THE DETERMINANTS OF FOREIGN DIRECT INVESTMENT INFLOWS IN SOUTH AFRICA

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ABSTRACT

This study attempts to identify the determinants of FDI inflows into South Africa using annual data for the period from 1980 to 2012. Firstly, it provides an overview of FDI and the state of macroeconomic variables in South Africa. Secondly, it provides a review of the literature, both theoretical and empirical, on the proposed factors that determine FDI inflows. Based on the empirical literature review, The Johnsen cointegration method was chosen to analyse the long-term relationship between the variables of interest which is a VAR based model. The empirical results revealed that there is a long-term relationship between FDI and its determinants as specified in the study. The Vector Error Correction Model was estimated to analyse both the short-run and long-run determinants of FDI inflows. The empirical results revealed that GDP, Openness, inflation, exchange rate, corporate tax and a measure of financial crisis are important determinants of FDI inflows into South Africa. The Granger Causality was estimated to analyse if there is a causal relationship between FDI and other variables such as GDP, the results revealed that there is a uni-directional causality from GDP to FDI. These results were consistent with the long-run cointegrating vector. This suggests that authorities need to take into account factors which hamper the growth of the economy given its importance to attracting FDI inflows. In addition, the financial crisis variable was found to be negative and significant in determining the flow of FDI into the country. This point out that factors beyond the country's boarder have a large bearing on the flow of FDI into the country. This in part questions the sustainability of foreign capital as a form of development finance given in the face of a crisis it diminishes.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller
AGOA	African Growth and Opportunity Act
AIC	Aikaike's Information Criterion
ARDL	Auto-Regressive Distributed Lag
ASEAN	Association of Southeast Asian Nations
BRICS	Brazil, Russia, India, China and South Africa
CPI	Consumer Price Index
DF	Dickey-Fuller
DW	Durbin-Watson
EG	Engle-Granger
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEAR	Growth Employment and Redistribution
HIPC	Heavily Indebted Poor Countries
HQC	Hannan-Quinn criterion
IER	International Econometric Review
IMF	International Monetary Fund
IPAP	Industrial Policy Action Plan
LR	Likelihood Ratio
MDG	Millennium Development Goals
MENA	Middle East
NDP	National Development Plan
NGP	New Growth Path
NIP	National Industrial Policy
OLI	Ownership Location and Internalisation
OLS	Ordinary Least Squares
PP	Phillips-Perron
RDP	Reconstruction Development Program
SADC	South African Development Community
SAP	Structural Adjustment Programme
SARB	South African Reserve Bank
SEDA	Small Enterprise Development Agency
SIC	Schwarz's Information Criterion
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Auto-Regressive
VECM	Vector Error Correction Model

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

The importance of FDI to a developing country cannot be underestimated. This is clearly indicated by the large number of academic studies that focus on this topic, such as those by Adefeso and Agboola (2012); Wafure (2010); Ibrahim, Elhiraika, Hamdok and Kedi (2011) and others.

The term 'inflow of FDI' refers to foreign firms making direct investments in a host country. FDIs are currently of particular interest because they play a major role in creating employment, allowing local companies to gain access to international markets, developing managerial skills, fostering improvements in productivity and transferring technology to local firms, all of which will eventually boost the domestic economy. Moreover, in developing economies, FDIs perform the critical functions of supplementing domestic savings, generating employment and growth. This, in turn, leads to integration of the local economy into the global economy, the transfer of modern technologies, and the enhancement of local skills (Anyanwu, 2012).

In the case of South Africa, given that the country has generally low levels of savings and investment; FDIs are considered to be an important catalyst for investment and economic development. Currently, despite South Africa's efforts to attract investors, its level of FDI remains low relative to emerging markets in other countries. In this context, this study seeks to establish the key determinants of FDI inflows into South Africa.

1.2 Statement of the Research Problem

According Rusike (2007), South African authorities have tried to ensure that FDI drives economic growth. They have done this by putting in place policies designed to attract foreign investors. These polices include the reduction of tax burdens and import tariffs, allowing for easier exchange and return of profits and helping to alleviate the country's overall socio-economic difficulties.

After its first democratic elections in 1994, South Africa was able to enter into various trade agreements with other countries, to reduce trade barriers and to implement sound monetary and fiscal policies. These efforts now seem to have been in vain: the country has attracted very little foreign investment since then (Arvanitis, 2006). In the 1980s, the lack of foreign investment was attributed to political instability and was expected to improve after 1994. However, according to Arvanitis (2006), this period was followed by the global financial crisis of 2007-2008, the tightening of capital controls and the declaration of a moratorium on payments to external creditors. These developments effectively cut South Africa off from international capital markets.

Research by the United Nations Conference on Trade and Development (UNCTAD) in 2011 shows that FDI inflows decreased by 24%, amounting to a 9.9% share of Africa's FDI inflows for 2011 and 2012. This was attributed to a decrease in investment in South Africa.

Research thus far indicates that attracting foreign direct investors is one of the ways South Africa can keep up with other emerging economies, given the low levels of savings the country is experiencing. It is therefore important to establish what the main determinants of FDI inflows are, since this will help to establish the variables that authorities can focus on in order to attract much-needed finance for growth.

Using data from the SARB, Luüs (2007) shows that during the 1960s net household saving in South Africa averaged 6, 9% of the GDP. However, this declined to 5, 9% in the 1970s, 3, 2% in the 1980s, and 1, 7% in the 1990s. From a ratio of 0, 8% in 2000, net household saving diminished to a negligible 0, 1% in 2005. At its high in 1972, net household saving constituted 12, 4% of household disposable income. The comparable figure for 2006 was -0, 3%. In contrast, net corporate saving constituted on average 2, 6% of gross domestic saving in the 1960s, 4, 3% in the 1970s, 6, 6% in the 1980s, 5, 6% in the 1990s, and around 3, 7% during the past six years up to 2005.

1.3 Objectives of the Study

The main objective of this study is to identify core factors which determine FDI inflows into South Africa. The specific however objectives include:

- To examine the trends in the growth of the FDI inflows in South Africa
- To econometrically identify the key determinants of FDI inflows in South African

- based on the empirical results, articulating policy implications of the study

1.4 Hypotheses

The hypotheses which this study seeks to test are:

- H_0: The identified set of variables do not individually influence FDI inflows in the South Africa
- H_1: The identified sets of variables do individually influence FDI inflows in the South Africa.

The variables to be tested will be specified and defined later.

1.5 The Significance of the Study

The importance of FDI inflows cannot be underestimated, since it is one of the major drivers of development in an economy, especially given the low levels of savings in developing countries. Anyanwu (2012) suggests that FDI is the best alternative source of finance. FDI inflows are seen as a means of overcoming the economic shortcomings of low savings, as a source of capital for the implementation of projects to improve the living standards of a population, to alleviate poverty and as having other positive spillover effects.

Since foreign capital is such an important source of development finance for South Africa, this study will identify the variables which the country needs to focus on so as to attract more FDI inflows into the country. Many previous studies, such as those of Adefeso et al. (2012), Anyanwu (2011), Demirhan et al. (2008) and Rusike (2007) have not given adequate accounts of all the factors affecting FDI inflows; for example, they did not take into account the effects of the 2007/2008 global financial crisis. In this study, the Johansen Cointegration Test was utilised to examine the relationship between FDI and its determinants as scpecified also taking into account the effects of the global financial crisis.

1.6 Outline of the Study

This study is organised as follows:

- Following chapter 1, the rest of the study is organised as follows:-
- Chapter 2 provides an overview of South African economy with emphasis on the trends and characteristics of FDI inflows into the country.

- Chapter 3 focuses on the theoretical framework and literature review.
- Chapter 4 deals with the empirical analysis, with emphasis on the formulation and estimation of the models to examine the key determinants of FDI inflows into the country.
- Chapter 5 focuses on interpretation of the models estimated in Chapter 4 and assesses their robustness.
- Chapter 6 summarizes the main conclusions, policy recommendations and limitations of the study.

CHAPTER 2

AN OVERVIEW OF FOREIGN DIRECT INVESTMENT IN SOUTH AFRICA

2.1 Introduction

FDI has always been preferable to direct portfolio investment as a means of overcoming the shortcomings of lower savings in the South African economy, as asserted by researchers such as Ahmad, Cova and Harrison (2004), Evans, (2002) and Loungani and Razin (2005). In the nineteenth century, during the British colonial era, South Africa had foreign corporations operating in the country; it was largely dominated by direct investments from European, British and American firms (Gelb and Black, 2009). The manufacturing, mining and service industries, in particular, attracted enormous foreign investment.

In the early 1970s, new flows of FDI decreased substantially. Gelb et al. (2009) report that during this time portfolio investment increased and investors moved from FDI to the former. In the 1980s, the pressure increased for foreign investors to disinvest from South Africa as a result of apartheid policies. Approximately 245 firms withdrew from the economy. As the economy continued to struggle, FDI inflows continued to decline, and eventually the portfolio investment also declined. This shows that FDI inflows to South Africa have fluctuated considerably over the years.

The aim of this chapter is to provide an overview of South African FDI inflows. After the introduction, Section 2.2 provides a review of key macroeconomic variables that indicate the current state of FDI inflows into South Africa as well as the state of macroeconomic performance. Section 2.3 provides a review of FDI inflows into South Africa. Section 2.4 reviews sectors attracting FDI flows in South Africa. Section 2.5 highlights the sources of FDI inflows into South Africa. Section 2.6 covers FDI inflows into emerging economies, mainly the BRICS economies, in comparison with South African FDI inflows. Section 2.7 evaluates FDI inflows in developing African countries in comparison with those in South Africa. Section 2.8 reviews FDI inflows in other regions of the world and compares them with those in the Southern African region. Section 2.9 analyses the South African economy and investments. Section 2.10 reviews the existing regulations affecting FDI in South Africa and Section 2.11 concludes to the chapter.

2.2. Macroeconomic Performance Indicators in South Africa

South Africa has consistently implemented economic reforms while pursuing a free-market approach to financial-sector development and integrating its economy with the rest of the world. The country experienced higher economic growth after the abolition of apartheid in 1994, as indicated by the economic indicators in Table 2.1 below, which compares the periods 1990-2000 and 2001-2010.

Table 2.1: Major Macroeconomic Indicators in South Africa

Period	1980 – 1990	1991 – 2000	2001 - 2010
GDP growth (annual %)	2.24	1.81	3.55
GDP per capita growth (annual %)	-0.26	-0.64	2.24
Consumer price Index	1.62	1.04	0.60
Industry, value added (annual % growth)	1.35	0.67	2.38
Services, etc., value added (annual % growth)	2.50	2.99	3.82
Exports of goods and services (annual % growth)	1.47	5.26	1.57
Gross capital formation (annual % growth)	1.63	2.61	6.99
Gross capital formation (% of GDP)	23.43	18.25	18.63
Current account balance (% of GDP)	0.00	0.00	-2.99
Foreign direct investment, net inflows (% of GDP)	0.01	0.67	2.08
Total reserves in months of imports	0.00	0.00	2.30

Source: *World Bank Development Indicators (2014)*

In the periods 1990–2000 and 2001-2010, the GDP growth rate almost doubled, increasing from 1.81% to 3.55%. The same applied to GDP per capita, manufacturing and services industry, which increased by 1.60, 1.71, and 0.83 respectively. Economic stability improved in the early 2000s; this is evident from the inflation rate (CPI), since the central bank launched a policy of inflation targeting. There has been an improvement in the rate to 0.60% for 2001-2010. Increase in gross capital formation (% of GDP) and gross capital formation (annual % growth) and other indicators resulted in an increase in the FDI net inflows by 1.4. The country achieved macroeconomic stability, as shown by 62 quarters of uninterrupted economic growth between 1994 and 2007, when it was affected by the global financial crisis. The sectors which have contributed to the growth of the economy include mining, manufacturing, retail wholesale, finance and general government among others, as indicated

in Table 2.1. However the growth in the economy has been criticised for not leading to a reduction in the level of unemployment, which currently stands at 25.2% and has led to other socio-economic challenges (UNCTAD 2014).

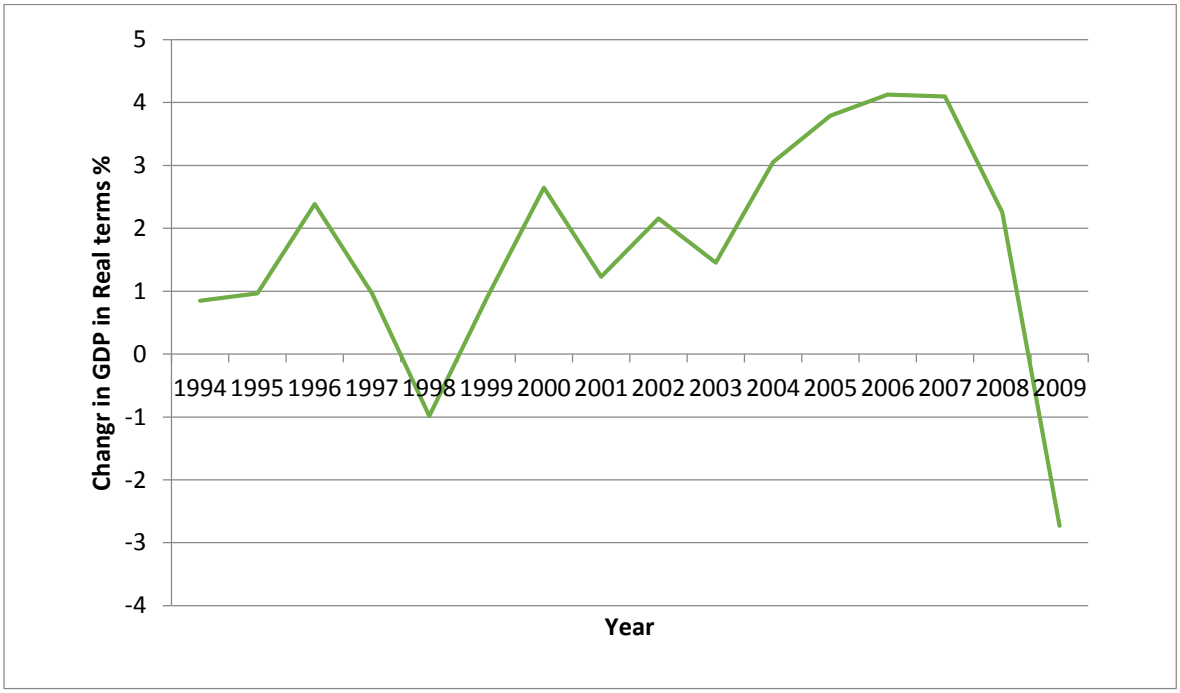

Figure 2.1 Trend in GDP Growth in South Africa, 1994–2009 (% growth rates)

Source: *South African Reserve Bank, (2015)*

In examining macroeconomic variables in South Africa, it should be noted that another important variable is the gross capital formation (GCF). According to Chetty (2007), GCF is a measure of investment that is at the foundation of virtually all value-creating activities in an economy. GCF comprises buildings, machinery and equipment. It adds to the productive base of an economy by contributing to real economic growth and employment creation. Slow growth in GCF can hinder the growth of an economy, hence the relation to FDI. Krkoska (2001) asserts that FDI results in growth in GCF. This suggests that improvements in the investment climate help to attract higher FDI inflows, eventually translating into GCF. These assertions are supported by Hejazi and Pauly (2002), who believe that GCF and FDI are complementary, since GCF is a form of investment. This implies that changes in FDI patterns result in changes in GCF and in the economy as a whole.

South Africa has shown positive growth since 1994 and the biggest contribution to this trend comes from private corporations. An analysis of trends in South Africa shows that they are in line with those of other countries, because in 2008 FDI inflows were increasing and GCF also

increased. However, GDP decreased because of other factors, therefore there is a positive relationship between FDI and GCF.

Table 2.2: GCF in South Africa 1994 -2013 (Rm)

Year	GCF Public corporations	GCF Private Corporations
1994	8 658	56 405
1995	10 639	67 946
1996	12 302	78 095
1997	14 300	87 677
1998	22 842	92 033
1999	17 588	94 290
2000	15 036	107 534
2001	15 262	120 844
2002	18 964	135 374
2003	23 158	153 384
2004	25 325	178 552
2005	30 111	210 165
2006	R 39 734	256 827
2007	R 58 832	307 189
2008	**R 93 479**	**376 918**
2009	R 115 084	342 142
2010	R 111 710	341 517
2011	R 115 941	361 664
2012	R 124 889	396 288
2013	R 137 097	461 244
Total	**R 1 010 951**	**4 226 088**

Source: *South African Reserve Bank, (2015)*

2.3. FDI Inflows in South Africa

In the early 1990s South Africa implemented a policy regime that became far more liberal and outward-oriented, with the aim of attracting new foreign investment (Arvanitis, 2006). After 1994 the country implemented a policy aimed mainly at ensuring stable economic growth (Gelb et al., 2009). This policy was the Growth Employment and Redistribution (GEAR) Policy, which was announced in June 1996. The aim of the policy was to improve macroeconomic factors, including the fiscal deficit, inflation and changes in tariffs and in the financial system generally. It was reasonable to focus on economic growth to secure a stable economy, but it was a mistake to believe that foreign capital would improve as a result of the narrowly-focused policy. This is evident from the country's low FDI inflows, regardless of the policies implemented. However, the fact that the country had total inflows as low as a

total of 0, 49% between 1989 and 1990, and that they increased to 3. 58% between 2001 and 2010 is proof that inflows are improving, but at a slow rate, as indicated in Figure 2.2 below (UNCTAD, 2014).

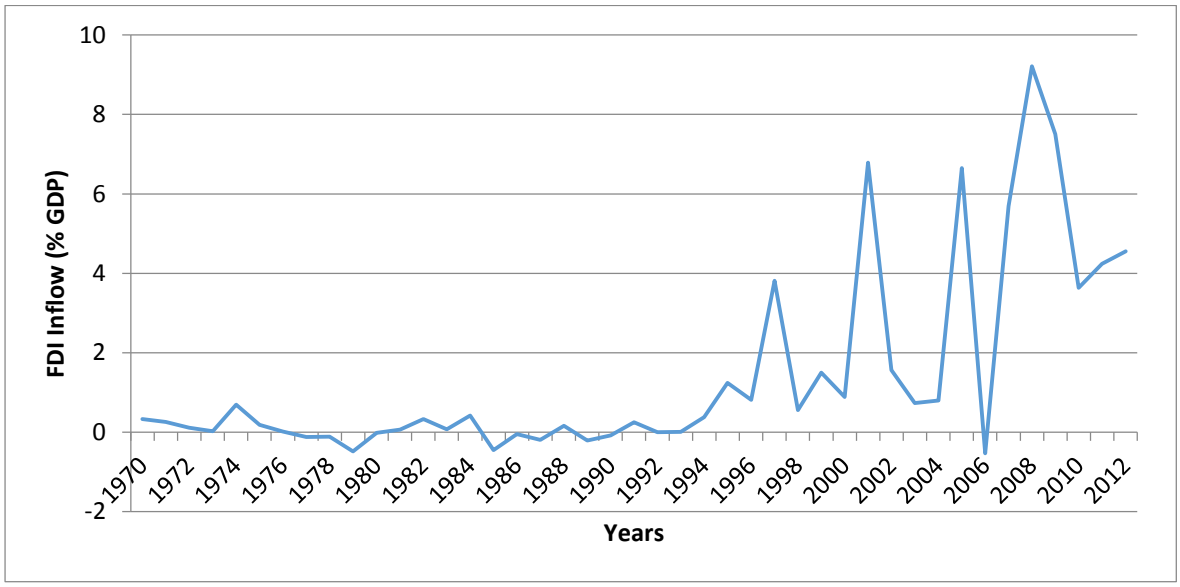

Figure 2.2: South Africa's FDI Net inflow 1970 – 2012 (% GDP)

Source: *UNCTAD (2014)*

Table 2.2 highlights the volatility that has existed in South Africa's FDI inflows, especially after 1994. Economists believe that these are the result of the transition from the apartheid regime to a democratic government, which introduced changes in economic policies and regulations.

2.4. Sectors Attracting FDI Flows in South Africa

FDI inflows come from multiple sectors that are grouped into primary, secondary and tertiary sector. The tertiary sector has the most industries, but the primary sector remains the highest contributor to FDI inflow into the economy.

Table2.3: FDI inflows by Sectors in South Africa

Sector		Industry
Primary		Agriculture and hunting
		Mining and quarrying
Secondary		Unspecified secondary
Tertiary		Electricity, gas and water
		Community, social and personal service activities
		Construction
		Wholesale and retail trade
		Transport, storage and communications
		Business activities

Source*: FDI intelligence, 2015*

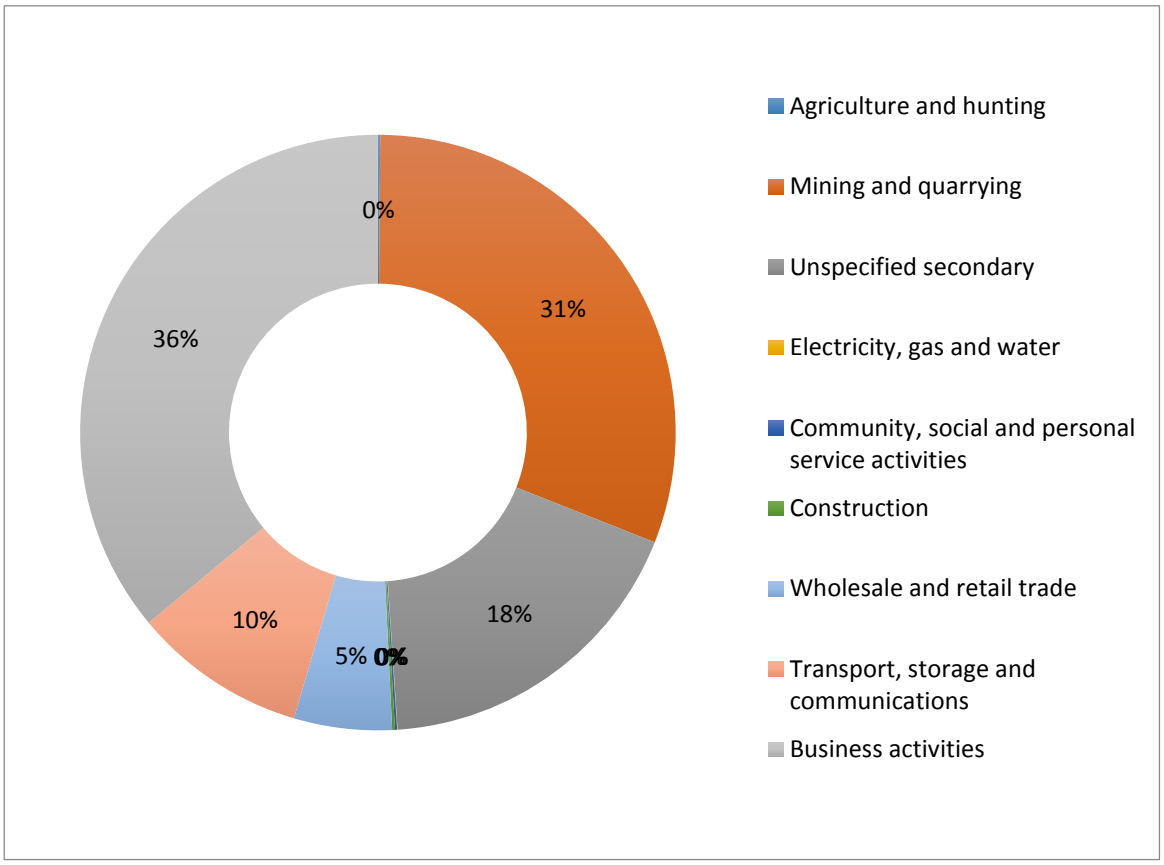

Figure 2.3: FDI Inflows by Sector in South Africa 2012

Source: *FDI Intelligence 2015*

2.4.1 The Primary Sector in South Africa

The primary sector consists of mining and quarrying, and agriculture and hunting. This sector involves the direct use of natural resources. Concerning FDI inflows, mining is one of the biggest contributors to the economy, as agriculture does not contribute. The mining industry

in South Africa contributes 31% of the FDI inflows. It has divisions such as coal, gold and minerals. The annual mining report by PwC (2013) affirms that the mining industry should be very attractive to FDI. However, surveys that were conducted more recently highlighted constraints and suggested reasons why the industry might not attract FDI inflows in the near future. These included the lack of control of labour unrest, the lack of wage flexibility, the low quality of education, rigid labour legislation and the inefficiency of government spending, among other causes (PwC, 2013).

These constraints were confirmed by Leon and Grove (2013), who highlighted challenges faced by the industry, including production loss as a result of labour unrest, difficulty in ensuring the safety of workers and the increased cost of labour, an increase of up to 40% in the gold and platinum industry in recent years. All these constraints have resulted in job losses, because if the labour cost has increased but production has decreased, it is difficult for mining companies to absorb labour. In order for the industry to attract FDI inflows, it clearly needs to provide a stable, efficient operating and regulatory environment for mining companies (Awudi, 2002).

2.4.2 The Secondary Sector in South Africa

The secondary sector is generally dominated by the manufacture of finished goods. Petroleum products, chemicals, rubber and plastic, metals, metal products, machinery and equipment, food, beverages and tobacco are the largest sectors in the economy (SEDA, 2012). This study will focus on manufacturing as whole; the secondary sector contributed 18% of FDI inflows between 2000 and 2012. According to SEDA (2012), the manufacturing sector is growing more slowly compared with other sectors, and has decreased from 19% of GDP in 1993 to 17% of GDP in 2010. SEDA (2012) asserts that South Africa has a huge opportunity for FDI in the manufacturing sector.

2.4.3 The Tertiary Sector in South Africa

As indicated in Table 2.3 above, the tertiary sector includes electricity, gas and water; community, social and personal service activities; construction; wholesale and retail trade; transport, storage and communications; and business activities. It is the biggest sector of the economy; with the business sector the biggest contributor, providing 36% of FDI inflows, followed by transport, storage and communications, which contributes 10% of FDI inflows, and a contribution of 5% from the wholesale and retail trades. Electricity, gas and water and

construction did not contribute to FDI inflows between 2000 and 2012 because electricity was provided mainly by Eskom, while gas and social products are provided by government. Soussa (2004) highlights that Africa and the Middle East shared 2% of FDI inflows from the 1990s to the early 2000s. 58% went to Italy, which had a well-developed financial system that was recognised worldwide. Of the remainder, 16% went to Asian countries and 24% went to other European countries.

Goldberg asserts that financial sectors FDI from well-regulated and well-supervised source countries can support emerging market institutional development and governance, improve a host country's mix of financial services and risk management tools, and potentially reduce the incidence of sharp crises associated with financial (Goldberg, 2004, p9). This suggests that financial development encourages FDI into the economy and will overcome the shortage of funds for small business and encourage investments.

2.5. Sources of FDI inflows in South Africa

An investment country profile of South Africa by UNCTAD (2012) highlighted countries in the European Union that held the majority of South African's FDI inflow of 77% in 2010. The United Kingdom was the largest investor in 2010, with 50%, followed by the Netherlands with 18% and the United States with 6%. Africa countries showed very little contribution to total FDI inflows, amounting to 21% of the total stock.

According to Mazenda (2012), the EU is a major source of investment in South Africa because of the multinational companies that are based in the UK and have preferential access to the UK market through free-trade agreements. The textile manufacturing industry has grown and US inflows to South Africa have increased as a result of the African Growth and Opportunity Act, which came into force in November 2000 (Mazenda, 2012).

Table 2.4 FDI stocks in the host economy, by geographical origin, 2001–2010 (RM)

Region / economy	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
World	370 695	255 837	303 545	355 088	489 317	611 722	751 925	632 619	866 664	1 015 517
Developed economies	355 769	239 351	284 762	342 436	480 074	592 223	721 468	563 025	782 091	942 092
Europe	332 336	211 208	245 823	301 045	436 338	535 607	656 084	492 301	697 407	850 028
European Union	324 217	203 633	238 272	285 410	411 420	515 927	626 215	452 460	652 273	785 820
Austria	96	86	147	136	623	647	723	726	776	1 517
Belgium	875	545	782	937	1 691	1 336	3 090	3 337	3 752	4 007
France	3 094	3 644	4 069	6 515	7 699	9 157	12 304	9 228	10 500	9 450
Germany	22 397	22 045	22 858	25 755	29 903	34 121	41 359	46 960	58 095	60 878
Greece	1 072	1 078	1 083	2 867	1 325	1 331	1 334	1 438	1 441	1 451
Ireland	157	93	218	158	1 218	1 220	1 223	1 218	1 227	2 049
Italy	1 408	1 416	1 979	2 062	1 215	2 909	3 542	4 607	4 406	6 334
Luxembourg	2 487	2 964	1 840	1 943	2 170	1 883	8 569	8 419	10 708	15 815
Netherlands	10 728	12 752	16 066	16 211	14 120	22 106	28 952	32 224	91 414	177 934
Sweden	640	842	819	854	997	960	949	1 831	1 923	2 110
United Kingdom	281 263	158 168	188 411	227 972	350 459	440 257	524 170	342 472	468 031	504 275
Other developed	6 976	6 328	6 249	6 604	10 854	12 761	21 902	29 848	29 412	46 845
Switzerland	6 780	6 003	6 102	6 398	10 636	12 263	21 338	29 235	28 783	46 146
North America	20 991	24 175	30 993	32 838	32 268	37 510	47 460	48 122	57 387	63 876
Canada	2 069	292	1 472	1 622	129	132	1 114	957	1 574	1 144
United States	18 922	23 883	29 521	31 216	32 139	37 378	46 346	47 165	55 813	62 732
Other developed	2 442	3 968	7 946	8 553	11 468	19 106	17 924	22 602	27 297	28 188
Australia	148	142	420	528	811	948	1 167	1 570	1 588	1 505
Bermuda	302	383	390	627	752	3 417	3 799	3 963	8 248	7 387
Japan	1 984	3 435	7 127	7 382	9 887	14 725	12 934	17 036	17 461	19 274
Developing economies	14 926	16 486	18 676	12 652	9 242	19 388	30 332	69 455	84 392	73 268
Africa	5 049	5 468	4 659	4 167	3 989	4 074	5 711	5 225	5 922	6 461
Other Africa	4 996	5 382	4 528	3 940	3 822	3 915	5 517	4 741	5 359	5 509
East Africa	3 615	4 423	4 104	3 298	3 403	3 514	4 120	4 048	4 658	4 384
Mauritius	1 525	2 289	1 966	1 160	1 265	1 376	1 982	1 910	2 520	2 246
Southern Africa	1 381	959	424	642	419	401	1 397	693	701	1 125
Botswana	758	693	172	211	203	182	182	222	222	466
Lesotho	52	70	74	74	75	75	75	104	104	104
Namibia	40	45	22	22	22	22	1 015	102	114	327
Swaziland	531	151	156	335	119	122	125	265	261	228
Zimbabwe	2 090	2 134	2 138	2 138	2 138	2 138	2 138	2 138	2 138	2 138
Latin America and the	1 121	581	664	667	797	10 241	12 834	13 111	14 506	2 207
Asia	8 756	10 437	13 353	7 818	4 456	5 073	11 787	51 119	63 964	64 600
West Asia	1 227	2 233	2 042	3 489	- 546	- 991	- 3 112	- 4 236	- 740	- 1 031
Saudi Arabia	1 227	2 233	2 042	3 489	- 546	- 991	- 3 112	- 4 236	- 740	- 1 031
South, East and South-	6 939	7 612	10 631	3 600	3 601	3 892	4 771	42 155	51 172	57 256
China	169	219	209	319	340	486	480	26 760	33 981	37 251
Hong Kong, China	28	28	37	36	36	36	811	1 309	1 357	1 414
Malaysia	6 458	7 066	10 043	2 371	2 348	2 407	2 343	12 750	14 566	17 240
Singapore	22	28	42	238	234	318	312	333	337	402
Taiwan Province of	262	271	300	636	643	645	825	1 003	931	949
Unspecified	-	-	107	-	1	111	125	139	181	157

Source: *UNCTAD Investment Country profiles -South Africa, (2012)*

Table 2.4 confirms the finding that Europe was the largest source of FDI inflows into South Africa, which were worth R850 028 million. It was followed by the UK, with R504 275 million. The USA was the last of the top countries, with R63 876 million.

2.6. FDI Inflows in Emerging Economies (BRICS)

Figure 2.4 indicates that South Africa performs very much worse than any of the other BRICS countries in receiving inflows into the economy, lagging behind India. China has

always received the bulk of the inflows, although, in contrast to South Africa, it was not open to foreign investment before 1979. In the early 1980s China moved from restrictive to liberal policies, then to policies encouraging FDI in general. In the mid-1980s it introduced policies that encouraged more high-tech and more capital-intensive FDI projects. In the mid-1990s, according to Morrison (2012) and Chunlai (1997), economic zones were established and given incentive policies to ensure sustainability of FDI inflow into the country. Despite these efforts, the spillover effects did not materialise as expected, leading to another change in policies. The new policies and regulations produced remarkable results that have accelerated since 1992, reaching the highest inflows of $72 billion, recorded in 2000. The main reason why China has become the leading economy to attract FDI inflows is its stable economic growth, and it is able to achieve this economic growth because of its high levels of domestic savings.

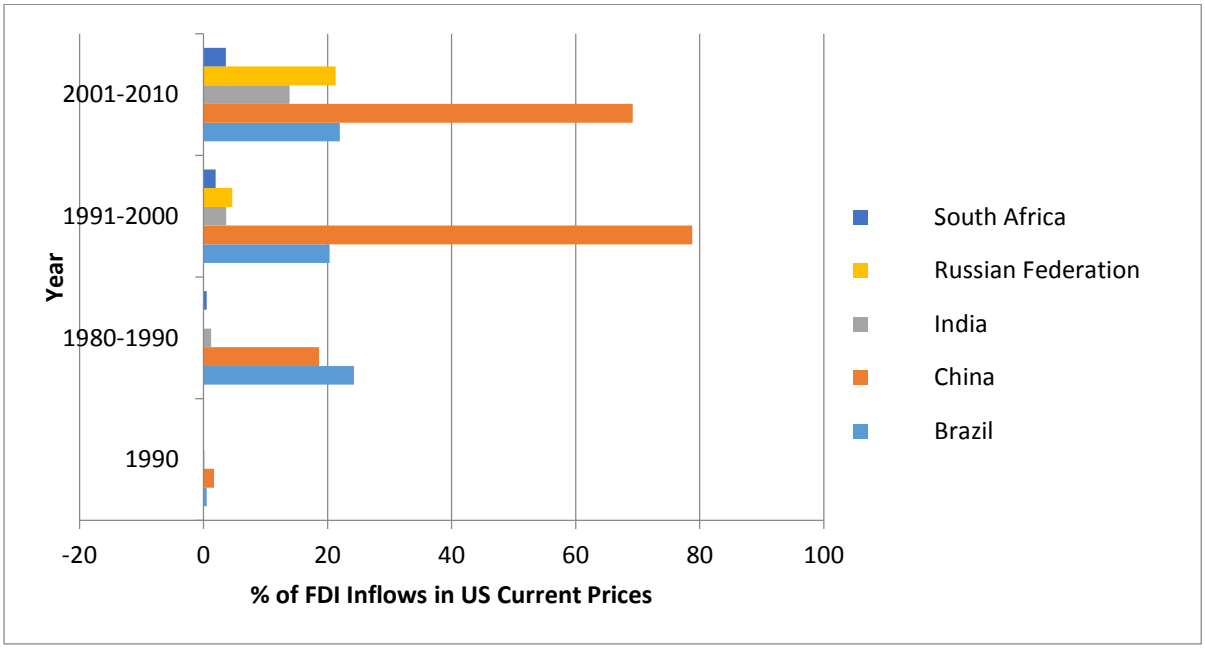

Figure 2.4: FDI Inflows Annual (%) Measured in US Current Prices; BRICS Countries (1980 -2010)

Source: *UNCTAD (2014)*

2.7. FDI inflows in developing African countries

Recent studies reveal that Africa is gaining importance as a destination for global FDI, although from a lower base than other regions. This means that, even though Africa is attractive to foreign investors, the inflows into African countries remain low when compared to other regions (UNCTAD, 2014).

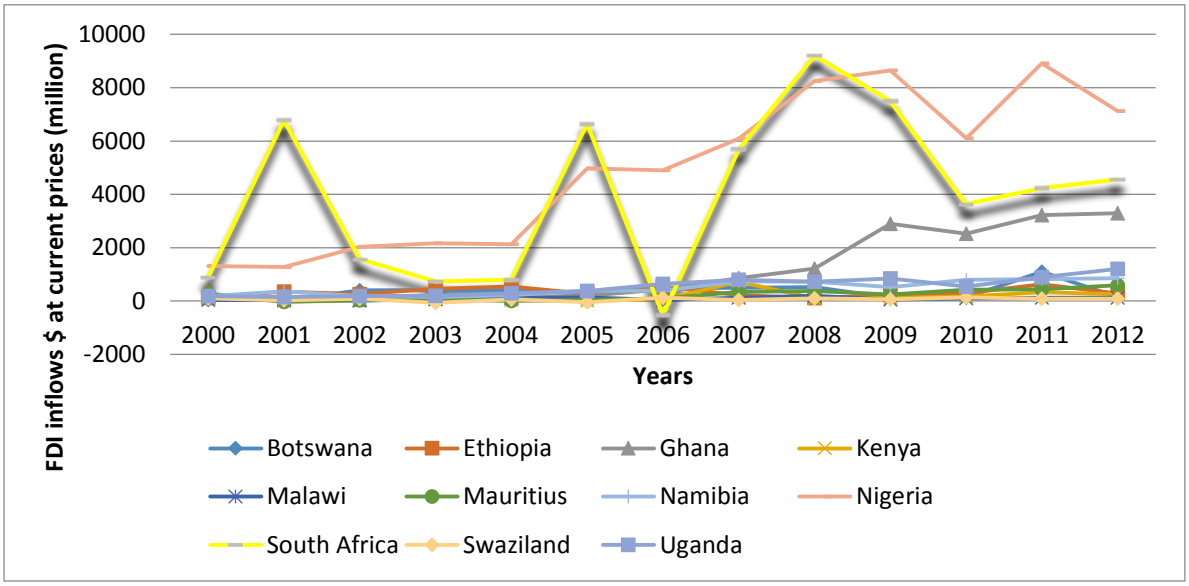

Figure 2.5 Trends in FDI Inflows in selected African countries (2000 -2012)

Source: *UNCTAD (2014)*

Figure 2.5 provides a clear indication of how competitive South Africa is compared with other emerging economies in the continent. Overall, it indicates that inflows into the continent have improved over the last 14 years and South Africa has attracted large inflows of foreign capital compared with other African countries. Nigeria is its biggest competitor where FDI inflows are concerned. Nigeria is rich in natural resources such as oil and gas, mineral deposits and plant products. The Nigerian government adopted several policies to ensure the constant increase in FDI inflows into the economy (Dinda, 2009). According to Dinda (2009) the implementation of policies to ensure globalisation included those suggested by the of the International Monetary Fund (IMF) which enabled liberalisation of the economy, opened it to foreign investors in the manufacturing sector and offered incentives for ownership of equity in all industries except key industries like the manufacture of military equipment. Incentives, including tax relief and concessions for the use of local raw materials, were made available to investors (Ahmed and Mayowa, 2012). As a result, Nigeria's trend of

inflows is less volatile than South Africa's, and is consistent with the rest of the market over the years.

2.8. FDI Inflow in Other Regions of the World Compared With Southern Africa Region

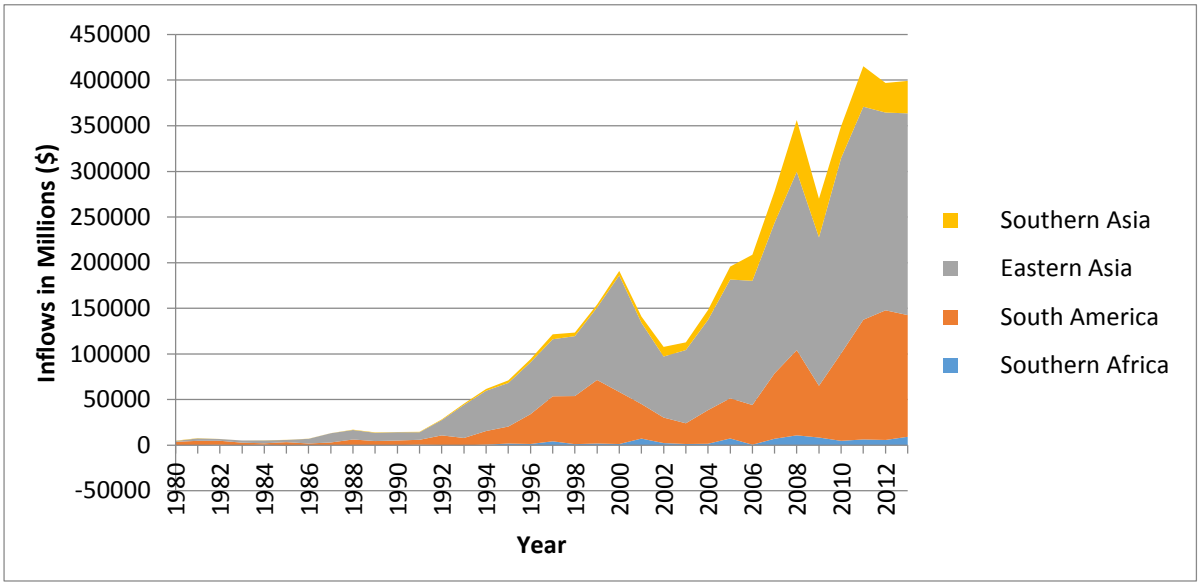

Figure 2.6: FDI Inflows by Region

Source: *UNCTAD (2014).*

FDI in developing countries has increased significantly over the last 25 years. Total FDI rose from US $4 billion in 1980, to US $182 billion in 1999, before falling back to US $152 billion in 2003 (Busse and Hefeker, 2007). Asian countries are the largest recipients of FDI inflows in the world, followed by American countries, leaving South African economies the least significant recipient (UNCTAD, 2014).

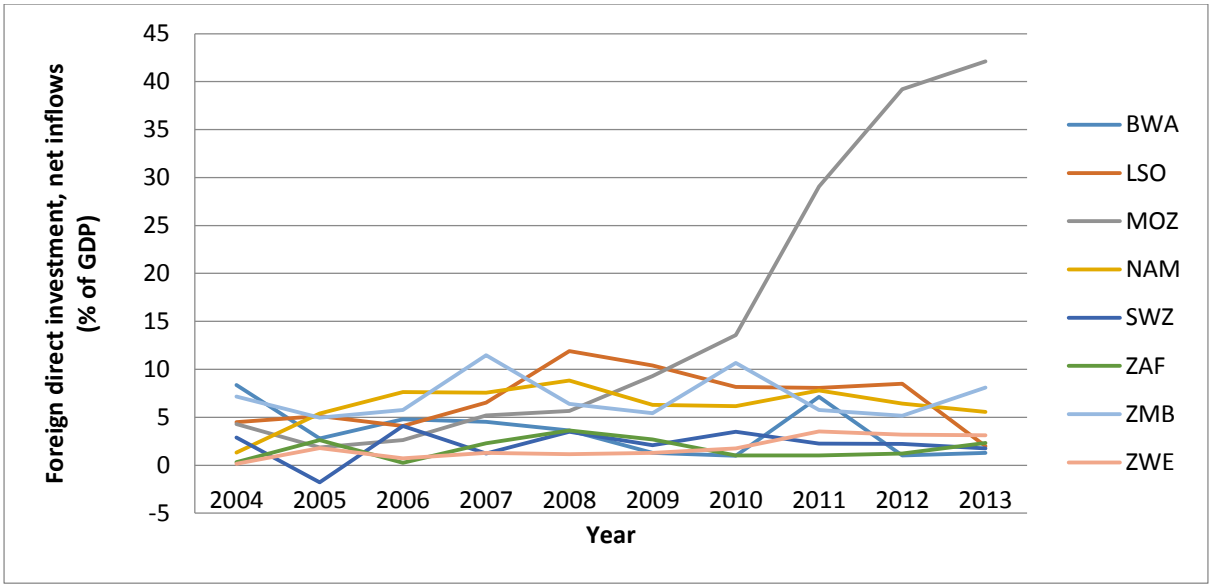

Figure 2.7: FDI Inflows within the SADC Region

Source: *UNCTAD (2014)*

In the Southern African region, Mozambique is the largest recipient of FDI inflows. In 2010 its inflows increased by 10%, as indicated in the UNCTAD World Investment Report (2010). Mozambique's ability to be the leading recipient of FDI inflows in the region is the result of a process that started in the late 1980s, when Mozambique restructured its economic policies, moving away from a central economy to an open economy (UNCTAD, 2010). This resulted in Mozambique privatising most of its state-owned companies, so that it currently has state-owned companies only for public services. A unique aspect of Mozambique's ability to attract FDI inflow has been the role of large-scale investments in the industrial sector and extractive industries known as mega-projects. One of these was the Mozal project, a $500 million aluminium smelter that increased FDI inflows in the early 2000s (UNCTAD, 2010). It is this project that first drew the attention of the foreign investors to Mozambique. Other mega-projects were coal and titanium mining projects, which continued to attract FDI inflows between 1998 and 2005. Overall, mega-projects generated FDI inflows of $1.6 billion in the 10-year period between 1996 and 2005, with other projects representing inflows of $0.6 billion (UNCTAD, 2010).

2.9. South African Government Policy

South Africa inherited an economy in crisis; one that had been shaped by apartheid policies that were based on systematically-enforced exclusion linked to racial division (Du Plessis and Smit, 2006), and by a dependence on mining exports. The apartheid system excluded black

people from opportunities in the labour market and from direct ownership of businesses and land (Rispel, Moorman and Munyewende 2014). It limited investment in infrastructure and services in black communities, and black entrepreneurs were denied access to industrial and retail sites, as well as to credit. Only the whites had access to opportunities and participation in the economy. During this period, the economy was characterised by high unemployment, inequality, political instability, low economic growth and high levels of poverty.

In 1994 the country gained freedom after its first democratic elections. This meant that the economy had to catch up with global trends and open up to international investments and trade, leading to the implementation of new policies and programs to transform the economy. The policies in the early 1990s drew criticism, but were part of the process of developing better policies. These included the GEAR strategy, the main objectives of which included the elimination of poverty and the reduction of inequality, while simultaneously maintaining investment and growth (Rispel et al., 2014). The Reconstruction Development Program provided a broad framework for meeting basic social needs, reducing inequality and promoting investment and growth. The Accelerated and Shared Growth Initiative for South Africa (ASGI-SA) also provided a framework, from the mid-2000s, for government's increased focus on economic infrastructure and skills development. The National Industrial Policy Framework (NIP), published in 2007, and the Industrial Policy Action Plan which followed, provided frameworks for improving policy interventions to stimulate industrial development. The New Growth Path identified a number of key sectors to focus on in order to diversify and grow the economy and create jobs.

These earlier strategies ensured that South Africa enjoyed a real recovery in growth and investment after 1994, and continued to experience more robust and stable growth. The National Development Plan provided long-term targets for investment, growth and employment creation, as well as a holistic plan for reaching these targets by drawing on other policies and programmes. It has yet to produce results.

The economy managed to grow after 1994, showing a growth of 3.2 % in 2012. According to this resulted in the transformation of the South African economy from a GDP of US$ 136 billion in 1994 to a GDP of US$ 384 billion in 2012 (Rispel et al., 2014). The GDP has achieved macroeconomic stability, but there has been pressure from global financial situations, for example, the Asian crisis, the Dotcom crisis, the global commodity crisis and, most importantly, the global financial crisis. When looking at South African's GDP growth

compared to those of other emerging economies in BRICS, it is not surprising that China has the highest GDP levels and Brazil has the lowest, with South Africa slightly ahead of Brazil.

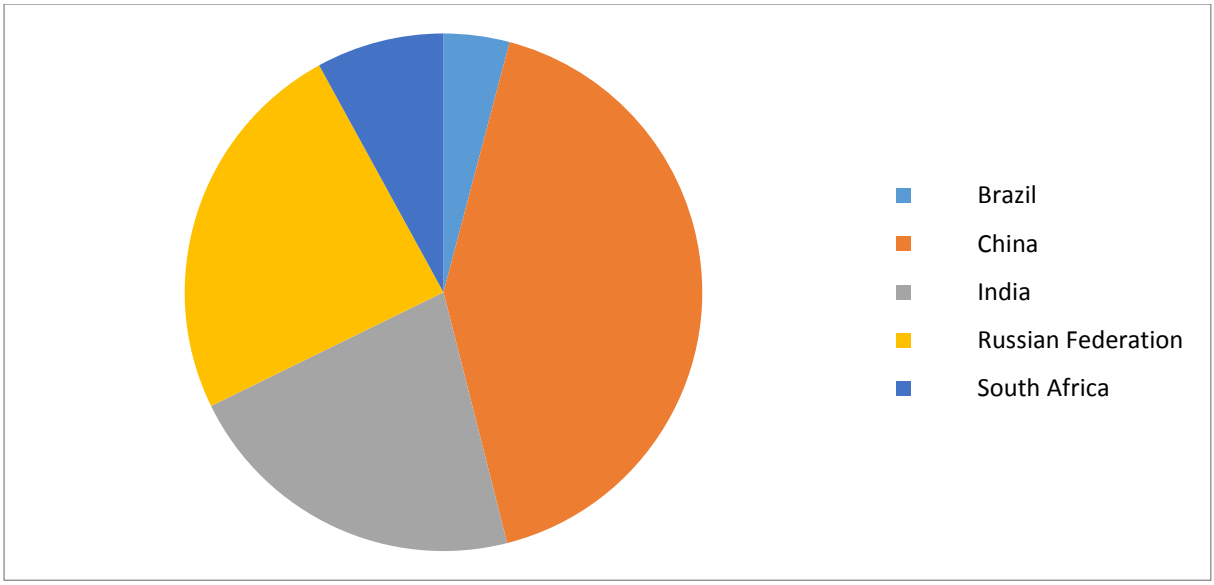

Figure 2.4: FDI Inflows within the SADC Region

Source: *World Bank, (2015)*

For the economy to experience sustainable economic growth, it needs investments that comprise between 20% and 25% of GDP (Harmse, 2006). South Africa's investment showed an improvement after 1994, reflecting 24.8% of GDP in the fourth quarter of 2008 (UNCTAD World Investment Report, 2011). During the financial crises of 2007/2008, it declined to below 19 % of GDP, but recovered in 2013 to 19.2% of GDP.

2.10. Existing Regulations Affecting FDI in South Africa

South Africa has concluded that the current regulations are some of the reasons the country has low FDI inflows compared to other emerging economies. Currently there are no specific regulations for FDI. Instead, FDI is governed by other polices or regulations that will be discussed below.

2.10.1 Exchange Control

There are currently no controls governing foreign investments in the country. Exchange control only serves to ensure that the movement of foreign capital is completed at a fair price and influences the channels for financing FDI inflows (National Treasury, 2011). The policy also states that foreign capital may also raise capital in the local equity and bond markets, provided it has approval for doing so. Foreign investments into South Africa that are

structured and financed through acquisitions tend to be more complex (National Treasury 2011), therefore they undergo a long process for approval by the Minister of Finance.

2.10.2 Mergers/Acquisitions under the Competition Act

Mergers and acquisitions in South Africa are currently subject to screening and approval under the Competition Act 1998 (except the banking sector). The purpose of screening is to analyse the effects of the merger and to decide whether or not it is likely to substantially prevent or lessen competition in any of the markets in which the parties compete (National Treasury 2011). It is also intended to analyse the impact of the mergers and acquisitions on the economy in general. The Act does not distinguish between foreign and domestic mergers. The Competition Commission is responsible for reviewing mergers. In the event that there are adverse implications for competition, the Competition Commission must determine whether there are offsetting gains and whether the merger can be justified on grounds of public interest (National Treasury 2011). These grounds include consideration of a particular industrial sector or region, employment creation and the ability of small businesses or companies controlled or owned by historically disadvantaged persons to be competitive, and the ability of national industries to compete in international markets (Competition Act 1998).

2.10.3 Sector Regulation Affecting Foreign Entry and Ownership

Strategic sectors in South Africa are subject to sector regulation for FDI inflows. These regulations involve licensing or similar requirements that include some form of public interest review by the relevant minister or delegated authority (National Treasury 2011). Sector regulations apply to both domestic and foreign investors (National Treasury 2011). Strategic industries subject to sectoral regulation include the financial and mining sectors, telecommunications and broadcasting and transport.

The existing regulations portray South Africa as an open environment for foreign investment. However, the fact that South Africa does not have a policy framework that is directed to FDI may be a setback to encouraging inward foreign investments, because there is a lack of transparency in processing applications and investments are dealt with in the context of the regulations, on an ad hoc basis.

2.11. Conclusion

This chapter has provided a review of the state and trends of FDI inflows into the South African economy in relation to the trends of FDI inflows into other countries and regions. This chapter indicated that South Africa improved between the 1990s and the current period, as indicated by macroeconomic indicators, due to the implementation of economic reforms. It was also shown that the country was a competitive recipient of FDI inflows when compared to other developing African countries, but was less competitive when compared to other BRICS member countries. South Africa has skewed FDI inflows by sectors: some industries do not contribute to the FDI inflows, and the country could focus on these industries for new opportunities to attract investors. The reflection of sector analysis might have resulted from the fact that most inflows comes from three major regions: the EU, the UK and the United States, indicating a lack of diversity. Economic growth improved after the 1994 democratic elections but in the recent years it has declined. Another important factor that policy-makers need to look at is the need to develop regulations that are directed at FDI and ensure transparency, with the aim of encouraging inflows. The next chapter is a review of the literature relating to FDI inflows.

CHAPTER 3

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

3.1. Introduction

This chapter presents a review of both the theoretical literature and the empirical and the relating to the determinants of FDI inflows. The extraordinary increase in the number of studies that examine the importance of foreign investment is an indication of their importance in overcoming the challenge of a lack of capital as a result of low savings in the host country. This chapter consists of four sections. Section 1 introduces the chapter; Section 2 focuses on the theoretical analysis of determinants of FDI inflows, while Section 3 reviews the available empirical literature and Section 4 deals with empirical analysis.

3.2 Theoretical Framework

Gichamo (2012) asserted that theories of international trade paved a way for FDI. International trade theories include the Absolute Advantage Theory, the Comparative Advantage Theory, the Heckscher-Ohlin Model and the Product Life-Cycle Theory. Applying such theories is a main focus of this study.

Secondly, the study discusses recently developed theories to explain the determinants of FDI. They include Monopolistic Advantage Theory, Eclectic Paradigm and Market-Size Hypothesis.

Thirdly, the study examines theories that explain FDI inflows from the perspective of investments; these theories include Portfolio Theory and Hymer FDI Theory. Nayak et al. (2014) postulate that several of these theories have been put forward by researchers to explain FDI, but until now there has been no single theory that fits the different types of direct investment, or any particular investment, made by a multinational corporation or country in any region.

3.2.1 Absolute Advantage Theory

The classical theories on trade were first proposed by Adam Smith and David Hume. David Hume was a Scottish economist who formulated the theory of current account balance in 1752 (Gichamo, 2012). A current account balance is the sum of net exports of goods and services, net primary income and net secondary income. It is usually measured as a

percentage of GDP. Hume argued against the mercantilist economic policy which promoted current account surplus. He criticised the mercantilist idea of collecting more money and abandoning the export of precious metal like gold and silver, arguing that the accumulation of money can increase domestic labour and commodity prices, so that imports will increase and exports decrease. Hume's argument was that import and export will be at equilibrium by automatic adjustment, suggesting that, in order for an economy to overcome current account surplus, it is necessary to encourage exports and discouraging imports.

Adam Smith, on the other hand, argued in 1776 that the idea of mercantilism was not favourable for the entire population and it did not result in wealth and economic growth for the whole country. He opposed the mercantilist view that the export surplus was supposed to enrich the nation through the inflow of precious metals. In his view, mercantilism benefits only merchants and producers, while workers and others were neglected (Gichamo, 2012). In Smith's view, 'the encouragement of exportation and discouragement of importation are the two engines by which the mercantilist system use to enrich every country' (Gichamo 2012). Smith then proposed a theory of Absolute Advantage through promoting free trade between countries - a theory that simply asserts that if Economy A can buy a commodity from a foreign Economy B at more cheaply than Economy A can produce it, then Economy A should buy that commodity from Economy B instead of making it. This theory also suggests that all countries could gain by practising free trade and specialising in their Absolute Advantage, because a nation's import is the export of another.

3.2.2 Comparative Advantage Theory

Smith (1776) was more concerned with the role of foreign trade in economic development and his model was essentially a dynamic one, with variable factor supplies (labour of production). His hypothesis therefore failed to explain how foreign trade will happen in the case of a nation having Absolute Advantage in nothing. David Ricardo (1817, in Gichamo, 2012) proposed a model of international trade theory that overcame the shortcomings of the Absolute Advantage Theory by introducing a theory called the Comparative Advantage Theory.

Unlike Absolute Advantage, the Comparative Advantage Theory is mainly concerned with resource allocation, which is determined by labour productivity ratios (Ozawa, 1992). This theory suggested that labour was the most important factor. As a result, Ricardo viewed foreign trade as a win-win situation because both countries benefited from trade, and

participants in the economy also benefited. The disadvantage of this theory is that it gives rise to complications when another factor such as capital was introduced, and if the producers responded to changes in the factor price ratio in favour of the cheaper factor. The model made the unrealistic assumption that labour is the only factor of production, guaranteeing fixed labour productivity and employment (Ozawa, 1992). Technology is assumed to be the only factor of production that differs from country to country. The model has been criticised, but its main contribution lies in highlighting comparative advantage, making it more robust than the Absolute Advantage when considering foreign investment.

3.2.3 The Heckscher-Ohlin Model

In an attempt to overcome the shortcomings of the Comparative Advantage Theory, the Heckscher-Ohlin Model was presented by Eli Heckscher and Bertil Ohlin. It argued that trade occurs due to differences in labour, capital and other factors of production across countries (Sajal et al., 2008).

The Heckscher-Ohlin Model assumes two countries, two kinds of goods and two factors of production, such as labour and capital, and constant returns to scale. It also assumes that there are no technological differences (Gichamo 2012). The Heckscher-Ohlin Model focuses on factor endowment, suggesting that an economy has the ability to specialise if it has a comparative advantage on a specific factor of production. For example, if Economy A has a comparative advantage in capital, and enters into a trade agreement with Economy B, Economy A will mainly produce capital-intensive goods, while Economy B will produce labour-intensive goods. Gichamo (2012) highlights that in the Heckscher-Ohlin Model there is no commodity trade between the countries, but factors of production movement until the price of the factors become equal. This is called Factor Price Equalisation. The comparative advantage is determined by the difference in factor endowment.

3.2.4 The Product Life-Cycle

Another theory which explains the flow of FDI is the product life-cycle, which was developed by Raymond Vernon in 1966. This theory was the most relevant to international trade, and was also able to explain the FDI inflows. It has been recognised by researchers such as Denisia (2010), Shenkar (2007), Nayak et al. (2014), Jadhav (2012), Xinzhong (2005) and Gichamo (2012). The theory is illustrated in Figure 3.1.

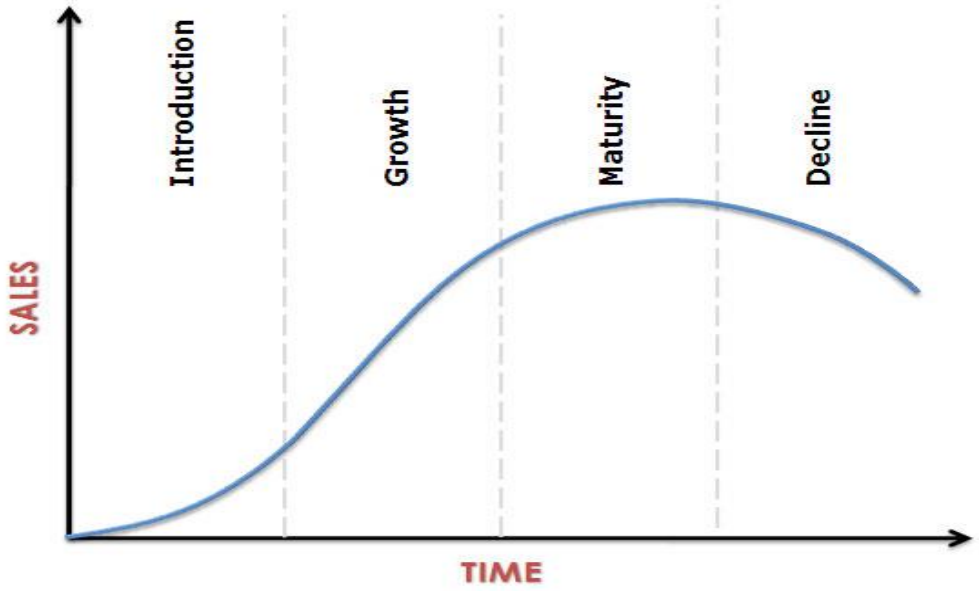

Figure 3.1: The Product Life-Cycle

Source: *Denisia (2010)*

The following stages are more applicable to FDI flows (Xinzhong 2005):

- **At the introductory stage**, a new product is initially invented in the home country with comparative advantage, with advanced technology and innovatory capability to produce for the home market.
- **At the growth stage**, demand is expanding and supply is sufficient, leading to intensive competitiveness in the market of the home country. The product is exported to other countries that are similar to the home country in demand patterns and supply capabilities.
- **At the maturity stage,** the product is standardised as production costs have become the more important ingredient.

FDI flows are motivated to produce abroad at lower costs than in the home country. Economies of scale, transportation and labour costs are the determining factors for location choice. For example, if a less-developed country is rich in labour, the products will be produced in the labour-abundant country, resulting in the home country (if it is capital-intensive) being the importer. This is highlighted in the Heckscher-Ohlin Model. In contrast, Dudas (2013) maintains that the stages to receive FDI inflows are at the maturity and decline stage. At the maturity stage, the product will have high demand and an increase in the market share, in profits and in competition. During these stages there is

technology transfer, therefore exporters become importers. Shenkar (2007), on the other hand, suggests that the innovation state is the stage that is more relevant to FDI inflows in an economy. This is the stage when the economy is able to monopolise the products it develops before any other country can copy them. However, as the product moves to the other stages, it will be easy to duplicate and technology will make it possible for other economies to produce the same products and not have to import them from the host country.

3.2.5 The Eclectic Paradigm

Dunning (1981) developed this paradigm, which examines three possible drivers of FDI: ownership-specific (O), location-specific (L), and internalisation (I), so it is generally referred to as the OLI Framework.

The ownership-specific (O) advantage ensures that the country has a monopolistic advantage through resources such as human capital, patents, technologies, branding and goodwill. The location-specific (L) advantage ensures that, for the above-mentioned advantages of ownership, the location must be viable to allow the economy to boom, in the sense that there is political stability, viable social services, developed technology, proper infrastructure and access to cheap input and minimal trade barriers. Internalisation (I) will ensure that ownership and location are sufficient to produce the desired outcomes: to monopolise on the market imperfection and to get the market share or profits, which will, in return, ensure FDI inflows into the host country (Gichamo, 2012). Xinzhong (2005) highlighted that ownership and internalisation advantages belong to supply-side factors, resulting in location advantages being a demand-side factor.

The OLI Framework also explains the motives of firms for investing in foreign economies as part of revolution, as outlined by Dunning (1981). The first motive is the natural resource-seeking motive: firms might wish to acquire natural resources at a lower cost than they can in their own country, so they can maximise their profits. In return, the firm aims to be competitive in the market in which it operates. Such firms are primary producers and manufacturing enterprises that seek raw materials and physical resources (fuel, minerals, metals, agricultural products) (Gichamo, 2012). They can fulfil their natural-resource seeking motives through the location advantage.

The second cluster of natural resource seekers are firms that are looking for cheap, unskilled labour. Location advantage is also the determinant of this motive, because in an economy where labour cost increases, a firm will move its operations to an economy that has cheaper labour. The last clusters of resource-seeking FDIs are the firms that wish to gain access to management and organisational skills, technology, information and marketing expertise. This is also attained through location.

The second motive for FDI is market-seeking. Firms engage in market-seeking FDI in order to get access to large markets and market growth. The advantages of market-seeking FDI include decreases in production and transaction cost, the ability to adopt local tastes and preferences, business behaviour, legal requirements and market procedures. In essence, market-seeking is about eliminating trade barriers.

The third motive of FDI is efficiency-seeking. This is for firms that invest in different countries to take the advantage of resource endowment and economies of scale. For example, an economy that has a comparative advantage in capital will produce capital-intensive goods. The aim is to take advantage of factor endowments, cultures, institutional arrangements, demand patterns, economic policies and market structures by concentrating production in a limited number of locations to supply multiple markets (Gichamo, 2012). According to Gichamo (2012) the last motive is strategic-asset seeking and the main aim of the firm is to sustain and strengthen its competitiveness in order to dominate in a global market.

3.2.6 The Market-Size Hypothesis

This hypothesis postulates that FDI is a positive function of the market size of the host country. The market size is usually measured by the country's GDP. Most empirical studies support the market-size hypothesis. Anyanwu (2012) observed that flows of per capita FDI into African countries were positively correlated with their GDP. Etim, Onyebuchi and Udo (2014) concluded that market size was a major determinant of FDI inflow in Nigeria from 1975 to 2010. According to Shamsuddin (1994), it is worth noting that the size of the market in the host country is likely to influence the FDI undertaken to produce importable rather than exportable goods.

3.2.7 Portfolio Theory

Portfolio Theory or Modern Portfolio Theory, formulated by Harry Markowitz (1952), is an investment theory based on the idea that risk-averse investors can construct portfolios to

optimise or maximise expected return based on a given level of market risk, emphasising that risk is an inherent part of higher reward. It is one of the most important and influential economic theories in dealing with finance and investment. In the context of FDI inflows, this theory suggests that if the rates of return on various investment projects across countries have a less than perfect correlation, a firm can reduce its overall risk exposure by diversifying its investment internationally (Shamsuddin, 1994).

It is this theory that explains why countries will exchange capital through FDIs. In its simplest form, it asserts that a country will undertake an FDI agreement in order to acquire international capital at an optimal rate of return and risk. However, this theory has been criticised because, in a perfect capital market, firms need not diversify their portfolio internationally to reduce risk for their shareholders: individual investors can do so by directly diversifying their individual portfolios. Therefore, under the assumption of perfect competition, the portfolio approach cannot explain the FDI inflows (Shamsuddin, 1994). However, such a perfect competition case is unlikely to occur.

3.2.8 The Hymer FDI Theory

Hymer (1960) explained FDI by comparing the difference between FDI and portfolio investment. The main aim of Hymer's theory was to analyse the ability of a foreign company competing successfully in an unfamiliar market, where it must be at a disadvantage compared to a local company (Dunning, 1981). According to Gichamo (2012), portfolio investment theory is capital movement from a location that has a low interest rate to one that has a high interest rate; until the interest rate is equal everywhere. Portfolio investment theory assumes that there are no barriers to capital movement, such as risks and uncertainties. However, Hymer countered this view, asserting that portfolio investment theory has a risk and uncertainty implicit in the fact that portfolio investment does not explain control (Hymer 1960). This means that investors who invest in foreign countries do not have a right to control the enterprises they invest in. In the light of these insights, an investment portfolio made it possible for a foreign company to compete in an unfamiliar market because investors will have control over the company through FDI. Investors seek control in multinational companies in order to ensure the safety of investments and less competition in foreign countries. Fundamentally, FDI allows multinational companies to invest in foreign countries to gain control of their enterprises. Control results in advantages such as getting factors of

production at a lower cost, capital, access to raw materials, economies of scale, patents and superior management, hence multinational companies prefer to engage in direct investments.

3.3 Empirical Literature Review

Studies on determinants of FDI inflow have been done both at country level and across countries. Also, it is interesting to note that the majority of the studies confirm the positive relationship between economic growth and FDI inflows, suggesting that a high growth rate is the basis for higher FDI inflows. This is justified as it allows comparisons to be made between countries. A number of authors have focused on establishing long-term relationships between the determinants and inflows of FDI, using the Johansen Cointegration Test.

Bevan and Estrin (2000) investigated FDI determinants in transitional economies of central and Eastern Europe. The analysis used panel data sets containing information on FDI flows from 18 countries within the region over the period 1994 to 1998. The study established that FDI inflows are determined by country risk, unit labour costs, host market size and gravity factors. The announcements of progress in EU accession have a direct impact on FDI receipts because of attributes to political stability of the economy, resulting to changes in credit ratings.

Artige and Nicolini (2006) assert that, empirically, economies in the same region have different determinants of FDI inflows into the region or into individual economies. This assertion is supported by a study that investigated FDI determinants inflows into three European regions, Catalunya, Baden-Wurttemberg and Lombardia, from 1995 to 2005. Artige et al. (2006) states that the determinants differ from region to region mainly because of diversity that can be explained by the FDI distribution per sector, thus different sectors across regions have different determinants.

The second reason for different determinants between regions lies in the existence of different priorities for an economy's needs. This is mainly attributed to the different development levels of different regions, for example in Catalunya market size, openness to trade, research and development effort and human capital are required in order to attract FDI inflows, whereas in Baden-Wurttemberg, market size and labour productivity performance as the main determinants of FDI inflows. Lombardia's main determinant is manufacturing. Despite the differences, the study indicated that there is always a positive and statistically significant relationship between GDP and FDI per capita for all regions.

In contrast, Mateev (2008) examined the major determinants of FDI flows in Central and South-Eastern European countries during the years 2001 to 2006. The study grouped the determinants into two groups: gravity factors (distance, population and GDP) and non-gravity or transition-specific factors (risk, labour costs and corruption). Using an econometric model based on cross-section panel data analysis, the author found that both gravity factors and non-gravity factors can explain the size of FDI flows in transition economies. Moreover, the study found that FDI flows into different groups of transitional economies are determined by the same macroeconomic factors, and not by the timing of their accession to the EU. Interestingly, the study highlighted infrastructure and trade openness as economic factors that are not significant to FDI flows into European countries. Furthermore, the study found institutional factors that involve risk and privatisation to be highly significant. These findings suggest that strict measures and efforts to improve governance and combat corruption and bureaucracy have a direct impact on FDI in these countries.

Fernandes (2001), who investigated FDI inflows in services and manufacturing productivity in Chile from 1990 to 2002, found that FDI in services industries had a positive effect on Chilean manufacturing. An increase in FDI inflows into the service sector therefore increased inflows in the manufacturing sector. The study indicated that spillover effects could increase if the service sector was more open in its trade policies and increased innovation. Innovation can improve through skills development or human capital development. The study also found that FDI in the services industry offered opportunities for lagging firms or economies to catch up with the industry leaders (Fernandes, 2001). This contradicts the view that only developed economies or firms realise the benefits of FDI inflows; it also provides opportunities for developing economies and firms to catch up, as outlined by Mlachila and Takebe (2011).

Haufler and Stöwhase (2003) argue that there is a need to understand the complex interrelationships between individual elements of potential host countries' tax systems and sector or activity specific FDI flows for the period 1982 to 2001 in Europe. Their findings indicate that investments in different sectors respond with rather different elasticity to tax incentives, and FDI undertaken for different purposes will respond in qualitatively different ways to specific tax incentives such as a low statutory tax rate or generous depreciation allowances. The study recommends that tax as a determinant of FDI inflow needs to be understood from the perspectives of the host and source countries, as well as the motive for acquiring FDI. However Herger, Kotsogiannis and McCorriston (2010) argue that the effect

of tax on FDI inflows differs according to the investment strategies pursued by multinational firms.

Ranjan and Agrawal (2011) conducted a study to identify the factors determining FDI inflows of BRIC countries (excluding South Africa) over the period 1975-2009. The determining factors included market size, economic stability, labour cost, infrastructure facilities, trade openness, total labour force and GCF. The researchers discovered that, apart from the total labour force and GCF, all other factors are influential in determining FDI inflows in BRIC countries. Investors view China as the world's manufacturing hub and fastest-growing consumer market, India is recognised as the leading business-processing and IT services centre, with long-term market potential. Brazil, on the other hand, specialises in trade openness, geographical position and cheap labour. Russia has abundant resources of oil and gas, so has the advantage of attracting hydrocarbon related FDIs (Ranjan et al., 2011). This means that BRIC countries have promising prospects for FDI inflows, as their low labour costs, large market size and growth potential will remain as the key determinants and attractions over the years.

In recent work by Agrawal (2015), it is proposed that there is a positive long-run relationship between FDI inflows and economic growth in BRICS (including South Africa) countries over the period 1980-2012. The results also indicate a relationship of bidirectional causality between FDI inflows and economic growth, meaning that FDI inflows induce economic growth and economic growth induces FDI inflows in BRICS countries. The results suggest that an economy can focus efforts on either economic growth or FDI inflows, since one of them appears to induce the other.

Vijayakumar, Sridharan and Rao (2010), investigating the determinants of FDI in BRICS countries for the period 1975-2007, found that market size, cost of labour, infrastructure facilities, currency value and GCF act as the additional determinants of FDI inflows after economic stability, growth prospects and trade openness in BRICS countries. Vijayakumar et al. (2010) concluded that the BRICS economies need to improve investment in order to attract higher FDI inflows, thus facilitating improvement in market potential, infrastructural development and capital formation.

Ho, Ahmad and Dahan (2013) agree with Vijayakumar et al. (2010) in an empirical analysis of the determinants of FDI in BRICS and Malaysia over the period 1977-2010. The findings indicated that trade openness, economic growth, government expenditure and infrastructure

quality were critical factors in determining FDI flows in BRICS and Malaysia. The study also showed that economic freedom is found to significantly affect FDI in Brazil, China and Malaysia.

In a holistic approach, Jadhav (2012) compiled a study to explain the economic, institutional and political FDI determinants in BRICS economies. The study covers the period between 2000 and 2009, uses panel data and employs panel unit root and linear regressions. The study took into account the economic determinants (market size, openness, natural-resource availability) and inflation rate (macroeconomic stability); political stability; government effectiveness; regulatory quality; control of corruption; voice and accountability and rule of law as potential institutional and political determinants of FDI. The findings indicated that the economic determinants are more significant than the institutional and political determinants in BRICS economies. The study also found that market size and openness were significant determinants, while resource availability was comparatively insignificant. According to Jadhav (2012), economic determinants are significant because FDI inflows into BRICS economies are motivated by the market-seeking reasons, not resources.

Interestingly, the institutional and political determinants are insignificant because investors from countries with high corruption, where there is a lack of enforcement of anticorruption laws, select similar countries when making foreign investments, in order to exploit their familiarity with corrupt environments.

Mottaleb and Kalirajan (2010) argue that, by bridging the gap between domestic savings and investment, and by bringing the latest technology and management, FDI can play a vital role in achieving rapid economic growth in developing countries. Their first step was to analyse the FDI inflows determinants in developing countries, covering the period 2005-2007 in 68 developing countries in Asia, Africa and Latin America. In their analysis of the underlying factors that affect FDI inflow, the researchers found that lower-middle income countries and Asian countries were highly successful in attracting FDI when compared to low-income and African and Latin American countries. They also found that dominating factors in determining FDI inflow into developing countries were market size, linkages with the global market through international trade, the relationship with major donor countries of foreign as well as business-friendly environments, measured by the days required to start a business. They proposed that small, developing countries across the globe could attract substantial

amount of FDI by adopting more outward-oriented trade policies and providing more business-friendly environments for foreign investors (Mottaleb et al., 2010).

Liargovas and Skandalis (2011) examined the importance of trade openness in attracting FDI inflows, using a sample of 36 developing economies from 1990-2008. Their study used a direct test of causality between FDI inflows, trade openness and other key variables (political stability, exchange-rate stability and market size) in developing regions of the world: Latin America, Asia, Africa (including South Africa), CIS (Commonwealth of Independent States) and Eastern Europe. Empirical findings revealed that in the long run, trade openness contributes positively to the inflow of FDI in developing economies. However, it attracted only small amounts of the world FDI. The researchers also found that there are some other factors, such as political stability; exchange-rate stability and market size, that exert a positive influence on FDI.

Demirhan and Masca (2008) did a cross-sectional analysis of the determinants of FDI using econometric models over the period 2000-2004 in 38 developing countries. Inflation was found to be an insignificant determinant, as long as it was not too high. Inflation could be accepted as good for an economy only if the disposable income of the population keeps up with the increase, as it will suggest economic growth.

The worst that can happen is deflation, the opposite of inflation, where prices generally decrease. This means that people will not spend, because they expect prices to decrease even more. This is very dangerous as the policy-makers cannot control it. This view is reinforced by Rusike (2007), who asserts that a lower inflation rate is an indication of a stable macroeconomic environment, resulting in more FDI flowing into a country. The study also found that market size, infrastructure and openness impact positively on FDI inflows in developing countries.

While on the subject of developing economies, Cuyvers, Plasmans, Soeng and Bulcke (2008) examined the factors that affect inflows of FDI into Cambodia's small open economy from 1995-2005, using panel data. The study employed the OLS model to perform empirical analysis. The authors maintained that an economy needs to differentiate between approved FDI (projects that were officially authorized by the Cambodian Investment Board of the Council for the Development of Cambodia) and realised FDI (investment projects that were in operation after being approved by Cambodian Investment Board), because the

determinants of approved FDI and realised FDI were consistently similar, but not identical (specifically in Cambodia). The GDP of the home country, trade of the host country and the exchange rate had a positive impact on the FDI inflows into Cambodia. Geographical distance and financial crises had a negative effect on the level of FDI inflows in Cambodia.

From a different angle, Nunnenkamp (2002) investigated the effect of globalisation on FDI determinants in developing countries. The main purpose of the study was to narrow the view of globalisation-induced changes in international FDI competition and to highlight the evidence on changes to the relative importance of traditional and non-traditional FDI determinants in 28 developing countries from 1980-1990. The results showed that traditional determinants (market size, cost factors and human capital) remained dominant factors in shaping the distribution of FDI. On the other hand, non-traditional determinants (cost factors, complementary factors of production and openness to trade) remained insignificant in the process of globalisation. The study indicated that tariffs were irrelevant to FDI inflows before the emergence of globalisation. According to Nunnenkamp (2002), the results suggested that the importance of FDI determinants depends on the motive for FDI in a specific economy. For example, openness may be a leading determinant for an economy that is seeking efficiency and focusing mainly on manufacturing. The author maintained that the results of the study indicated that international trade relations influenced the emergence of globalisation until the present period.

Hussain and Kimuli (2012) investigated reasons why some developing countries are able to receive large volumes of FDI inflows, but others are not. The authors empirically used panel data to analyse 57 low-income and lower-middle income countries from 2000-2009. The study identified market size as the most important determinant of FDI inflows into developing countries. In addition, global integration, the availability of a skilled labour force and better financial institutions encouraged FDI inflows.

Saifullah and Qaisar (2013) analysed and evaluated the impact of core macroeconomic variables (GDP, inflation and the exchange rate) on FDI inflows in Pakistan during 1971-2009. The results showed that all three macroeconomic variables are positively associated with FDI inflows. The results also indicated that political, legal and social factors have an impact on FDI inflows. This implies that a nation should focus on stabilising inflation and the

exchange rate and on growing GDP in order to enhance the confidence of foreign investors and attract more FDI into the country.

In another study, Awan, Ahmad, Shahid and Hassan (2014) employed time-series data from 1988-2012, using the OLS technique. Empirical results showed that GCF, exports and gross national income significantly and positively affected FDI inflows. In contrast, external debt had a negative effect on FDI inflows. Imports had a negative relationship with the FDI inflow in Pakistan. Due to war conditions in Pakistan, military expenditure increases sharply. This was reflected as a negative attribute for FDI, since foreign investors disinvested from Pakistan when the military expenditure increased, indicating a negative relationship between war conditions and FDI inflows. Moreover, the study indicated that domestic investment had an influence on foreign investments.

Bhavan, Changsheng and Zhong (2011) investigated the determinants and growth effect of FDI in South Asian economies using panel data over the period 1995-2008. The results indicated that distance in both home and host country significantly determined FDI inflows into the South Asian region. The results also suggested that cyclical factors in home and host economies were important factors in FDI inflows. Other factors such as trade openness, human development, population and infrastructure were also found to be significant factors. The second part of the study, which investigated the growth effect on FDI, revealed a significant and positive relationship associated with growth rate and FDI. The empirical results also revealed that low corruption, lower taxes and reduced trade protection were important in ensuring FDI inflow growth in South Asia (Bhavan *et al*., 2011).

Nasrin, Baskaran and Muchie (2010) compiled a study that analysed the major determinants and hindrances of FDI inflow into Bangladesh from 1990-2000. Qualitative research methodology was used through primary and secondary data. The findings revealed that, after adopting liberalised policy measures in the 1990s, there was a significant increase in FDI inflow. Both foreign investors and policy-makers identified low-cost labour as a major determinant of FDI inflow into Bangladesh; the barriers to FDI inflow included poor infrastructure; in spite of having investment-friendly policies, there were some implementation problems at the levels of facilitating agencies. As Bangladesh was facing infrastructural constraints, special incentive packages were suggested for the investors to invest in a sector for certain periods.

Attempting to explain why China has attracted high volumes of FDI inflow, Wen-Hsien, (2010) examined the possible determinants of FDI inflows to the source country from in 1989-2006. The results showed that countries with higher export ratio, depreciation of real exchange rate, lower borrowing cost, lower GDP per capita, higher relative labour cost, strong intellectual property rights protection and depreciation of exchange rate tended to invest more in China. This could be explained by the risk-aversion of the investors (Wen-Hsien 2010). Remarkably, the study found that source-country market size exerted a negative effect on FDI inflow in China. This was the only indication of why China was different.

Chunlai (1997) explained empirically the reasons why China was a leading recipient of FDI compared to other developing countries during 1987-1994. The study focused mainly on location as a determinant of FDI inflows. The findings indicated, firstly, that location advantage for the hosting country was important in determining the magnitude distribution of FDI inflows. Secondly, location was a major determinant, and developing countries with larger market size, faster economic growth, high level of FDI stock and more liberalised trade policies attracted relatively more FDI inflows. Higher efficiency, wages and greater remoteness from the rest of the world discouraged FDI inflows into China. The results did not suggest what China did differently to other developing countries, and it remains inconclusive as to why China is the largest recipient of FDI among the developing countries.

In a study by Bushra, Aamrahand and Muhammad (2003), volume and determinants of FDI in developing countries were analysed. The analysis was based on a sample of 15 developing countries with five each from upper-middle, lower-middle and lower-income countries over the period 1970-1997. In the study, urbanisation was highlighted as a determinant of FDI inflows. The study included analysis of GDP per capita, standard of living, inflation, current account, wages, labour force, domestic investment, trade openness and external debt. Urbanisation significantly affected FDI inflows in lower, lower-middle and upper-middle income countries. The findings also indicated that the higher the income in an economy, the more factors affecting FDI inflows, and the higher the number of inflows received (Bushra et al., 2003). Thus lower-income countries, in general, received less FDI than the higher-income groups because of their low levels of GDP and domestic investment and because of internal imbalances. The study highlighted that each country must strive to develop and implement policies that are suitable for its structural needs in order to attract FDI.

Xinzhong (2005) asserts that the underlying factors of the location advantage are important to an economy that aims to attract FDI inflows. This was concluded from a study that analysed location FDI determinants of over the period 1992-2003. Among other variables, higher marketing economic level was a factor that affected FDI inflows. Others included lower labour costs, liberal trade, larger market size, economic development, human capital, infrastructure, better geographical location and a steady environment of policies and institution.

According to Xinzhong (2005), another important factor to consider is the source country of FDI inflow into China. The findings indicated that FDI inflows from the newly-industrialised economies and Association of Southeast Asian Nations (ASEAN) had the strong characteristics of export-oriented FDI. In contrast, FDI inflows from the developed countries and Western Europe tended to present the characteristics of market-oriented FDI (Xinzhong, 2005). This implies that the location determinants that attract FDI inflows differ on the bases of the source country, not only of the host country. This study showed that domestic investment has an impact on FDI inflows in an economy with a bidirectional relationship. According to Lautier and Moreaub (2012), understanding the linkage between domestic investments and FDI is important in understanding the determinants of FDI inflows. Domestic investments serve as an incentive to attract foreign investors. As suggested by Nunnenkamp (2002), that whatever is good for domestic investment is also good for FDI.

Çevis and Camurda (2007) provide an empirical definition of economic determinants of FDI inflows. Using panel data, they analysed 17 developing countries and transition economies during the period 1989-2006. The results indicated that FDI is positively related to interest rates, economic growth, trade openness and the previous period's FDI, but inversely related to inflation rates. Interest rates are a measure of macroeconomic policy stability. The study noted that the previous period's FDI was one of the most important economic determinants since it was directly related to the host country's economic resources.

From a different perspective, Xin, Thye, Chun, Yoke and Chun (2012) explained factors that affect the decisions behind FDI from 1982-2010. The authors argued that strong growth performances in a specific economy depend to a great extent on the FDI, because the FDI generates economic growth by increasing capital formation through expansion of production capacity, promotion of export growth and creation of employment. Empirical results demonstrated that market size; trade openness and inflation rate significantly and positively

affected Malaysian FDI inflows. Furthermore, exchange rates also affected Malaysia FDI inflows. When Ringgit (the Malaysian currency) depreciated against other currencies, FDI inflows into Malaysia decreased. Quality of infrastructure was insignificant to Malaysian FDI inflows (Xin et al., 2012).

Ho (2010) contributed a sectoral analysis of determinants of FDI inflows in China. The study was based on the pooled data of 13 sectors in China and nine sectors in Guangdong province over the period 1997-2002. The results indicated that FDI inflows in China and in Guangdong were positively influenced by market size and innovation. However, labour cost and state ownership influenced FDI inflows negatively in China (Ho, 2010). The findings of the study also indicated that determinates at a national and provincial level differed according to the perspective of the investor making the decision about foreign investments.

In the same vein, Piyaphan (2010) carried out a study on five ASEAN countries (Indonesia, Malaysia, Philippines, Thailand and Vietnam) to explore the determinants of FDI by industry. The analysis is based on the Gravity Model and OLI Paradigm for the period of 2000-2003. The study indicated that GDP and GDP per capita of the host and home countries, industry imports from home country, industry exports to home country, industry tariff rates and industry output levels all have a positive effect on FDI (Piyaphan 2010). However, the study also showed that distance, wages and education have a negative effect on FDI. The study further indicated that population variables of the host and home countries have impact positively on FDI, provided that the GDP per capita variables are constant.

Wijeweera and Mounter (2008) investigated FDI determinants in Sri Lanka from 1977 to 2003. The findings indicated wage rate as the most important determinant of FDI inflows to Sri Lanka and suggested that, for Sri Lanka to attract FDI, it needs to maintain cheap labour costs by ensuring that it has high levels of productivity. Furthermore, the findings indicated that positive, long-run relationships were found between FDI and real GDP, and between FDI and previous levels of FDI.

From a different point of departure, Adjabeng (2013) investigated FDI determinants from a company perspective, focusing on Walmart in China from 2001-2009. Market size, labour costs, tax and infrastructure were identified as determinants. These determinants affect the market conditions for the consumers, because disposable income, consumer confidence, GDP per capita income and GDP growth rate are seen as having the most effect on Walmart's FDI

into China. Furthermore, the results show infrastructure development as a foundational and potent determinant of FDI location.

Esso (2010) used a cointegration and causality approach to conclude the long-run relationship between FDI and economic growth in Angola, Liberia, Senegal, Kenya and South Africa from 1970-2007. The results indicated that there was a long-run relationship between FDI and economic growth in all the targeted countries, except for Kenya. Moreover, GDP affected FDI significantly and positively in Senegal and South Africa. There was a significant link between FDI and economic growth, suggesting that FDI caused economic growth in Angola and Kenya; however, in Liberia and South Africa, growth causes FDI inflows (Esso 2010). These findings were contradicted by the findings of Mazenda (2012) in a study that analysed the effect of FDI on economic growth in South Africa from 1980-2010 and concluded that there is a negative relationship between FDI inflows and economic growth.

Suliman and Mollick (2009) argue that, in addition to trade liberalisation or economic and trade policies determinants, human capital development and the incidence of war affected FDI flows to sub-Saharan African countries. The study focused on the determinants of FDI for a sample of 29 sub-Saharan countries from 1980-2003. The findings indicated that a positive relationship between FDI inflows and literacy rate (proxy for educational level), improvement in political rights (proxy for freedom) and civil liberties increased FDI inflows. War events have a significantly negative effect on FDI flows into sub-Saharan African countries. Suliman et al. (2009) asserts that slow-growing literacy rates and continuing political instability need to be major concerns for the development of effective FDI policies for sub-Saharan African countries.

Gichamo (2012) employed panel data analysis when analysing the determinants of FDI to sub-Saharan Africa, sampling 14 countries over the period 1986-2010. Among other variables, telephone lines, gross fixed capital formation, inflation and lag of FDI were included in the study. It was found that trade openness, gross domestic product, gross fixed capital formation, inflation and lag of FDI were main FDI determinants in sub-Saharan Africa. The study noted openness as the main determinant, because countries with open trade policies have greater FDI inflows. There is an insignificant relationship between telephone lines and FDI. Gichamo (2012) also highlighted that policies have different outcomes in different countries.

Asiedu (2002) analysed determinants of FDI inflows in developing countries with the aim of establishing whether or not Africa was different during 1970 to 2000. This was a comparative analysis between non-sub-Saharan African and Sub-Saharan African countries. The results indicated that, firstly, a higher return on investment and infrastructure had a positive impact on FDI in non-sub-Saharan African countries, but had no significant impact on FDI in sub-Saharan African. Secondly, openness to trade promotes FDI in sub-Saharan African and non-Sub-Saharan African countries (Asiedu 2002). It is important to note that these results imply that Africa is different to some extent; therefore policies that have been successful in other regions may not be equally successful in Africa.

Macias and Massa (2009) did a study of the global financial crisis and sub-Saharan Africa, exploring the effect of financial crisis on capital inflows over the period 1980 to 2007. The study highlighted that global financial crisis impacts negatively on FDI inflows. The results also indicated a positive relationship between FDI inflow and economic growth. These results further illustrate the impact of the global financial crisis on economic growth, since the crisis affected FDI inflows and affected sub-Saharan Africa's growth. Gould and Tan (2013) also agreed that the global financial crisis affected FDI inflows for both developing and developed economies.

Anyanwu (2012) investigated the impact of FDI inflows into African countries from 1970-2009, using the OLS testing technique. The result reflected market size to be an insignificant determinant of FDI inflows into the African continent. The author stated that the reason for this was the fact that in most African countries, even though natural resources were the driver of FDI, they were mostly exported to other countries. This meant that the host country was left with nothing happening in its economy. Similar findings were made by Huand and Kimuli (2012) in a study that investigated FDI determinants from 2000-2009 in sub-Saharan Africa. They maintained that market size was the most important determinant of FDI. This was strongly supported by Ibrahim et al. (2011), who investigated the key determinants of net FDI inflows into Africa using panel data models. The results identified market size, in addition to share of fuel in exports. They also identified risk factors, such as corruption and religious tension, as important influences on FDI inflows into Africa. The results demonstrated that the markets are interested in investing in the African continent, but African countries need to improve governance, eliminate corruption and address religious tensions.

Hailu (2010) studied the demand-side determinants of the inflow of FDI to African nations, with particular emphasis on stock market availability from 1980-2007. The study found that natural resources, labour quality, trade openness, market accession and infrastructure had positive and significant effects on FDI inflows. Also, stock market availability had an insignificant effect on FDI inflow. The author emphasised that this was because stock markets in Africa were not structured so that they could contribute to attracting FDI, because the majority of the national policies were not linked to the capital markets. Another reason was the fact that capital markets in African countries were too controlled to play their intended role. These findings suggest measures that policy-makers in African countries need to consider in order to attract FDI inflows; these include keeping stable political environments, encouraging trade and improving infrastructure. Also, African countries should not exert excessive control over capital account transactions such as exchange-rate controls and foreign ownership. These findings are consistent with the findings of Van der Lugt, Hamblin, Burgess and Schickerling (2011) which indicated that attracting FDI is not enough for economic growth. The host country needs to have policies in place to reap the benefits of FDI. It suggested that SADC had limited capabilities to manage FDI due to its bottom-up approach. This meant that African countries needed to have relaxed and effective policies in place before they could attract FDI inflows into their economies.

Vinesh, Boopendra and Hemraze (2014, p.146) proclaim that, "compared to other parts of the world, the performance of South African Development Community (SADC) countries in attracting FDI is poor.". The aim of their study was to analyse the determinants of FDI inflows to SADC countries for the period 1985-2010. Their findings reflected the significant effect of openness, market size, natural resources and education on FDI inflows for SADC countries. Natural resources are highlighted as a major determinant that promotes FDI in the SADC region, both in the short and the long run. Countries that strive to attract FDI by providing several benefits fail to realise high volumes of FDI inflows; instead, they need to implement open and friendly policies that ensure economic development and stability.

A study by Dinda (2008) investigated factors determining FDI in Nigeria. The study employed a time-series econometrics approach for the period 1970-2006. The unit root and cointegration tests were carried out. The results seemed to suggest that the legacy of natural resources, macroeconomic risk factors and policy variables like openness are significant determinants of FDI flow to Nigeria. In the same vein, Etim et al. (2014) also examined determinants of FDI inflows and their impact in Nigeria from 1975-2010. The data was

analysed using OLS and a cointegration and error model (ECM). The empirical results revealed that market size, openness and exchange rate have a positive impact on FDI inflow, while political risk discourages FDI inflows. Infrastructure was discovered to be favourable, but its level is inadequate to improve FDI to the point required for sustainable growth and development. The authors recommended an improvement in infrastructural and technological development through knowledge spillover, maintaining that an effective political and social environment is necessary to attract FDI inflows.

In recent work by Enu, Havi and Attah-Obeng (2013), it is argued that FDI served as a source of development finance in Ghana during the period 1980-2012. The authors discovered this in their study, which investigated determinants of FDI inflows into Ghana. According to Enu et al. (2013), Ghana had implemented several economic reform policies since the early 1980s, such as the Structural Adjustment Programme in 1983 and, more recently, the enhanced Heavily Indebted Poor Countries Initiatives. The primary aim of these reforms was to reduce the impact of the 1980 debt crisis and, more importantly, to facilitate the attraction of FDI inflows to Ghana. The results revealed that the exchange rate and trade openness encouraged the FDI inflows in Ghana.

Sawkut, Boopen, Taruna and Vinesh (2011) argued that "FDI inflows into Africa are not only very low as a share of total global FDI flows or even as a share of FDI inflows to developing countries, but also the share is on a steady downward trend for three decades." The aim of their study was to analyse the leading determinants of FDI inflows, based on a sample of 20 African countries over the period 1990-2005. Natural resources, openness, market size and stock of human capital were reported to have a positive impact on FDI.

Mohamed and Sidiropoulos (2010) carried out a study in Middle East and North Africa (MENA) countries for the period 1975-2006, employing panel testing techniques to investigate FDI inflow determinants. The empirical results revealed that the key determinants of FDI inflows in MENA countries included size of the host economy, government size, natural resources and institutional variables (measured by institutional quality). The results suggested that for MENA countries to attract FDI inflows, removing all barriers to trade, developing financial systems, reducing corruption, improving the policy environment and building appropriate institutions were key and should not be overlooked (Mohamed et al., 2010). This implied that government-owned enterprises in the MENA region should be privatised.

In the same vein, Jabri, Guesmic and Abid (2013), in their most recent analysis of the economy of the MENA countries during the period 1982-1986, agreed that macroeconomic variables had a long-term effect on FDI. These results suggested that economic openness, and the growth rate, increases FDI in the MENA region. The study also shows that economic instability and exchange rates exerted a negative effect on the inward FDI flows and therefore deterred foreign investment.

Thaddeus and Emeh (2013) examined determinants of FDI inflows into Nigeria from 1980-2010, using a unit root test, cointegration test, Variance Decomposition and VECM testing techniques. The empirical results showed that exchange rate, GDP, inflation, stock market capitalisation and interest rate individually and jointly exerted significant long-run effects on FDI inflows. The overall findings suggested that Nigeria needed to focus on macroeconomic stability policies as a way to attracting FDI into the country.

A comparable study by Arvanitis (2006) examined determinants of FDI inflows into South Africa. Panel data across 17 countries for the period 1984-2001 were used. Another 16 countries were also included: China, Colombia, Costa Rica, Egypt, Guatemala, India, Korea, Malaysia, Mexico, Morocco, Panama, Philippines, Poland, Thailand, Tunisia and Uruguay. The study included a unique variable, financial risk index, among others. The results indicated that GDP, infrastructure, openness and exchange rates are the drivers of the FDI in an economy. The study also asserted that tax levels indicated the fiscal burden in an economy and it discouraged FDI when the exchange rates indicated the location of investment, in support of the Eclectic Theory.

Financial risk reflected mixed results: in some countries it was a negative factor, in others it was positive. Overall, the results indicated that all fixed factors tended to determine FDI inflows into South Africa. Infrastructure includes roads, ports, railways and telecommunication systems to institutional development. These enable investors to do business in the hosting country, allowing investor to cut costs as possible (Anyanwu 2012).

Streak and Dinkelman, (2000) discussed location determinants of FDI and South Africa's industrial development strategy from 1980-1998. The aim of the study was to discover whether South Africa had a location advantage to attract FDI into the country, with the desired outcome of understanding why FDI inflows had been low. The study concluded that South Africa had failed to create a location advantage in order to attract FDI inflows and instead focused on the supply determinants for foreign capital. These conclusions were drawn

from the findings that South Africa had high levels of crime, political instability and low levels of manufacturing and financial development during the period covered. This explained why South Africa remained with relatively low inflows compared to other emerging economies.

According to Kransdorff (2010, p.68), "the inequality between rich and poor in South Africa ranks among the largest in the world." The author suggested that, in order to respond to these daunting developmental challenges, FDI inflows were needed. This was clear from the finding that, despite greater economic liberalisation, the economy had limited tax incentives and relatively high corporate rates. The study also highlighted that even the few available tax incentives are not well marketed, resulting to inefficiency when implemented. This implied that foreign investors are discouraged from investing in the country because of the tax burden, among other factors.

In a study covering the period 1980-2011, Wocke and Sing(2010, p.9), stated that South Africa's natural resource endowments, its market size and improved macroeconomic fundamentals since its first democratic elections in 1994 should serve as much-needed incentives to attract inward FDI that could contribute to its economic development and offset its low domestic savings rate.

However, this is not practical in reality. Although the country has a sound regulatory and legislative environment for investment, a sophisticated business sector and globally competitive financial markets, these become ineffective in the face of overwhelming poverty, high income inequality, challenges in healthcare and education, inefficient labour markets and government's indecisiveness about some key economic policy issues.

All these challenges continue to create uncertainty for investors and mean that South Africa remains a problem to many foreign investors (Wocke et al. 2010). The empirical results indicated political stability, currency volatility, resource endowments and labour market unrest as the factors that foreign investors focus on when making decisions about investing in South Africa. Interestingly, the study highlighted that the economy has been shielded from the global crisis due to stronger exchange controls than are now in place. On the note of political risk, Rusike (2007) and Augustina (2007) concluded that the impact of political risk on FDI inflows depended on the specific country and how investors perceived it. This was because it depended solely on the foreign company and on how it assesses the political stability of the host country, or sometimes even on the type of product.

3.4 Analysis of the Literature, and Conclusion

This chapter has focused on analysing the available theory and empirical studies on the determinants of FDI inflows. Neither empirical nor theoretical literature has reached a consensus about the determinants of FDI inflows into economies. In the theoretical framework, most studies used the Eclectic Paradigm, which provides strong arguments of determinants of FDI inflows. It highlighted the advantages that investors consider when making decisions of FDI, and these can then be used to identify the factors determining FDI inflows. Most of the reviewed empirical studies used panel data and very few used the VAR model: consequently, the results are ambiguous and inconsistent.

There has been little work done to establish the determinants of FDI inflows into South Africa; this highlights the need to conduct empirical tests to finally establish the determining factors of FDI inflows. Also, the majority of the available studies do not take into account the effects of the global financial crisis. This study therefore attempts to bridge that gap and contribute to the debate on the determinants of FDI inflows into South Africa.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

The literature review and the analysis of the South African economy in previous chapters have provided different perspectives on determinants of FDI inflows. The current chapter sets out the methodological framework which will be used in this study. The chapter consists of seven sections. Following the introduction in Section 4.1, Section 4.2 presents the model specification. Section 4.3 provides a definition of variables and *a priori* expectations. Section 4.4 presents data sources, Section 4.5 provides a review of estimation techniques for the study to establish the FDI determinants inflows, while Section 4.6 discusses the diagnostic tests, and Section 4.7 concludes the chapter.

4.2 Model Specification

The analytical framework used in this study is based on the Eclectic Paradigm discussed in the previous chapter. The model is augmented with other variables to take into account key macroeconomic activities in South Africa. The model also accounts for the motives for countries or firms to decide to undertake foreign investments. The framework regards FDI as a way of transferring foreign capital not limited to goods and services. According to Dunning (1981), the Eclectic Paradigm remains a useful and robust general framework for explaining and analysing the economic rationale of international investment.

In the theoretical and empirical literature outlined in the previous chapter, a number of possible determinants of FDI inflows were highlighted. These include market size, openness, infrastructure, exchange rate, labour cost, inflation, financial development, external debt, natural resources, tax and political stability. This study will employ variables that consist of macroeconomic indicators, government stability and a dummy variable.

The study follows empirical work, particularly that of Adeisu (2002), to investigate the determinants of FDI inflows in South Africa. The model will improve on Aseidu's (2002) work by accounting for the possibility of dynamics in FDI determinants modelling:

$$FDI = f(GDP, RER, CPI, GCF, CT, O, D) \quad 4.1$$

The empirical model to be used in the study can be specified as follows:

$$FDI_t = \beta_0 + \beta_1 GDP_t + \beta_2 RER_t + \beta_3 CPI_t + \beta_4 GCF_t + \beta_5 CT_t + \beta_6 O_t + \beta_7 D_t + u_t \quad 4.2$$

FDI	Foreign Direct Investment
GDP	Gross Domestic Product
O	Openness
RER	Real Exchange Rate
CPI	Consumer Price Index
GCF	Gross Capital Formation
CT	Corporate Tax
D	Dummy Variable

4.3 Definition of Variables and Priori Expectations

GDP is the proxy of the host market size; this represents the host country's economic conditions and the potential demand for output, and it is an important element in FDI decision-making. Moreover, Rusike (2007) argues that FDI responds positively to the market size once it reaches a threshold level that is large enough to allow economies of scale and efficient utilisation of resources. The importance of the market size has been confirmed in many previous empirical studies (Mottaleb et al., 2010, Anyanwu 2012, Huand et al., 2012, Dinda 2008, Etim et al., 2014). The study assumes a positive relationship between FDI and GDP. However, according to Rusike (2007), market size will not be very high in mining countries because the final products in such countries are exported.

RER is used to measure the effect of exchange rate on FDI inflows. According to Banga (2003) there is mixed evidence on the impact of depreciation of real exchange rates in the host country on FDI inflows. An inconclusive relationship is expected with FDI inflows, as the relationship might be either positive or negative. For example, foreign investors may gain or lose from a devalued exchange rate. However, foreign investors might not enter the country if they believe that depreciation may continue after they have done so, as this might involve them in costs that are too high to justify their investments (Banga 2003). A negative relationship will be expected between FDI inflow and RER in South Africa.

Openness: In the literature, the ratio of trade to GDP is often used as a measure of the openness of a country and is also often interpreted as a measure of trade restrictions. This proxy is also important for foreign direct investors who are motivated by the export market. Empirical evidence obtained by Hailu (2010) backs up the hypothesis that higher levels of exports lead to higher FDI inflows. The study therefore includes trade/GDP in the regression in order to examine the impact of openness on FDI inflows.

Corporate tax: Taxes are obviously a very important factor for companies when they are making their investment decisions (Nikula and Kotilainen 2012). This study measures corporate taxes, as taxes on income, profits and capital gains, as a percent of GDP. A negative relationship is expected between FDI and corporate tax, because a higher tax reduces the returns of investment.

The consumer price index: This measures inflation and the stability of the macroeconomic variables. A negative relationship is to be expected between FDI and CPI. This is in line with Bengoa and Sanchez-Robles (2003).

Infrastructure will be proxied by the GCF and is expected to have a positive relationship with FDI inflows because good-quality, well-developed infrastructure increases the productivity of investments in a country, and therefore stimulates FDI inflows. Essentially, good infrastructure means that investors are able to transport products cheaply, efficiently and safely.

A dummy variable will be used to capture the effect of financial crises before and after 2008. Prior to 2008, the dummy variable will have a value of zero, and after 2008 a value of 1. A negative relationship will be expected between the dummy variable and FDI inflows.

4.4 Data Sources

Data used in the study relate to the period 1980-2012, in annual series. The choice of the study period is to capture the period when the South African economy had access to international finance after the abolition of apartheid. It was during this period that the country's financial sector was liberalised, further enhancing its financial sector. Data for the variables was obtained from the South African Reserve Bank and UNCTAD.

4.5 Estimation Techniques

The study seeks to establish whether there is a long-term relationship between the variables of FDI by employing the Johansen Cointegration Test. However, before this can be utilised, the time-series properties of the variables have to be established through unit root tests.

There are several tests which can be employed to establish if there is cointegration between variables. These methods include the Engle-Granger (EG) method, the Auto-Regressive Distributed Lag (ARDL) approach and the Johansen Cointegration Tests. In this study, the Johansen Cointegration Test is preferable as it has several advantages over the simple EG approach, as well as the ARDL method. Brooks (2008) shows that when testing for cointegration using the Engle and Granger approach, all variables are treated as endogenous variables. In addition, the Johansen Cointegration Test has the advantage of analysing more than two cointegrating vectors. Such an analysis is impossible with the EG or the ARDL methods. The EG approach relies on a two-step estimator. The first step involves generating residuals and the second step involves testing the stationarity of the residuals. This results in a lack of power in unit root tests, simultaneous equation bias and the impossibility of performing hypothesis tests about the actual cointegrating relationships (Brooks, 2008).

4.5.1 Unit Root Tests

Unit root tests have become popular for determining non-stationarity and stationarity time series. Failure to perform the stationarity tests in the time series, and the use of non-stationary data in running a regression, will result to spurious regressions, so that the results will be biased and misleading. The study will employ the Augmented Dickey-Fuller (ADF) Test and the Phillips-Peron Test to check for the stationarity of the variables, as well as to determine the order of integration of the variables. These two methods will be discussed in detail later in this section.

4.5.1.1 The Augmented Dickey-Fuller Test

The ADF Test is an improvement on its predecessor, the Dickey-Fuller Test (DF) (1979, 1981). The improved ADF Test gives better results than the DF test because it includes extra lagged terms of the dependent variable in order to eliminate autocorrelation.
The ADF is given by the following equation:

$$\Delta y_t = a_0 + \gamma y_{t-1} + a_2 t + \sum_{i=1}^{p} \beta_i \Delta y_{t-1} + u_t \quad 4.3$$

The equation shows that: $\Delta Y_t = Y_t - Y_{t-1}$; $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$ etc., and the number of lags to be included is empirically determined using Schwarz information criteria. The test continues to test the significance of the coefficient of Y_{t-1}. The augmenting is done to remove possible autocorrelation among error terms. In the event that the calculated values are greater than the critical values, we reject the null and state that the variable is stationary. The test suggests that the more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some level (Brooks, 2008).

However, according to Chinhamu and Chikobvu (2010), the ADF Test has the limitation of not being able to determine whether to include exogenous variables in the test regression or to include more than one lag. In addition, the ADF Test tends to accept the null unit root more frequently than is acceptable, implying that the test may find a unit root even when none exist. Another shortfall of the ADF Test is that it does not consider the cases of heteroscedasticity and non-normality frequently revealed in raw data of economic time-series variables (Asteriou, 2011). Finally, the ADF Test may not detect structural breaks in a time series (Chinhamu et al., 2010).

4.5.1.2 Phillips-Perron Test

The Phillips-Perron Test (PP Test) will be carried out to check if the results are consistent with the ADF Test. The test is similar to the ADF Test, but incorporates an automatic correction to the DF procedure to allow for autocorrelated residuals (Brooks 2008). That is, the PP Test uses nonparametric methods to take care of the serial correlation in the error terms without adding lagged difference terms. Thus the test is needed as it allows that error disturbances are heterogeneously distributed and weak dependent (Gujarati, 2004). The test regression for the PP Test is the AR (1) process given as:

$$\Delta y_{t-1} = \alpha_0 + \gamma y_{t-1} + e_{t-1} \quad 4.4$$

Chinhamu et al. (2010) argues that the PP Test has an advantage over the ADF Test when the time series concerned has a structural break. This becomes apparent in our case given that the time series stretches over a longer period of time. Brooks (2008) asserts that unit root tests ADF and PP Tests should produce the same results to confirm robust outcomes, either to

reject or accept the null hypothesis, hence the fact that the both tests (ADF and PP) suffer from the same limitation.

4.5.2 Cointegration Tests

Once the order of integration of the variables has been established, cointegration tests will be performed, using the Johansen Cointegration Test. Cointegration tests will help to establish if there is a long-term relationship between the variables. Subject to proof of cointegration, that will be an indication that the variables share a certain type of behaviour in terms of their long-term fluctuations. However before testing for cointegration, the lag length to incorporate in the model will be selected empirically. This will ensure that the model avoids spurious rejection or acceptance of estimated results and to have standard normal error terms that do not suffer from non-stationary, autocorrelation or heteroscedasticity.

The Johansen Test can be affected by the lag length employed in the VECM which is chosen optimally (Brooks, 2008). This becomes important because the chosen lag length should produce the number and form of cointegration relations that conform to all the *a priori* expectation associated with economic theory. Asterio et al. (2007, pp.271-272) assert that choosing lags can be complicated, because "including too many lagged terms will waste degrees of freedom and may introduce the possibility of multicollinearity, yet including too few lags will lead to specification errors and omission of important lag dependences".

In order to choose appropriate lag length for the model, information criteria are used. Various information criteria are available, such as Aikaike's Information Criterion (AIC) (Akaike 1973), Schwarz's Information Criterion (SIC) (Schwarz 1978), the Hannan-Quinn Criterion (Hannan and Quinn 1979) and the Final Prediction Error (FPE) ((Akaike 1970). AIC has been popularly adopted in economic studies because most of the times it produces a white-noise residual (Mazenda, 2012). Suggesting that the criterion has the ability to pick up the correct lag length at least half of the time in a small sample, and its performance increases substantially as the sample size grows.

The next step, after choosing the correct lag length, is to conduct the cointegration tests.

The Johansen Cointegration Test to be used in the study is discussed below. Assuming that X_t is the nx1 vector of variables, the intra-impulse transmission process of which is to be captured by the study, the dimension of X_t (that is n) is 7, given the seven variables of the

analysis. Using matrix algebra notations, a 7-variable structural dynamic economic model for the study can be stated as:

$$BX_t = \mu + \Gamma X_{t-1} + \varepsilon_t \quad 4.5$$

Where B is the matrix of variable coefficients

X_t is the 7 x 1 vector of observations at time t of the variables of the study that is vector X is defined as $X_t = (GDP_t, RER_t, CPI_t, GCF_t, CT_t, O_t, D_t)$ 4.6

Also, μ is the vector of constants

Γ is a matrix polynomial of appropriate dimension

ε_t is a diagonal matrix of *structural innovations* that has zero means, constant variance, and are individually serially uncorrelated, i.e.

$$\varepsilon_t \sim (O, \sum) \quad 4.7$$

The Johansen Test involves two test statistics: the Likelihood Ratio Test, based on maximum eigenvalue of the stochastic matrix and the test based on the trace of the stochastic matrix. These statistics are used to determine the number of cointegrating vectors. The test is based around an examination of the π matrix, where π can be interpreted as a long-run coefficient matrix. The test for cointegration between the variables is calculated by looking at the rank of the π matrix via its eigenvalues. π can be defined as the product of two matrices:

$$\pi = \alpha\beta' \quad 4.8$$

The matrix β gives the cointegrating vectors, while α gives the amount of each cointegrating vector entering each equation of the VECM (denoted by $\lambda_{\max}$) test the null hypothesis that rank $(\Pi) = r$ is tested against the hypothesis that the rank is $r+1$. The null hypothesis attests

that there is cointegrating vectors and that there are up to r cointegrating relationships, with the alternative suggesting that there is (r+1) vectors.

The test statistics are based on the characteristic roots (eigenvalues) obtained from the estimation process. The test consists of ordering the largest eigenvalues in descending order, and considering whether they are significantly different from zero. If the variables are not cointegrated, the rank of Π is zero and all the characteristic roots will equal zero. In order to test how many of the numbers of the characteristic roots are significantly different from zero, the maximum eigenvalue uses the following statistic:

$$\lambda_{\max}(r, r+1) = -TIn(1-\hat{\lambda}_{r+1}) \qquad 4.9$$

The second method is based on a Likelihood Ratio Test about the trace of the matrix and is called the trace statistic. The trace statistic considers whether the trace will increase by adding more eigenvalues beyond the rth eigenvalue. The null hypothesis then will be the number of cointegrating vectors is less than or equal to r. Just like under the maximum eigenvalue, in the event that $\hat{\lambda}_i = 0$, the trace statistic will be equal to zero as well. On the other hand the closer the characteristic roots are to unity the more negative is the ln (1-$\hat{\lambda}_i$) term and therefore, the larger the trace statistic. The trace statistic is calculated by:

$$\lambda_{trace}(r) = -T\sum_{i=r+1}^{n}\ln(1-\hat{\lambda}_{r+1}) \qquad 4.10$$

The process to determine the presence of cointegration involves working downwards and stopping at the value of r which is associated with a test statistic that exceeds the displayed critical value. Critical values for both the maximum eigenvalue and trace statistic will be provided in Eviews.

In testing the long-run cointegration relationship, the following cointegration vector was utilised:

$$(\beta_{11}\,FDI_{t-1} + \beta_{21}\,GDP_{t-1} + \beta_{31}RER_{t-1} + \beta_{41}CPIa_{t-1} + \beta_{51}GCFi_{t-1} + \beta_{61}CT_{t-1} + \beta_{71}O_{t-1} + \beta_{81}D_{t-1}) \qquad 4.11$$

which feeds into eight different equations as follows:

$$\Delta LogFDI_t = a_{11}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.12$$

$$\Delta LogGDP_t = a_{21}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.13$$

$$\Delta LogRER_t = a_{31}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.14$$

$$\Delta LogCPI_t = a_{51}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.15$$

$$\Delta LogGCF_t = a_{41}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.16$$

$$\Delta LogCT_t = a_{51}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.17$$

$$\Delta LogO_t = a_{51}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.18$$

$$\Delta LogD_t = a_{51}[\beta_{11} FDI_{t-1} + \beta_{21} GDP_{t-1} + \beta_{31} RER_{t-1} + \beta_{41} CPIa_{t-1} + \beta_{51} GCFi_{t-1} + \beta_{61} CT_{t-1} + \beta_{71} O_{t-1} + \beta_{81} D_{t-1}] \quad 4.19$$

In the event that there is cointegration a Vector Error Correction model will be estimated, however, if there is no cointegration a VAR model in first difference will be estimated.

Since a constant is included in the cointegrating space, there are at most five cointegrating vectors for the above estimated VAR model.

4.5.3 Vector Error Correction Model (VECM)

It is appropriate to estimate an ECM if the relevant variables are cointegrated. VECM will be estimated to analyse the joint behaviour of the series in the dynamic model. According to Aziakpono (2006) in a VECM, the short term dynamics of the variables in the model are influenced by the deviation from equilibrium.

The VEC model matrices are specified below:

$$\begin{bmatrix} \Delta LogFDI_t \\ \Delta LogGDP_t \\ \Delta LogRER_t \\ \Delta CPI_t \\ \Delta LogGCF_t \\ \Delta LogCT_t \\ \Delta LogO_t \\ \Delta D_t \end{bmatrix} = \begin{bmatrix} d_{11}\ d_{12}\ d_{13}\ d_{14} \\ d_{21}\ d_{22}\ d_{23}\ d_{24} \\ d_{31}\ d_{32}\ d_{33}\ d_{34} \\ d_{41}\ d_{42}\ d_{43}\ d_{44} \\ d_{51}\ d_{52}\ d_{53}\ d_{54} \\ d_{61}\ d_{62}\ d_{63}\ d_{64} \\ d_{71}\ d_{72}\ d_{73}\ d_{74} \\ d_{81}\ d_{82}\ d_{83}\ d_{84} \end{bmatrix} \begin{bmatrix} D_1 \\ D_2 \\ D_3 \\ D_4 \end{bmatrix} + \begin{bmatrix} \gamma_{11}\ \gamma_{12}\ \gamma_{13}\ \gamma_{14}\ \gamma_{15}\ \gamma_{16}\ \gamma_{17}\ \gamma_{18} \\ \gamma_{21}\ \gamma_{22}\ \gamma_{23}\ \gamma_{24}\ \gamma_{25}\ \gamma_{26}\ \gamma_{27}\ \gamma_{28} \\ \gamma_{31}\ \gamma_{32}\ \gamma_{33}\ \gamma_{34}\ \gamma_{35}\ \gamma_{36}\ \gamma_{37}\ \gamma_{38} \\ \gamma_{41}\ \gamma_{42}\ \gamma_{43}\ \gamma_{44}\ \gamma_{45}\ \gamma_{46}\ \gamma_{47}\ \gamma_{48} \\ \gamma_{51}\ \gamma_{52}\ \gamma_{53}\ \gamma_{54}\ \gamma_{55}\ \gamma_{56}\ \gamma_{57}\ \gamma_{58} \\ \gamma_{61}\ \gamma_{62}\ \gamma_{63}\ \gamma_{64}\ \gamma_{65}\ \gamma_{66}\ \gamma_{67}\ \gamma_{68} \\ \gamma_{71}\ \gamma_{72}\ \gamma_{73}\ \gamma_{74}\ \gamma_{75}\ \gamma_{76}\ \gamma_{77}\ \gamma_{78} \\ \gamma_{81}\ \gamma_{82}\ \gamma_{83}\ \gamma_{84}\ \gamma_{85}\ \gamma_{86}\ \gamma_{87}\ \gamma_{88} \end{bmatrix} \begin{bmatrix} \Delta LogFDI_{t-1} \\ \Delta LogGDP_{t-1} \\ \Delta LogRER_{t-1} \\ \Delta CPI_{t-1} \\ \Delta LogGCF_{t-1} \\ \Delta LogCT_{t-1} \\ \Delta LogO_{t-1} \\ \Delta LogD_{t-1} \end{bmatrix} +$$

$$\begin{bmatrix} a_{11}\ a_{12}\ a_{13}\ a_{14}\ a_{15}\ a_{16}\ a_{17}\ a_{18} \\ a_{21}\ a_{22}\ a_{23}\ a_{24}\ a_{25}\ a_{26}\ a_{27}\ a_{28} \\ a_{31}\ a_{32}\ a_{33}\ a_{34}\ a_{35}\ a_{36}\ a_{37}\ a_{38} \\ a_{41}\ a_{42}\ a_{43}\ a_{44}\ a_{45}\ a_{46}\ a_{47}\ a_{48} \\ a_{51}\ a_{52}\ a_{53}\ a_{54}\ a_{55}\ a_{56}\ a_{57}\ a_{58} \\ a_{61}\ a_{62}\ a_{63}\ a_{64}\ a_{65}\ a_{66}\ a_{67}\ a_{68} \\ a_{71}\ a_{72}\ a_{73}\ a_{74}\ a_{75}\ a_{76}\ a_{77}\ a_{78} \\ a_{81}\ a_{82}\ a_{83}\ a_{84}\ a_{85}\ a_{86}\ a_{86}\ a_{88} \end{bmatrix} \begin{bmatrix} \beta_{11}\ \beta_{12}\ \beta_{13}\ \beta_{14}\ \beta_{15}\ \beta_{16}\ \beta_{17}\ \beta_{18} \\ \beta_{21}\ \beta_{22}\ \beta_{23}\ \beta_{24}\ \beta_{25}\ \beta_{26}\ \beta_{27}\ \beta_{28} \\ \beta_{31}\ \beta_{32}\ \beta_{33}\ \beta_{34}\ \beta_{35}\ \beta_{36}\ \beta_{37}\ \beta_{38} \\ \beta_{41}\ \beta_{42}\ \beta_{43}\ \beta_{44}\ \beta_{45}\ \beta_{46}\ \beta_{47}\ \beta_{48} \\ \beta_{51}\ \beta_{52}\ \beta_{53}\ \beta_{54}\ \beta_{55}\ \beta_{56}\ \beta_{57}\ \beta_{58} \\ \beta_{61}\ \beta_{62}\ \beta_{63}\ \beta_{64}\ \beta_{65}\ \beta_{66}\ \beta_{67}\ \beta_{68} \\ \beta_{71}\ \beta_{72}\ \beta_{73}\ \beta_{74}\ \beta_{75}\ \beta_{75}\ \beta_{77}\ \beta_{78} \\ \beta_{81}\ \beta_{82}\ \beta_{83}\ \beta_{84}\ \beta_{85}\ \beta_{85}\ \beta_{87}\ \beta_{88} \end{bmatrix} \begin{bmatrix} LogFDI_{t-1} \\ LogGDP_{t-1} \\ LogRER_{t-1} \\ CPI_{t-1} \\ LogGCF_{t-1} \\ LogCT_{t-1} \\ LogO_{t-1} \\ D_{t-1} \\ C \end{bmatrix} +$$

$$\begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \\ \varepsilon_{7t} \\ \varepsilon_{8t} \end{bmatrix} \qquad 4.20$$

Where, the α represents the short term dynamics with the β representing the long run cointegrating vectors.

4.5.4 Variance Decomposition

The study will conduct variance decompositions. Variance Decomposition analysis indicates the proportion of movements in the dependent variables that are due to its own shocks, against shocks to other variables (Brooks, 2002). The variance decomposition analysis provides information relative to each random movement in the variables in the model.

4.5.5 Granger Causality Tests

The Granger Causality Test will be carried out to determine any correlation between FDI and others variables. The model assumes that time series involved in the analysis are stationery and is sensitive to lag length selection, hence the need for conducting stationarity tests and determining the proper lag length as discussed earlier. Thus, the test seeks to establish the causality relationship between changes in FDI inflows and changes in GDP in South Africa.

Thus the causality test will be performed to identify the existence and nature of the causality relationship between the variables (FDI and GDP).

4.6 Diagnostic Tests

Diagnostic tests of the VECM based test will be conducted to examine the validity of the fitted model. These tests check the stochastic properties of the model such as residual heteroscedasticity, normality and autocorrelation, among the rest.

4.61 The Lagragian Multiplier Test

The Lagragian multiplier test will be used to examine if there is serial correlation in the error term. The null hypothesis for this test can be stated as:

H_0: $E(\mu_t, \mu_{t-q}) = 0$ for $t \neq q, q = 1,2,..., p$ 4.21

4.6.2 The Normality Tests

The normality tests will also be performed to examine if the residuals are normally distributed. The null hypothesis for the normality tests will be stated as:

H_0: Residuals are normally distributed

The widely used test includes the Jarque-Bera Test (JB). The JB uses the property of a normally distributed random variable that the entire distribution is characterised by the first two moments, that is, the mean and the variance. In the event that the residuals from the model are either significantly skewed the null hypothesis of normality would be rejected.

4.6.3 The Heteroscedasticity Test

The heteroscedasticity test will be conducted to check if the residuals are homoscedastic. The null hypothesis for homoscedasticity will be stated as:

H_0: Variance of the residuals is constant

The most common test is the White Test. This test is useful because takes into account the assumption that the estimated regression model is linear. The test regression produces residuals which are regressed to test the joint significance of the regression. Acceptance of the null hypothesis indicates homoscedasticity. Rejection of the null hypothesis indicates heteroscedasticity.

4.6.4 The Autocorrelation Test

The autocorrelation test will be conducted to check if the error term in one time period is not correlated with the error term in any other time period. If the error term in one time period is correlated with the error term in the previous time period, there is first-order autocorrelation. The Durbin-Watson is a test for first-order autocorrelation, that is, it tests only for a relationship between an error and its immediately previous value. If there is evidence of a relationship between the successive residuals, the null hypothesis which states that the error terms are independent is rejected.

4.7 Conclusion

This chapter discussed the methodology of the study through model specification, variable analysis and the estimation techniques in the pursuit of investigating the determinants of FDI inflows from a South African perspective. The model estimated includes a number of variables which are important determinants of FDI inflows into South Africa. The Johansen Cointegration Test was selected and discussed as the testing technique to establish the long-run relationship between the variables of interest. In the event that there is cointegration, the VECM will be estimated to analyses short-run dynamics. The Granger Causality Test will also be used to examine the causal relationship between the FDI and GDP. Several diagnostic tests will also be carried out to check the model acceptability. Thus the contents of this chapter provide a basis for the actual estimations to the study, which will be presented in Chapter 5.

CHAPTER 5

EMPIRICAL ANALYSIS AND DISCUSSION

5.1 Introduction

This chapter presents the results of the models estimated in Chapter 4. The chapter has nine sections. After the introduction in Section 5.1, Section 5.2 presents descriptive statistics. Section 5.3 presents the analysis of the time-series properties of the data through unit root tests. Section 5.4 discusses the model selection and the Johansen Cointegration Tests. Section 5.5 discusses the VECM. Section 5.6 presents the Granger Causality Test, Section 5.7 deals with variance decomposition and Section 5.8 is concerned with the diagnostic tests. Section 5.9 provides concluding remarks to the chapter.

5.2 Descriptive Statistics

Table 5.1 reports the summary statistics for all the variables used in this study. The mean value of the FDI inflows variable is 10, with a standard deviation of 1. It is interesting to note that the mean value of all the variables in the model is positive; GCP with the highest value of 13, followed by GDP and openness with 12, suggesting that South Africa experienced an increase in FDI inflows during most of the years under consideration. The mean of the dummy variable is the lowest, at 0.2, with the standard deviation of 0.4 indicating that financial crises contributed positively to FDI inflows. While the descriptive statistics show clearly that South Africa's FDI inflows are different, it also points to the fact that other factors may be at play in explaining the low FDI inflows. This issue is covered in the empirical analysis and these results are inconclusive at this stage, to clearly indicate the determinants of FDI inflows.

Table 5.1 Summary Statistics

	LFDI_INFLOWS	LGDP	LGCF	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	LOPENNESS	DUMMY_VARIABLE
Mean	10.273	14.473	12.651	4.607	4.586	3.071	12.364	0.212
Median	9.659	14.417	12.539	4.705	4.572	3.144	12.433	0.000
Maximum	12.098	14.902	13.344	5.198	4.918	3.541	14.441	1.000
Minimum	8.954	14.185	12.189	3.683	4.283	2.573	10.211	0.000
Std. Dev.	1.105	0.237	0.367	0.480	0.133	0.259	1.342	0.415
Skewness	0.412	0.517	0.648	-0.601	0.331	-0.449	-0.063	1.408
Kurtosis	1.551	1.812	2.069	2.057	3.391	2.142	1.721	2.984
Jarque-Bera	3.819	3.411	3.503	3.207	0.814	2.118	2.273	10.909
Probability	0.148	0.182	0.174	0.201	0.666	0.347	0.321	0.004
Sum	339.031	477.619	417.492	152.038	151.3340	101.358	407.999	7.000
Sum Sq. Dev.	39.075	1.793	4.308	7.381	0.569	2.141	57.677	5.515

Table 5.2 Correlation Matrix (Relationship between FDI inflows and the variables used in the study)

Correlation								
Probability	**LFDI_INFLOWS**	**LGDP**	**LGCF**	**LOPENNESS**	**LCPI**	**LEFFECTIVE_EXCHANGE_RATE**	**LCORPORATE_TAX**	**DUMMY_VARIABLE**
LFDI_INFLOWS	1.000							
LGDP	0.954***	1.000						
	0.000	-----						
LGCF	0.923***	0.925***	1.000					
	0.000	0.000	-----					
LOPENNESS	0.899***	0.965***	0.812***	1.000				
	0.000	0.000	0.000	-----				
LCPI	-0.946***	-0.993***	-0.912***	-0.961***	1.000			
	0.000	0.000	0.000	0.000	-----			
LEFFECTIVE_EX	-0.467**	-0.577***	-0.363**	-0.673***	0.544***	1.000		

CHANGE_RATE								
	0.006	0.000	0.037	0.000	0.001	-----		
LCORPORATE_TAX	0.350**	0.269	0.494**	0.071	-0.206	-0.044	1.000	
	0.0458	0.130	0.003	0.691	0.247	0.805	-----	
DUMMY_VARIABLE	0.747***	0.808***	0.850***	0.693***	-0.821***	-0.326	0.344**	1.000
	0.000	0.000	0.000	0.000	0.000	0.063	0.049	-----

*** Correlation is significant at the 0.01 level of significance

** Correlation is significant at the 0.05 level of significance

* Correlation is significant at the 0.1 level of significance

Table 5.2 presents the relationship between FDI inflows and GDP, GCF, openness, CPI, effective exchange rate, corporate tax and dummy variable. As illustrated in Table 5.2, the correlation between FDI inflows and GDP, GCF, openness, corporate tax and dummy variable is positive and significant. On the other hand, the relationship between FDI and an effective exchange rate is negative, though significant. It should be noted that the highest correlation in excess of 95% is exhibited by the correlation between FDI inflows and GDP. This implies that GDP is the most important variable for explaining the variation of FDI inflows for the data currently under review. GDP is followed by GCF, openness, CPI and dummy variable leaving effective exchange rate and corporate tax with lowest correlations. This implies that there is a relationship between them and FDI inflows, although it may be weak. However, these preliminary results are insufficient for reaching a conclusion, and further tests will be carried out in the following sections. Unprofessional

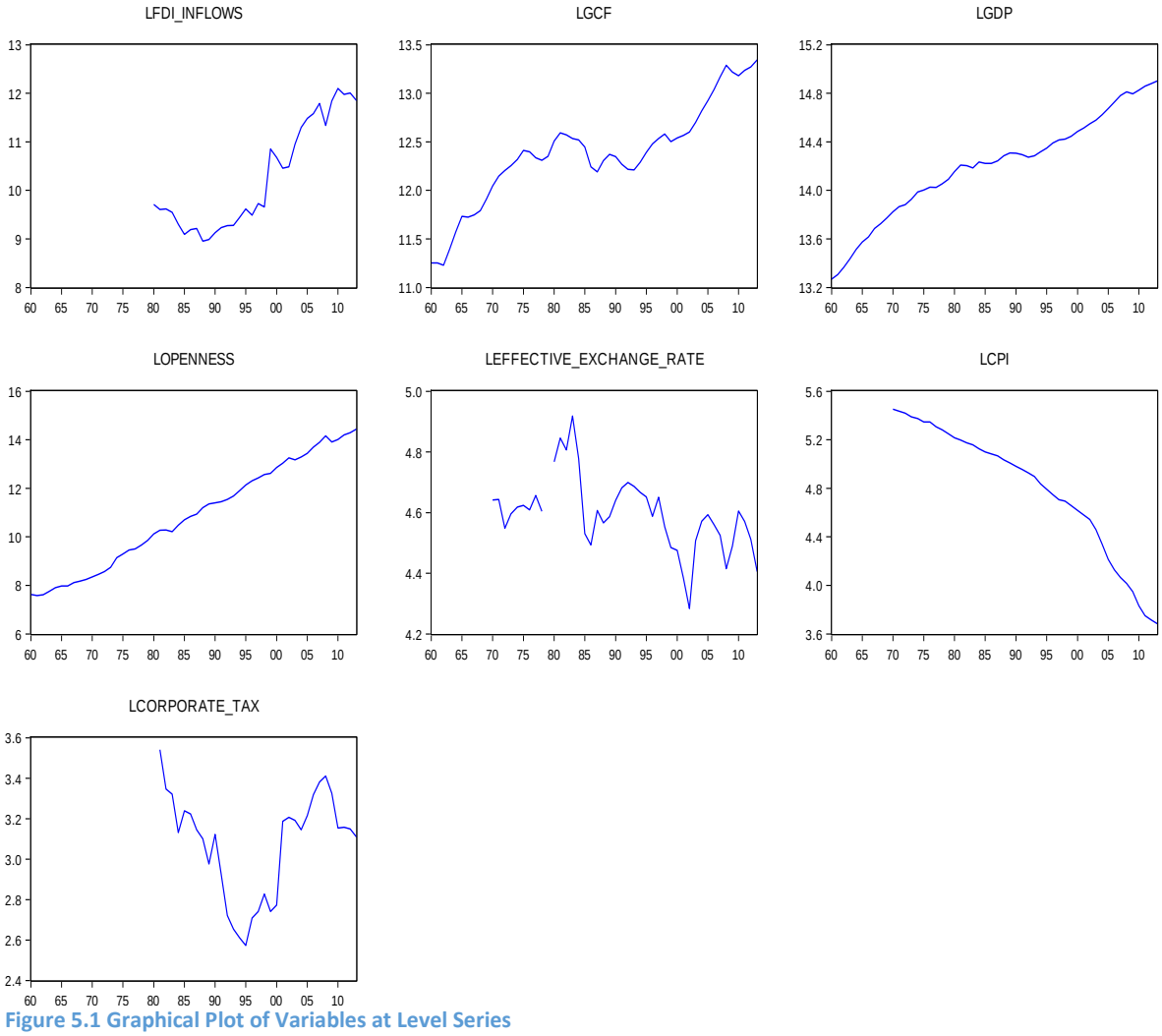

Figure 5.1 Graphical Plot of Variables at Level Series

The graphical plots of the data indicate that the key variables used in the study show some evidence of non-stationarity as they trend. The same variables were examined at first difference, and the results are illustrated in Figure 5.2 below.

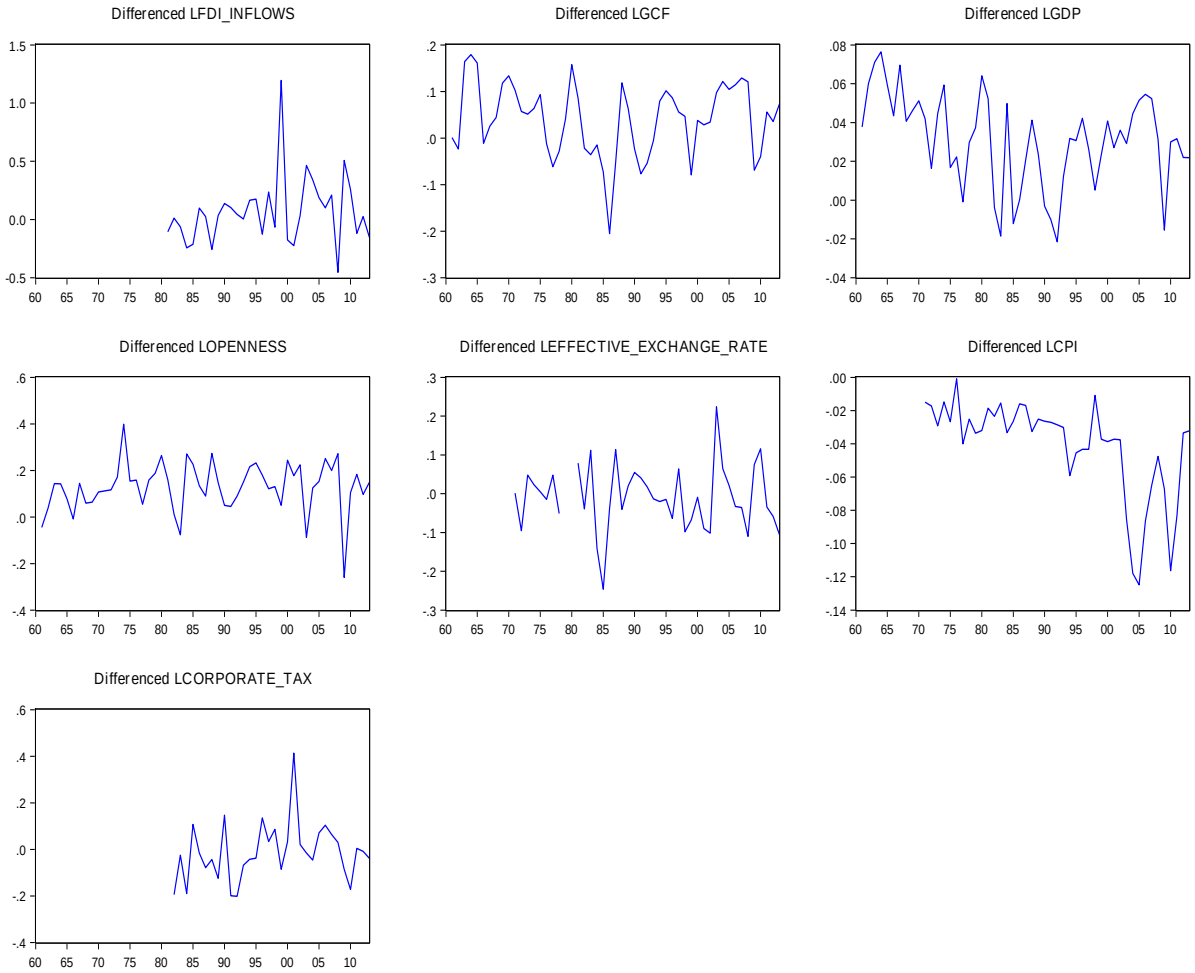

Figure 5.2 Graphical Plot of Variables at First Difference Series

Figure 5.2 shows that all differenced variables fluctuate around the mean; hence the variables will be integrated at first difference. This implies that the data is stationary if differenced once. However, one cannot derive precise conclusions from the graphical analysis because the graphical plots are regarded as informal tests; formal tests are used to analyse the time-series properties of the data in detail. This is discussed in Section 5.3 below.

5.3. Unit Root Tests

Tables 5.3.1 and 5.3.2 report some preliminary statistics on all the variables in the explained model: FDI inflow, GDP, GCF, CPI, exchange rate, openness and corporate tax for the period of 1982Q1 to 2013Q4. The statistics refer to the unit root test based on the ADF and the PP Tests as discussed earlier. The results that are reported in Table 5.3 show level series results; while Table 5.3.2 reflects results at first difference both the ADF and the PP Tests.

Table 5.3: Unit root tests: Level Series

	Augmented Dickey-Fuller Test			Phillips-Perron Test		
Variable	**Constant**	**Trend and constant**	**None**	**Constant**	**Trend and constant**	**None**
FDI inflow	-0.117	-2.56	1.258	0.025	-2.679	1.396
GDP	-2.071	-3.219	3.149	-2.412	-2.83	6.102
GCF	-1.640	-2.288	2.642	-1.168	-1.569	3.605
CPI	2.145	-0.253	-2.013**	4.226	0.267	-4.124***
Exchange rate	-2.283	-3.477	-0.799	-1.956	-2.301	-1.695
Openness	0.408	-3.775	8.549	0.762	-3.689	8.938
Corporate tax	-2.038	-2.155	-0.775	-2.099	-2.155	-0.752

Note: ***denotes significance at 1%; ** significance at 5% and * significance at 10%

Table 5.4: Unit root test: First Difference Series

	Augmented Dickey-Fuller Test			Phillips-Perron Test		
Variable	**Constant**	**Trend and constant**	**None**	**Constant**	**Trend and constant**	**None**
FDI inflow	-6.231***	-6.374***	-5.944***	-6.261***	-6.548***	-5.944***
GDP	-4.196***	-4.474***	-2.429**	-4.215***	-4.516***	-2.076**
GCF	-5.125***	-5.139***	-4.088***	-3.858***	-3.849**	-3.492***
CPI	-2.579*	-3.722**	-1.314*	-2.543*	-2.622	-1.187
Exchange rate	-5.699***	-5.622***	-5.669***	-6.221***	-6.100***	-5.739***
Openness	-5.826***	-5.774***	-0.367*	-9.693***	-9.854***	-3.215***
Corporate Tax	-5.096***	-5.093***	-5.172***	-5.096***	-5.095***	-5.172***

Note: ***denotes significance at 1%; ** significance at 5% and * significance at 10%

Table 5.3.2 shows obtained results confirming that each series contains a unit root (non-stationary) at level series, except for CPI which is statistically significant at intercept model at 1%, using the PP Test, though it is at none model and at 5% in when using ADF Test. But FDI inflow, GDP, GCF, exchange rate, openness and corporate tax became stationary at first difference level at both tests. It is worth noticing that CPI has the weakest level of significance of 10% and 5% at first difference when using the ADF Test and is not significant when using PP, but strongly significant at second difference at 1% for both tests. Another

point of inconsistency is that GDP obtained a lower level of significance at none model of 5% when using PP Test.

5.4 Cointegration Tests

Cointegration tests will help to establish if there is a long-term relationship between the variables. Subject to proof of cointegration, that will be an indication that the variables share a certain type of behaviour in terms of their long-term fluctuations. However before testing for cointegration, the lag length to incorporate in the model will be selected empirically. This will ensure that the model avoids spurious rejection or acceptance of estimated results and to have standard normal error terms that do not suffer from non-stationary, autocorrelation or heteroskedasticity, the results are reported in Section 5.4.1

5.4.1 Lag Length Selection Criteria

The selection of optimal lag length is used in the estimation of a VAR model. This is important to avoid spurious rejection or acceptance of estimated results.

Table 5.5: Lag length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	145.516	NA	1.94e-14	-8.872	-8.502	-8.751
1	400.890	362.467	9.66e-20	-21.219	-17.888	-20.133
2	569.082	151.915*	2.99e-22*	-27.941*	-21.649*	-25.890*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

In the study, the selection is made using a maximum of two lags in order to permit adjustment in the model and accomplish well behaved residuals. Table 5.4 confirms the lag lengths selected by different information criteria. All the information criteria; include AIC, SIC, Hannan-Quinn Information Criterion (HQI), FPE and the Likelihood Ratio Test (LR) selected two lags, therefore the information criteria approach produced agreeing results to adopt two lags. Subsequently, the Johansen Cointegration Test is conducted using two lags for the

VAR. Even though it is simple not to have conflicting results, however too few lags may lead to specification errors and omission of important lag dependences (Asteriou et al. 2007).

5.4.2 Johansen Cointegration Model Selection

Johansen Cointegration Model selection provides the model the study will use to establish the long-term relationship. The results are reported in Table 10-5 below.

Table 5.6: Johansen Cointegration Method Model Selection Results

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	6	6	5	5	6
Max-Eig	5	5	5	6	7

*Critical values based on MacKinnon-Haug-Michelis (1999)

In Table 5.5, there is an agreement between trace statistic and the maximum eigenvalue at the third model of linear intercept and no trend. The model of linear intercept and no trend is therefore chosen for checking if there is a long-term relationship between the variables using the Johansen Cointegration Test.

5.4.3 Johansen Cointegration Technique

Table 5.7: Johansen Cointegration Technique Results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesised		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.522	271.212	159.529	0.000
At most 1 *	0.323	178.858	125.615	0.000
At most 2 *	0.295	130.065	95.754	0.000
At most 3 *	0.259	86.338	69.818	0.001
At most 4 *	0.179	48.948	47.856	0.039
At most 5	0.095	24.168	29.797	0.193
At most 6	0.081	11.759	15.495	0.169
At most 7	0.009	1.173	3.841	0.278

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesised		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.522	92.355	52.363	0.000
At most 1 *	0.323	48.792	46.231	0.026
At most 2 *	0.295	43.727	40.078	0.019
At most 3 *	0.259	37.389	33.877	0.018
At most 4	0.179	24.780	27.584	0.109
At most 5	0.095	12.408	21.132	0.508
At most 6	0.081	10.586	14.265	0.176
At most 7	0.009	1.173	3.841	0.279
Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level				

Notes:

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 5.6 tabulates the cointegration test's results between variables based on the Johansen approach using a lag length of 2. Trace test and the maximum eigenvalue test evidently generate conflicting results. The trace test indicates at least five cointegrating equations at 5% level of the model. On the other hand the maximum eigenvalue test indicates at least four cointegrating equations at 5% level of the model. Even though the results reveal the existence of a long-run equilibrium relationship between the variables, the contracting results are of concern.

Empirical work by Luintel and Khan (1999) indicated that, where there is presence of conflict cointegrating equations, it is essential to use the trace test because it is robust since it is strict to results of both tests. On the other hand, Batchelor (2000) suggested a need for normalisation of the cointegrating coefficients. The normalisation process yields one cointegration equation and one cointegration vector.

However, the study's main aim is to establish if there is a long-term relationship between the variables and not necessarily the number of cointegrating vectors, so the null hypothesis of no cointegration was rejected at 0.05 level of significance from both the trace statistic and the

maximal-Eigen value at none, indicating that there is a cointegrating relationship among the variables.

5.4.4 Cointegrating Relationship Normalised On FDI

$$FDI = 1.000 + 53.67LGDP + 0.439LGCF + 3.996LOppns + 16.69LCPI + 1.773EX + 7.294CTax - 0.417D$$
$$(9.64678) \quad (1.56893) \quad (0.78198) \quad (3.09784) \quad (1.80606) \quad (1.07190) \quad (0.64255)$$
$$[5.56367] \quad [-0.28003] \quad [-5.11042] \quad [-5.39028] \quad [-0.98209] \quad [-6.80506] \quad [-0.65003]$$

Nearly all the variables enter the long-run equation significantly, and the signs and magnitudes also appear reasonable based on the model. The results suggest that GDP, GCF, openness, effective exchange rate and dummy variable have a positive impact on FDI inflows in South Africa. However, CPI and corporate tax had a negative effect on FDI inflows in South Africa. The results are explained in detail below.

Gross Domestic Product (GDP)

The positive cointegrating coefficient of 53.6 illustrates a positive relationship between GDP and the FDI inflows in that a unit increase in GDP would translate to a 5.3% increase in FDI inflows. The results confirm the priori expectations, and are in line with the findings of Mottaleb, et al. (2010), Anyanwu (2012), Huand et al. (2012), Dinda (2008), and Etim et al. (2014). GDP is statistically significant in explaining changes in FDI inflows, suggesting that market size is an important factor in attracting FDI inflows into South Africa.

Gross Capital Formation

In the study GCF is used as a proxy of investment in the form of infrastructure like roads and electricity. A positive coefficient of 0.43 indicates a positive relationship between FDI inflows and GCF even though the variable is statistically insignificant, implying that a 1% change in GCF will render a 43% increase in FDI inflows. This confirms the priori expectations and findings of Ranjan et al. (2011) in BRICS countries; Vijayakumar et al. (2010), also in BRICS countries and Awan et al. (2014) in Pakistan. This suggests therefore that there is need to invest more in infrastructure development so as to attract more FDI inflows into the country.

Openness

According to the results, the cointegrating coefficient for openness is 3.99, illustrating a positive relationship between the openness and FDI inflows, thus a unit increase in openness

causes a 399% increase in FDI inflows. These results are consistent with the prior expectations and supported by Ranjan et al. (2011) and Xin, et al. (2012). In addition, the variable is statistically significant. This suggest that multinational companies to South Africa are into export-oriented investments and prefer to locate in a more open economy, since increased imperfections that accompany trade protection generally imply higher transaction costs associated with exporting.

Consumer Price Index (CPI)

The negative cointegrating coefficient 16.69 as a measure of economic stability shows a negative relationship between CPI and FDI inflows into South Africa. The results agree with *a priori* expectations that macroeconomic instability discourages FDI inflows and is consistent with Çevis et al. (2007). The variable is statistically significant explaining that any macroeconomic instability brings with it economic uncertainty. This will result in foreign investors becoming sceptical about investing in the country.

Effective Exchange Rate

The positive cointegrating coefficient of 1.77 shows a positive relationship between effective exchange rate and the FDI inflows in South Africa meaning a unit increase in effective exchange rate would translate to a 177% increase in FDI inflows even though the variable is statistically insignificant. The results are consistent with Liargovas et al, (2011) and Thaddeus et al, (2013).

Corporate Tax

The empirical results show that there is a negative relationship between corporate tax and FDI inflows into South Africa. These results are consistent with Haufler et al. (2003); Bhavan, et al. (2011) and Arvanitis (2006) and correspond to the priori expectations. The variable is statistically significant, implying that corporate tax is a very important variable determining FDI inflow into South Africa. The empirical results suggest that higher levels of tax discourage foreign investors.

Dummy Variable

The financial crisis captured by the dummy variable has a negative relationship with FDI inflow to South Africa even though it is statistically insignificant. This result is consistent with the priori expectations and a number of available studies such as Cuyvers, et al. (2008) and Macias et al. (2009). The results suggest that the crisis reduced the amount of FDI inflows to South Africa. Foreign companies, in this case, were concentrating on their parent

countries rather that investing in other countries. This, in a way, raises a question about relying on foreign capital for sustainable development, in the event that it is determined by forces outside the country.

5.5 Vector Error Correction Model

This section seeks to analyse the short-run effects on FDI inflows into South Africa. The persistence of the analysis is to determine whether the short-run dynamics are influenced by long-run equilibrium cointegrating vectors.

Table 5.8: Vector Error Correction Model

Error Correction:	D(LFDI_INFLOWS)	D(LGDP)	D(LGCF)	D(LOPENNESS)	D(LCPI)	D(LEFFECTIVE_EXCHANGE_RATE)	D(LCORPORATE_TAX)	D(DUMMY_VARIABLE)
CointEq1	-0.039	-0.002	0.001	0.004	0.001	-0.005	0.023	-0.001
	(0.012)	(0.001)	(0.002)	(0.005)	(0.00)	(0.003)	(0.004)	(0.008)
	[-3.211]	[-2.421]	[0.297]	[0.938]	[1.495]	[-1.462]	[5.623]	[-0.752]
D(LFDI_INFLOWS(-1))	-0.465	0.007	0.024	0.039	0.002	0.001	0.013	0.014
	(0.167)	(0.009)	(0.026)	(0.064)	(0.007)	(0.046)	(0.056)	(0.101)
	[-2.781]	[0.745]	[0.932]	[0.608]	[0.284]	[0.025]	[0.229]	[0.139]

Table 5.7 shows the results of short-run VECM based on the value of CointEq1 for every variable in the table. Based on the result of the VECM test, it is found that the value of CointEq1 for the FDI inflows is significant and negative. This proves that the explanatory variables are the long-term Granger cause for FDI inflows. In other words, FDI inflows in the equation bear the burden of dispersed error correction of short term balance to achieve long-term balance as much as 3.9% within a quarter.

5.6 Granger Causality Tests

Granger Causality tests were used to examine causality in the VEC system. Granger Causality tests provide the direction of causality. The results from the Granger Causality Test are reported in the Table 5.8 below.

Table 5.9: Granger Causality Tests

Granger Causality			
Excluded	**Chi-sq**	**df**	**Prob.**
D(LGDP)	2.099	2	0.045
D(LGCF)	2.735	2	0.254
D(LOPENNESS)	0.262	2	0.877
D(LCPI)	0.389	2	0.822
D(LEFFECTIVE_EXCHANGE_RATE)	1.129	2	0.568
D(LCORPORATE_TAX)	0.612	2	0.736
D(DUMMY_VARIABLE)	3.607	2	0.164
All	7.103	14	0.930

In this section, the study seeks to establish if there is evidence of a causal relationship between the variables of interest. Special interest is given to the causal relationship between FDI and GDP because there are studies in which argue that there is a causality relationship between these variables. The results reflect that there is evidence of uni-directional causality from GDP to FDI. These results are consistent with Agrawal (2015); Liargovas et al. (2011) and Esso (2010) who concluded that there is a causality relationship between FDI and GDP. These results are in line with the long-term cointegration test results.

5.7 Variance Decomposition

Variance decomposition analysis provides a means of determining the relative importance of various shocks in explaining variations in the variable of interest.

Table 5.10: Variance Decomposition

Period	S.E.	LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1	0.022	100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.078	87.916	4.634	1.035	0.672	0.544	0.599	2.266	2.332
10	0.126	68.556	13.612	3.321	0.801	1.798	1.460	6.233	4.219
15	0.158	64.626	14.693	4.233	0.605	2.684	1.701	6.605	4.852
20	0.187	62.358	14.865	5.081	0.458	3.312	1.767	6.736	5.423
25	0.212	60.185	15.187	5.788	0.357	3.922	1.769	7.046	5.746
30	0.235	58.826	15.243	6.273	0.291	4.426	1.763	7.192	5.986
36	0.260	57.531	15.300	6.7295	0.238	4.914	1.754	7.325	6.207

Cholesky Ordering: LFDI_INFLOWS LGDP LGCF LOPENNESS LCPI LEFFECTIVE_EXCHANGE_RATE LCORPORATE_TAX DUMMY_VARIABLE

The variance decomposition is reported over a period of 36 quarters. The results show that the major source of variation in FDI inflows is own shock, which account for between 57% and 100%. Approximately 15% of the change in FDI inflows is attributable to GDP in the long run. The GCF explains about 6% change, openness 0.23% change, CPI 5%, effective exchange rate 1.7%, corporate tax 7% and financial crisis 6% change on FDI inflows. From the results it is clear that the independent variables the changes in FDI inflows is GDP though the chief contributor is the FDI inflow itself.

5.8 Diagnostic Tests

Diagnostic tests of the VECM test are presented below to examine the validity of the fitted model.

5.8.1 The AR Roots Graph

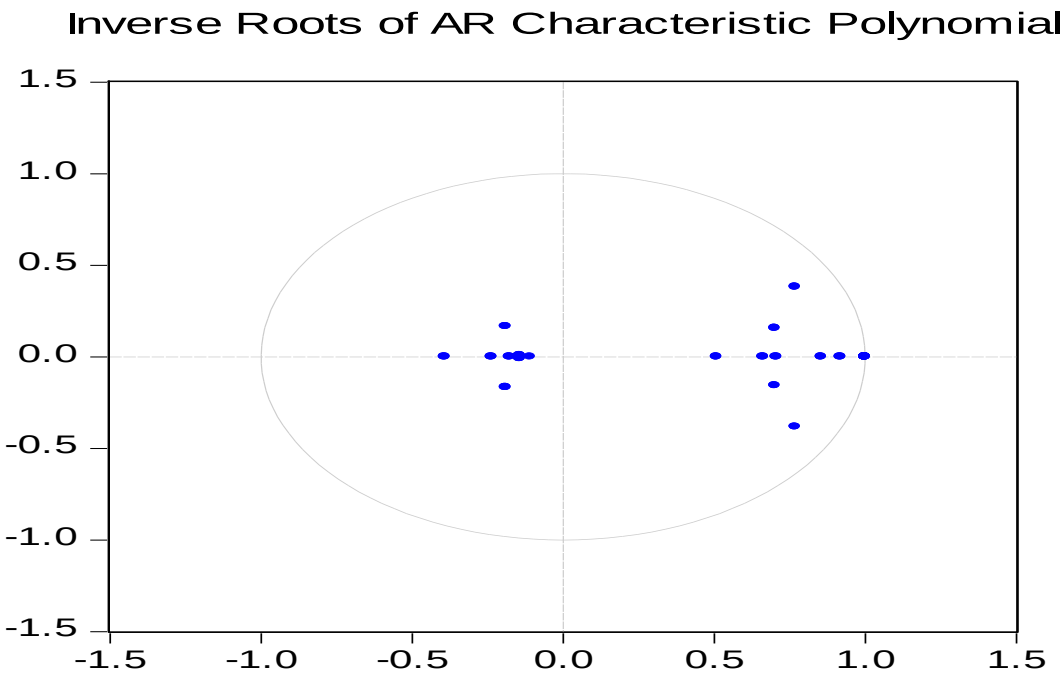

Figure 5.3: Inverse Roots of AR Characteristic Polynomial

The AR Roots Graph reports the inverse roots of the characteristic AR polynomial. The estimated VAR is stable, that is, stationary if all roots have modulus less than one and lie inside the unit circle. In this case as illustrated in Figure 5.3 all roots lie inside the unit circle which is an indication that the VAR is stable.

5.8.2 Normality, Autocorrelation and Heteroscedasticity Results

The residuals were also examined for the normality, autocorrelation and heteroscedasticity and the results are reported in Table 5.10.

Table 5.11: Other Diagnostic tests

Test	H_0	Test Statistic	P-Value	Conclusion
Jarque-Bera	Residuals are normally distributed	1.070	0.079	Errors are not normally Distributed at 10% level of significance.
VEC Residual Serial Correlation LM Tests	There is no serial correlation in the residuals	3.042	0.787	no serial correlation in the residuals.
VEC Residual Heteroskedasticity Tests	The residuals are homoscedastic	4.644	0.622	No Heteroskedasticity in the residuals.

The results presented in Table 5.12 in Appendix 3, the joint Jarque-Bera statistic is 1.070371 at 16 degrees of freedom (df) with a probability of 0.07, thus the null hypothesis of normality in the residuals is rejected at 10% significance level as reflected in Appendix 3.

Results from Appendix 5 test the presence of autocorrelation. At lag 12, the test statistic is 3.041615 with a probability of 0.7865. Thus the model is significant at all levels of significance; hence the null hypothesis which states that the error terms are independent is accepted.

As presented in Table 5.15 in Appendix 4, for heteroscedasticity, the model is significant at 10% level of significance. The Chisquare statistic is 4.644000 with a probability of 0.6224. Testing the null hypothesis that there is homoscedasticity against the alternative hypothesis of heteroscedasticity, we fail to reject the null hypothesis. There by concluding that there is homoscadasticity, implying that the error terms have a constant variance.

5.9 Conclusion

The chapter has focused on interpreting the results of models estimated in Chapter 4. The chapter began with analysing the time-series properties of the data using two methods of testing for unit root. Both methods confirmed that the variables are integrated of order one. Having determined the order of integration of the variables, the lag length to be used in the estimation for the Johansen Cointegration Test was determined empirically, with the all of the information criteria settling for the lag of 2. At lag of two the Johansen Cointegration Test established that there is four and five cointegrating 1 vectors for the trace test and the maximum eigenvalue test respectively. This therefore implied that there is a long-term relationship between FDI inflows and its dependent variables. The VECM was also estimated to analyse both the long run and the short-run interaction between the variables. The long-run equation showed that some of the variables employed in the model are significant while others are insignificant and contradicted the prior expectations. The results established that GDP is the major determinant of FDI inflows into South Africa. These results were all confirmed by the variance decomposition test. The results also observed all the assumptions which underlie the classical linear regression model.

Chapter 6

CONCLUSION and RECOMMENDATIONS

6.1 summary and conclusion of the study

In this study, an attempt was made to identify the determinants of FDI inflows into South Africa. This chapter draws conclusions from the results of the study and sets forth recommendations for future policy formulation. Due to the growing interest in FDIs by economists and other agents, the study can provide substantial suggestions for dealing with the adverse market conditions that South Africa is currently facing.

The available theoretical literature was taken into account, including international trade theories such as the Absolute Advantage Theory, the Comparative Advantage Theory, the Heckscher-Ohlin Model and the Product Life-Cycle Theory. More recently developed theories were also drawn on, including the Monopolistic Advantage Theory, the Eclectic Paradigm and the Market-Size Hypothesis. From the perspective of investments, the Portfolio Theory and Hymer FDI Theory were relevant.

In addition to theory, a number of empirical studies were reviewed. Relationships identified in the various studies varied considerably depending on the model used, the data frequency and the economies analysed. As a result, neither the empirical nor the theoretical literature reaches consensus about the determinants of FDI inflows into economies. In the theoretical framework, most studies used the Eclectic Paradigm, which provided strong arguments of determinants of FDI inflows and was able to highlight the advantages that investors consider when making decisions about FDI. These can determine the factors determining FDI inflows and identify motives for consideration.

Based on the literature, market size has been highlighted as a key determinant of FDI inflows. The other variables identified include FDI inflow (the dependent variable) and GDP, openness, real exchange rate, CPI, GCF, corporate tax, dummy variable (explanatory variables).

In order to determine the relationship between the dependent variable and independent variables, the Johansen Cointegration Test was preferred to other techniques because of its advantages. When first applying this methodology, the time series properties of the data

employing tests for stationarity, thus, the ADF tests and PP tests were analysed. The variables were found to be integrated of the same order, as all of them were first difference stationary. Johansen Cointegration Tests used a lag length of 2 and provided of two cointegrating equations. The trace test indicated at least 5 cointegrating vectors at 5% level of the model. On the other hand, the maximum eigenvalue test indicates at least 4 cointegrating vectors at 5% level of the model. Evidence of cointegration allowed the estimation of VECMs, which provided the parameter estimates for the long run relationships. The VECMs revealed that FDI inflows in the equation bears the burden of dispersed error correction of short term balance to achieve long-term balance as much as 3.9% within a quarter.

After establishing that there is are long-term relationships between the variables, the results provided that some explanatory variables were significant while others were insignificant in the model. The variables that were significant and positive to FDI inflows included GDP and openness. Inflation, exchange rate, corporate tax and the dummy variable were found to have a negative relationship with FDI inflows into South Africa

In analysing the short-run, the results revealed that there is evidence of granger causality between FDI and GDP. Also, the variance decomposition results revealed that FDI inflow respond to its own shocks as well as the shocks from other variables. GDP also emerged as a very important variable, determining FDI inflows from the medium to the long-run. Finally, the results also observed all the assumptions which underlie the classical linear regression model were observed as the model did not suffer from non-normality heteroscedasticity and autocorrelation. The VAR model was also found to be stable.

6.2 Policy Implications and Recommendations

The results reflected that GDP is a very important variable determining FDI inflows into South Africa. This suggests that South Africa needs to implement policies that will induce a fast-growing economy which is able to attract a greater share of FDI inflows. This is particularly important given the country's has low levels of savings, as FDI can act as a bridge to a more robust and sustainable national economy.

The empirical results also suggested that openness is another important factor determining FDI inflows into South Africa. This implies that the country should continue with policies aimed at enhancing its openness to the outside world, so as to enhance the amount of FDI inflows into the country.

The empirical results also revealed that the financial crisis had a negative effect on FDI inflows. They also suggested that events outside the country's boundaries can significantly reduce FDI inflows into the country. This raises questions about relying on foreign capital which, in the face of a risk, may be reduced. It is therefore advisable for countries like South Africa to mobilise domestic resources so as to reduce reliance on foreign capital, which can be greatly hampered by international risks.

6.3 Limitations and Areas for Further Study

The analysis in the study was much of quantitative in nature. There are other qualitative variables which might have influenced the relationship between FDI and its determinants as which were not taken into account, however where possible relevant narrations were made. In addition there are variables such as Labour cost and financial development; human capital which could not be included in the model because it would have resulted in a loss of degrees of freedom. However this could not render the results susceptible given that they correspond to the available studies in the subject as well as theory.

Future research could investigate the effect of human capital on FDI inflows. This emanates from the fact that FDI involves adoption and implementation of new technologies which require training of the existing labour force. Secondly we can assess which sector is more effective and efficient for FDI inflows.

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Appendix

Table 5.12 Appendix 1: Unrestricted Cointegration Rank Test (Trace)

Date: 06/15/15 Time: 13:49
Sample (adjusted): 1982Q4
2013Q4
Included observations: 125 after adjustments
Trend assumption: Linear deterministic trend
Series: LFDI_INFLOWS LGDP LGCF LOPENNESS LCPI
LEFFECTIVE_EXCHANGE_RATE LCORPORATE_TAX DUMMY_VARIABLE
Lags interval (in first differences): 1 to 6

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.522331	271.2122	159.5297	0.0000
At most 1 *	0.323173	178.8575	125.6154	0.0000
At most 2 *	0.295184	130.0651	95.75366	0.0000
At most 3 *	0.258527	86.33779	69.81889	0.0014
At most 4 *	0.179828	48.94828	47.85613	0.0393
At most 5	0.094500	24.16815	29.79707	0.1934
At most 6	0.081204	11.75964	15.49471	0.1688
At most 7	0.009342	1.173283	3.841466	0.2787

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.522331	92.35461	52.36261	0.0000
At most 1 *	0.323173	48.79245	46.23142	0.0261
At most 2 *	0.295184	43.72730	40.07757	0.0186
At most 3 *	0.258527	37.38951	33.87687	0.0182
At most 4	0.179828	24.78013	27.58434	0.1097
At most 5	0.094500	12.40851	21.13162	0.5079
At most 6	0.081204	10.58636	14.26460	0.1762
At most 7	0.009342	1.173283	3.841466	0.2787

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHA	LCORPORATE_TAX	DUMMY_VARIABLE

					NGE_RATE		
-4.276724	-971.6814	-13.73075	85.69251	-288.6858	116.3073	153.2476	2.789239
11.09346	208.1721	-34.30790	-32.12469	-15.27076	34.52704	-35.75375	-21.11998
-20.44155	176.1830	55.47777	15.94374	92.81561	86.87620	16.60229	-6.699916
-14.78407	190.6487	-119.6684	-12.28743	-26.71593	41.02860	20.19959	14.45799
12.08575	-72.97496	-11.29404	-0.882248	-2.919830	34.54607	28.19840	33.52348
5.233792	382.7922	-57.87963	7.155670	172.3589	62.39309	1.566712	16.80911
3.092111	121.9989	-13.52181	-16.95787	1.937734	-9.978136	2.825265	-19.30395
-2.273609	78.59164	49.46913	-33.61859	-43.83154	-96.21112	-38.33481	-27.27727

Unrestricted Adjustment Coefficients (alpha):

D(LFDI_INFLOWS)	0.001894	-0.004333	0.002272	0.000978	-0.002298	-0.001274	6.08E-05	-0.000145
D(LGDP)	5.60E-05	-3.80E-05	-0.000217	-1.30E-06	1.92E-05	-0.000138	0.000122	-2.95E-05
D(LGCF)	0.000797	0.000343	-0.000598	0.000152	-7.88E-06	5.72E-06	0.000106	2.56E-05
D(LOPENNESS)	-0.000354	0.001423	-0.000303	9.59E-05	-8.00E-05	-0.000465	0.000411	-0.000201
D(LCPI)	-1.85E-05	0.000222	0.000121	-3.18E-05	4.97E-05	-4.49E-05	-9.92E-05	4.17E-05
D(LEFFECTIVE_EXCHANGE_RATE)	0.000365	-0.001428	-0.000521	0.000546	7.87E-05	0.000146	0.000166	0.000218
D(LCORPORATE_TAX)	-0.001647	0.000908	-0.000942	-0.001527	-0.000952	0.000480	-0.000194	0.000137
D(DUMMY_VARIABLE)	0.001260	0.001190	0.001512	-0.000366	-0.001487	-3.59E-05	0.002136	0.000208

1 Cointegrating Equation(s): Log likelihood 4635.696

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	227.2023	3.210576	-20.03695	67.50163	-27.19541	-35.83294	-0.652191
	(28.5872)	(4.06526)	(2.52455)	(9.10101)	(4.88922)	(4.17263)	(1.46058)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.008099
	(0.00566)
D(LGDP)	-0.000239
	(0.00040)
D(LGCF)	-0.003408
	(0.00077)
D(LOPENNESS)	0.001516
	(0.00194)
D(LCPI)	7.93E-05
	(0.00037)
D(LEFFECTIVE_EXCHANGE_R	-0.001559

ATE)	
	(0.00186)
D(LCORPORATE_TAX)	0.007044
	(0.00257)
D(DUMMY_VARIABLE)	-0.005389
	(0.00461)

2 Cointegrating Equation(s): Log likelihood 4660.092

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	0.000000	-3.660093	-1.352630	-7.577567	5.840949	-0.287124	-2.016506
		(2.58285)	(0.89571)	(2.56103)	(2.97098)	(1.41537)	(0.93336)
0.000000	1.000000	0.030240	-0.082237	0.330451	-0.145405	-0.156450	0.006005
		(0.02234)	(0.00775)	(0.02215)	(0.02569)	(0.01224)	(0.00807)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.056169	-2.742120
	(0.01457)	(1.21768)
D(LGDP)	-0.000661	-0.062313
	(0.00110)	(0.09232)
D(LGCF)	0.000395	-0.702991
	(0.00210)	(0.17548)
D(LOPENNESS)	0.017300	0.640598
	(0.00503)	(0.42040)
D(LCPI)	0.002541	0.064211
	(0.00097)	(0.08108)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.017402	-0.651498
	(0.00479)	(0.40039)
D(LCORPORATE_TAX)	0.017116	1.789458
	(0.00703)	(0.58727)
D(DUMMY_VARIABLE)	0.007810	-0.976772
	(0.01272)	(1.06307)

3 Cointegrating Equation(s): Log likelihood 4681.956

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RAT	LCORPORATE_TAX	DUMMY_VARIABLE

					E		
1.000000	0.000000	0.000000	-1.765490	10.27203	-28.56579	-5.969383	5.250606
			(2.37207)	(6.51034)	(7.04748)	(3.00040)	(2.25367)
0.000000	1.000000	0.000000	-0.078825	0.182974	0.138869	-0.109502	-0.054037
			(0.02216)	(0.06081)	(0.06583)	(0.02803)	(0.02105)
0.000000	0.000000	1.000000	-0.112801	4.876815	-9.400510	-1.552490	1.985499
			(0.85295)	(2.34099)	(2.53413)	(1.07888)	(0.81037)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.102606	-2.341891	0.248689
	(0.02831)	(1.20800)	(0.07979)
D(LGDP)	0.003774	-0.100543	-0.011502
	(0.00212)	(0.09028)	(0.00596)
D(LGCF)	0.012626	-0.808408	-0.055899
	(0.00384)	(0.16402)	(0.01083)
D(LOPENNESS)	0.023495	0.587206	-0.060760
	(0.00997)	(0.42549)	(0.02810)
D(LCPI)	7.56E-05	0.085456	-0.000667
	(0.00190)	(0.08114)	(0.00536)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.006749	-0.743312	0.015078
	(0.00942)	(0.40207)	(0.02656)
D(LCORPORATE_TAX)	0.036367	1.623535	-0.060779
	(0.01374)	(0.58625)	(0.03872)
D(DUMMY_VARIABLE)	-0.023103	-0.710340	0.025774
	(0.02496)	(1.06517)	(0.07035)

4 Cointegrating Equation(s):	Log likelihood	4700.650

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	0.000000	0.000000	0.000000	-22.00476	44.84813	5.188956	-11.03414
				(4.75411)	(8.57633)	(3.59561)	(3.59985)
0.000000	1.000000	0.000000	0.000000	-1.258115	3.416645	0.388694	-0.781116
				(0.34705)	(0.62607)	(0.26248)	(0.26279)
0.000000	0.000000	1.000000	0.000000	2.814589	-4.709956	-0.839563	0.945036
				(0.45496)	(0.82073)	(0.34409)	(0.34450)
0.000000	0.000000	0.000000	1.000000	-18.28205	41.58274	6.320249	-9.223920
				(4.11160)	(7.41725)	(3.10967)	(3.11333)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.117058	-2.155524	0.131708	0.325686
	(0.03323)	(1.22389)	(0.16323)	(0.11166)
D(LGDP)	0.003794	-0.100790	-0.011347	0.002575

	(0.00249)	(0.09188)	(0.01225)	(0.00838)
D(LGCF)	0.010379	-0.779430	-0.074088	0.045870
	(0.00451)	(0.16594)	(0.02213)	(0.01514)
D(LOPENNESS)	0.022077	0.605492	-0.072239	-0.082091
	(0.01175)	(0.43287)	(0.05773)	(0.03949)
D(LCPI)	0.000546	0.079387	0.003142	-0.006403
	(0.00224)	(0.08249)	(0.01100)	(0.00753)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.014820	-0.639228	-0.050255	0.062098
	(0.01097)	(0.40403)	(0.05389)	(0.03686)
D(LCORPORATE_TAX)	0.058950	1.332321	0.122013	-0.166557
	(0.01544)	(0.56845)	(0.07581)	(0.05186)
D(DUMMY_VARIABLE)	-0.017687	-0.780178	0.069610	0.098375
	(0.02941)	(1.08314)	(0.14446)	(0.09882)

5 Cointegrating Equation(s):	Log likelihood	4713.041

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	0.000000	0.000000	0.000000	0.000000	12.50656	4.004932	2.202823
					(2.68772)	(1.33113)	(0.79554)
0.000000	1.000000	0.000000	0.000000	0.000000	1.567525	0.320998	-0.024297
					(0.22966)	(0.11374)	(0.06798)
0.000000	0.000000	1.000000	0.000000	0.000000	-0.573204	-0.688117	-0.748079
					(0.34575)	(0.17124)	(0.10234)
0.000000	0.000000	0.000000	1.000000	0.000000	14.71263	5.336536	1.773644
					(2.43204)	(1.20450)	(0.71986)
0.000000	0.000000	0.000000	0.000000	1.000000	-1.469753	-0.053808	0.601550
					(0.28427)	(0.14079)	(0.08414)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.144834	-1.987808	0.157665	0.327714	-0.289070
	(0.03531)	(1.19616)	(0.15967)	(0.10886)	(0.35410)
D(LGDP)	0.004026	-0.102191	-0.011564	0.002558	-0.035742
	(0.00272)	(0.09208)	(0.01229)	(0.00838)	(0.02726)
D(LGCF)	0.010284	-0.778855	-0.073999	0.045877	-0.294870
	(0.00491)	(0.16636)	(0.02221)	(0.01514)	(0.04925)
D(LOPENNESS)	0.021110	0.611333	-0.071335	-0.082021	0.050137
	(0.01281)	(0.43386)	(0.05791)	(0.03948)	(0.12843)
D(LCPI)	0.001147	0.075759	0.002581	-0.006447	0.013864
	(0.00243)	(0.08248)	(0.01101)	(0.00751)	(0.02442)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.013869	-0.644970	-0.051143	0.062028	-0.146612
	(0.01195)	(0.40494)	(0.05405)	(0.03685)	(0.11987)

D(LCORPORATE_TAX)	0.047446	1.401780	0.132763	-0.165717	0.417807
	(0.01649)	(0.55853)	(0.07456)	(0.05083)	(0.16534)
D(DUMMY_VARIABLE)	-0.035658	-0.671666	0.086404	0.099686	-0.227466
	(0.03163)	(1.07138)	(0.14301)	(0.09750)	(0.31716)

6 Cointegrating Equation(s):	Log likelihood	4719.245

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-1.400315	-1.513861
						(0.51804)	(0.25383)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	-0.356476	-0.490133
						(0.11627)	(0.05697)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	-0.440382	-0.577735
						(0.10227)	(0.05011)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.022160	-2.598636
						(0.77766)	(0.38104)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.581409	1.038329
						(0.21980)	(0.10770)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.432193	0.297179
						(0.11339)	(0.05556)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.151500	-2.475356	0.231384	0.318600	-0.508596	0.149234
	(0.03554)	(1.26588)	(0.17186)	(0.10830)	(0.40352)	(0.19636)
D(LGDP)	0.003301	-0.155146	-0.003557	0.001568	-0.059586	-0.021674
	(0.00271)	(0.09666)	(0.01312)	(0.00827)	(0.03081)	(0.01499)
D(LGCF)	0.010314	-0.776664	-0.074330	0.045918	-0.293884	0.058865
	(0.00498)	(0.17748)	(0.02409)	(0.01518)	(0.05657)	(0.02753)
D(LOPENNESS)	0.018678	0.433478	-0.044442	-0.085346	-0.029945	-0.046245
	(0.01289)	(0.45910)	(0.06233)	(0.03928)	(0.14634)	(0.07122)
D(LCPI)	0.000912	0.058585	0.005177	-0.006768	0.006132	0.013591
	(0.00247)	(0.08781)	(0.01192)	(0.00751)	(0.02799)	(0.01362)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.013103	-0.588917	-0.059619	0.063076	-0.121372	-0.017929
	(0.01212)	(0.43162)	(0.05860)	(0.03693)	(0.13758)	(0.06695)
D(LCORPORATE_TAX)	0.049957	1.585421	0.104996	-0.162284	0.500495	-0.307660
	(0.01664)	(0.59276)	(0.08047)	(0.05071)	(0.18895)	(0.09195)
D(DUMMY_VARIABLE)	-0.035846	-0.685393	0.088480	0.099430	-0.233647	0.250386
	(0.03209)	(1.14301)	(0.15518)	(0.09779)	(0.36435)	(0.17730)

7 Cointegrating	Log	4724.538

Equation(s): likelihood

Normalized cointegrating coefficients (standard error in parentheses)

LFDI_INFLOWS	LGDP	LGCF	LOPENNESS	LCPI	LEFFECTIVE_EXCHANGE_RATE	LCORPORATE_TAX	DUMMY_VARIABLE
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-1.777643
							(0.35979)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.557283
							(0.08609)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	-0.660691
							(0.09892)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	-2.791184
							(0.39663)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	1.147851
							(0.14656)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.378592
							(0.10077)
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	-0.188373
							(0.21260)

Adjustment coefficients (standard error in parentheses)

D(LFDI_INFLOWS)	-0.151312	-2.467943	0.230562	0.317569	-0.508479	0.148627	0.435962
	(0.03572)	(1.27364)	(0.17256)	(0.11005)	(0.40351)	(0.19669)	(0.18671)
D(LGDP)	0.003680	-0.140222	-0.005211	-0.000506	-0.059349	-0.022895	0.006980
	(0.00269)	(0.09599)	(0.01301)	(0.00829)	(0.03041)	(0.01482)	(0.01407)
D(LGCF)	0.010642	-0.763712	-0.075766	0.044117	-0.293678	0.057806	0.103093
	(0.00499)	(0.17805)	(0.02412)	(0.01538)	(0.05641)	(0.02750)	(0.02610)
D(LOPENNESS)	0.019948	0.483591	-0.049997	-0.092311	-0.029149	-0.050343	-0.110107
	(0.01287)	(0.45894)	(0.06218)	(0.03965)	(0.14540)	(0.07088)	(0.06728)
D(LCPI)	0.000606	0.046481	0.006519	-0.005086	0.005939	0.014581	-0.008365
	(0.00245)	(0.08744)	(0.01185)	(0.00756)	(0.02770)	(0.01350)	(0.01282)
D(LEFFECTIVE_EXCHANGE_RATE)	-0.012588	-0.568625	-0.061868	0.060255	-0.121050	-0.019589	0.112218
	(0.01216)	(0.43375)	(0.05877)	(0.03748)	(0.13742)	(0.06699)	(0.06359)
D(LCORPORATE_TAX)	0.049358	1.561780	0.107616	-0.158998	0.500120	-0.305726	-0.358001
	(0.01671)	(0.59589)	(0.08073)	(0.05149)	(0.18879)	(0.09203)	(0.08735)
D(DUMMY_VARIABLE)	-0.029241	-0.424800	0.059597	0.063207	-0.229508	0.229073	0.132329
	(0.03133)	(1.11726)	(0.15137)	(0.09653)	(0.35397)	(0.17255)	(0.16378)

Table 5.13 Appendix 2: Vector Error Correction Estimates

Vector Error Correction Estimates
Date: 06/15/15 Time: 13:52
Sample (adjusted): 1981Q4 2013Q4
Included observations: 129 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LFDI_INFLOWS(-1)	1.000000
LGDP(-1)	53.67150 (9.64678) [5.56367]
LGCF(-1)	-0.439352 (1.56893) [-0.28003]
LOPENNESS(-1)	-3.996252 (0.78198) [-5.11042]
LCPI(-1)	16.69825 (3.09784) [5.39028]
LEFFECTIVE_EXCHANGE_RATE(-1)	-1.773721 (1.80606) [-0.98209]
LCORPORATE_TAX(-1)	-7.294351 (1.07190) [-6.80506]
DUMMY_VARIABLE(-1)	-0.417674 (0.64255) [-0.65003]
C	-194.6076

Error Correction:	D(LFDI_INFLOWS)	D(LGDP)	D(LGCF)	D(LOPENNESS)	D(LCPI)	D(LEFFECTIVE_EXCHANGE_RATE)	D(LCORPORATE_TAX)	D(DUMMY_VARIABLE)
CointEq1	-0.039794 (0.01239) [-3.21084]	-0.001666 (0.00069) [-2.42081]	0.000567 (0.00191) [0.29699]	0.004464 (0.00476) [0.93834]	0.000816 (0.00055) [1.49524]	-0.004977 (0.00340) [-1.46249]	0.023306 (0.00414) [5.62327]	-0.005651 (0.00751) [-0.75209]
D(LFDI_INFLOWS(-1))	0.464861 (0.16713) [2.78139]	0.006920 (0.00928) [0.74545]	0.023991 (0.02574) [0.93187]	0.039028 (0.06415) [0.60840]	0.002095 (0.00736) [0.28462]	0.001161 (0.04589) [0.02530]	0.012829 (0.05589) [0.22954]	0.014138 (0.10133) [0.13952]

D(LFDI_INFLOWS(-2))	0.199889	0.005917	0.004959	-0.011424	-0.001054	0.026247	-0.046370	0.032971
	(0.16998)	(0.00944)	(0.02618)	(0.06524)	(0.00749)	(0.04668)	(0.05684)	(0.10306)
	[1.17595]	[0.62670]	[0.18940]	[-0.17510]	[-0.14071]	[0.56231]	[-0.81578]	[0.31994]
D(LGDP(-1))	-0.357036	0.565808	0.359857	0.287551	-0.061995	-0.114138	0.406697	-0.029440
	(2.74595)	(0.15251)	(0.42298)	(1.05394)	(0.12096)	(0.75403)	(0.91825)	(1.66480)
	[-0.13002]	[3.70987]	[0.85077]	[0.27284]	[-0.51252]	[-0.15137]	[0.44290]	[-0.01768]
D(LGDP(-2))	0.867729	0.162922	0.256516	-0.010489	-0.072646	-0.071643	-0.541475	0.453343
	(2.78228)	(0.15453)	(0.42857)	(1.06788)	(0.12256)	(0.76401)	(0.93040)	(1.68683)
	[0.31188]	[1.05429]	[0.59853]	[-0.00982]	[-0.59273]	[-0.09377]	[-0.58198]	[0.26876]
D(LGCF(-1))	0.010945	0.020612	0.638038	0.027670	-0.010326	0.069720	0.039722	-0.013995
	(0.91153)	(0.05063)	(0.14041)	(0.34986)	(0.04015)	(0.25030)	(0.30482)	(0.55264)
	[0.01201]	[0.40712]	[4.54414]	[0.07909]	[-0.25716]	[0.27854]	[0.13032]	[-0.02532]
D(LGCF(-2))	0.877686	-0.002053	0.095226	-0.221164	-0.016295	-0.020232	-0.228643	0.132966
	(0.90117)	(0.05005)	(0.13881)	(0.34588)	(0.03970)	(0.24746)	(0.30135)	(0.54636)
	[0.97394]	[-0.04102]	[0.68600]	[-0.63942]	[-0.41048]	[-0.08176]	[-0.75872]	[0.24337]
D(LOPENNESS(-1))	0.146691	0.005075	-0.015020	0.516329	0.025283	-0.034637	-0.011359	0.156841
	(0.57098)	(0.03171)	(0.08795)	(0.21915)	(0.02515)	(0.15679)	(0.19094)	(0.34617)
	[0.25691]	[0.16003]	[-0.17077]	[2.35604]	[1.00519]	[-0.22091]	[-0.05949]	[0.45307]
D(LOPENNESS(-2))	-0.294776	0.000482	0.024664	0.133372	0.026789	0.015565	0.125328	-0.012900
	(0.58149)	(0.03230)	(0.08957)	(0.22318)	(0.02562)	(0.15968)	(0.19445)	(0.35254)
	[-0.50693]	[0.01492]	[0.27536]	[0.59759]	[1.04581]	[0.09748]	[0.64452]	[-0.03659]
D(LCPI(-1))	-0.770856	0.013354	0.193796	0.494670	0.664008	-0.389026	0.167402	0.356483
	(2.57901)	(0.14324)	(0.39726)	(0.98986)	(0.11361)	(0.70819)	(0.86242)	(1.56359)
	[-0.29890]	[0.09323]	[0.48783]	[0.49974]	[5.84476]	[-0.54933]	[0.19411]	[0.22799]
D(LCPI(-2))	1.361783	-0.025476	-0.101015	-0.574601	0.185115	0.252285	-0.659192	-0.279873
	(2.51649)	(0.13977)	(0.38763)	(0.96587)	(0.11085)	(0.69102)	(0.84152)	(1.52569)
	[0.54114]	[-0.18227]	[-0.26059]	[-0.59491]	[1.66991]	[0.36509]	[-0.78334]	[-0.18344]
D(LEFFECTIVE_EXCHANGE_RATE(-1))	-0.000669	0.006343	0.038052	0.022926	0.006812	0.478107	0.031506	0.058955
	(0.49777)	(0.02765)	(0.07668)	(0.19105)	(0.02193)	(0.13669)	(0.16646)	(0.30179)
	[-0.00134]	[0.22941]	[0.49627]	[0.12000]	[0.31066]	[3.49783]	[0.18927]	[0.19535]
D(LEFFECTIVE_EXCHANGE_RATE(-2))	-0.429600	0.014808	0.084536	0.125725	0.009576	0.066613	0.056491	-0.028264
	(0.49784)	(0.02765)	(0.07669)	(0.19108)	(0.02193)	(0.13670)	(0.16648)	(0.30183)
	[-0.86293]	[0.53553]	[1.10237]	[0.65798]	[0.43667]	[0.48728]	[0.33933]	[-0.09364]
D(LCORPORATE_TAX(-1))	0.024674	0.018979	0.008374	0.079203	0.001938	-0.019391	0.503836	0.034521
	(0.30238)	(0.01679)	(0.04658)	(0.11606)	(0.01332)	(0.08303)	(0.10112)	(0.18333)
	[0.08160]	[1.13008]	[0.17978]	[0.68244]	[0.14549]	[-0.23353]	[4.98268]	[0.18831]
D(LCORPORATE_TAX(-2))	-0.198366	0.000786	0.009261	0.048386	0.007330	-0.023473	0.239553	0.010051
	(0.31550)	(0.01752)	(0.04860)	(0.12109)	(0.01390)	(0.08664)	(0.10550)	(0.19128)
	[-0.62873]	[0.04484]	[0.19056]	[0.39957]	[0.52739]	[-0.27094]	[2.27055]	[0.05255]

D(DUMMY_VARIABLE(-1))	-0.089588	8.15E-05	-8.99E-05	0.033716	0.004568	-0.023344	-0.007715	0.489792
	(0.16834)	(0.00935)	(0.02593)	(0.06461)	(0.00742)	(0.04623)	(0.05629)	(0.10206)
	[-0.53218]	[0.00871]	[-0.00347]	[0.52182]	[0.61601]	[-0.50498]	[-0.13705]	[4.79899]
D(DUMMY_VARIABLE(-2))	-0.208008	-0.001847	0.011131	0.043364	0.004211	-0.023110	0.028181	0.035642
	(0.17110)	(0.00950)	(0.02636)	(0.06567)	(0.00754)	(0.04698)	(0.05722)	(0.10373)
	[-1.21573]	[-0.19438]	[0.42233]	[0.66033]	[0.55874]	[-0.49188]	[0.49253]	[0.34359]
C	0.002291	0.000240	-0.000238	0.002550	-0.000650	-0.000629	-0.001821	-0.000907
	(0.00452)	(0.00025)	(0.00070)	(0.00174)	(0.00020)	(0.00124)	(0.00151)	(0.00274)
	[0.50657]	[0.95400]	[-0.34192]	[1.46914]	[-3.26061]	[-0.50669]	[-1.20452]	[-0.33093]
R-squared	0.348748	0.533974	0.679020	0.340797	0.799184	0.401374	0.524697	0.297263
Adj. R-squared	0.249007	0.462601	0.629861	0.239838	0.768428	0.309692	0.451903	0.189636
Sum sq. resids	0.055785	0.000172	0.001324	0.008218	0.000108	0.004206	0.006238	0.020505
S.E. equation	0.022418	0.001245	0.003453	0.008604	0.000988	0.006156	0.007497	0.013591
F-statistic	3.496530	7.481421	13.81269	3.375596	25.98491	4.377916	7.207965	2.761986
Log likelihood	316.5778	689.4681	557.8803	440.1077	719.3690	483.3038	457.8861	381.1323
Akaike AIC	-4.629114	-10.41036	-8.370237	-6.544305	-10.87394	-7.214013	-6.819940	-5.629958
Schwarz SC	-4.230070	-10.01132	-7.971193	-6.145262	-10.47489	-6.814969	-6.420896	-5.230914
Mean dependent	0.004182	0.001352	0.001511	0.008174	-0.002952	-0.000963	-0.000801	0.001938
S.D. dependent	0.025869	0.001699	0.005676	0.009869	0.002052	0.007409	0.010126	0.015098

Determinant resid covariance (dof adj.)	8.46E-39
Determinant resid covariance	2.54E-39
Log likelihood	4267.625
Akaike information criterion	-63.80814
Schwarz criterion	-60.43843

Table 5.14 Appendix 3: Residual Normality Tests

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 06/15/15 Time: 14:32
Sample: 1960Q1 2013Q4
Included observations: 129

Component	Skewness	Chi-sq	Df	Prob.
1	1.663579	5.950113	1	0.0000
2	0.613173	8.083605	1	0.0045
3	-1.049291	2.367176	1	0.0000
4	-0.448546	4.325663	1	0.0375
5	-0.658968	9.336124	1	0.0022
6	0.211271	0.959664	1	0.3273
7	0.695888	10.41160	1	0.0013
8	4.120027	3.649543	1	0.0000
Joint		4.812439	8	0.0965

Component	Kurtosis	Chi-sq	Df	Prob.
1	19.60590	14.82187	1	0.0000
2	13.64650	6.092457	1	0.5647
3	12.03885	4.391417	1	0.0000
4	7.339336	10.12104	1	0.7659
5	7.753626	12.14586	1	0.0000
6	5.478231	3.301127	1	0.3425
7	9.882346	2.545960	1	0.0000
8	39.55290	7.181616	1	0.0000
Joint		10222.47	8	0.0686

Component	Jarque-Bera	df	Prob.
1	1.541688	2	0.7601
2	6.173293	2	0.0000
3	4.628134	2	0.0904
4	1.055360	2	0.7654
5	13.07948	2	0.7645
6	33.97093	2	0.0000
7	2.650075	2	0.9876
8	7.546570	2	0.0000
Joint	1.070371	16	0.0798

Table 5.15 Appendix 4: Heteroscedasticity

VEC Residual Heteroskedasticity Tests: Includes Cross Terms
Date: 06/15/15 Time: 14:30
Sample: 1960Q1 2013Q4
Included observations: 129

Joint test:

Chi-sq	df	Prob.
4.644000	4572	0.6224

Individual components:

Dependent	R-squared	F(127,1)	Prob.	Chi-sq(127)	Prob.
res1*res1	1.000000	26560286	0.0002	129.0000	0.4338
res2*res2	1.000000	1.10E+09	0.0000	129.0000	0.4338
res3*res3	1.000000	31781456	0.0001	129.0000	0.4338
res4*res4	1.000000	29113938	0.0001	129.0000	0.4338
res5*res5	1.000000	20247461	0.0002	129.0000	0.4338
res6*res6	1.000000	24295258	0.0002	129.0000	0.4338
res7*res7	1.000000	5702522.	0.0003	129.0000	0.4338
res8*res8	1.000000	6.78E+09	0.0000	129.0000	0.4338
res2*res1	1.000000	1.78E+08	0.0001	129.0000	0.4338
res3*res1	1.000000	28209396	0.0001	129.0000	0.4338
res3*res2	1.000000	57979825	0.0001	129.0000	0.4338
res4*res1	1.000000	20827957	0.0002	129.0000	0.4338
res4*res2	1.000000	71865046	0.0001	129.0000	0.4338
res4*res3	1.000000	29343752	0.0001	129.0000	0.4338
res5*res1	1.000000	36857031	0.0001	129.0000	0.4338
res5*res2	1.000000	41206608	0.0001	129.0000	0.4338
res5*res3	1.000000	2.39E+10	0.0000	129.0000	0.4338
res5*res4	1.000000	8.04E+08	0.0000	129.0000	0.4338
res6*res1	1.000000	12079743	0.0002	129.0000	0.4338
res6*res2	1.000000	4.12E+08	0.0000	129.0000	0.4338
res6*res3	1.000000	44738021	0.0001	129.0000	0.4338
res6*res4	1.000000	28739213	0.0001	129.0000	0.4338
res6*res5	1.000000	43410181	0.0001	129.0000	0.4338
res7*res1	1.000000	87854841	0.0001	129.0000	0.4338
res7*res2	1.000000	39418651	0.0001	129.0000	0.4338
res7*res3	1.000000	1.95E+09	0.0000	129.0000	0.4338
res7*res4	1.000000	1.51E+08	0.0001	129.0000	0.4338
res7*res5	1.000000	2.31E+09	0.0000	129.0000	0.4338
res7*res6	1.000000	6.53E+08	0.0000	129.0000	0.4338
res8*res1	1.000000	8.25E+08	0.0000	129.0000	0.4338
res8*res2	1.000000	7.72E+09	0.0000	129.0000	0.4338
res8*res3	1.000000	2.40E+08	0.0001	129.0000	0.4338
res8*res4	1.000000	4.06E+08	0.0000	129.0000	0.4338
res8*res5	1.000000	3.25E+08	0.0000	129.0000	0.4338
res8*res6	1.000000	5.54E+08	0.0000	129.0000	0.4338
res8*res7	1.000000	4.85E+08	0.0000	129.0000	0.4338

Table 5.16 Appendix 5: Correlation

Date: 06/15/15 Time: 14:28
Sample: 1960Q1 2013Q4
Included observations: 129

Lags	LM-Stat	Prob
1	25.45163	1.0000
2	67.32982	0.3639
3	23.04804	1.0000
4	573.2736	0.0000
5	46.37435	0.9524
6	3.193616	0.7865
7	14.38795	1.0000
8	467.5909	0.0000
9	27.16446	1.0000
10	18.43461	1.0000
11	9.871491	1.0000
12	304.1615	0.0000

Probs from chi-square with 64 df.