation which according to Kolstad (2011) is among key priorities of developing country governments.

Further, it is also envisaged that the results of this research project can also be utilised by social entrepreneurs and socially motivated investors that are motivated by both economic profit and social good. Social entrepreneurs and socially motivated investors will be able to identify which industries to invest in and make the best impact in contributing to national welfare and poverty alleviation which in general is regarded as a social good while making good return on their capital.

The research project will also contribute to literature and current debate on the effect of FDI inflows on economic growth and poverty alleviation in developing countries. The research brings a new angle to the debate by advocating the need to combine the impact of sectorial FDI and forms of FDI inflows in understanding the impact of FDI inflows to economic growth. Great insights on which economic sectors as well as forms of FDI that have the greatest impact on economic growth will be gained by reading this research project.

1.4 Research Structure

This research report contains seven chapters discussing various matters of the research topic in detail. Chapter 1 presents the introduction to the research problem which explains the need for the research and the research objectives. Chapter 2 is dedicated to a comprehensive literature review which seeks to define the statement of the research problem as well as discuss academic arguments around the impact of FDI and sectorial FDI on economic growth in developing countries. Research Questions and Hypothesis are presented in Chapter 3 while Chapter 4 presents the research methodology. Chapter 5 presents the research results which will be analysed in great detail in Chapter 6. Lastly, Chapter 7 presents the conclusions and recommendations of the research project. The references contain a comprehensive list of the materials cited in this piece of work.

CHAPTER 2:

THEORY AND LITERATURE REVIEW

2.0 Introduction

Although empirical evidence of FDI on economic growth is not conclusive, Kolstad (2011), Özkan-Günay (2011), Madem, Cudla & Rao (2012) argue that FDI plays a major role as one of the key drivers of economic growth and poverty eradication in developing countries. Carlos (2009) argues that FDI leads to economic development due to capital accumulation and the fact that the interaction between FDI and host country generates positive long term spillovers to various stakeholder groups. On the other hand, however, some authors including Moyo (2009) and Adams (2009) argue that developing countries reliance on foreign investment has negative effects on economic growth and income distribution due to negative spillovers that foreign companies may bring to the host countries. Kennedy, Bardy & Rubens (2012) present an argument which is somewhere between the above noted extreme views in the sense that they argue that if FDI is to result in accelerated economic growth, priority should be directed to investments in industries that have the greatest impact on economic development, otherwise the benefits of the FDI will not be fully realised.

This chapter seeks to explore contemporary debates and various schools of thought around key themes found in recent and relevant literatures which give insight into FDI, economic sectors' FDI absorption capacity, economic growth and how these key themes are woven together. As a departure point, the literature review builds an overall understanding of FDI, its forms, determinants, classifications as well as the roles and impact of various economic sectors setting the scene for a discussion around sectorial FDI and economic growth. Thereafter an exploration of arguments around economic fundamentals that link sector FDI and economic growth as well as sector FDI absorption capacity will be discussed in greater detail. As a concluding discussion, the literature review will explore arguments why it is important to look at sector specific FDI and its relation to economic growth.

2.1 Understanding Foreign Direct Investment (FDI) and its importance

Organisation for Economic Co-operation and Development (OECD) defines FDI as follows:

“An investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy (“direct investor”) in an entity resident in an economy other than that of the investor (“direct investment enterprise”). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise” (OECD, 1996, p7, 8).

It is important to understand that FDI stock takes into account the initial capital injection made by the foreign company and all succeeding capital transactions between two corporates and among affiliated companies, regardless of their status (Cotula, Vermeulen, Leonard, & Keeley, 2009). Cotula, Vermeulen, Leonard, & Keeley (2009) distinguishes FDI net inflows as the value of inward direct investment made by non-resident investors in the reporting economy.

Özkan-Günay (2011) and Adams (2009) agree that FDI inflows are an important external source of financing economic growth around the world and are a more stable and beneficial capital injection substitute to financial aid in developing countries. Kennedy, Bardy & Rubens (2012) add to the argument of the importance of FDI inflows from a different angle by providing evidence that there is a connection between non-participation in global markets and economic poverty using the case of North Korea. In their model failure to attract FDI and encourage FDI out flows was accounted as non-participation in global markets.

As discussed in Chapter 1, this study seeks to examine the impact of FDI at a disaggregated level by critically understanding how different economic sectors' FDI injection contributes to economic growth in developing countries. This is because different economic sectors in the developing countries have different absorptive capacity which influences the economic sectors' impact on economic growth (Yanling, 2010). It is therefore important to understand the economic sectors in developing countries at the

onset.

2.2 Economic Sectors in developing economies

A country's economy is made up of various economic sectors that contribute to the activities of the economy. Different economic sectors have different absorptive capacities and thus their contributions to the performance of the total economy vary. It is therefore important to understand the different economic sectors. Wöcke & Sing (2013) explains that an economy is generally subdivided into three traditional sectors as discussed below.

2.2.1 The Primary Sector

The primary economic sector is responsible for the extraction of natural resources. This includes the production of raw material and basic foods and involves activities associated with agriculture and farming, forestry, fishing, mining and quarrying. Packaging and light processing of the above mentioned industries' extractions is regarded as part of the primary sector activities Wöcke & Sing (2013). According to Deller & Schreiber (2012) natural resource extraction is one of the important economic growth strategies for developing countries.

2.2.2 Secondary Sector

The secondary sector of the economy is involved with the conversion of raw materials into finished products. Manufacturing, processing, and construction are the main secondary sector activities. Examples of activities found in the secondary sector include automobile and aerospace manufacturing, metal and woodworking, smelting, textile and garment production, engineering and chemical processors, energy utilities, breweries and bottlers, buildings and ship construction companies Wöcke & Sing (2013). Using the GMM estimation technique, Elhiraika, Aboubakar & Muhammad (2014) indicate that the development of the manufacturing and construction industries in developing countries are among the key drivers of real economic growth.

2.2.3 Tertiary Sector

The tertiary sector is also referred to as the services industry. It is involved with the provision of intangible goods and services to both the retail and business sectors. Activities associated with the service sector include retail and wholesale distribution, transportation, clerical services, media and entertainment, restaurants, tourism, banking, insurance, healthcare, and law Wöcke & Sing (2013). According to Bălan & Bălan (2011) the service sector, particularly the development of new means of communication, information technology and transport is an important factor for increasing economic activity which results in economic growth. The development of communication, information technology and transport sectors assist in improving mobility and opening new perspectives for a better organization of work and for creating new jobs.

Figure 2 below summarises the various classifications of different economic sectors as generally presented in developing countries.

Figure 2 Economic Sectors



Sources: Wöcke & Sing (2013),

Wöcke & Sing (2013) explain that generally developing countries usually attract FDI mainly into the natural resources sector of the economy, especially mining and manufacturing. The service sector industries in developing countries generally attract less FDI relative to the natural resource sectors.

The discussion in this chapter thus far gives a broader understanding of FDI and economic sectors as well as insight into well-developed arguments and schools of thought that demonstrate the importance of FDI in advancing host countries economic growth. It should be understood however, that for FDI to be beneficial to the host country's economic growth the correct form of FDI should be attracted by the host country and therefore it is important to understand the forms of FDI.

2.3 Forms of FDI

There are two main forms of FDI, "brownfield" and "greenfield" investments (Wang & Wong, 2009). A "brownfield" investment is also known as cross border mergers and acquisitions (M&As). Ndikumana & Verick (2008) note that cross border M&As involve the purchase of existing facilities while greenfield investment entails setting up new facilities. According to Vasconcellos & Kish (2013) M&As by foreign firms are one of the fastest ways of entering a foreign market. However, Wang & Wong (2009) critique cross-border M&As as speculative funds with not much value-adding to important elements of FDI such as technology transfer and skills transfer. Therefore in general cross border M&As as a form of FDI could have potential negative impact on economic growth. On the other hand, Ndikumana & Verick (2008) argue that contrary to cross border M&As, greenfield investments have a positive impact on economic growth because they have the ability to create new production capacities, new working places, new consumer and new taxes payers. In addition to the above, Wang & Wong (2009) also found that greenfield investments promote economic growth and contribute significantly to poverty alleviation.

More specifically, various forms of FDI may have varying impacts on economic growth in different economic sectors. According to Monastiriotis & Alegria (2011) brownfield investments have direct transfer of new technologies, capital, management and know-how which accrue directly to the firms acquired by a foreign entity. This to a greater extent means that brownfield investments are likely to result in accelerated economic growth in sectors that are skills and technologically hungry. On the other hand, greenfield investments are likely to be more beneficial in economic sectors where firms improve themselves through learning from other firms and engaging in competitive behaviour. Nanda (2009) conducted a research using econometric analysis on 89 countries to find which FDI form is more beneficial and his results concluded that not only is the brownfield

M&A-related FDI less beneficial, compared to greenfield investment, it may also have adverse impact on economic growth.

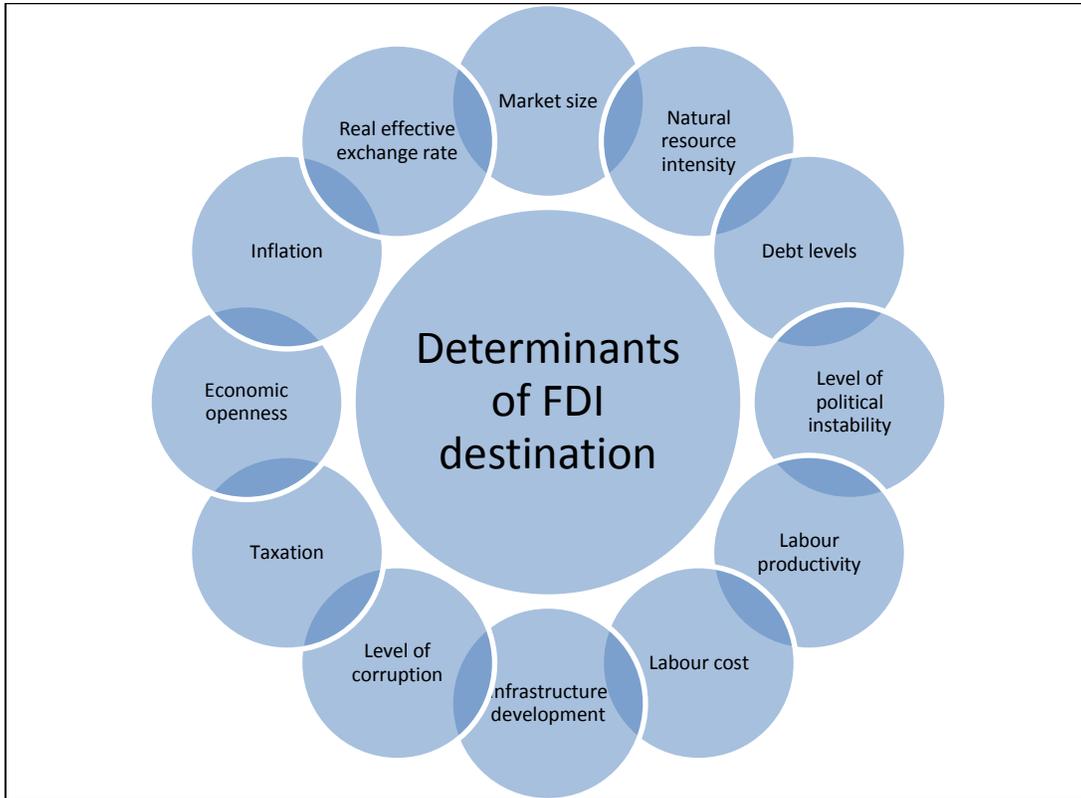
It is also important to understand what drives the decision by a foreign firm to settle on a form of FDI. According to Nagano (2013), foreign firms are likely to choose greenfield FDI when they have prior relationship with the host country or when their country of origin is geographically close to the foreign country of investment. In contrast, foreign firms tend to choose brownfield FDI when the aim of the foreign company is to have sales and distribution platforms in the host country. This means that economic sectors such as wholesaling and retailing are likely to attract brownfield investments as opposed to greenfield investments. In addition, Head & Ries (2008) and Ahern, Kenneth, Daminelli, Daniele, Fracassi & Cesare (2012) conclude that other factors that determine the form of FDI include geographical distance, past relationship between the countries as well as absence of communication barriers such as language.

The above discussion seems to suggest that different forms of FDI have varying impacts on economic growth at a sectorial level in developing countries. It should be noted that when exploring the understanding of sector FDI on economic growth in developing countries, in addition to understanding how the forms of FDI influence sector economic growth it is equally important to understand the factors or determinants that drive the decisions by foreign companies to invest into a country and more specifically an economic sector.

2.4 Determinants of FDI

There are various factors that determine the amount of FDI flowing into a country including the economic sector. Figure 3 below summarises the significant determinants of FDI presented by Alam & Shah (2013).

Figure 3 Determinants of FDI



Source: Alam & Shah (2013).

From the above noted determinants of FDI, this research shall only focus on explaining in detail factors that attract foreign investments into a particular economic sector. It is important to note that some determinants have a higher influence in the attraction of the foreign investor into a particular economic sector and others have less influence Alam & Shah (2013).

Ndikumana & Verick (2008) explain that FDI flows into developing countries target the primary resources sector and are usually driven by commodity price surges. In addition they also argue that the size of local markets and economic development level determines long run capital attraction into the wholesale and retail economic sectors. Vasconcellos & Kish (2013) study on the impact of political risk on FDI concluded that there is a negative correlation between political risk and the level of foreign investments that flow into economic sectors. This is in line with the work done by Goswami & Haider (2014) who also concluded that the higher the political risk the less inflow of FDI in a country. This is so because foreign capital seeks more political stable environments where the risk of losing the invested capital due to political instability is lowered. In terms of taxation, Jensen (2013) states that the competition for international capital affects the setting of national tax rates. Thus countries use tax regimes to compete for international capital into various economic sectors. Further, macroeconomic factors such as inflation, real effective exchange rate and national debt levels are factors that also affect the attractiveness of a country in terms of international investment.

Although empirical studies on sectorial determinants of FDI seem limited, great insights can be drawn from the little available literature of Doytch & Eren (2012) and Nefussi & Schwellnus (2010). These studies are discussed in the following paragraphs.

Doytch & Eren (2012) conducted a study on the determinants of the sectorial distribution of FDI in Eastern Europe and Central Asia using a dynamic system generalized method-of-moments estimator in 21 countries for the period 1994–2008. Their findings revealed that the host country's level of democracy has a positive correlation with FDI inflows into agricultural and manufacturing sectors because of the economic sectors sensitivity to quality of institutions due to long term and huge capital outlays required in the sectors. Further, their results also show that FDI inflow into the service sector is attracted by the level of labour skills and education while FDI into manufacturing and agriculture is attracted by labour cost.

Nefussi & Schwellnus (2010) performed a study to determine whether FDI in manufacturing causes FDI in business services and they concluded that there is no significant difference in the model underlying location choices of manufacturing and service firms. Further their results demonstrated that the resident choices of manufacturing and services firms are interdependent because FDI in service firms increases with the downstream demand generated by FDI in manufacturing firms. In other words FDI decisions in services are correlated to FDI decisions in manufacturing. This relationship is important to understand because an economic sector may not have an impact on economic growth on its own right, but its development results in the growth of economic sectors that have impact on economic growth which ultimately benefits the country.

As much as it is important to understand the determinants of sectorial FDI as detailed in the above cases, it is also critical to understand the motives that drive the foreign companies to invest in foreign countries as well as the economic sectors that they invest in. The motives of the foreign companies tend to be classified in a number of ways and the following section discusses the various FDI classifications.

2.5 FDI Classifications

As indicated earlier, it is important to understand what drives or motivates a foreign company to set up operations in other countries. There are four main classifications of FDI determined by the motives of the foreign company for investment abroad namely natural resource-seeking, market-seeking, efficiency seeking and strategic asset-seeking (Ching-Mu, Melachroinos, & Chang, 2010).

Natural resource-seeking motive is concerned with investing in the extraction of the host country's natural resources. Profitability is made by arbitraging the resource prices across the world. According to Doytch & Eren (2012) natural resource-seeking motive has tended to direct FDI into the agriculture and manufacturing sectors. Amighini, Rabellotti & Sanfilippo (2013) add that the resource-seeking motives in medium to high income developing countries tend to be in the manufacturing sector while resource-seeking motive in low-income countries tend to be concentrated in the primary resource sectors. Ching-Mu, Melachroinos, & Chang (2010) argue that because natural resource-seeking motive is mainly concerned with the arbitrage of natural resource prices across the globe, it is uncertain whether it has a huge positive impact on economic growth as there may be limited local spill over effects or the trigger of resource development related skills and activities.

Market-seeking motive relates to setting up an operation to distribute goods and services to the local market. It is concerned with the market size, demographics as well as consumer preferences (Ching-Mu, Melachroinos, & Chang, 2010). Foreign investors driven by market-seeking motives have tended to invest in the services, wholesaling and retail sectors of the economy. It is argued that market-seeking FDI is likely to have a good impact on economic growth only if it has the ability to facilitate backward integration with the upstream local suppliers. The foreign firms act as the distribution channel for local markets and thus increase products footprint. Further, the foreign firms require high quality products from the local firms to facilitate the local firms to compete internationally.

Ching-Mu et al (2010) explain that the efficiency-seeking motive is concerned with improving operational efficiency levels through taking advantage of economies of scale and scope. Amighini et al (2013) argues that efficiency-seeking is likely to be in the

manufacturing sector where economies of scale and scope give a multinational company significant competitive advantages in the market. Efficiency-seeking FDI has a number of benefits to local firms and the host country which include access to foreign sources of supply, improvement of host countries economic structural rigidities and the strengthening of the comparative advantages of the hosting country. These factors have huge advantages in improving with host countries economic growth. It should be noted that however that some researches including that of Inekwe (2013) and Imoudu (2012) have shown that FDI in the manufacturing sector in Nigeria, an African developing country has negative impact economic growth.

Ching-Mu et al (2010) research also adds that strategic asset-seeking motive is concerned with improving long-run competitiveness of the foreign company in a variety of ways. The competitiveness can be improved by having a dominant presence in the local market, raising barriers to entry for competitors as well as realising learning effects. Strategic asset-seeking investment is usually achieved through M&A and has the advantage that it improves the competitive advantages of the acquired firm. It is argued however that it may not contribute to job creation and thus the economic growth driven by foreign firms seeking strategic assets is limited. Research by Amighini et al (2013) reveals that strategic-asset seeking motivation as measured by the level of research and development spending on gross domestic product positively and significantly affected Chinese manufacturing and service FDI to OECD countries. Although in this research paper FDI classifications have been discussed separately, the reality is that the classification demarcations are blurred. Amighini et al (2013) concludes that although Chinese FDI has been attracted by natural resource seeking, Chinese investment has also been found in manufacturing and service sectors.

This literature review has discussed contemporary debates and schools of thought that examines how different forms of FDI can affect different economic sectors in terms of economic growth, determinants that attract FDI into specific economic sectors and the resulting economic growth and more recently the motives that drive foreign investors to invest in foreign countries and specific economic sectors in order to understand the impact of sector FDI on economic growth in developing countries. In addition, it is important to understand that the impact of sector FDI on economic growth is also heavily influenced by the level of both the host country's and economic sector's FDI absorption capacity. The

following section discusses FDI absorption in greater detail and forms part of the holistic themes of sector FDI and its impact on economic growth in developing countries.

2.6 Theory of FDI absorption

This section of the literature review seeks to explore technical reasons why different economic sectors have different impact on economic growth along the lines of understanding absorptive capacity. Monastiriotis & Alegria (2011) define absorptive capacity as the economy's ability to internalise spill overs to be able to accelerate the country's economic growth. The key economic structural abilities play a major role in influencing the FDI's ability to assist in economic development. It is disappointing to note that although developing governments seek to attract FDI to drive economic growth, according to Yanling (2010) most developing countries lack absorptive capacity to take advantage of FDI as an enabler to accelerate economic development because of lack of proper infrastructure and a strong technological base.

Barclay (2010) studied how resource rich developing countries can create an enabling environment for accelerated FDI driven development using the case of the Jamaican bauxite mining industry. The results of the study suggest that in the mining industry positive spill overs occur when host country policymakers implement policies that increase indigenous technological capability. Increasing indigenous technological capability enhances the absorptive capacity of developing countries, which allows them to capture the spillovers arising from the foreign companies' activities. The research argued that theoretically economic sectors with a higher absorptive capacity of FDI are better positioned to have a greater impact on FDI driven economic growth.

Yanling (2010) research focused on the role of inter-industry linkages and productivity growth on Canadian firms and concluded that industries with a rapid growing capacity to absorb technology and human capital entrenched in the intermediate inputs produced by foreign company affiliates in upstream industries had greater productivity growth effects which result in accelerated economic growth in the specific industries.

Monastiriotis & Alegria (2011) argues that foreign investments in the form of greenfield are likely to create less spillovers depending on the foreign company's investment strategy as some companies would want to protect their intellectual property. This means that regardless of the economic sector's absorptive capacity if the strategy of the foreign company is to protect its intellectual property then the host country's industries may not be able to absorb the benefits of FDI.

In the above discussion on sector absorptive capacity the theme that comes out very clearly is that the technological, infrastructural and the skills level of the economic sector has a huge effect in influencing the impact that FDI has on economic growth in developing countries. It should be noted that although an economic sector may have a good absorptive capacity, foreign investments that are too technologically advanced for the recipient country context, may create non absorbable spillovers. Further, investments in common technology create too few spillovers to be absorbed (Yanling, 2010).

The understanding that some technologies and motives (determinants) of foreign companies impacts on absorptive capacity of the host country brings an interesting subject of seeking to understand if the FDI country-of-origin has an influence on the impact of sector FDI on economic growth in developing countries. In the following section the effect of FDI country-of-origin is discussed.

2.7 Effect of FDI country-of-origin

Debates around whether the origins of FDI have an impact on the host country's economic growth have surfaced (Kolstad, 2011). Literature in this area is still limited and opinions are divided in terms of the effects of capital origin as a source of economic growth.

Javorcik & Spatareanu (2011) provides evidence that foreign company's country-of-origin has an influence on the level of vertical spillovers to local companies in the upstream sectors that supply intermediate inputs in a number of ways. Their research concludes that the distance between the foreign company's country-of-origin and the host country is a major factor contributing to the foreign owned firm's use of local upstream firms as a source of inputs and therefore increasing the vertical spillovers to the local firms. In addition the research also suggests that the trade treaties between countries, regions and firms also affect the sourcing patterns of foreign companies which also affect the amount and quality of vertical spillover to the local firms.

According to Nagano (2013), the foreign firm's country-of-origin has an influence in its choice on the form of investment. They argue that foreign firms tend to choose greenfield FDI if they are geographically located close to the foreign country of investment. It is also logical that firms that originate from foreign countries that have comparative advantage in a specific industry tend to invest in those industries when they set up their operations in foreign countries.

2.8 Theoretical links between FDI, sector FDI and economic growth

The previous sections of this literature review went through a journey which started by building a general understanding of FDI and its importance to developing countries. Thereafter economic sectors of developing countries were discussed in detail to set an understanding of sector FDI and this discussion led to the establishment that various sectors are likely to attract different forms of FDI which naturally have varying impact on economic growth in the respective economic sectors. It was further argued that the various determinants and motives (classifications) that drive the decisions of foreign companies to invest into a country and or specific economic sectors have an influence on the FDI's impact on economic growth. This rich discussion led to an interesting introspection of the host country's and economic sector absorptive capacity in order to benefit from FDI driven growth as well as a discussion of whether the country-of- FDI-origin has an influence on economic growth. Taking into account the above the question that now requires examination is what brings the linkages between FDI, sector FDI and economic growth.

This section is organised in two sub sections as follows, the first sub-section discusses the theoretical links between FDI and economic growth in general and the second sub-section discusses the impact of sector FDI to both sector growth and overall economic growth.

2.8.1 Theoretical links between FDI and economic growth

Economic development and improving national welfare are among key priorities of developing countries governments and FDI is thought to be a key driver of economic growth and ultimately poverty eradication (Kolstad, 2011). It is vital to understand that there are both macro and micro-economic fundamentals that should be satisfied for FDI to have a positive impact on the host countries' economic development. From a macroeconomic point of view there should be capital accumulation which is brought about by having a positive net transfer on the capital account, current account and government revenues (Sarode, 2012; Salman & Hui Xiao, 2009). While from a microeconomic point of view there should be a positive spillover effect to the indigenous firms (Damijan, Rojec, Majcen, & Knell, 2013).

In terms of the micro-economic point of view, FDI has been shown to assist in economic development through a two pronged approach, the direct and indirect channels. Conceptually from a direct channel point of view, FDI has been noted to help create jobs, develop local skills, stimulate technological progress and spillovers to the local private sector (Gohou & Soumare, 2009). In order for FDI to be beneficial to the host country in terms of job creation there should be more jobs created by FDI-related activities as compared to the ones lost as a result foreign owned company activities such as dismissals following mergers and acquisitions, and local firms' closures due to competition from the foreign companies (Damijan, Rojec, Majcen, & Knell, 2013). Further, local skills should have the capacity to be up-skilled by the foreign companies. Gohou & Soumare (2009) explains that technological progress and positive spillovers occur when FDI creates backward linkages with local firms who would be supplying them with inputs or forward linkages with local firms that will distribute their outputs. FDI may also create positive horizontal spillovers by encouraging competition among foreign owned and local firms which forces firms to be more innovative resulting in new technologies being implemented.

The macroeconomic point of view on the linkage between FDI and economic growth follows the neo-liberal school of thought which gained prominence in the 1980s which asserts that there is an almost automatic link on the inflow of FDI to economic development due to capital accumulation (Carlos, 2009). The fundamental reasoning is that if a country's overall net transfer of revenues is positive then foreign capital would increase a country's total investments thus automatically increasing the Gross Domestic Product (GDP) (Gohou & Soumare, 2009).

The above micro and macroeconomic fundamentals are important in understanding the linkages between FDI and economic growth but do not explain the extent to which FDI influences economic growth. The absorptive capacity of the host country is a crucial factor which determines the impact that FDI can have on economic growth. There are various absorptive capacity factors that influence the impact of FDI on economic growth and development and these include the host country's structural foundation. Countries which possess appropriate conditions including a well-developed financial system, institutions,

good governance and suitable government policies tend to benefit more from FDI injection.

Government policies which promote good operating structures, development of local businesses and entrepreneurship and encourage foreign firms compete by providing value-adding activities have been identified to be important in ensuring that the positive impacts of FDI prevail (Ching-Mu, Melachroinos & Chang, 2010). This means that governments should seek to reduce structural rigidities, distortions and institutional impediments in order to create a good macroeconomic operating environment for businesses. Ching-Mu et al (2010) also argues that the closer the countries cultures are, the easier it becomes for the host country to benefit from FDI.

2.8.2 Sectorial FDI and economic development

The above sub-section has explained the theoretical link between FDI and economic growth in general and this sub-section seeks to narrow down the above discussion by discussing sector specific FDI and its impact on both sector and economic growth.

As has been the theme of this literature review FDI can either have positive or negative impact on economic growth depending on a variety of factors which include the form of the FDI, motives of the foreign investors and the economic sector absorptive capacity. The challenge is to ensure that FDI contributes positively to economic development by taking measures to maximise positive spill overs and minimize the negative effects. Madem, Cudla & Rao (2012) suggest that FDI should be prioritised in industries that have greater positive spillover effects in employment creation, technology development and transfer, manpower and skills development, and industries that benefit mass consumption as opposed to increasing consumption by small group of privileged elite. The high levels of unemployment in developing countries requires FDI to be directed to labour intensive industries such as agriculture and fisheries, mining and quarrying ensuring that the developing countries receive the benefits of FDI as a tool of fighting unemployment and poverty in the lower end of the economic sectors (Madem, Cudla & Rao, 2012).

There are case studies available in literature that discuss sectorial FDI and its impact on economic growth. Chaudhuri and Banerjee (2010) analysed the impact of greenfield FDI on agricultural land in a developing economy and their results concluded that increased FDI in agriculture improves unemployment of both unskilled and skilled labour as well as national welfare. The study upholds the view that FDI inflow into agriculture in the developing economies is very desirable towards managing the huge unemployment level of unskilled workers.

Imodu (2012) examined the relationship between disaggregated FDI into various economic sectors, economic growth and the factors that drive FDI in Nigeria for the period between 1980 and 2009. The results show that FDI in manufacturing, agriculture, and petroleum sectors have had little impact on economic growth while FDI into service sectors such as telecommunications has yielded better impact on real economic growth. The author proposes that the differences in the sector FDI impact on economic growth were due to different industries absorptive capacity built from past infrastructure. In addition telecommunications assist in the opening up of the economy and allow for more efficient production and trade.

In a latter study, Inekwe (2013) examined the links between economic growth, unemployment and FDI in Nigeria for the manufacturing and services sectors for a ten year period commencing 1990 until 2009. The results show that FDI in the services industry results in positive economic growth while FDI in the manufacturing sector has a negative economic growth. Although the research produces interesting results on the relationship between manufacturing sector and economic growth, the research did not give explicit reasons why the manufacturing sector resulted in negative economic growth. The author however recommended that FDI into manufacturing sector should be directed into productive manufacturing units. Further, the results also revealed that FDI in the manufacturing sector has had a positive relationship with employment rate while FDI in the servicing sector a negative relationship with employment rate was observed. The reason for this relationship is that the manufacturing sector employs more people than those required in the service industry.

Noland, Park & Estrada (2012) study shows that in Asian countries because the manufacturing sector is automated the sector is less labour intensive relative to the services sector which tends to be more labour intensive. The results of their study produced statistical evidence that growth of the services sector is associated with poverty reduction. The reason is that the service industry tends to support both the primary and the secondary sectors of the economy. They also concluded that growth in the services sector results in more inclusive growth and political stability.

Madem, Cudla & Rao (2012) research observed that sectors with high government support tend to receive a good share of FDI inflow and have a better absorptive capacity which ultimately results in positive economic growth. This was also because government was able to build infrastructure and institutions that intensify the absorptive capacity.

The aftermath of the 2008/ 2009 global economic and financial crisis brought a new dynamic in terms of sustainability, economic growth and FDI in industry's sensitivity to business cycles. For economic growth and sustainability, developing governments should seek to attract FDI in both high growth sensitive industries such as chemicals and the automobile industry and not overlook the balance that relatively resilient industries such as pharmaceuticals and food and beverage products bring to sustainable economic growth.

The above studies show that there are varied schools of thought in terms of sector FDI contribution to the economy. It seems that further research in this area is required to give a better perspective in terms of the impact of various forms of FDI on economic growth as well as the impact of sector FDI on economic growth.

2.9 Conclusion

In conclusion, the literature review has demonstrated a specific need for research that examines specific economic sector impact of FDI on economic growth (Inekwe, 2013; Noland, Park & Estrada, 2012; Imoudu, 2012; Chaudhuri and Banerjee, 2010). Insight into which forms of FDI in specific economic sectors provides the most economic growth (Madem, Cudla & Rao, 2012) in developing countries has also emerged. This is set to contribute to the quest to inform policy on which sectors and which form of FDI should be attracted in order to achieve accelerated economic growth. Furthermore, the literature review has validated that while FDI may have positive impact on economic growth the extent to which FDI can impact growth is determined by the various sectors' absorptive capacity (Imoudu, 2012; Gohou & Soumare, 2009). There is also need for research in the developing countries that details conditions precedent for sector FDI to have an increased impact on economic growth. The literature review has also revealed that there is a new school of thought interested in understanding whether the origin of FDI has consequences in the host country economic development. This interesting and important debate is in its infancy and is outside the defined scope of this study.

CHAPTER 3:

RESEARCH QUESTIONS & HYPOTHESES

3.0 Introduction

This chapter discusses the research questions and hypothesis used by the researcher to achieve the research objectives set in Chapter 1. According to Saunders & Lewis (2012), formulating research questions assists the researcher in clarifying the research problem. A research hypothesis on the other hand is a testable proposition stating that there is a significant difference or relationship between two or more variables. Research hypothesising is important because it enables proposed thoughts to be tested and allow further analysis on why a school of thought behaves in a given manner (Saunders & Lewis, 2012).

3.1 Research Questions

The purpose of this research is to investigate the impact of sector Foreign Direct Investment on economic growth in developing countries and the hypothesis of this study seeks to answer the following questions:

- (i) Which economic sectors have the greatest impact on GDP growth as a measure of FDI driven economic growth in developing countries?

Inekwe (2013) noted that there are sectorial differences in terms of FDI's impact to economic growth. The above question seeks to understand which economic sectors have the greatest impact on GDP as a measure of economic growth. The answer to this question requires that economic sectors be ranked in order of their total contribution to the overall GDP of the economy to ascertain which sectors provide the greatest impact on economic growth. The answer will also enable recommendations to be drawn on which economic sectors that policymakers should seek to attract the most FDI in order to boost economic growth.

- (ii) Is there a better form of sector FDI which enhances an economic sector's capacity to contribute towards accelerated economic growth in developing economies?

Wang & Wong (2009) explains that various forms of FDI that is 'brownfield' and 'greenfield' investment have varying degrees to their contribution to economic growth. The aim of the second question is to provide answers whether there should be a preferred form of FDI in a particular sector that enhances the sector's ability to contribute more to the country's overall economic growth. In other words are economic sectors sensitive to the form of FDI in delivering economic growth?

3.2 Research Hypothesis

The hypothesis of this study is developed from the key literatures of Madem, Madem, Cudla & Rao (2012), Imoudu (2012), Gohou & Soumare (2009), Inekwe (2013), Noland, Park & Estrada (2012), Chaudhuri and Banerjee (2010), Damijan, Rojec, Majcen, & Knell (2013), Monastiriotis & Alegria (2011), Wang & Wong (2009), Ndikumana & Verick (2008) and Nagano (2013).

This study considered the following hypothesis to answer the above posed research questions:

3.2.1 Hypothesis One

Null Hypothesis (H₀ I): Economic sectors' FDI accumulation has different impacts on economic growth as measured by GDP

Alternative Hypothesis (H_a I): Economic sectors' FDI accumulation does not have different impacts on economic growth as measured by GDP

3.2.2 Hypothesis Two

Null Hypothesis (H_0): Economic sector FDI forms have different impacts on the economic sector's contribution to economic growth as measured by GDP

Alternative Hypothesis (H_a): Economic sector FDI forms do not have different impacts on the economic sector's contribution to economic growth as measured by GDP

CHAPTER 4:

RESEARCH METHODOLOGY

4.0 Introduction

This chapter explains the method that the researcher followed in order to provide answers to the questions and hypothesis outlined in Chapter 3. The chapter discusses in great detail how the research was designed, the population of reference, the sampling technique used, unit of analysis, how data was collected and analysed, how results were interpreted and finally the limitations of this research.

4.1 Research Design

Research design is a set of advance decisions that make up the master plan specifying the methods and procedures for collecting, analyzing and interpreting the needed data (Creswell, 2013). Saunders & Lewis (2012) distinguishes between two key research methods, the qualitative and the quantitative approach. A qualitative approach is usually used when researching into new phenomena, or where the research problem is uncertain and requires exploration. On the other hand a quantitative - descriptive approach is used in research that seeks to accurately describe the characteristics of a relevant phenomenon, whilst a quantitative - causal approach is adopted to identify cause and effect relationships between variables.

The primary reason for this research was to examine the relationship between sector FDI and economic growth to determine which sector provides the greatest economic growth to the economy as well as which form of sector FDI enhances an economic sector to contribute an accelerated economic growth in developing countries. A quantitative - descriptive approach was therefore deemed the most appropriate research design because the approach determine the link between an independent variable (sector FDI and or form of sector FDI) and a dependent variable in the population (economic growth) (Saunders & Lewis, 2012). Further, although there were contradictory results in terms of the relationship between FDI and economic growth, there is a reasonable previous understanding of the problem (relationship between FDI and economic growth) at hand.

Thus this research was more of a verification of already formulated theories and as such a quantitative descriptive approach was deemed more appropriate.

The research employed quantitative secondary data available in public domain including Statistics South Africa, South African Reserve Bank as well as data collected by independent research institutions such as FDI Markets. The data from the above noted sources is argued to be reliable because it is data produced by official governmental sources and is verified by recognised independent parties. Saunders & Lewis (2012) states that the major advantage of employing secondary data is that it is cheaper and less time consuming as the data is readily available. However, one of the major drawbacks of secondary data is that the data might have been collected to answer other specific research questions of the researcher who collected the data and may not necessarily completely fulfil the objectives of the current research needs at hand. To mitigate the above risk the data which was used for this research was collected from institutions that objectively collect FDI and GDP data for use by a wide variety of data users with the said data being normally used for purposes closer to that of the research objectives of this study.

4.2 Population

The purpose of this research was to examine the impact of sector FDI on economic growth as well as which form of sector FDI enhances an economic sector to contribute an accelerated economic growth in developing countries. Therefore the population reference of this research was all countries classified as developing countries by the United Nations and the World Bank. Although there is no universally agreed-upon criterion of defining both developed and developing countries, for the purposes of this research, a developing country is a nation with a lower living standard, underdeveloped industrial base, and low Human Development Index (HDI) relative to other countries.

4.3 Sampling Method

Saunders & Lewis (2012) submit that researchers usually collect data from a sample rather than the whole population because it may not be practical to collect data from the whole population given the limitations resources that typically characterize research work. In this research a non-probability convenience sampling technique was used. Convenience sampling is a non-probability sampling technique whereby the researcher uses a sample which is easier to extract information from (Saunders & Lewis, 2012).

This research examined the impact of sector FDI on economic growth as well as which form of sector FDI enhances an economic sector to contribute an accelerated economic growth in developing countries and as such the research required granular data in terms of sector FDI including the forms of the FDI inflows and its impact on economic growth. The researcher had access to the necessary data in its requisite granularity for South Africa and as such it logically followed that the research would focus on this Southern African developing country. Apart from the ease of data access there were other reasons for choosing South Africa as a sample and these are discussed in the following subsection.

4.3.1 Reasons for Sample Choice

South Africa presented exciting dynamics which made it an ideal developing country to examine for this research. The country was one of the leading country destinations for foreign investment receiving about 17% of Africa's FDI which had the most diversified mix of financial and manufacturing activity (Rogerson, 2009). Further, the country has experienced a shift of foreign investment from natural resources and/ or manufacturing activities to investment in services in the last decades (Rogerson, 2009). Despite South Africa's leading position as a destination for foreign investment as discussed earlier, the country has limited growth, high poverty levels and a high level of unemployment (Mabugu & Chitiga Mabugu, 2014). An important question under these circumstances is whether FDI was been usefully directed to sectors that possess the potential to deliver greatest impact on economic development and ultimately address issues of growth, poverty and inequality. According to Gohou & Soumare (2009) if economic growth is required to improve population well-being, and the economic growth is not pro-poor, the effect may be a large inequality with a worsening of national welfare.

South Africa could arguably be regarded a fair representation of developing countries as it exhibit most characteristics of developing countries which include low income levels, inadequate housing, an undeveloped healthcare system, high poverty and unemployment rates, inadequate existent of public services, low labor productivity because of the lack of complementary factors, such as capital, skills and experienced management (Mabugu & Chitiga Mabugu, 2014).

4.4 Unit of analysis

The unit of analysis of this research was based on the two research questions and hypotheses discussed in Chapter 3. The first unit of analysis was the sector FDI. The research set out to examine the impact of sector FDI on economic growth as measured by GDP and as such sector FDI was one of the key units of analysis of the research. The second unit of analysis was the form of sector FDI. It was important to identify the form of sector FDI because the literature review indicated that the form of sector FDI have a varying impact on the economic growth and the economic sectors ability to contribute to the overall economic growth. This research used greenfield FDI because that was the FDI form which was available to the researcher. The final unit of analysis was GDP. GDP was crucial in determining whether the sector FDI had impact on the economic growth as measured by GDP growth.

4.5 Data collection

The data used for this research was secondary data gathered from multiple data sources available in public domain. The data was gathered only from reliable sources whose intention of data gathering was generally for public use and not for a specific cause or research. This was preferred because data collected for a specific cause or research tends to suit a specific requirement of the research and may not be suitable for other researches. Further, the data collected from local sources was validated by comparing it with data presented in other international sources such as the OECD and the World Bank database. The next sub sections describe the sources of the various data items used in this research.

4.5.1 Sectorial FDI data

Sectorial FDI data was obtained from the South African Reserve Bank quarterly bulletins. The original data was split into various economic sectors and was reorganized to align with economic sectors as presented in other data sources thus enabling the data to be matched for statistical modeling.

4.5.2 Forms of FDI data

Greenfields FDI data was obtained from fDiMarkets, an online database which provides cross-border greenfield investments available worldwide covering both developing and developed countries. The database provides access to real-time monitoring of investment projects, capital investment and job creation.

4.5.3 Sector GDP data

Sectorial GDP data was obtained from Statistics South Africa. The original data was split into various economic sectors and was reorganized to match economic sectors as presented in other data sources to enable the data to be matched for statistical modeling.

Table 1 below summarises data and data sources used to perform statistical modeling:

Table 1 Data Collection Framework

Specific Data Required	Data Sources
Sectorial FDI inflows data	1. South African Reserve Bank
Forms of FDI	1. South African Reserve Bank 2. fDiMarkets database
Sectorial GDP data	1. Statistics South Africa

4.6 Economic sector data organization

The economic sectors used in this research were adopted from the South African Reserve Bank grouping of economic sectors, except for one economic sector which was pragmatically termed “other” by the researcher and incorporated agriculture, forestry & fishing, electricity, gas, water, construction, government services. This economic sector consolidated the economic sectors that had volumes of FDI low enough to not affect the statistics. The economic sectors used in this research are therefore as follows:

- Transport, storage and communication industry
- Wholesale, retail and motor trade; catering and accommodation
- Mining and quarrying
- Manufacturing
- Finance, real estate & business services
- “Other” - Agriculture, forestry & fishing, electricity, gas, water, construction, government services

4.7 Data Analysis

According to Saunders & Lewis (2012) data analysis enables the interpretation of data in an objective way. Below is an explanation of how the gathered data was analysed and tested to enable an informed and objective conclusion to the subject matter.

This research utilised panel data estimation techniques. There are a number of researches that have studied time series data to estimate the impact of FDI on economic growth using panel data estimation techniques successfully and these include Gui-Diby (2014), Ren, Yuan, Ma & Chen (2014), Iwasaki, Csizmadia, Illéssy, Makó, & Szanyi (2012), Cieślík & Tarsalewska (2011) and Adams (2009).

Panel data which is also referred as cross-sectional time-series data is a dataset in which the behavior of entities are observed across time (Hill, Griffiths & Lim, 2008). One of the major advantages of using panel data estimation techniques for this research was that it allowed the control of variables that ordinarily cannot be observed, like improvement in the business environment, education and cultural factors that may improve economic growth but not linked to changes in foreign investments. Further, the panel data estimation techniques controlled for variables that have been noted to change over time but not across entities such as national policies, regulations changes and international agreements (Kariya & Kurata, 2004). In other words panel data estimation techniques account for individual heterogeneity. It should be noted however, that according to Kariya & Kurata (2004), panel data suffers from data collection issues such as sampling design and coverage as well as non-response in the case of micro panels.

Panel data estimation techniques are broadly divided into fixed and random effects and these are discussed in detail below.

4.7.1 Fixed Effects

According to (Güven, 2014), Fixed-effects (FE) assumptions are used when the researcher is only interested in analyzing the impact of variables that vary over time. He further explains that FE explores the relationship between predictor (sector FDI) and outcome variables such as the GDP within a sector. Each sector has its own individual characteristics that may or may not influence the predictor variables. According to Gunasekara, Richardson, Carter, & Blakely (2014), FE typically assumes that something within the sector may impact or bias the predictor or outcome variables and thus there is need to control for this. This is the rationale behind the assumption of the correlation between an entity's error term and predictor variables. FE takes out the effect of time-invariant characteristics from the predictor variables so one can assess the predictors' net effect. Another important assumption of the FE model is that the time-invariant characteristics are unique to each sector and should not be correlated with other sector characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others (Gunasekara, Richardson, Carter, & Blakely, 2014). If the error terms are correlated then FE is not suitable since inferences may not be correct and one needs to model that relationship probably using random-effects. This is the main rationale for using the Hausman test as it ensures that the correct assumption is made.

The equation for the fixed effects model becomes:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \quad \text{Where:}$$

α_i ($i=1 \dots n$) is the unknown intercept for each entity (entity-specific intercepts)
Y_{it} is the dependent variable (DV),
X_{it} represents one independent variable (IV),
β_1 is the coefficient for that IV
u_{it} is the error term
i = entity,
t = time.

4.7.2 Random Effects

The rationale behind the random effects model (RE) is that, unlike the FE model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model (Güven, 2014). According to Green (2008), the crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not. An advantage of the random effects measure is that it can include time invariant variables. In the fixed effects model these variables are absorbed by the intercept. The random effects model is:

$$Y_{it} = \beta X_{it} + \alpha_i + \epsilon_{it} \quad \text{Where:}$$

α_i ($i=1 \dots n$) is the unknown intercept for each entity (entity-specific intercepts),
Y_{it} is the dependent variable (DV),
X_{it} represents one independent variable (IV),
β_1 is the coefficient for that IV,
ϵ_{it} is the error term
i = entity
t = time

Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables (Güven, 2014). In random-effects one needs to have specified those individual characteristics that may or may not influence the predictor variables. However, the problem with this is that some variables may not be available therefore leading to omitted variable bias in the model. It should also be noted that according to Güven (2014), RE allows generalizing the inferences beyond the sample used in the model.

4.7.3 Test Procedure

This section of the report details the procedure that was followed in testing the hypotheses presented in chapter 3 using panel data estimation techniques. The procedure followed in this research is explained in the following sub-sections.

Firstly, an assumption to use either fixed effects or random effects was made using the Hausman test which is a formal and objective way of determining which test to employ as opposed to a subjective way of looking closely at the panel identifiers such as sectors within the economy and concluding the effects to use. Once a conclusion was reached whether to assume fixed or random effects, panel data estimation techniques was employed and these included the following:

4.7.3.1 Pooled Ordinary least squares

Ordinary least squares (OLS) computational methods are commonly used to test hypotheses of differences among factor-level means in repeated measures data. OLS methodology has important assumptions and limitations that can directly affect both the computation of F-tests, and the estimation of means and standard errors (SE) on repeated measures data. One such assumption is that there are constant correlations for measurements within a subject and unfortunately this assumption may not be true in many cases (Ugrinowitsch, Fellingham, & Ricard, 2004).

4.7.3.2 Generalised Methods of Moments (GMM)

Kelejia & Prucha (1999) assert that the advantage of GMM method is that it suits a dynamic model very well compared to OLS. A dynamic model is one that has a lagged dependent variable included as one of the explanatory variables in a panel set up. Further, GMM provides a computationally convenient method for the estimation of nonlinear dynamic models without complete specification of the probability distribution of the data. However, the disadvantage of GMM is that the use of instruments creates problems under this model.

4.7.3.3 Generalised least Squares (GLS)

According to Kariya & Kurata (2004), one of the advantages of GLS is that it provides with efficient estimates because it weights data in terms of the size of their variances, and in terms of whether their errors are correlated or not. Therefore the model equation improves to new models whose errors are uncorrelated and have equal variances as opposed to OLS. GLS was used in this research when assuming random effects.

4.7.3.4 Least Squares Dummy variables (LSDV)

Hill, Griffiths & Lim (2008) state that least square dummy variables are used to estimate separate intercepts for different groups. It is recognized as the simplest way to estimate separate intercepts for each individual. Although LSDV is problematic when there are many groups or subjects in the panel data, this research did not have many subjects and as such LSDV was used when assuming fixed effects.

The above discussion of the four possible methods provides with good background information on the different options that were considered. The GLS and LSDV methods were chosen because of the advantages they provide as stated above.

4.7.4 Diagnostic and Robustness Checks

Lastly for robustness, the Breusch-Pagan test was used as a diagnostic test to check the appropriateness of the assumptions and once confirmations were obtained, emergent conclusions were drawn from the data.

4.8 Results

Results gathered from the data analysis exercise were interpreted in an objective manner by analysing the chi2 and the F statistic. If chi2 on the Hausman test which determines which assumption to use was < 0.05 then it validated the assumption and the method was used with 95% confidence. In testing the various regressions if the F statistic was < 0.05 then a statistical significant relationship between the variables (sector FDI and GDP) was confirmed at a 95% confidence, otherwise no statistical significant results were found. Therefore objective analysis was used to provide recommendations to the various users of this research including policy makers, social entrepreneurs and investors, academics and future researchers.

4.9 Research Assumptions

The purpose of the study was to understand the impact of sector FDI on economic growth to determine which sectors provide the greatest contribution to economic growth using GDP figures as well as which form of sector FDI enhances an economic sector to contribute towards accelerated economic growth within a developing country context. The main assumptions were that GDP figures are a good proxy of economic growth and as such the increase or decrease of the GDP figures would define the extent of economic growth. The other assumption gathered from the literature review was that there exists an appropriate level of sectorial FDI form or a combination of forms that enhances an economic sector to contribute an accelerated economic growth.

It was further assumed economic growth leads to human development and poverty alleviation.

4.10 Research Limitations

This section of the chapter recognises the limitations of this study based on the research design and scope.

Although South Africa was a good sample with interesting dynamics of being among one of the leading developing country destinations of FDI and having one of the least economic growth in Africa, the conclusions of this research cannot be statistically inferred to all developing countries because South Africa may not statistically represent the entire population as a non-probability sampling method was employed to reach the sample decision. This limitation was unavoidable because the researcher did not have access to granular data for all the developing countries to enable a probability based sampling method to be used. From a non-statistical point of view South Africa is a fair representation of developing countries as the country exhibit most of the characteristics evident in most developing countries as discussed earlier in this chapter (Mabugu & Chitiga Mabugu, 2014).

The research used sixteen data points being the FDI and GDP figures for sixteen years. It may be argued that because the research has relatively few data points the results of this research maybe limited, as often few data points reduces the chances of multiple tests of data points. This limitation does not invalidate the results, but rather requires that the results be interpreted with caution.

CHAPTER 5:

RESEARCH RESULTS

5.0 Introduction

This chapter presents the results from the statistical analysis performed on the data collected. The chapter will commence by analysing variables used in the tests that is, sectorial FDI, greenfield FDI, sectorial GDP and total GDP. As previously discussed in chapter 4, this research used greenfield FDI because that was the FDI form which was available to the researcher. Descriptive statistics will be used to analyse the data in order to quantitatively describe the main features of the collected data. This will be followed by a detailed presentation of the results obtained on statistical tests performed in order to answer the hypothesis presented in Chapter 3.

5.1 Data Analysis

This section of the report seeks to analyse the data gathered from both a time series point of view as well as a general description of the data using descriptive statistics. The economic sectors used in this research are as per the Reserve Bank of South Africa sector grouping, except for the sector grouped as “other” which combined agriculture, forestry & fishing, electricity, gas, water, construction, government services as these individual sectors had very small FDI which made statistical results insignificant.

5.1.1 Time Series Analysis

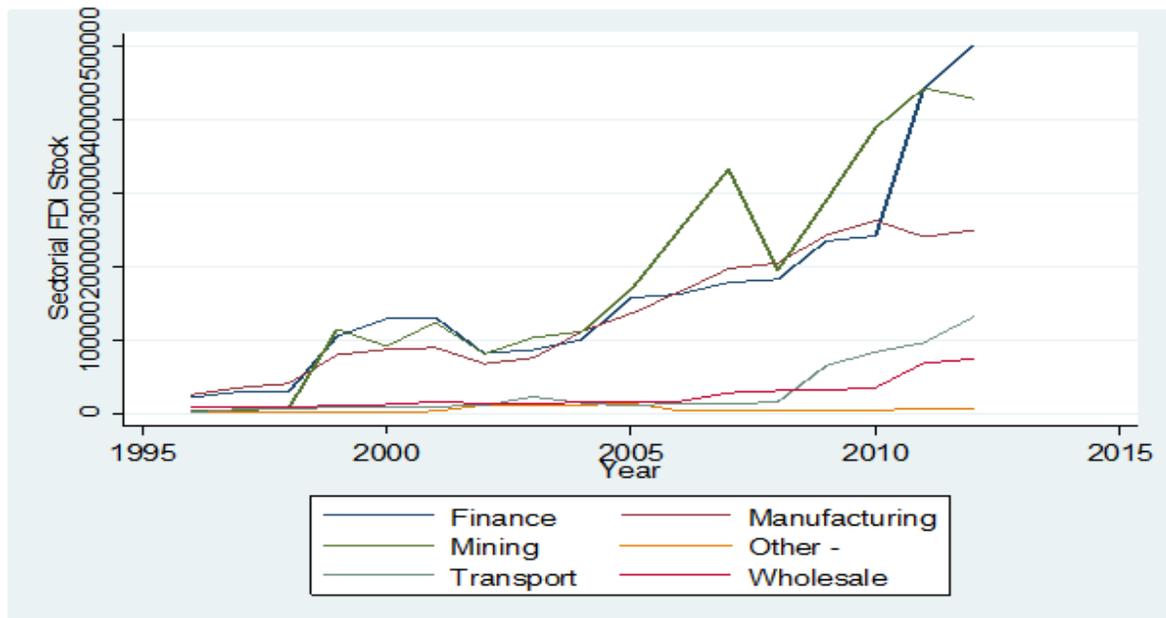
This section presents sectorial FDI, greenfield FDI, sectorial GDP and total GDP time series. It should be noted that the sectorial FDI time series and the greenfield FDI time series have different time frames and intervals because greenfield FDI data was only available from 2007 to 2013. Greenfield FDI was found reported on a quarterly basis which made the data points enough to run statistical analysis. On the other hand, sectorial FDI data was found on an annual basis from 1996 to 2012. The 2013 figures were not included as they had not yet been released at the time of running the statistics.

5.1.1.1 Sectorial FDI

The sectorial FDI time series used FDI stock values. According to the Reserve Bank of South Africa, FDI stock is the value of the share of capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprise.

Figure 4 below indicates that mining and quarrying has attracted the highest sectorial FDI stock. To some extent this outcome was expected as the mining and quarrying sectors have been the main driving force behind the historic development of the South African economy. The finance, real estate & business services sector has had the second highest sectorial FDI and this has been rising steadily over the last few years. The manufacturing sector has managed to attract an increasing amount of FDI owing to a well-established and diversified manufacturing base which has shown resilience and potential to compete in the global economy. After 2011 FDI in the manufacturing sector accelerated from the prior years' slow growth. The other three sectors, that is transport, storage & communication industry, wholesale, retail and motor trade; catering & accommodation industry and other –comprising agriculture, forestry & fishing, electricity, gas, water, construction, government services industry have received a comparatively low amount of FDI as shown in figure 4. This may be attributed to the fact that most FDI in developing countries tends to be directed at primary resource sectors as well as manufacturing and less so towards the tertiary industries (Amighini, Rabellotti & Sanfilippo, 2013).

Figure 4 Sectorial FDI Stock time series (1996 - 2012) Values in millions

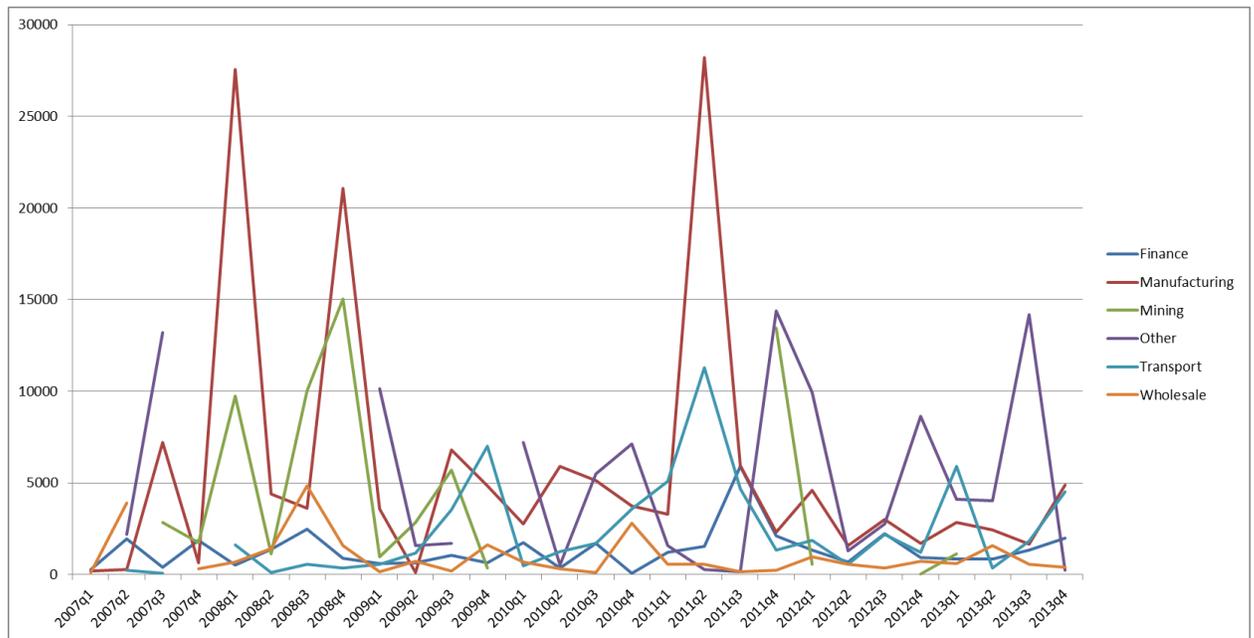


Source: South African Reserve Bank quarterly bulletins (1996 to 2012)

5.1.1.2 Sectorial Greenfield FDI Inflows

Figure 5 below shows greenfield FDI inflows into South Africa recorded on a quarterly basis. The manufacturing sector has managed to attract more greenfield foreign investments in the period under review and this can be attributed to the fact that the South African manufacturing sector was still in its infancy and foreign investors had to invest into brand new operations as there were limited established operations. Prior to the 4th quarter of 2009, the mining and quarrying sector was able to attract greenfield investments, however, post 2010 greenfield FDI slowed down and this can be attributed to various challenges that the South African mining industry has faced in recent history including labour dispute matters. The transport, storage & communication industry received a fair amount of greenfield FDI prior to 2009 which has since slowed down, this can be attributed to the dominance of the four mobile companies that tend to make new entrance into the market difficult. The “other” – comprising of agriculture, forestry & fishing, electricity, gas, water, construction, government services post the 2011 3rd quarter has attracted an increased amount of greenfield FDI as shown in figure 5 below. This can be linked to the growth of the agricultural and construction sectors.

Figure 5 Sectorial Greenfield FDI inflows time series (2007 - 2013) value in millions

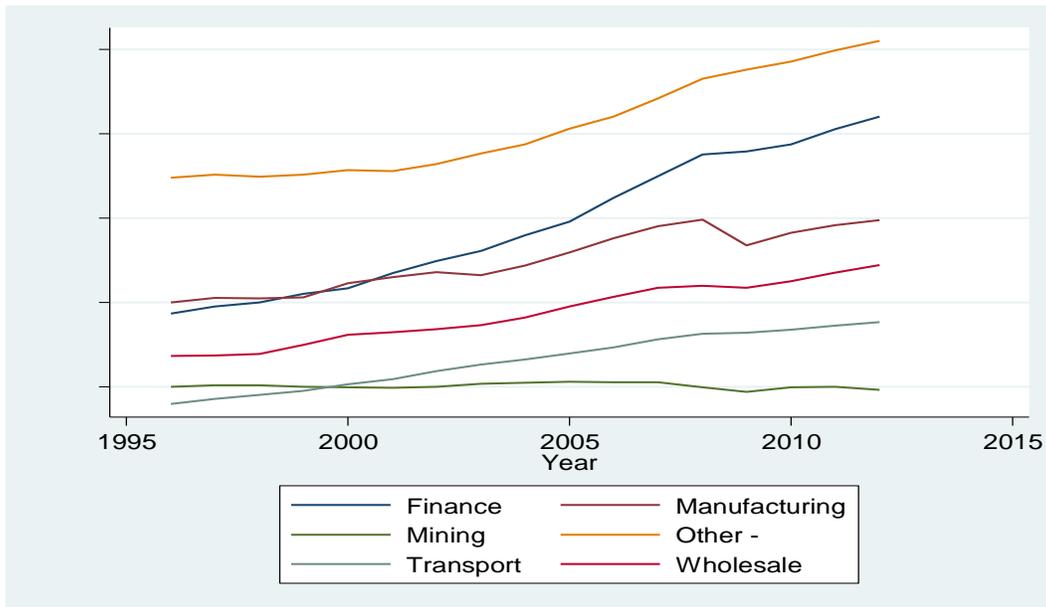


Source: fDiMarkets database (2007 to 2013)

5.1.1.3 Sectorial GDP

Figure 6 below indicates that the “other sector” – comprising of agriculture, forestry & fishing, electricity, gas, water, construction, government services has the highest combined GDP figures for the period under review. Finance, real estate and business services overtook manufacturing in the year 2000 to become the second highest contributor to South Africa’s total GDP. Manufacturing is the third highest contributor to total GDP and in 2009, the industry’s GDP slowed owing to the financial crisis which hit the world markets in the 2008/9 period. The last three clusters contributing to South Africa’s GDP are wholesale, retail and motor trade; catering & accommodation followed by transport, storage & communication and lastly mining and quarrying. As can be noted from figure 6 the mining and quarrying sector’s GDP has been shrinking from 2008, this can be attributed to various challenges that the industry has been facing including labour strikes.

Figure 6 Sectorial GDP time series (1996 - 2012) value in millions

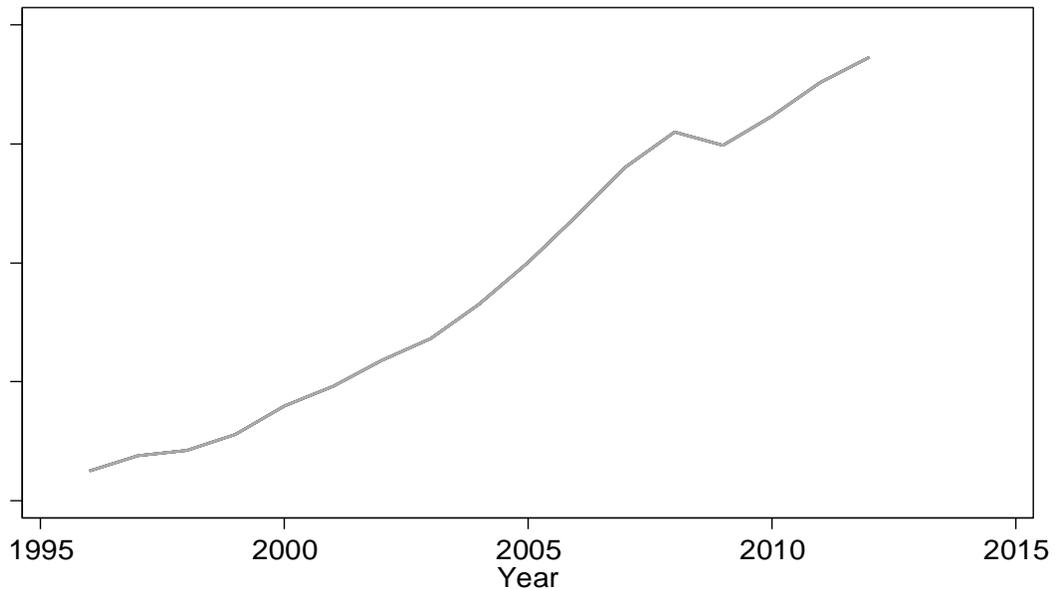


Source: Statistics South Africa data source

5.1.1.4 Total GDP

Total GDP has been on the rise until 2008/09 when the world market experienced the global financial crisis. Figure 7 below shows that after 2010, the South African GDP bounced back to an upward trend albeit at a slowing rate.

Figure 7 Total GDP time series (1996 - 2012) values in millions



5.1.2 Descriptive Statistics

Descriptive statistics for each variable were performed in order to quantitatively describe the main features of the data collected. Tables 2 to 5 below detail the results of each variable that will be used in data analysis to answer the hypothesis presented in Chapter 3.

Table 2 Sectorial FDI Stock

variable	N	mean	p50	sd	skewness	kurtosis	range	min	max
sectorialf~k	102	90741.75	32829.5	113828.2	1.687802	5.48963	500191	534	500725

A total of 102 observations were made on sectorial FDI stock. The data shows that on the whole an average FDI stock of R90.7 billion was available annually with a range of 500 191 which shows that FDI stock is volatile. The standard deviation as noted above confirms that there is great variation in the data which makes panel estimation techniques more appropriate.

Table 3 Greenfield FDI

variable	N	mean	p50	sd	skewness	kurtosis	range	min	max
gfdi	149	3236.315	1583	4585.646	3.033295	14.31283	28183	31	28214

A total of 149 observations were made on greenfield FDI. The data shows that on average R3.2 billion of greenfield FDI was made in a quarter in the period under review. The standard deviation as noted above confirms that there is great variation in the data which makes panel estimation techniques more appropriate. The kurtosis statistic shows that the distribution of the time series is peaked given that kurtosis is positive.

Table 4 Sectorial GDP

variable	N	mean	p50	sd	skewness	kurtosis	range	min	max
sectorialgdp	102	228128.5	206268.5	114140.5	.6681946	2.481669	430469	79542	510011

A total of 102 observations were made on sectorial GDP. The data shows that the average sector GDP was R228 with a range of 430 469 which shows that sectorial GDP is also volatile. The standard deviation as noted above confirms that there is great variation in the data which makes panel estimation techniques more appropriate.

Table 5 Total GDP

variable	N	mean	p50	sd	skewness	kurtosis	range	min	max
totalgdp	102	1368771	1330390	235611.7	.1534888	1.534411	695377.4	1049975	1745353

A total of 102 observations were made on total GDP. The data shows that the mean GDP was R1.3 trillion with a range of 695 377 which shows that total GDP is also volatile. The standard deviation as noted above confirms that there is great variation in the data which again makes panel estimation techniques more appropriate.

5.2 Hypotheses

This section answers the hypotheses that were presented in Chapter 3 using various statistical methods.

5.2.1 Hypothesis One

Null Hypothesis (H₀): Economic sectors' FDI accumulation has different impacts on economic growth as measured by GDP

Alternative Hypothesis (H_a): Economic sectors' FDI accumulation does not have different impacts on economic growth as measured by GDP

In order to comprehensively conclude on the above hypothesis, two models were performed. Firstly it was important to analyse the impact of sector FDI accumulation into the specific sector's economic growth as measured by sector GDP and secondly to measure the impact of a particular economic sector's FDI accumulation to total economic growth as measured by total GDP. The two models gave both a narrow and a broader understanding of how FDI in an economic sector contributes to economic growth both in a particular economic sector and the economy as a whole.

Model 1: Sectorial FDI and Sectorial GDP

As a departure point, the Hausman test was conducted in order to inform which panel data estimation techniques to use. The results of the test are presented in Table 6.

Table 6 Hausman fixed random effects

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V _b -V _B))
	fixed	random	Difference	S.E.
sectorialf~k	.2799849	.2767495	.0032355	.0031953

b = consistent under H₀ and H_a; obtained from xtreg
 B = inconsistent under H_a, efficient under H₀; obtained from xtreg

Test: H₀: difference in coefficients not systematic

chi2(1) = (b-B)' [(V_b-V_B)⁻¹] (b-B)
 = 1.03
 Prob>chi2 = 0.3113

The result shows that $\text{prob} > \chi^2 (< 0.05)$ at 95% confidence interval which is statistically significant implying that random effects are valid.

Following the above conclusion General Least Square (GLS) regression was conducted assuming random effects and the results are presented in Table 7 below.

Table 7 Random-effects GLS regression

Random-effects GLS regression	Number of obs	=	102
Group variable: sectorr	Number of groups	=	6
R-sq: within = 0.2729	Obs per group: min	=	17
between = 0.0813	avg	=	17.0
overall = 0.0000	max	=	17
	Wald $\chi^2(1)$	=	35.01
$\text{corr}(u_i, X) = 0$ (assumed)	Prob > χ^2	=	0.0000

sectorialgdp	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
sectorialf~k	.2767495	.0467746	5.92	0.000	.185073	.3684259
_cons	203015.7	49864.25	4.07	0.000	105283.6	300747.9

sigma_u		121286.78	
sigma_e		41004.323	
rho		.89742734	(fraction of variance due to u_i)

From the above results, albeit very low r-squared (r^2), sectorial FDI was found to significantly and positively affect sectorial GDP in the South African data (at 1% as $P > |z| < 0.01$). The coefficient shows that for every one rand increase in FDI, GDP increases by twenty eight cents.

Although the above results are very informative, they come short in expressing the differences across economic sectors which is the main purpose of running panel data at sectorial level. In order to obtain such additional information, the Least Squares Dummy Variable (LSDV) model was estimated on the same data. LSDV model allows intercepts to differ across sectors thus allowing comparisons of results across sectors. Table 8 details the results of the LSDV model.

Table 8 LSDV regression model

LSDV model					
Source	SS	df	MS	Number of obs = 102	
Model	1.1561e+12	6	1.9268e+11	F(6, 95) =	114.60
Residual	1.5973e+11	95	1.6814e+09	Prob > F =	0.0000
-----				R-squared =	0.8786
-----				Adj R-squared =	0.8709
Total	1.3158e+12	101	1.3028e+10	Root MSE =	41004

sectorialgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sectorialf~k	.2799849	.0468836	5.97	0.000	.1869093	.3730606
sectorrr						
2	-34362	14133.7	-2.43	0.017	-62420.94	-6303.063
3	-196702.8	14092.1	-13.96	0.000	-224679.1	-168726.4
4	161175.6	15955.77	10.10	0.000	129499.4	192851.8
5	-123466.8	15433.42	-8.00	0.000	-154106	-92827.61
6	-65931.94	15561.52	-4.24	0.000	-96825.46	-35038.42
_cons	245936.8	12617.42	19.49	0.000	220888.1	270985.6

Adjusted r-squared of over 87% implies that variations in sectorial GDP are as a result of movements in sectorial FDI. As the p-values are less than 0.05 the results conclude that all sectors are significant, meaning effects of sectorial FDI to sectorial GDP is strong in all sectors, however intercepts vary.

For robustness checks and to ensure sound inferences on the above results, it was appropriate to compare other possible models. Table 9 presents such results and as expected simple Ordinary Least Square (OLS) does not fit the nature of the data, however the other three models fit the data well.

Table 9 Methods Comparison

Variable	ols	fixed	random	ols_dum
sectorialf~k	-.00453907	.27998494***	.27674946***	.27998494***
sectorrr				
2				-34362.002*
3				-196702.79***
4				161175.59***
5				-123466.82***
6				-65931.942***
_cons	228540.35***	202722.15***	203015.74***	245936.81***
N	102	102	102	102
r2	.00002049	.27294338		.87861029
r2_a	-.0099793	.22702402		.87094357

legend: * p<0.05; ** p<0.01; *** p<0.001

The chosen model of assuming random effects is befitting as well as the LSDV that allows a close scrutiny of the effects across each economic sector. Sector specific effects are detected in the LSDV model which is not possible with other models. The Breusch-Pagan as a diagnostic test for robustness checks was also positive. Table 10 shows the results.

Table 10 Breusch and Pagan Lagrangian Multiplier Test For Random Effects

```
sectorialgdp[sectorr,t] = Xb + u[sectorr] + e[sectorr,t]

Estimated results:
-----+-----
                |          Var          sd = sqrt(Var)
sectori~p | 1.30e+10          114140.5
e | 1.68e+09          41004.32
u | 1.47e+10          121286.8

Test:  Var(u) = 0
                chibar2(01) = 550.04
                Prob > chibar2 = 0.0000
```

In conclusion, sectorial FDI has a statistically significant and positive impact to sectorial GDP. Further, the GLS model concluded that sectorial FDI accumulation has different impacts to economic growth as measured by sectorial GDP. Therefore we accept Ho I and conclude that economic sectors' FDI accumulation has different impacts on economic growth as measured by GDP.

Model 2: Sectorial FDI & Total GDP

In contrast to the model 1 discussed above which uses sectorial GDP, when total GDP for South Africa is used, random effects are chosen based on the Hausman test results reported in Table 11 below.

Table 11 Hausman Fixed Random Effects

```
----- Coefficients -----
                |          (b)          (B)          (b-B)          sqrt(diag(V_b-V_B))
                |          fixed        random        Difference        S.E.
-----+-----
sectorialf~k | 1.912369          1.117812          .7945574          .0911642
-----+-----
                b = consistent under Ho and Ha; obtained from xtreg
                B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:  Ho:  difference in coefficients not systematic

                chi2(1) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
                = 75.96
                Prob>chi2 = 0.0000
```

The result shows that prob >chi2 (< 0.05) at 95% confidence interval which is statistically significant implying that fixed effects are valid.

Table 12 shows that sectorial FDI are positively related to total GDP assuming fixed effects. This was as expected since total GDP (as influenced by sectorial GDP in the previous estimations) adds up to form the total GDP of the country. The Prob>F is less than 0.05, implying the model is perfect for the data.

Table 12 Fixed-Effects (Within) Regression

Fixed-effects (within) regression	Number of obs	=	102
Group variable: sectorr	Number of groups	=	6
R-sq: within = 0.4989	Obs per group: min =		17
between = .	avg =		17.0
overall = 0.2916	max =		17
	F(1, 95)	=	94.60
corr(u_i, Xb) = -0.6446	Prob > F	=	0.0000

totalgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
sectorialf~k	1.912369	.1966222	9.73	0.000	1.522025 2.302714
_cons	1195239	24662.81	48.46	0.000	1146277 1244201
sigma_u	152950.02				
sigma_e	171965.54				
rho	.44167525	(fraction of variance due to u_i)			

F test that all u_i=0:	F(5, 95) =	7.86	Prob > F =	0.0000
------------------------	------------	------	------------	--------

However, the above test lack in expressing the differences across economic sectors which is the main purpose of running panel data at sectorial level. A LSDV model was run to separate the effects of each sector to total GDP. Table 13 shows that manufacturing sector (2) (p =0.338 which is greater than 0.05) and finance, real estate & business services (3) (p =0.543 which is greater than 0.05) are not statistically significant. This means that FDI into these two particular sectors do not statistically contribute to economic growth as measured by GDP.

Table 13 LSDV Regression Model

Source	SS	df	MS			
Model	2.7974e+12	6	4.6624e+11	Number of obs =	102	
Residual	2.8094e+12	95	2.9572e+10	F(6, 95) =	15.77	
				Prob > F =	0.0000	
				R-squared =	0.4989	
				Adj R-squared =	0.4673	
				Root MSE =	1.7e+05	
Total	5.6068e+12	101	5.5513e+10			

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
totalgdp						
sectorialf~k	1.912369	.1966222	9.73	0.000	1.522025	2.302714
sectorrr						
2	57033.04	59274.46	0.96	0.338	-60641.64	174707.7
3	-36044.67	59100	-0.61	0.543	-153373	81283.67
4	307361.6	66915.94	4.59	0.000	174516.7	440206.6
5	259212.3	64725.28	4.00	0.000	130716.4	387708.2
6	271656.2	65262.51	4.16	0.000	142093.8	401218.7
_cons	1052036	52915.44	19.88	0.000	946985.8	1157087

Further the results in Table 13 above shows that FDI into the transport, storage and communication industry (4) has the greatest impact on economic growth as measured by GDP followed by Other - Agriculture, forestry & fishing, Electricity, gas, water, construction, government services (6), followed by Wholesale, retail and motor trade; catering and accommodation (5), followed by Mining and quarrying. FDI into Manufacturing (2) and Finance, real estate & business services (3) has no statistically significant impact on economic growth.

For robustness checks and to ensure sound inferences on the above results, it was appropriate to compare other possible models. Table 14 shows that the chosen model (being the Fixed Effects) does not disappoint as the last model (ols_dum run in an LSDV framework), Manufacturing (2) and Finance, real estate and business services (3) are shown not to be significant.

Table 14 Methods Comparison

Variable	ols	fixed	random	ols_dum
sectorialf~k	1.1178119***	1.9123693***	1.1178119***	1.9123693***
sectorrr				
2				57033.041
3				-36044.675
4				307361.63***
5				259212.33***
6				271656.23***
_cons	1267338.8***	1195239.3***	1267338.8***	1052036.2***
N	102	102	102	102
r2	.29163757	.49893791		.49893791
r2_a	.28455395	.46729189		.46729189

legend: * p<0.05; ** p<0.01; *** p<0.001

Overall FDI into Transport, storage and communications sector (Sector 4) has the greatest effect on economic growth of that sector (sectorial GDP) as well as for the total GDP.

In conclusion, sectorial FDI has a statistically significant and positive impact to total GDP in all economic sectors expect for manufacturing and finance, real estate & business services, where though FDI has a positive impact it is not statistically significant. Further, the GLS model concluded that sectorial FDI accumulation has different impacts to economic growth as measured by total GDP. Therefore we accept H_0 I and conclude that economic sectors' FDI accumulation has different impacts on economic growth as measured by GDP.

5.2.2 Hypothesis Two

Null Hypothesis (H_0 II): Economic sector FDI form has an impact on the economic sector's contribution to economic growth as measured by GDP

Alternative Hypothesis (H_a II): Economic sector FDI form does not have an impact on the economic sector's contribution to economic growth as measured by GDP

Model 3: Greenfield sectorial FDI and sectorial GDP

In this model, instead of controlling for FDI stock values, greenfields foreign investments inflows were considered and regression done to investigate whether the form of FDI inflows has an effect on sectorial GDP on quarterly observations.

The Hausman test was conducted in order to inform which panel data estimation techniques to use. The results of the test are presented in Table 15.

Table 15 Hausman Fixed Random Effects

```

----- Coefficients -----
      |          (b)          (B)          (b-B)      sqrt(diag(V_b-V_B))
      |          fixed          random      Difference      S.E.
-----+-----
gfdi |   -.0135926   -.0130558   -.0005368      .0101634
-----+-----
      b = consistent under Ho and Ha; obtained from xtreg
      B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:  Ho:  difference in coefficients not systematic

      chi2(1) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
              =          0.00
      Prob>chi2 =          0.9579

```

The Hausman tests statistic (Prob>chi2) of 0.9579>0.05 implies random effects. Therefore random effects were assumed in running the GLS model and the results are presented in Table 16.

Table 16 Random-Effects GLS Regression

```

Random-effects GLS regression              Number of obs   =       149
Group variable: sectorrr                   Number of groups =         6

R-sq:  within = 0.0001                    Obs per group:  min =         17
        between = 0.0199                      avg =        24.8
        overall = 0.0042                      max =         28

corr(u_i, X) = 0 (assumed)                  Wald chi2(1)    =         0.01
                                              Prob > chi2     =        0.9175

-----+-----
sectorialgdp |      Coef.   Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
gfdi |   -.0130558   .125981   -0.10  0.917   -.2599742   .2338625
_cons |   69004.62   15821.3   4.36  0.000   37995.43   100013.8
-----+-----
sigma_u |   38840.008
sigma_e |   6406.6088
rho |   .9735126   (fraction of variance due to u_i)
-----+-----

```

The results show that greenfield FDI did not have an effect on sectorial GDP in South Africa over the period under investigation (2007 to 2013 on a quarterly basis). This comment is made because Prob>chi2 greater than 0.05; the P>|Z| >0.05 as well as a z value below absolute 1.96 (it is at -0.10).

When sector specific effects are taken into account and the Least Squares Dummy Variable (LSDV) model is estimated, again greenfield FDI has no effect on sectorial GDP. However the significance of greenfield FDI in each sector was observed in each sector's intercept. All sector intercepts are significant at 1% ($p > |t| < 0.01$) as shown in Table 17 below. It should be noted that the significance discussed here is not in terms of influencing GDP but rather in terms of different intercepts.

Table 17 LSDV Regression Model

```
. reg sectorialgdp gfdi i.sectorr
```

Source	SS	df	MS			
Model	1.3620e+11	6	2.2700e+10	Number of obs =	149	
Residual	5.8283e+09	142	41044636.3	F(6, 142) =	553.06	
Total	1.4203e+11	148	959661790	Prob > F =	0.0000	
				R-squared =	0.9590	
				Adj R-squared =	0.9572	
				Root MSE =	6406.6	

sectorialgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gfdi	-.0135926	.1263903	-0.11	0.915	-.2634425	.2362572
sectorr						
2	-25635.28	1799.714	-14.24	0.000	-29192.98	-22077.59
3	-73640.36	2006.682	-36.70	0.000	-77607.19	-69673.53
4	20716.8	1869.505	11.08	0.000	17021.15	24412.46
5	-55747.46	1750.261	-31.85	0.000	-59207.4	-52287.53
6	-40526.95	1728.587	-23.45	0.000	-43944.04	-37109.86
_cons	98141.99	1222.46	80.28	0.000	95725.41	100558.6

All the four models considered that is simple ordinary least squares (ols), fixed effects, random effects and the LSDV (ols_dum) show that greenfield FDI has no effect on sectorial GDP. The four models are summarised in Table 18.

Table 18 Methods Comparison

Variable	ols	fixed	random	ols_dum
gfdi	.43706526	-.01359263	-.01305585	-.01359263
sectorr				
2				-25635.284***
3				-73640.364***
4				20716.804***
5				-55747.462***
6				-40526.953***
_cons	69590.566***	71049.037***	69004.616***	98141.986***
N	149	149	149	149
r2	.00418577	.00008144		.95896402
r2_a	-.00258848	-.04216864		.9572301

Legend: * p<0.05; ** p<0.01; *** p<0.001

The chosen model of assuming random effects was befitting as well as the LSDV that allowed a close scrutiny of the effects across each economic sector. Sector specific effects were detected in the LSDV model which is not possible with other models. The Breusch-Pagan as a diagnostic test for robustness checks was also positive. Table 19 shows the results.

Table 19 Breusch and Pagan Lagrangian Multiplier Test For Random Effects

$$\text{sectorialgdp}[\text{sectorr},t] = Xb + u[\text{sectorr}] + e[\text{sectorr},t]$$

```

Estimated results:
      |          Var          sd = sqrt(Var)
-----+-----
sectori~p | 9.60e+08          30978.41
e | 4.10e+07          6406.609
u | 1.51e+09          38840.01

```

```

Test:  Var(u) = 0
          chibar2(01) = 1306.37
          Prob > chibar2 = 0.0000

```

It may be argued that the reason why the above noted models show no significant effects of sectorial FDI to sectorial GDP could be perhaps due to the small volume of sectorial greenfield FDI in comparison to the total amount of sectorial GDP. It was therefore deemed fit to take the natural logarithm for both variables and run the test again as a way to take out the effects of sizes. The results were basically the same as discussed above, therefore it is fair to conclude that greenfield investment has no effect on sectorial GDP.

Again the Hausman test was conducted on logged data in order to inform which panel data estimation techniques to use. The results of the test are presented in Table 20 below.

Table 20 Hausman Fixed Random Effects

```

----- Coefficients -----
      |          (b)          (B)          (b-B)          sqrt(diag(V_b-V_B))
      |          fixed        random        Difference        S.E.
-----+-----
lgfdi |          .0058902        .005906        -.0000158        .0004107
-----+-----
                b = consistent under Ho and Ha; obtained from xtreg
                B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:   Ho:   difference in coefficients not systematic

        chi2(1) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
                =          0.00
        Prob>chi2 =          0.969

```

The Hausman tests statistic (Prob>chi2) of 0.969>0.05 implies random effects. Therefore random effects were assumed in running the GLS model and the results are presented in Table 21.

Table 21 Random-Effects GLS Regression

```

Random-effects GLS regression              Number of obs   =       149
Group variable: sectorrr                  Number of groups =         6

R-sq:  within = 0.0092                    Obs per group:  min =       17
        between = 0.0198                    avg =       24.8
        overall = 0.0077                    max =       28

corr(u_i, X) = 0 (assumed)                Wald chi2(1)    =       1.34
                                           Prob > chi2     =       0.2472

-----+-----
lgdp |          Coef.   Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
lgfdi |          .005906   .0051043   1.16  0.247   -.0040982   .0159102
_cons |         10.96891   .2626982  41.75  0.000   10.45403   11.48379
-----+-----
sigma_u |          .63876901
sigma_e |          .0758275
rho     |          .98610404   (fraction of variance due to u_i)
-----+-----

```

The results show that greenfield FDI did not have an effect on sectorial GDP in South Africa over the period under investigation (2007 to 2013 on a quarterly basis). This comment is also made because Prob>chi2 greater than 0.05; the P>|Z| >0.05 as well as a z value below absolute 1.96 (it is at 1.16).

The Least Squares Dummy Variable (LSDV) model was estimated to take account of sector specific effects and again greenfield FDI has no effect on sectorial GDP. This is detailed in the results presented in Table 22.

Table 22 LSDV Regression Model

Source	SS	df	MS	Number of obs = 149		
Model	34.7047261	6	5.78412101	F(6, 142)	=	1005.97
Residual	.816472915	142	.005749809	Prob > F	=	0.0000
				R-squared	=	0.9770
				Adj R-squared	=	0.9760
Total	35.521199	148	.240008101	Root MSE	=	.07583

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lgdp						
lgfdi	.0058902	.0051208	1.15	0.252	-.0042326	.0160131
sectorrr						
2	-.3092054	.0210432	-14.69	0.000	-.3508039	-.267607
3	-1.392381	.0235354	-59.16	0.000	-1.438906	-1.345856
4	.1822353	.021979	8.29	0.000	.1387869	.2256837
5	-.8404039	.0206866	-40.63	0.000	-.8812975	-.7995104
6	-.5321826	.0206329	-25.79	0.000	-.57297	-.4913952
_cons	11.45098	.0381618	300.06	0.000	11.37554	11.52642

Again, all the four models considered that is simple ordinary least squares (ols), fixed effects, random effects and the LSDV (ols_dum) show that greenfield FDI had no effect on sectorial GDP. The results of the four models are show in Table 23.

Table 23 Methods Comparison

Variable	ols	fixed	random	ols_dum
lgfdi	.03174888	.00589025	.00590601	.00589025
sectorrr				
2				-.30920544***
3				-1.3923812***
4				.18223532***
5				-.84040393***
6				-.5321826***
_cons	10.83055***	11.019056***	10.968912***	11.450978***
N	149	149	149	149
r2	.00771309	.00923161		.97701449
r2_a	.00096284	-.03263185		.97604327

legend: * p<0.05; ** p<0.01; *** p<0.001

The Breusch-Pagan as a diagnostic test for robustness checks was performed and the results shows that the tests performed were in order.. Table 24 shows that the Breusch-Pagan tests confirming positivity as Prob > chibar (<0.05).

Table 24 Breusch and Pagan Lagrangian Multiplier Test For Random Effects

Breusch and Pagan Lagrangian multiplier test for random effects
 $lgdp[sectorrr,t] = Xb + u[sectorrr] + e[sectorrr,t]$

```

Estimated results:
-----+-----
          |          Var          sd = sqrt(Var)
-----+-----
    lgdp |    .2400081          .4899062
         e |    .0057498          .0758275
         u |    .4080258          .638769

Test:   Var(u) = 0
        chibar2(01) = 1202.80
        Prob > chibar2 = 0.0000

```

The above results show that greenfield FDI does not have an effect on sectorial GDP. This also means that greenfield FDI would not have effects of total GDP because sectorial GDP builds up to form the total GDP of the country. It was therefore deemed that it was not necessary to run the tests on total GDP as the results would be the same.

In conclusion, FDI form has no impact on economic growth as measured by GDP. Therefore we reject H_0 and conclude that economic sectors' FDI form does not have an impact on economic growth as measured by GDP.

5.3 Conclusion

The results of this research show that sectorial FDI has had statistically significant and positive impact to total GDP in four economic sectors namely Transport, storage & communication industry, Other -Agriculture, forestry & fishing, electricity, gas, water, construction, government services, Wholesale, retail and motor trade; catering & accommodation and Mining & quarrying. However, Manufacturing and Finance, real estate & business services have no statistically significant impact on total GDP. Further, the results show that sectorial FDI form has no impact on economic growth as measured GDP. The following chapter discusses these results and seeks to explore explanations to the above noted findings from various literature presented in chapter 2.

CHAPTER 6:

DISCUSSION OF RESULTS

6.0 Introduction

The main objective of this research paper was to evaluate the impact of sector FDI on economic growth in developing countries. In pursuit of evaluating the above, two questions and two hypotheses were proposed in Chapter 3. A convenience sampling technique was used and South Africa was chosen on the basis that granular data was easily available to the researcher. Panel data estimation techniques were performed on the sectorial FDI, greenfield FDI, sectorial GDP and total GDP time series data and the results were presented in Chapter 5. This chapter discusses the results presented in Chapter 5 in more detail. The empirical findings of this research using panel data estimation techniques in order to answer the hypothesis and questions discussed in Chapter 3 were linked to previous studies and literature. Possible explanatory variables on sectorial FDI as well as forms of FDI's impact on economic growth for each economic sector were evaluated relative to the primary research aim.

In setting the discussion scene, general observations with regards to major themes of this research gained from the data analysis will be presented. Thereafter, results specific to each economic sector will be examined in so far as they served to answer the research questions and hypotheses.

6.1 Key observations

As was discussed, this research had two hypotheses. Hypothesis One was addressed from two angles, firstly it was important to analyse the impact of sector FDI accumulation into the specific sector's economic growth as measured by sector GDP and secondly to measure the impact of a particular economic sectors' FDI accumulation to total economic growth as measured by total GDP. These two perspectives were set to give a much more consolidated view of which economic sectors have significant impact on GDP growth as a measure of FDI driven economic growth in developing countries. Hypothesis Two sought to understand if there is a better form of sectorial FDI which enhances an economic sector to contribute towards accelerated economic growth in developing economies.

The results of this study show that there is statistically significant evidence that sectorial FDI, results in sector economic growth in South Africa. Random-effects GLS regression analysis as depicted in Table 7, details that on average every one rand FDI injection into an economic sector results in twenty eight cents increase in sector GDP. These results are favourable since the main objective of developing governments in attracting FDI is to accelerate economic growth Kolstad (2011). It is important to note that these results are in line with the results produced by Özkan-Günay (2011), Kolstad (2011), Madem, Cudla & Rao (2012) who argued that FDI results in economic growth in developing countries as measured by GDP. Although the results showed statistically significant evidence that sectorial FDI results in sector economic growth, further analysis using the LSDV regression model detailed in Table 8 showed that intercepts vary. This means that given FDI, some economic sectors contribute more than others to economic growth. This will be discussed in greater depth below when analysing the individual economic sectors.

Although the above results are interesting, they are narrowly focused in the sense that they measure sector economic growth given FDI injection in a particular sector. The research also analysed a more interesting and broader dynamic where sector FDI is measured against its contribution to the overall economic growth as measured by total GDP. The results of the statistics using fixed-effects on regression analysis shown in Table 12 conclude that on the whole, sectorial FDI has impact on economic growth as measured by total GDP. However, the LSDV regression model which inquired into the separate effects of each economic sector to total GDP shows that economic sectors such

as manufacturing and finance, real estate & business services have no statistical evidence that they contribute to economic growth. On the other hand, some sectors have statistically significant evidence that they contribute to economic growth and these sectors are:

- Transport, storage and communication industry
- Wholesale, retail and motor trade; catering and accommodation
- Mining and quarrying
- Other -Agriculture, forestry & fishing, electricity, gas, water, construction, government services

These results are in line with Kennedy, Bardy & Rubens (2012) research which acknowledged that different sector's FDI have variable impact on economic development and such if FDI is to result in accelerated economic growth, priority should be directed to investments in industries that have been identified to have a greater impact on economic growth.

Another key observation noted from this study is that there is no statistically significant evidence that FDI form has influence on an economic sector's ability to impact economic growth. Using greenfield sectorial FDI and sectorial GDP, this study showed that in all cases greenfield as a form of FDI does not have an impact on an economic sector's ability to contribute towards economic growth. The analysis incorporated both actual and natural logarithm for both variables in order to take out the effects of sizes. The results are in contradiction to assertions by Wang & Wong (2009) that greenfield investment and M&As have different impacts on economic growth, with greenfield investment having a significant impact on economic growth. One of the potential reasons for the result differences is that greenfield investment in South Africa might not have significant spillover effect because the human capital is not as developed as other parts of the world which Wang & Wong (2009) notes as a pre-requisite of greenfield investments to have a greater impact on economic growth.

6.2 Hypothesis and Questions

This section seeks to answer the hypothesis and questions proposed in Chapter 3 based on the research results presented in Chapter 5. Explanation of specific results and comparison of this study's results with existing literature and previous study results will be sort guided by the discussion in Chapter 2.

6.2.1 Hypothesis One

Null Hypothesis (H_0): Economic sectors' FDI accumulation has different impacts on economic growth as measured by GDP

Alternative Hypothesis (H_a): Economic sectors' FDI accumulation does not have different impacts on economic growth as measured by GDP

Hypothesis One above sought to answer the following question:

Are there differences in the economic sectors' impact on economic growth and which economic sectors have the greatest impact on GDP growth as a measure of FDI driven economic growth in developing countries?

The results of this study's first model show that different economic sector's FDI has varying impacts on economic growth as measured by sectorial GDP. To this extent the Null Hypothesis H_0 is accepted. When analysing the impact of sectorial FDI to sectorial GDP, the data as per Table 8 showed that intercepts differ across sectors using the LSDV regression model. These results were expected and are in line to the results presented by Kennedy, Bardy & Rubens (2012) who also argued that FDI in different economic sectors have different impact on economic growth. Further the results are also in line with Inekwe (2013) and Imoudu (2012) who utilised the co-integration method using the case of Nigeria to measure the differences in economic sectors' FDI contribution to economic growth. The convergence of the conclusions despite using different statistical methods confers greater confidence in the robustness of the conclusion that there are differences in economic sectors contribution to economic growth.

The results were also the same using the second model which instead of using sector GDP as the dependent variable used total GDP. This answered the hypothesis more diligently because it related the economic sector's FDI impact to the total GDP which is a good proxy for economic growth as a whole as discussed in Chapter 2. The results as shown in Table 13 which used the LSDV regression model answer the second part of the research question as proposed in Chapter 3 seeking to understand which economic sectors have the greatest impact on economic growth as measured by total GDP. The following sub-section discusses the economic sectors impact on economic growth using Table 25 results which is shown below for easy of reference.

Table 25 LSDV Regression Model

Source	SS	df	MS			
Model	2.7974e+12	6	4.6624e+11	Number of obs =	102	
Residual	2.8094e+12	95	2.9572e+10	F(6, 95) =	15.77	
Total	5.6068e+12	101	5.5513e+10	Prob > F =	0.0000	
				R-squared =	0.4989	
				Adj R-squared =	0.4673	
				Root MSE =	1.7e+05	

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
totalgdp						
sectorialf~k	1.912369	.1966222	9.73	0.000	1.522025	2.302714
sectorrr						
2	57033.04	59274.46	0.96	0.338	-60641.64	174707.7
3	-36044.67	59100	-0.61	0.543	-153373	81283.67
4	307361.6	66915.94	4.59	0.000	174516.7	440206.6
5	259212.3	64725.28	4.00	0.000	130716.4	387708.2
6	271656.2	65262.51	4.16	0.000	142093.8	401218.7
_cons	1052036	52915.44	19.88	0.000	946985.8	1157087

6.3.1.1 Transport, storage and communication industry

Table 25 LSDV regression model shows that the transport, storage and communication industry has the highest contribution to economic growth in South Africa. These results are aligned with the intimations by other researchers including Inekwe (2013) who through the application of vector error correction methodology and Johansen's co-integration technique showed a positive long-run relationship between growth and FDI in the servicing sector. Inekwe (2013) research defined the service sector to include transport and communication, building and construction, trading and business services and miscellaneous services.

Furthermore, Imoudu (2012) who also used the Johansen's co-integration technique to measure the impact of FDI on Nigeria's economic growth using data from 1980 to 2009, concluded that FDI in the telecommunication sector had a better contribution to real economic growth.

One of the potential reasons why the transport, storage and communication industry's FDI has the greatest impact on economic growth as measured by the total GDP is that the injection of FDI into the industry has great positive spillovers into other industries. Bălan & Bălan (2011) argue that the service sector, particularly the development of new means of communication, information technology and transport is an important factor for increasing mobility of skills, goods and services. This is because such improvements enhance economic activities in a number of sectors which ultimately leads to economic growth. Further, the transport, storage and communication industry has a direct influence on financial strengthening in that the investment into the industry is usually capital intensive which means that it results in capital formation which according to the neoclassical framework yields growth inducing capital accumulation (Carlos, 2009).

6.3.1.2 Manufacturing

LSDV regression model results as per Table 25 revealed that there is no significant statistical evidence that FDI in the manufacturing sector in South Africa has had an impact on economic growth. These empirical results are disappointing considering that theoretical explanation points towards the assertion that increased FDI in manufacturing should result in economic growth (Elhiraika, Aboubakar & Muhammad, 2014). There is however consistency in this outcome with parallel empirical evidence produced by Inekwe (2013) who through the application of vector error correction methodology and Johansen's cointegration technique on the Nigerian data showed that FDI in the manufacturing sector has a negative association with economic growth.

One of the potential reasons for this outcome is the fact that according to Amighini, Rabellotti & Sanfilippo (2013) the natural resource-seeking motive in medium to high income developing countries, within which South Africa is classified, tends to be in the manufacturing sector.

This means that most FDI injected in the manufacturing sector in South Africa is not motivated by efficiency-seeking and thus the manufacturing sector fails to take advantage of economies of scale and scope as they prefer to only meet the basic minimum of beneficiation required by legislation.

Further to the above, Yanling (2010) argues that most developing countries lack absorptive capacity to take advantage of FDI as an enabler for accelerating economic development due to lack of proper infrastructure and strong technological base. In addition, even if the South African manufacturing sector may have a good absorptive capacity, foreign investments that are too technologically advanced for developing countries may create non absorbable spillovers (Yanling, 2010). According to Damijan, Rojec, Majcen, & Knell (2013) from a microeconomic point of view, there should be a positive spillover effect to the indigenous firms if FDI is to result in economic growth.

6.3.1.3 Finance, real estate & business services

The results of this study show that there is no significant statistical evidence that FDI in the finance, real estate and business services sector in South Africa has impact on economic growth. Again these empirical results are concerning as theoretical explanation and some empirical evidence lean towards the assertion that FDI results in economic growth (Kolstad, 2011; Özkan-Günay, 2011; Cudla & Rao, 2012). It should be noted however, that other researches, although not sector specific, including that of Moyo (2009), Chaudhuri & Banerjee (2010) and Oladipo (2013) have also shown that FDI does not necessarily result in economic growth.

Thus far it has been well illustrated that FDI into the manufacturing and the finance, real estate & business services sectors has no statistically significant impact on economic growth. The fact that these two sectors have the same result is of no surprise. Research conducted by Nefussi & Schwellnus (2010) concluded that manufacturing and services firms are interdependent because FDI in service firms increases with the downstream demand generated by FDI in manufacturing firms. This means that the failure of the manufacturing sector to impact economic growth has a negative spillover to the business service industry's ability to impact economic growth.

In addition to the above, the other potential reason why FDI in finance, real estate & business services in South Africa has no statistically significant impact to economic growth is that the education system in South Africa is not optimally established. According to Doytch & Eren (2012) who conducted a study on the determinants of sectorial distribution of FDI in Eastern Europe and Central Asia, FDI inflow into the service sector is attracted by the level of labour skills and education. This therefore means that the poor education system in South Africa may be a hinderance to the success of the finance, real estate & business services industry capacity to attract sufficient and correct FDI that has the ability to positively impact economic growth.

6.3.1.4 Mining and quarrying

The LSDV regression model results detailed in Table 25 show that the mining and quarrying industry has notable impact on economic growth in South Africa. These results are in contradiction to the results produced by Imoudu (2012) who employed the Johansen's co-integration technique to reveal that FDI in mining and petroleum sectors in Nigeria have had little impact on economic growth. One of the reasons why there could be differences in the results is the fact that the two countries may have different absorptive capacity built from past infrastructure which according to Yanling (2010) most developing countries lack. Barclay (2010) presented insight that the Jamaican bauxite mining industry has had a positive impact on the economic development because bifurcated bureaucracies were well funded and embedded within both local and foreign firms by the Jamaican government.

The results of this current study affirm assertions made by Barclay (2010) that the mining industry positive externalities occur when host country policymakers implement policies that increase indigenous technological capability. The Black Economic Empowerment (BEE) programme implemented by the government of South Africa arguably increased indigenous technological capability thereby enhancing the absorptive capacity of the South African mining industry to capture the spillovers arising from the foreign companies' activities.

Another important factor that explains why mining and quarrying in South Africa has had a statistically significant impact on economic growth, relates to comments made by Noland, Park & Estrada (2012) who assumed that FDI in labour intensive industries was likely to result in economic growth and poverty reduction. Although their data was based on the manufacturing and services sectors in Asian countries the point was made that the less automated the sector, the more labour intensive the sector was likely to be. This scenario was shown to result in statistical evidence that growth in labour intense industries associated well with improved economic development and helped to explain the South African mining sector results in this research.

6.3.1.4 Wholesale, retail and motor trade, catering and accommodation

Table 25 presents the LSDV regression model results which show that FDI in the wholesale, retail and motor trade, catering and accommodation industry has been significant and had positive impact on economic growth. These empirical results are aligned with views expressed by Chackochen & Ramalingam (2012) who argued that FDI in the retail market should result in accelerated economic growth. They argued that the retail industry in general results in inclusive development which empowers the rural regions and thus is critically important from the perspective of sustainable and fairly distributed market prosperity.

These findings were expected based on earlier discussion in the literature review that argued that foreign investors driven by market-seeking motives tend to invest in the services, wholesaling and retail sectors of the economy. The empirical data argued that market-seeking FDI is likely to have a reasonable impact on economic growth because market-seeking FDI facilitates backward integration with the upstream local suppliers (Ching-Mu, Melachroinos, & Chang, 2010). Foreign firms tend to demand higher quantities and quality from the local suppliers as they expand product footprints in the local and international markets thereby instigating accelerated economic growth.

6.3.1.6 Other - Agriculture, forestry & fishing, electricity, gas, water, construction, government services

The findings showed that the category combining of agriculture, forestry and fishing, electricity, gas, water, construction and government services classified as “other” for the purposes of this study, was significant in its impact on economic growth as measured by total GDP. These results are in line with empirical outcomes from Chaudhuri and Banerjee (2010) who analysed the impact of greenfield FDI on agricultural land in a developing economies and concluded that increased FDI in the agricultural sector improves unemployment of both unskilled and skilled labour as well as national welfare as measured by GDP. However, the results differ to those presented by Imoudu (2012) who used the co-integration method to assess sectorial FDI in Nigeria for the period between 1980 and 2009. That study showed that FDI in the agriculture sector among others has little impact on economic growth. One of the potential explanations to the differences in these results alluded to by Imoudu (2012) is the need to overhaul the economic sector and the creation of an enabling investment climate that channels FDI into the most productive aspects of the agricultural sector in Nigeria.

The construction industry has had the advantage of enhancing the absorptive capacity of developing countries to take advantage of FDI as an enabler to accelerate economic well-being through infrastructure development Yanling (2010). In this regard the construction industry fulfills dual roles, firstly as an industry that provides necessities (goods and services) and more importantly as an enabler of future growth by improving the country’s absorptive capacity. In terms of government services, the above results are aligned to Madem, Cudla & Rao (2012) argument noting that sectors with high government support tend to receive a good share of FDI inflow and have a better absorptive capacity which ultimately results in positive economic growth. This is because government has the ability to build infrastructure and institutions thus intensifying absorptive capacity.

In conclusion, the above discussion indicates that there are sectorial differences on the impact of FDI on economic growth in developing countries. Therefore in order to enhance the impact of FDI on economic growth, priority should be directed to investments in economic sectors with the greatest impact on economic growth. Further, it was also established that within the productive economic sectors, FDI should be channeled into the most productive aspects of that particular economic sector.

6.3.2 Hypothesis Two

Null Hypothesis (H_0 II): Economic sector FDI forms have different impacts on the economic sector's contribution to economic growth as measured by GDP

Alternative Hypothesis (H_a II): Economic sector FDI forms do not have different impacts on the economic sector's contribution to economic growth as measured by GDP

Hypothesis Two above seeks to answer the following question:

Is there a better form of sector FDI which enhances the capacity for an economic sector to contribute towards accelerated economic growth in developing economies?

In order to answer the above hypothesis this research used the quarterly greenfield FDI and sectorial GDP data from 2007 to 2013. The results of this analysis were detailed in Table 16 based on a Random-effects GLS regression which shows that greenfield investments as a form of FDI does not have statistically significant evidence of influencing an economic sector's FDI to impact sectorial economic growth as measured by sector GDP in South Africa. As can be noted in Table 16, $\text{prob} > \chi^2$ greater than 0.05; the $P > |Z| > 0.05$ as well as a z value below absolute 1.96 (it is at -0.10). As discussed earlier, these results are in contradiction to Wang & Wong (2009) and Ndikumana & Verick (2008) who found that greenfield investments have a significant impact on economic growth over brownfield.

Further, Ndikumana & Verick (2008) argued that greenfield FDI has a positive impact on economic growth as it has the ability to create new production capacities, new working places, new consumers and new tax payers. One of the potential reasons noted for the departure of the data emerging in this study is that greenfield investment in South Africa might not have significant spillover effect because the human capital is not as well developed as in other parts of the world. Wang & Wong (2009) notes that human capital development increases a country's absorptive capacity which is a pre-requisite of greenfield investments to have a greater impact on economic growth.

To augment the analysis, the Random-effects GLS regression test on greenfield field data in Table 21 was also performed on natural logarithm for both variables in order to take way the effects of sizes as it could be argued that the sectorial greenfield FDI into South Africa was small compared to the sectorial GDP. The results of the natural logged data for both variables detailed in Table 21 showed that greenfield investments as a form of FDI has not been significant evidence that it is a better form of FDI in influencing sector GDP.

Therefore, given the above discussed results Hypothesis Two null hypothesis is rejected and the research concludes that in South Africa there seems to be no better form of sector FDI which enhances an economic sector to contribute an accelerated economic growth.

6.4 Conclusion

In conclusion, the study found that sectorial FDI has varying impacts on economic growth as measured by GDP. This means that there are bound to be contradictory results among various researchers as they may focus on different economic sectors and FDI forms. The results of this research therefore supports Kennedy, Bardy & Rubens (2012) argument that different industries have different impact on economic growth and thus priority should be directed towards investment into economic sectors that have the greatest impact on economic development if developing countries are to benefit from FDI. Further, the research shows that in South Africa there is no better form of sector FDI which enhances an economic sector to contribute an accelerated economic growth. Therefore South African policy makers should seek to attract both forms of sectorial FDI in order to achieve accelerated economic growth.

CHAPTER 7:

CONCLUSIONS AND RECOMMENDATIONS

7.0 Introduction

The purpose of this chapter is to highlight the main findings of this research from the analysis of results presented in Chapter 6. The chapter will also discuss recommendations to various key stakeholders who were identified in Chapter 1 to have interest in the output of this research. Furthermore, the discussion will present proposals for future research based on the identified limitations of the study.

As discussed, one of the key priorities of developing countries' governments is to foster economic growth and to improve national welfare. Although FDI is thought as one of the key components of fostering economic growth in developing countries, various empirical studies have found contradictory results on the impact of FDI on economic growth. This, together with the fact that there has been a surge of FDI into developing countries owing to investor interest in politically stable developing countries in order to receive better returns prompted the researcher to explore how developing countries can take advantage of surging FDI to improve their economic growth. This research commenced with an in-depth review of available literature with the aim of understanding how and why there are contradictory results of FDI's impact on economic growth. The review suggested that there could be sectorial differences on the impact of FDI driven economic growth and as such more research was required in this arena. Further, the literature suggested that the FDI form may have influence on the impact that such investment has on economic growth. Two hypotheses were proposed in order to objectively address the above noted areas sieved from literature.

A non-probability convenience sampling technique was used and South Africa was conveniently chosen as the study context as the researcher had ease of access to the required data in necessary granular form. In addition to the above, South Africa presented exciting dynamics which made it an ideal developing country. The country has been one of the leading beneficiaries of foreign investment in Africa as it offers the most diversified mix of financial and manufacturing activity and yet this has only yielded limited growth. Concerns of high poverty levels and high rates of unemployment have stubbornly prevailed.

The results of this research confirmed that there have been sectorial differences in the impact of FDI on economic growth. These assertions were based on the fact that the LSDV regression model results showed that intercepts of sectorial FDI impact to economic growth as measured by GDP vary. Secondly, the statistics established that there is no significantly superior form of sectorial FDI which enhances an economic sector to contribute to accelerated economic growth in developing economies.

7.1 Major findings

This research had two objectives, firstly to determine the impact of sectorial FDI on economic growth as measured by GDP and secondly, to determine whether there is a better form of sectorial FDI which enhances an economic sector to contribute to accelerated economic growth in developing economies. The following sub-sections highlight the main findings of this research based on the two research objectives identified for this research.

7.1.1 Impact of sectorial FDI on economic growth

The results of this research established that sectorial FDI has different impacts on economic growth as measured by GDP contribution. This means that given FDI, some economic sectors have the propensity to contribute more than others towards economic growth. The results of this research established that FDI in transport, storage and communication industry has the highest impact on economic growth as measured by GDP. One of the potential reasons of this outcome established from literature is that the injection of FDI into the transport, storage and communication industry has great positive

spillovers into other industries. Bălan & Bălan (2011) note that the development of new means of communication, information technology and transport is an important factor for increasing mobility of skills, goods and services which result in improved economic activities in a number of sectors which ultimately results in economic growth.

The study showed disappointing results related to FDI in manufacturing industry which does not have significant statistical evidence of its ability to impact on economic growth. It was suggested that one potential reason for this result is that FDI injected in the manufacturing sector in South Africa is not motivated by efficiency-seeking and thus the manufacturing sector fails to take advantage of economies of scale and scope as investors prefer to only meet the basic minimum of beneficiation required by legislation. Further, FDI in manufacturing may currently be channelled towards the less productive areas of the sector. These results are in line with other research results produced by Inekwe (2013) and Imoudu (2012).

FDI in the finance, real estate & business services sector also showed no significant statistical evidence that it has had impact on economic growth. It was established that the potential reason for this result may be the absorptive capacity of the finance, real estate & business services industry in South Africa has been low. Reasoned analysis suggests that this may be due to the fact that the education system in South Africa is not well established and thus the industry has witnessed very low positive spillovers to the local firms which is a key ingredient to an industry's positive impact on economic growth.

The other three industries, that is, wholesale, retail and motor trade; catering and accommodation; mining and quarrying and the "other" - agriculture, forestry & fishing, electricity, gas, water, construction, government services have had a statistically significant impact on economic growth as measured by GDP. Although these industries have contributed to economic growth, they have varying intercepts which confirms that different sectors' FDI have different impact on economic growth and as such if FDI is to result in accelerated economic growth, priority should be directed towards investments in economic sectors that have a greater impact on economic growth.

In a much broader sense, the results of this study suggest that FDI may result in either an acceleration of economic growth or otherwise depending on which economic sector the FDI is channeled into. These findings contribute in explaining the contradictory assertions from empirical literature on FDI's impact on economic growth by the fact that different economic sectors have different impacts on economic growth as measured by GDP. This means that if the impact of FDI is measured from economic sectors with no significant impact on economic growth then the results will not be the same as with FDI injected in economic sectors with significant impact on economic growth.

7.1.2 Impact of FDI form on economic growth

The results established using quarterly greenfield FDI inflows into South Africa between 1st quarter 2007 to 4th quarter 2013 shows that such have not had a statistically significant impact on economic sectors' ability to impact economic growth. This therefore means that greenfield FDI cannot be regarded as a better form of sector FDI for growth in South Africa. One of the potential reasons noted for this revelation is that greenfield investment in South Africa might not have significant spillover effect because the human capital is not yet developed as required when compared to the other parts of the world.

7.2 Recommendations to stakeholders

This section of the report seeks to provide recommendations to various stakeholders identified in Chapter 1 based on the results of this research.

7.2.1 Governments and policymakers

As discussed, one of the key priorities of developing governments is poverty alleviation through economic growth. It was established in the literature review that FDI inflows are an important external source of financing for economic growth and are a more stable and beneficial capital injection substitute to financial aid in developing country contexts. The recommendations that follow are meant to ensure that FDI injections positively and effectively impact economic growth so that FDI is beneficial to the host country.

Firstly, the research established that sectorial FDI has variable impacts on economic growth and thus FDI should be channeled to economic sectors that have a greater impact on economic growth. FDI in the transport, storage and communication industry has the greatest impact on economic growth and thus governments and policymakers should encourage more FDI injection into this industry in order to accelerate FDI driven economic growth. Further, policies that encourage FDI inflows into wholesale, retail and motor trade; catering and accommodation industry, mining and quarrying industry and “other” - agriculture, forestry & fishing, electricity, gas, water, construction, government services industry should be promoted as FDI into these industries has potential for a positive impact on economic growth.

Economic sectors identified to have no significant impact on economic growth such as the manufacturing industry and finance, real estate & business services industry require policymakers to consider policies that incentivise and channel FDI into the more productive units of the economic sectors. In addition to encouraging the FDI into an economic sector, specific attention should be given into driving the FDI into defined operations of the economic sector that can accelerate its ability to contribute positively to economic growth.

The government and policymakers should also incorporate policies that enhance the

country's absorptive capacity to take advantage of the FDI inflows. In this regard, priority should be given to economic sectors that currently do not show sound evidence that they contribute towards accelerating economic growth. The same applies for economic sectors that have positive spillover effects in employment creation, technology development and transfer, manpower and skills development, and benefit mass consumption as opposed to increasing consumption by a small group of the privileged elite. The policies could take the form of increasing indigenous technological capability which allows economic sectors to capture the positive spillovers arising from the foreign companies' activities. In addition, the policies should seek to reduce structural rigidities, distortions and institutional impediments in order to create a good macroeconomic operating environment for local businesses to be able to capture positive spill overs from foreign firms.

7.2.2 Social entrepreneurs

For social entrepreneurs and socially motivated investors that are motivated by both economic profit and positively contributing to national welfare and poverty alleviation, this research suggests that they should prioritise investing in the transport, storage and communication industry. This industry has been shown to have the greatest impact on economic growth and thus their investments would likely result in improved national welfare and poverty alleviation. Furthermore, social entrepreneurs could assist by investing in economic sectors that do not currently have a significant impact on economic growth such as manufacturing in specific productive units that boost the economic sectors' ability to stimulate accelerated economic growth which ordinary entrepreneurs would not invest in for various reasons including low profitability.

7.2.3 Academics and researchers

This research paper contributes to existing literature by explaining possible differences in research results that have shown contradictory results. It is recommended that researchers should acknowledge that different economic sectors FDI have different impact on economic growth. Therefore, variable research results should be understood on the basis of which economic sectors the FDI was channeled into as opposed to dismissed as contradictory results.

7.3 Recommendations for Future Research

In this section of this research report, recommendations for future researches will be made. The recommendations are based on the outcomes of this research as well as other areas in line with the research topic that were beyond the scope of this report.

There seems to be an opportunity to further explore which economic sectors on attracting FDI, have positive spillovers to other economic sectors. Research that seeks to understand which economic sectors are interlinked with each other to the extent that FDI injection into those economic sectors is important in influencing other sectors to contribute accelerated economic growth is set to add further value. This research was limited to understanding which economic sectors have impact on economic growth. Although this research has shown that FDI in manufacturing has no impact on economic growth, it may well be that FDI into such a sector results in another sector impacting on economic growth.

Despite theoretical arguments that greenfield FDI has a better chance to have a positive impact on economic growth because of its ability to create new production capacities, new working places, new consumer and a new tax payers, the empirical evidence of this research shows that greenfield FDI has no impact on economic growth as measured by GDP. It is therefore proposed that studies to examine the possible reasons why greenfield FDI in South Africa and thence presumably other developing market contexts has no impact on economic growth are required.

Lastly, it would be interesting to explore whether the origin of FDI has any impact on economic growth. In this regards, the question is whether FDI originating from a certain region has varying impact to economic growth as compared to other regions.

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APPENDICES

Appendix 1: Sectorial Stock Composition of FDI (R millions)

Year	Mining and quarrying	Manu- facturing	Finance, real estate and business services	Transport, storage and communication	Wholesale, retail and motor trade; catering and accommodation	Other -Agric, forestry & fishing, Electricity, gas, water, construction, gvt services	Total FDI Stock
1996	2,897	25,422	21,622	534	7,619	614	58,708
1997	3,642	35,088	29,357	5,373	8,307	696	82,463
1998	7,269	40,429	29,357	5,779	8,237	791	91,862
1999	114,095	79,486	104,992	8,411	10,596	1,050	318,630
2000	91,540	86,783	129,162	8,521	11,895	958	328,859
2001	124,063	89,443	130,562	8,825	15,141	2,661	370,695
2002	80,617	67,248	81,634	10,131	13,312	11,477	264,419
2003	103,093	75,427	86,626	22,043	13,425	10,594	311,208
2004	111,639	111,354	100,215	14,112	14,517	11,021	362,858
2005	168,271	136,028	157,590	9,449	14,722	13,526	499,586
2006	250,361	165,432	162,521	13,809	16,172	3,427	611,722
2007	332,254	197,099	178,580	12,840	27,766	3,386	751,925
2008	195,365	204,754	182,420	15,525	30,990	3,565	632,619
2009	289,836	242,217	234,955	64,943	31,148	3,565	866,664
2010	388,772	262,920	241,792	83,942	34,511	3,580	1,015,517
2011	443,042	240,154	443,503	96,118	68,444	6,640	1,297,901
2012	429,276	249,334	500,725	130,991	73,924	5,772	1,390,022

Notes:

- The above data represents FDI stock per sector in South Africa.
- Figures are in Rand millions
- Data was collected from South African Reserve Bank quarterly bulletins

Appendix 2: Annual Sectorial GDP (R millions)

Year	Mining and quarrying	Manufacturing	Wholesale, retail and motor trade; catering and accommodation	Transport, storage and communication	Finance, real estate and business services	Other -Agriculture, forestry & fishing, Electricity, gas, water, construction, gvt services	Total
1993	103,509	180,053	121,284	64,803	162,850	323,693	956,192
1994	104,026	184,915	124,316	67,784	168,800	332,867	982,708
1995	100,802	196,934	131,650	74,969	174,720	332,620	1,011,696
1996	99,995	199,691	136,521	79,542	186,575	347,650	1,049,975
1997	101,695	205,083	137,067	85,588	195,356	351,472	1,076,261
1998	101,593	204,673	138,849	90,295	199,853	348,859	1,084,122
1999	100,171	205,901	149,402	94,990	210,067	351,344	1,111,875
2000	99,069	222,579	161,503	102,874	216,747	356,870	1,159,643
2001	98,970	229,701	164,572	108,944	234,450	355,880	1,192,518
2002	99,960	236,133	168,357	118,749	249,165	363,906	1,236,270
2003	103,355	232,581	172,845	126,287	261,123	376,938	1,273,129
2004	104,915	243,965	182,175	132,459	279,544	387,332	1,330,390
2005	105,992	259,101	195,012	139,472	295,504	405,986	1,401,066
2006	105,364	275,782	206,636	146,607	324,002	420,100	1,478,492
2007	105,336	290,246	217,607	156,289	349,501	442,097	1,561,076
2008	99,396	297,889	219,749	162,522	375,240	465,006	1,619,802
2009	94,057	267,723	217,074	163,999	378,987	476,220	1,598,060
2010	99,383	282,509	225,338	167,313	387,189	485,544	1,647,275
2011	99,687	291,785	235,295	172,530	405,479	499,025	1,703,801
2012	96,082	297,808	244,278	176,699	420,473	510,011	1,745,353
2013	99,076	300,050	249,607	180,108	430,597	518,515	1,777,954

Notes:

- The above data represents annual sectorial GDP values for South Africa.
- Figures are in Rand millions
- Data was collected from Statistics South Africa

Appendix 3: Quarterly Sectorial GDP (R millions)

Year	Quarter	Mining and quarrying	Manufacturing	Wholesale, retail and motor trade; catering and accommodation	Transport, storage and communication	Finance, real estate and business services	Other -Agric, forestry & fishing, Electricity, gas, water, construction, gvt services	Total
1996	1	24,907	48,083	31,777	19,268	44,425	83,534	251,994
	2	24,737	48,477	32,290	19,181	45,833	90,859	261,377
	3	25,181	51,529	33,855	20,490	47,500	88,124	266,680
	4	25,170	51,603	38,599	20,603	48,817	85,133	269,925
1997	1	24,809	48,886	32,450	20,408	48,115	85,228	259,895
	2	25,306	50,565	32,661	20,600	48,887	91,739	269,758
	3	25,838	53,014	33,915	22,022	49,172	88,735	272,696
	4	25,742	52,618	38,042	22,558	49,182	85,770	273,912
1998	1	25,391	49,840	32,465	22,051	48,537	84,679	262,963
	2	25,393	50,694	33,179	22,140	49,922	91,001	272,330
	3	25,469	52,238	34,404	22,920	50,635	88,172	273,839
	4	25,340	51,901	38,801	23,184	50,759	85,006	274,991
1999	1	24,819	48,788	33,900	22,545	51,054	85,301	266,407
	2	24,945	50,065	35,209	23,059	52,293	92,386	277,957
	3	25,190	52,918	37,235	24,413	53,177	88,962	281,894
	4	25,217	54,130	43,058	24,974	53,543	84,696	285,618
2000	1	24,545	52,236	37,121	24,539	52,888	84,934	276,263
	2	24,844	54,092	38,512	25,167	53,700	91,387	287,701
	3	24,830	57,401	40,140	26,412	54,622	93,539	296,944
	4	24,850	58,850	45,730	26,757	55,538	87,011	298,735
2001	1	24,394	55,590	38,628	25,921	56,219	86,359	287,110
	2	24,949	56,708	39,421	26,414	58,089	93,306	298,886
	3	24,964	58,319	40,506	27,868	59,463	90,632	301,752
	4	24,663	59,085	46,016	28,741	60,680	85,584	304,769
2002	1	24,272	55,853	39,113	28,219	62,383	87,184	297,024
	2	24,939	57,999	40,079	28,977	62,225	95,674	309,892
	3	25,304	61,089	41,610	30,426	61,925	92,025	312,379
	4	25,444	61,192	47,556	31,128	62,632	89,024	316,975
2003	1	24,977	56,905	39,758	30,280	65,193	89,567	306,680
	2	25,819	57,095	40,820	30,872	64,824	100,436	319,866
	3	26,341	59,577	43,057	32,080	65,121	95,955	322,131
	4	26,218	59,004	49,210	33,055	65,985	90,980	324,452
2004	1	26,218	57,990	41,559	31,536	69,261	91,754	318,318
	2	26,148	59,585	42,792	32,203	69,354	101,391	331,473
	3	26,941	63,263	44,739	33,963	69,721	99,351	337,978
	4	25,608	63,127	53,085	34,757	71,208	94,836	342,621
2005	1	27,314	60,083	44,714	33,325	73,169	97,020	335,625
	2	26,780	63,866	45,741	34,035	73,288	104,924	348,634
	3	26,436	67,716	47,897	35,687	73,956	104,894	356,586
	4	25,462	67,436	56,661	36,425	75,091	99,148	360,223
2006	1	25,829	64,270	47,122	34,860	79,305	101,249	352,635

	2	26,141	67,358	48,496	35,709	80,254	107,601	365,559
	3	26,338	71,460	50,913	37,790	81,374	107,410	375,285
	4	27,055	72,694	60,105	38,248	83,069	103,841	385,013
2007	1	26,386	68,753	50,059	37,390	86,091	107,056	375,735
	2	26,250	71,153	51,313	38,228	85,714	113,232	385,890
	3	26,459	74,004	53,701	40,002	87,185	112,927	394,278
	4	26,240	76,336	62,534	40,669	90,511	108,884	405,174
2008	1	24,068	70,732	52,157	39,017	91,562	112,558	390,094
	2	25,314	75,966	52,318	39,778	92,840	119,726	405,943
	3	24,891	77,526	53,125	41,545	94,186	119,475	410,748
	4	25,124	73,663	62,150	42,181	96,653	113,246	413,017
2009	1	22,503	63,676	51,506	39,882	94,301	115,315	387,183
	2	23,592	64,778	51,223	40,082	94,222	122,286	396,183
	3	23,799	69,106	53,059	41,692	94,319	121,578	403,553
	4	24,163	70,162	61,285	42,344	96,145	117,041	411,140
2010	1	24,643	66,217	52,037	40,141	95,659	117,654	396,351
	2	23,521	70,464	53,120	40,893	96,321	124,872	409,192
	3	25,355	72,846	55,522	42,757	96,651	123,498	416,629
	4	25,863	72,982	64,658	43,522	98,558	119,520	425,103
2011	1	25,031	70,097	54,224	41,354	99,559	120,806	411,071
	2	25,608	71,798	55,200	42,234	100,356	128,286	423,482
	3	24,410	74,585	57,967	44,033	101,565	126,903	429,463
	4	24,638	75,305	67,903	44,910	103,999	123,031	439,785
2012	1	22,685	70,548	56,782	42,585	105,061	123,765	421,426
	2	25,285	73,218	57,493	43,356	104,615	131,727	435,695
	3	24,231	76,220	59,979	44,995	104,333	129,316	439,075
	4	23,881	77,823	70,023	45,762	106,464	125,203	449,156
2013	1	23,481	70,340	58,055	43,369	106,799	126,234	428,278
	2	24,586	75,089	58,890	44,124	108,365	134,635	445,690
	3	24,880	75,947	61,194	45,927	107,820	130,570	446,338
	4	26,129	78,676	71,468	46,688	107,613	127,075	457,648

Notes:

- The above data represents quarterly sectorial GDP values for South Africa.
- Figures are in Rand millions
- Data was collected from Statistics South Africa

Appendix 4: Quarterly Sectorial Greenfields inflows FDI (R millions)

Year		Mining and quarrying	Manu- facturing	Finance, real estate and business services	Transport, storage and communication	Wholesale, retail and motor trade; catering and accomodation	Other -Agric, forestry & fishing, Electricity, gas, water, construction, gvt services	Total FDI Stock
2007	1	-	200	266	-	110	-	576
	2	-	279	1,925	229	3,917	2,200	8,550
	3	2,854	7,207	409	64	-	13,215	23,749
	4	1,730	653	1,874	-	297	-	4,554
2008	1	9,750	27,563	518	1,629	682	1,359	41,501
	2	1,116	4,397	1,391	90	1,427	-	8,421
	3	10,033	3,628	2,459	536	4,848	8,704	30,208
	4	15,051	21,079	865	338	1,563	-	38,896
2009	1	965	3,581	604	567	137	10,122	15,976
	2	2,854	123	630	1,180	737	1,555	7,079
	3	5,708	6,783	1,053	3,531	178	1,690	18,944
	4	351	4,821	650	7,020	1,619	-	14,461
2010	1	-	2,741	1,737	482	668	7,185	12,813
	2	5,421	5,889	365	1,260	320	524	13,779
	3	-	5,105	1,677	1,710	114	5,511	14,117
	4	-	3,718	74	3,588	2,795	7,121	17,296
2011	1	2,965	3,306	1,211	5,087	559	1,583	14,711
	2	-	28,214	1,531	11,276	561	288	41,870
	3	-	5,924	5,914	4,658	153	127	16,775
	4	13,451	2,326	2,101	1,340	239	14,398	33,855
2012	1	550	4,604	1,317	1,863	954	9,948	19,236
	2	-	1,558	671	564	571	1,275	4,639
	3	-	3,018	2,245	2,174	346	2,740	10,523
	4	31	1,688	907	1,228	738	8,651	13,243
2013	1	1,144	2,832	842	5,905	580	4,121	15,424
	2	-	2,417	858	368	1,583	4,009	9,234
	3	-	1,661	1,327	1,834	546	14,182	19,549
	4	226	4,893	1,997	4,500	382	232	12,230

Notes:

- The above data represents quarterly greenfield FDI inflows into South Africa.
- Figures are in Rand millions
- Data was collected from fDiMarkets