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THE IMPACT OF THE EXCHANGE RATE ON THE MANUFACTURING SECTOR IN SOUTH AFRICA (1983-2012)

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JULY 2015

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I, the undersigned, Ogunjobi Olamide Doris, student number 201205264, do hereby declare that this dissertation is my original work, with the exception of quotations and references whose sources I have acknowledged. I also declare that the work has not been submitted, and will not be presented at another University for similar or any other degree award.

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ABSTRACT

The study, in its quest to explore the impact of Real Exchange Rate on the manufacturing sector in South Africa over the quarterly period 1983-2012 (30years), a VAR technique and VECM by Johansen (1991, 1995) estimation techniques were used. The study adopted Hodge (2012) model using five variables with GDP manufacturing as the dependent variable and the independent variables include; real exchange rate, gross fixed capital formation, interest rate and trade openness. The empirical analysis shows that real exchange rate has a significant impact on the South Africa manufacturing Sector. The impulse response and variance decomposition analysis in this study also revealed that interest rate has a significant impact on the South African manufacturing Sector. Furthermore gross fixed capital formation has a positive impact on the manufacturing sector. The same cannot be said about the trade openness in the short run.

ACKNOWLEDGEMENTS

My thanks and gratitude goes to my loving husband for his love and tender care as well as the support given to me throughout my study. I also want to thank Govan Mbeki Research Centre for the financial assistance towards this research. I will forever remain grateful to my dissertation supervisor Prof. R. Ncwadi of the Department of Economics for the role he played in my academic career and his invaluable advice and encouragement towards the completion of this dissertation. My gratitude is also importantly extended to my mum and my parent in-law for their prayers and moral support. Sincere gratitude also goes to my classmates: Faith Mazambani, Idowu Seriki, Courage Mlambo, Christopher, Nadia and other friends whose names were not captured in this, but the greatest thanks go to Jehovah the creator of the Universe for his mercies and undeserved kindness bestowed upon me, without whom this dissertation would never have been written.

DEDICATION

This dissertation is dedicated to my loving husband Sobamowo Samuel Oluwafemi and my inestimable jewel Sobamowo Esther Damilola.

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LIST OF ACRONYMS

ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
BS	Balassa-Samuelson hypothesis
COINT	Cointegration
COSATU	Congress of South African Trade Union
DTI	Department of trade and industry
ELGH	Export-led growth hypothesis
EQU1	Equation 1
EQU2	Equation 2
EU	European Union
GDP	Gross Domestic Product
GFCF	Gross Fixed capital formation
GGDC	Groningen Growth and Development Centre
GEAR	Growth, Employment and Redistribution Policy
INT	Real interest rates
ICT	Information and Communication Technology
JB	Jarque-Bera test
KPS	Kwiatkowski-Phillips-schmidt-shin Test
LDC	Less Developed Countries

MC	The Manufacturing Circle
MEER	Manufacturing Equilibrium Exchange Rate
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PP	Phillips-Perron
PPP	Purchasing power parity
REER	Real effective exchange rates
SA	South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SARB	South African Reserve Bank
SEDA	Small Enterprise Development Agency
StatsSA	Statistics South Africa
TFP	Total Factor Productivity growth
TIPS	Treasury Inflation Protected Security
OTC	Over the Counter
OP	Trade openness
UIP	Uncovered Interest Parity
VAR	Vector Auto-regression
VECM	Vector Error Correction Modelling
VIF	Vector Inflation Factor
WTO	World Trade Organisation

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.0 BACKGROUND OF THE STUDY

The South African manufacturing sector growth has categorically deteriorated from the mid-1970s and an enhancement in the enactment of this industry is paramount to salvage the sector and the whole economy (Dube et al, 2007). The manufacturing sector in South Africa has been under compression and in a contraction zone. In line with Dube et al (2007) South African manufacturing sector for over ten years has been waning. Though it is contentious that the deterioration is structural in nature, of recent it has been a common thing to "appeal to policy makers to arbitrate in foreign exchange mark[illegible]en the Rand against the currencies of South Africa's major trading partners". (Dube, et al, 2007:43). The Kagiso purchasing managers' index (PMI), a reliable instrument for the manufacturing sector, has dropped recently. Pan African Investment and Research Services (2011) confirmed the growth rate in manufacturing production of 8.5% in 2008, 7.9% in 2010 and 6.9 % in 2011 and 5.8% in 2012. This sharp decline in 2011 is as a *result* of disheartening employment underlying forces within the manufacturing sector and an antagonistic sentiment towards labour followed by copious strikes in the second quarter of 2011. Jennings (2013) held that the manufacturing has been in waning since 2001 and this has been a source of distress and that the major issues that have been disturbing the manufacturing sector is the rand since the rand is stronger. He resolved to have a modest rand to a stronger rand.

In the manufacturing sector a feebler rand would enable exports. On the other hand, a weaker rand may be touted as the solution to SA's flagging manufacturing sector, but unless underlying structural problems are addressed such as low interest rate, it will only contribute to inflation (Bishop, 2011). While a weaker rand provides temporary relief, it ultimately results in inflationary pressures. The constant debate about the competitive levels of the local currency is back in full force with internally focused economic players crying foul about the latest slide and

rising inflationary pressures. The impact of a weak or strong rand depends on the amalgamation of inputs and outputs of markets that business services provide.

Pan-African Investment and Research Services (2011) states that for the South African manufacturing sector to be on a reasonable progressing path at least a 10% growth rate is required to uphold the sector and other sectors in the economy at large. The projected growth rate necessitates a significant and effective consensus between business and workforce within the sector, eradication of structural inadequacies as well as infrastructural blockages in water and energy re-evaluation of macroeconomics and foreign exchange polices.

Pan-African Investment and Research Services (2011) maintained further that the gross domestic product (GDP) manufacturing got to its peak in 1981 of 10% which could be as a result of the closed economic system that functioned back then in South Africa (Rodrik 2006). But in 2010, manufacturing contribution went down to 6 per cent of GDP thus growth in the manufacturing sector output deteriorated by 4%. Fu[illegible]he 2008/09 economic meltdown, kindled by the global financial crisis, drivelled into the real economy where it increased inefficiencies facing the Manufacturing industry and other sectors. Even though manufacturing sector accounts for virtually "one sixth of gross value added, since the 1980s, it has been branded by decrease in employment rate, a decreasing relative price and poor export performance due to the recession in world trade" (Rodrik 2006). Hence, it is on this score that the discussion of the role of the real exchange rate on the manufacturing sector turns out.This is expected ever since the real exchange rate has been publicized to be an authoritative foundation of the manufacturing exports also the overall condition of the manufacturing sector (Golub and Ceglowski 2002; Edwards and Golub 2003; Rodrik 2006).

Rahman and Hossain (2003) claimed that the real exchange rate reinforces both exports and imports competing sectors. This has boosted up the investment rate in the tradable sector and makes it more profitable than that of the non-tradable sector, thereby leading to movement of resources from the non-imports and non-exports sectors of the tradable sector. Rationalization of these resources helps and resulted in efficient use of the resources. In line with Pan-African Investment and Research Services (2011) a growth rate of 9.3 per cent was recorded in the manufacturing production in 1981, a period overlapping with the gold boom. The modern

development in the manufacturing output apparent since the mid-2000s as stated earlier has principally been attributed to poor macro-economic policieswhich was also intensified by the 2008/2009 economic recession

The South African exchange rate has been succeeded to preserve a viable real exchange rate."A suitable measure of the country's international competitive position is believed to be a key variable when evaluating the governments' success to raise long-run sustainable economic growth" (Walters & de Beer, 1999:22).Alas, the notion of global competitiveness is a multidimensional phenomenon that is somewhat hard to describe or apprehend in one single indicator.As a consequence, thereal exchange rate (that is, the inflation differential adjusted nominal exchange rate) is frequently applied to reflect the countries' relative competitive position in international trade (Walters & de Beer, 1999:54).Indeed, even within a nation, the dissimilarity of the real exchange rate from some fundamental equilibrium level still gives important information on the competitiveness of the currencies. Notwithstanding, equilibrium concept stay undetectable and in spite of the numerous endeavors, there is no single (flawless) measure of the offset or the degree of overvaluation or undervaluation of a currency.Aron, Elbadawi and Kahn (1997) indicate that the appropriate level of the real exchange rate is the degree consistent with "sustainable" long-term capital flows, and a level that is contributing to generating a more open export-oriented economic system.

Spatafora and Stavrev (2003) mentions that "an accurate analysis of thereal exchange rate is even more critical for resource dependent economies where they frequently experience large shocks in their terms of trade and relative productivity differentials".As a result, their currency values may experience great volatility, and the equilibrium level should therefore be supervised continuously.

To moderate the economic situation the Reserve Bank of South Africa and the government of South African harmonized to use interest rate and exchange rate policies effectively by setting the macroeconomic framework and also establish a precise prime as to the broad economic approach to be followed. Williamson (2007) affirms that the exchange rate is responsible ultimately for the connection between a country's national economy and the global economic system. On this account, there has been several exchange rate literatures which explore the concept of an "equilibrium exchange rate" and efforts to enumerate the extent of exchange rate

misalignment, whereby overvaluation is considered disadvantageous to growth. Later on the exchange rate is a key determinant of growth and patronage, consequently it is important to understand the drivers of the exchange rate policies.

1.2 PROBLEM STATEMENT

Historically South Africa has a trade deficit in the manufacturing sector (Nordas, 1996). It is generally accepted that the growth performance of South African manufacturing industry has noticeably worsened from the mid- 1970s, and an improvement in the performance of this sector is crucial to salvage the sector and the growth of the entire economy as whole (Dube et al 2011:98). The cause of this poor performance in the manufacturing sector has become debatable that the decline is structural in nature. In 2011, the confederation of the South African Trade Unions (COSATU) and stakeholders in the manufacturing industry cited the strength of the rand as a stumbling factor for both the growth of the manufacturing sector and economic growth at large. It is argued that a strong rand hampers exports. Countries such as China have pegged their exchange rate at a rate that is competitive for export promotion and consequently economic growth (Greenaway et al, 1993). This has made stakeholders in the manufacturing sector call for the intervention of the SARBto reduce the rand's strength.

1.3 OBJECTIVES

The following are the research project's objectives:

- To review the tendencies of the manufacturing sector in the economy of South African.
- To econometrically analyse the impact of the exchange rate on the manufacturing sector in South Africa.
- To provide policy recommendations based on the finding from the study.

1.4 HYPOTHESIS

H_0 : Real Exchange rates have no significant impact on the manufacturing sector in South Africa

H_1 : Real Exchange rates significantly affect the manufacturing sector in South Africa.

1.5 METHODOLOGY

1.5.1 Sources of Data

The bulk of the data will come from the South African Statistics websites and South African Reserve Bank. Relevant data will be from secondary sources (that is reported by someone else or by institution).

1.5.2 Method of data analysis.

To empirically investigate the impact ofreal exchange rates on the manufacturing sector in South Africa this study shall adopt Vector Error correction modelling (VECM) technique by Johasen 1995. This study will utilise the Philips-Peron unit root test and the Augmented Dickey-Fuller (ADF) test using E-views to determine the time series properties of the variables such as stationary and non-stationary.

With the purpose of confirming the parameter approximation result this study expect to use analytical tests for instance, theheteroscedacity, residual normality test and autocorrelation tests for misspecification.

1.6 RATIONALE OF THE STUDY

Deterioration in the performance of manufacturing industry coupled with low employment levels in South Africa is a major concern. However, there is no conclusive opinion as to the causes of this decline. Several stakeholders including trade unions in South Africa express the opinion that the strength of the rand weakens the performance of the manufacturing sector when it comes to production and employment (Nordas, H., 1996). On the other hand, even during the times when the Rand was in the lower levels in relation to US dollars South African manufacturing sector has not leveraged from the weak Rand (Nordas, 1996). There is therefore a need for an econometrical consideration of the relationship betweenthe performance of the manufacturing sector and the rand exchange rate.

This debate has not yet been resolved and there is a need for research in this area. The result of this study shall contribute towards this on-going discourse and shall be useful to policy makers at all levels of government and relevant stakeholders in the manufacturing sector.

1.7 ORGANIZATIONAL STRUCTURE OF THE RESEARCH

The study is divided into six chapters which include: Chapter one whereby the introduction and background of the study was discussed as above. Next is chapter two of which overview and trend in the manufacturing sector will be considered as well as the trend in the South African exchange rate. The third chapter will provide a detailed theoretical framework underpinning this study and the empirical literature on the effect of the rate of exchange on manufacturing sector and economy at large. Followed by this chapter will be chapter four where data presentation and the methodology utilised will be analysed also the justification of using this technique. In chapter five, the data was estimated using VECM. Lastly the study key findings, policy recommendations, suggestions for further research and conclusion are enclosed in chapter six.

CHAPTER TWO

OVERVIEW OF THE TRENDS OF THE SELECTED MACROECONOMIC VARIABLES AFFECTING THE MANUFACTURING SECTOR IN SOUTH AFRICA

2.1 Introduction

This chapter serves a purpose of providing an overview of the selected trends of the macroeconomic variables affecting the manufacturing sector in South Africa. It also serves to highlight trends in manufacturing performance and exchange rate patterns in the country over the past thirty years. Hence, this is divided into two sections. An analysis of the manufacturing sector and its components in South Africa will be provided in the initial section. This is followed by a discussion on the trends of the GDP in manufacturing sector from 1983 to 2012. The second section of the chapter presents a discussion on the trends of interest rates, gross fixed capital formation, trade openness and exchange rates during the period under review.

2.2. The Manufacturing sector in South Africa: an overview

South Africa has picked out a reputable and has expanded the manufacturing sector base that has demonstrated its ability to strive in the worldwide economic system. The manufacturing sector offers a pivotal point to motivate the development of further activitiesfor example, services and realizing particularresults, such as the creation of job prospect and economic empowerment. Van Niekerk (2012) states that South Africa's manufacturingindustry is facing and bound by organisational challenges related to the manufacturing sector in emerging economies such as Turkey, India, Brazil, Philippines and China just to name a few of them. Such limitations minimize the capacity of the sector to gain the benefits of favorable market atmospheres for example a depreciating currency.

Manufacturing industry contributessignificantly in the economy of South Africa justified by its potential to create affirmative and weighty spill-over effects on the economic system and the point that the segment maximum multiplier effects in terms of export earnings and monetaryreturns, employment and production. The South African "manufacturing sector increased from R180 053 million in 1993 (at constant 2005 prices) to R282 215 million in 2010 however, its contribution to the GDP decreased from 19 per cent to 17 per cent under that

period" (SEDA, 2013). This program of manufacturing brings about a prospect to significantly increase the country's development and growth. Manufacturing in South Africa comprises of many sub sectors as explained below;

2.2.1 Agri-processing industry

South Africa is blessed with different kinds of climates, oscillating from semi-arid and dry to sub-tropical. Due to this climate change, different kinds of crops, fishes, and animal are available in South Africa. The Agri-food in South Africa has numerous competitive advantages, for example it makes it an important trading partner and a worthwhile venture for investment. Small Enterprise Development Agency SEDA (2013) stated that 4 percent of the South Africa GDP is a contribution from agriculture which consists mostly of cattle and sheep farming, whereby land for crop planting only take 13 per cent. Of the total land for crop production, maize, wheat, oats, sugar cane and sunflowers are the major crops grown. The government is at work in developing small-scale farmi[illegible] to increase careeropportunities. Some fruits and local wines are exported such as citrus and deciduous fruits and also some flowers. According to SEDA (2013) "the Agri-food complex contributes about R124 billion to South Africa's GDP and employs 451 000 people in the formal sector. Exports of processed agricultural products amount to R17.2 billion in 2001". The infrastructure in South Africa is said to be anoutstanding infrastructure, counter-seasonality to developed nations, huge biodiversity and maritime resources, and viable input costs all these put together makes the nation a key player on global markets (Mhlanga and Roduck, 2010).

2.2.2 Automotive industry

The automotive and components manufacturer of South Africa is on the rise,in additionit is seamlessly positioned for investment prospects, "Vehicle manufacturers such as BMW, Ford, Volkswagen, Daimler-Chrysler and Toyota have production plants in the country, while component manufacturers (Arvin Exhust, Bloxwitch, Corning, Senior Flexonics) have established production bases in the country.SEDA (2013) claimed that one of the most important industries in the manufacturing sector in South Africa is the automotive industry. There are numerous conglomerates using South Africa to source components and to assemble vehicles for both the local and international markets. Regardless of its distance from some of the main

markets in Africa, most importantly South Africa automotive industry manufactures high quality products at competitive prices compared to other automotive manufacturing and assembly centres. The automotive industry has two manufacturing centres located in two provinces, the Eastern Cape (coastal) and Gauteng (inland)" (Manufacturing circle, 2013).

The Manufacturing Circle (2013) further notes that in South Africa firms that produce plants are enabled to take the benefit of low costs production, including right of entry into new markets due to the European Union trade agreements and the Southern African Development Community (SADC) free trade area. The industry also had chances in the manufacturing of materials such automotive steel and components. "South Africa's aim is to become an automotive investment destination of choice"(The Manufacturing Cirlce 2013). Innovation and improvement of fundamental elements in the South African automotive industry are necessary to keep the pace to attaining global competitiveness. Currently, the interest rates aresignificantly low whereby decreasing the investment costs. It is noteworthy to observe that the major transnational automotive producers are now embodied in South Africa; this therefore implies that global developments have impacted on the nation positively. The viewpoint of the vehicle manufacturing can be said to be brought in terms of exports of the domestic market.

2.2.3 Chemical Industry

According to Geyde (2012) the South African chemical industry was shaped through the administrative and controlling environment that led to a viewpoint of standoffishness and isolationism throughout the apartheid era. This inclined to nurture an innermost approach and an attention on local market's import replacement. The situation also stimulated the construction of small-scale plants with the abilities to gear, local demand, which is not economical. Since the chemical industry has been insulated from international competition and high raw material costs due to increase in import tariffs, "locally processed goods have more often than not been less than competitive in export markets" (Geyde 2012). Currently South Africa chemical industry is backward to the global community and the industry is concentrating on the need to be globally competitive therefore, reshaping the industry.

The chemical industry of South Africa is said to be "of substantial economic significance to the nation, contributing about 5percent to the gross domestic product (GDP) and approximately 25 percent of the manufacturing sector" (Treasury Inflation Protected Securities (TIPS), 2013). This is one of the largest industries in Africa compared to others. There are two conspicuous traits that characterize the chemical industry in South African. Principally, the upstream sector is rigorous and well produced, whereas the downstream sector – even though different - remains underdeveloped. Furthermore, the artificial coal and natural gas-based liquid energies and petrochemicals industry is bulging, as South Africa came to be world's leader in coal-based synthesis and gas-to-liquids (GTL) technologies.It is extremely complex and widely diversified, with finished products regularly being composed of different chemicals joined in some means to give the necessary attributes and features.

2.2.4 ICT and electronics industry

The information technology (IT)indu[illegible]outh Africaprogress exceeds the world's average contribution. The well recognised and classy localelectronics sector and information and communications technology (ICT) encompasses over 3,000 firms also the industry in 2001 was ranked 22nd international (Roduck, 2009). South African IT with adequate instruments and skills has the access advantage to the quickdevelopment of telecommunications and information technology all over the African region. The Software designers in South Africa are known to be world leaders when it comes to production brilliant local infrastructure, efficiency and innovation. This sector is shared among three sectors which include: information technology, telecommunications and electronics. The telecoms industry in the South African economy is thriving, giving in over 7 percent contribution to "the South Africa's gross domestic product (GDP) with approximately 5,5 million installed fixed-line telephones, South Africa are ranked 23rd in telecommunications development in the creation and interprets more than 30% of the total lines installed in South Africa. Telkom, the sole fixed-cable operator in South Africa, is a central participant in a US$630 million optical fiber submarine cable project that will cater for Africa's growing telecommunications needs for the succeeding 25 years" (Walser, 2012). The South African electronics industry is frequently improving in innovation and production engineering. The Industry is chockfull of different humanities with strong expert in electronics, some media companies focus on the security aspect and pre-payments meters for electricity.

There is thus an investment opportunity in the growth of software for the banking sector, financial institutes, schools, protection equipment, silicon processing and solar system.

2.2.5 Metal Industry

The South Africanmetal industry is quite big and developed, having a wide range of natural resources and substructure, the industry embodies almost a third of the total South Africanmanufacturing sector. The industry is prepared up of basic steel andiron ore, basic metal wares and non-ferrous metals. The iron and steel basic industries manufactures primarily focus on iron and steel products that are produced from smelting to semi-finished stages. "Ranked the world's 19th largest steel producing country in 2001, South Africa is the biggest steel producer in Africa (almost 60% of Africa's total production). Primary steel products and semi-finished products include billets, blooms, slabs, forgings, reinforcing bars, railway track material, wire rod, seamless pipes and shells. South Africa is a net exporter, ranked 10th in the world, to more than 100 nations. Close to 500 000 tons of ferrous scrap were exported by metal recyclers in 2001" (Walser, 2012). The principal steel producer in South Africa is Iscor followed by Cape Gate, Highveld steel, Colombus, Scaw Metals and Vanadium. Besides, the non-ferrous metal industries of South Africa encompass aluminium and other metals such as Cu, lead, zinc,brass and tin. Although one of the largest sectors of production is aluminium, however, South Africa does not have commercially useable deposits thus, import feedstock. Walser (2012) argues that "South Africa is ranked eighth in world production of aluminium. Key players include Billiton (with smelters in Richards Bay) and Hulett Aluminium. Other non-ferrous metals are small in relation, but are still important for exports and foreign exchange remunerations."Despite the fact that the nation'scopper, brass and bronze producing organisations have dropped, there is hope that new reclamation and miningequipment will fostergrowth of the earlier unviable deposits.Over the past two years, the global and the local steel manufacturing sector has changed radically.A number of steel firms have settled away and isolationism has gone higher. The South African primary steel industry has called for main steps to stay alive in harsh situations andto be competitive and efficient.

2.2.6 Textiles, clothing and footwear industry

The clothing and textile industry in South Africa has the visualization of using all resources; natural, human power and technology make the industry an ideal domestic and international merchandize for South African manufactured clothing and textiles. Despite the fact that the material and garments industry is little, it is very much set to make this introduction a reality. Because of innovative improvements, nearby material generation has advanced into a capital-serious industry, delivering manufactured strands in perpetually expanding extents. The attire business has likewise experienced profound innovative change and has benefitted from the nation's refined correspondence and transportation framework.

The increasing demand in the South African market reveals the intricacy of the markets, the local clothing and textile industry has also grown for example since the year 1994 over US%900 has been spent as a result they deal in numerous production from natural and synthetic fibre to non-wovens, knitting, weaving, dyeing and spinning "Since 1994, about US$900 million has been spent on modernising and upgrading the industry, making it efficient, internationally competitive, and ready to become a major force in the world market. In 2001 exports account for R1, 4 billion for apparel and R2, 5 billion for textiles, mostly in the US and European markets. Exports to the US increased by a dramatic 62% in 2001, driven primarily by the benefits offered under the Africa Growth and Opportunity Act (AGOA) which provides for duty-free imports of apparel produced in South Africa" (TIPS, 2013).

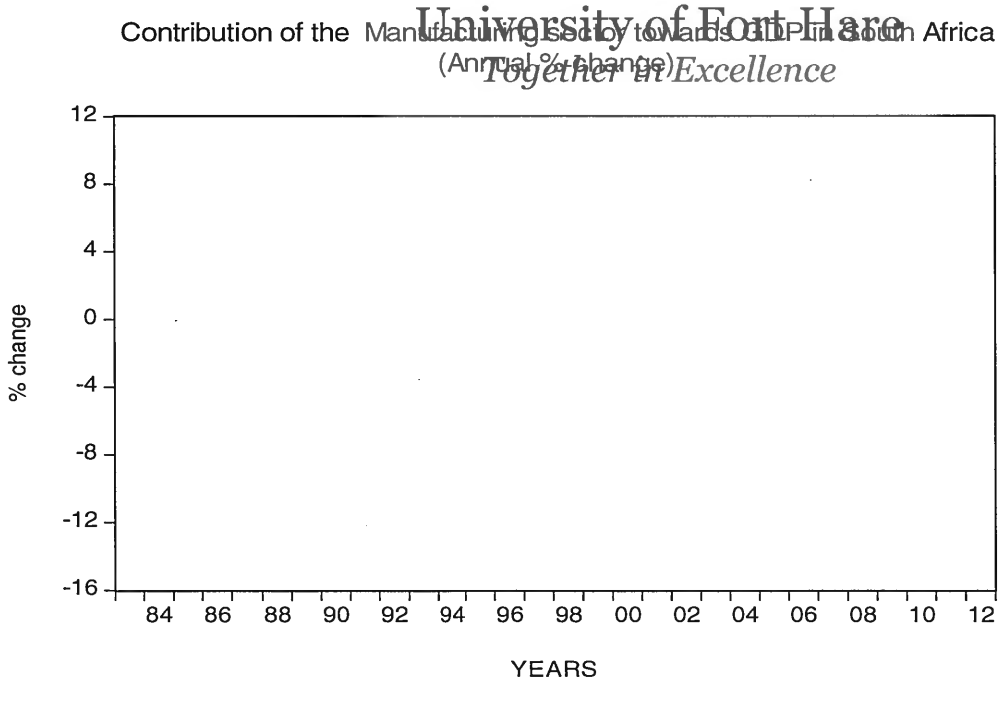
2.3 Contribution of the manufacturing sector to GDP in South Africa (1983-2012)

The Manufacturing sector's relative commitment to South Africa's Gross Domestic Product (GDP) has continually been weakening subsequent to 1981. "Manufacturing production reached a peak at 21.3% of the GDP in 1981 on the back of a closed economic system that operated in a sanction-burdened South Africa. As a result, growth of other sectors (such as Finance and Trade-related sectors) was hindered. Manufacturing production recorded the highest growth rate of 9.3% in 1981 as well, a period coinciding with the gold boom" (SEDA, 2013). Such happenstance focuses on the complementarity between the mining and manufacturing divisions. The contractionary incline in assembling yield saw following the mid-2000s has to a great extent been inferable from poor full scale financial approaches and was likewise worsened by the 2008 and 2009 monetary retreat.

The manufacturing division of South Africa confronts genuine and tying basic imperatives contrasted with its partners in rising economies, for example, China, the Philippines, Turkey, Brazil and India, to give some examples (TIPS, 2013).Such requirements decrease the capacity of the division to harvest the full advantages of good economic situations for instance a devaluing coin. Essentially, auxiliary imperatives likewise dissolve the intensity of the segment.

With a changed economy of the 1990s, the monetary portfolio of South Africa started to alter, as tertiary parts, for example, Finance and Trade started to pick up an expanding offer of financial action. This has shown a relative decrease in the manufacturing contribution to GDP. The worldwide financial emergency coupled with the defencelessness to global shocks has incited further disintegrations in the manufacturing sector contributions' to GDP. Against this background, a vital turnaround is needed for the area to recapture energy. The contributions from 1983 until 2012 are indicated in the diagram beneath.

Figure 2.1: Contribution of the manufacturing sector to GDP(1983-2012)



Source: StatsSA data (2013)

Figure 2.1 shows that growth of the manufacturing sector's contribution to GDP in the South African economy has been consistently declining over a prolonged periodfrom 1983 to 2012.

During the first quarter of 1984 the manufacturing sector's contribution to GDP decreased from 10%to -4% by third quarter of 1985. However this sector picked up again to a record high of 9.% by the fourth quarter of 1988. This was a highest pick which could not be achieved again during the period under review. During the early 1990s the manufacturing sector's contribution to GDP hovered around 8.5% until its huge decline to a record low of -14% in 2009 mainly because of the global economic meltdown. The sector began to climb upwards during the recovery phase to a record of 8.6% by second quarter of 2010 but soon declined during the first quarter of 2012 by almost 1%.

Noticeably, as a result of lack of attention in the competitiveness of the South Africanmanufacturing sectorand the structural impediments, energy shortages, rising input costs and inadequate infrastructure just to mention a few has made the manufacturingsectorof South Africa wrinkled over the period of ten years ascompared to the nation's peer markets. As such, this may well be credited to the way that the significant driver for local market's quick development through the decade has be[illegible]sed (specifically amid the blast years from 2003 to 2007), on the back of the liquidity blast. In applying that the economic generation side was ignored and the impacts of which were felt amid the retreat of 2009. TIPS (2013) states that goods and services imported into South Africa logged an average nominal development of about 15% per annum for 10 years, while export growth averaged about 13% over the same period. Hence, lower export development saw the economy fall more profound into de-industrialization, as the monetary structure moved in the direction of the tertiary segment exercises.

2.4 Factors affecting manufacturing Sectors

Manufacturing sector is very important to the South African economy due to the fact that its aids the development and economy growth of the nation in general by reducing the unemployment rate in South Africa and many other things. Macro-economic variables such as real interest rate, gross fixed capital formation and trade openness has been considered as factors affecting the manufacturing sector.

2.4.1 Exchange Rate Management

Roduck, (2007) confirms that an exchange rate not properly managed can be catastrophic to the development of an economy. With the increasing global integration of developing countries into the global trading system and involvement in international production networks, exchange rate

management becomes very vital. Exchange rate directly influences macro-economic factors such as the manufacturing productions, inflation, employment creation and income distribution. Exchange rates have the potential to directly improve the overall trade performance in a country (Flassbeck, et al. 2004). The exchange rate management becomes therefore necessary in South Africa being an open economy with lots of importation and exportation of goods and services.

There are several debates in many countries on the required level of flexibility of foreign exchange rate. Engel (2009) held that exchange rates ought to be spontaneously dictated by business constrains autonomously of any foreign trade intercession or focusing by national bank financial approach and secondly that the central bank should have control over the exchange rate market. This notion is based on the fact that markets work better than the government to determine the suitable level of the rate of exchange and secondly that the central bank can be handy in dealing with undesirable aspects such as currency volatility and exchange rate misalignment. Several measures have been taken to stabilize the South Africanforeign exchange rate market. These measures include alterations in the exchange rate regimes namely;

- Dual exchange rate regime under a managed float commercial and free float financial rand 1985-1995
- Unitary exchange rate regime (managed float rand) 1995-2000
- "Unitary exchange rate (Free floating rand with inflation targeting framework of monetary policy)" 2000 to date (Engel, 2009).

2.4.1The Role of Real Interest rate on manufacturing in South Africa 1983-2012

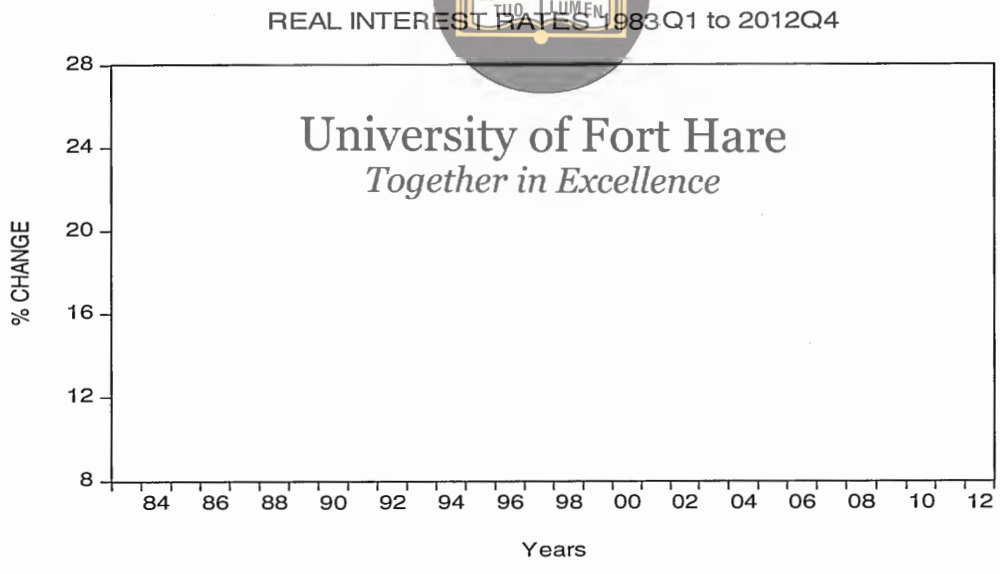
Even though in the long run real interest is subject to real factors like propensity to save as well as the efficiency of capital while the financial policy can determine the interest ratio in the short run, it is believed to be at the core of the transmission device of financial policy.

Granting South African short-term real interest rates was high during the 1990s according to history and when compared to a number of low-swelling nations, it is contended that this circumstance cannot be realised in disconnection from the present fiscal strategy structure and the level of inflation rate in respect to the target. Current ratesare very reasonable from the graph in page 15 reflecting to some extentthe RBSA'sprevailingobligation to the inflation target.

The real interest rates for South Africa slanted to extensively follow the global patterns. Thiswas the era when important exemptions existed, amid the 1980s, around the responsibility

emergency as well as monetary assents era, and since 1995 (SARB, 2012). This is particularly the situationwith the long term rate. However, the South African long-term rates do not appear to be out of line with worldwide levels, especially once we represent hazard premiums, fleeting rates are higher, due to a limited extent to fiscal arrangement choices. This circumstance is however steady with the encounters of different nations (for instance Australia and New Zealand) that have opened up their capital records, and in the time also adopted enthusiastic anti-inflation strategies where the bona fide rate of inflation is over the targeted rate. Hence, high short-term real interest rate would be expected to be high. Interest rate is essential to the manufacturing sector since it influences the performance of the sector. Change in real interest rate for example a fall in the interest rate has a positive effect on manufacturing because the borrowing cost will be reduced.

2.2: Real Interest rates (1983-2012)



Source: StatsSA data (2013)

Figure 2.2 shows changes in interest rates during the period under review. During the second quarter of 1983 interest rates were at about 15% and increased further to 25% by first quarter of 1985. However there was a decline of interest rates to 12.5% by fourth quarter in 1987. During the early 1990s interest rates climbed up to 21% during the second quarter of 1990 but decline thereafter to a low of 15.2% by end of second quarter 1994. Towards 1998 interest rates began to increase again to a record high of 25% by third quarter 1998 which was similar to the high

interest rates of 1985. However since 1998 there has been a gradual decrease in interest rates to a record of 13% by fourth quarter 2001 and a further decline to 8.5% by the fourth quarter of 2012.

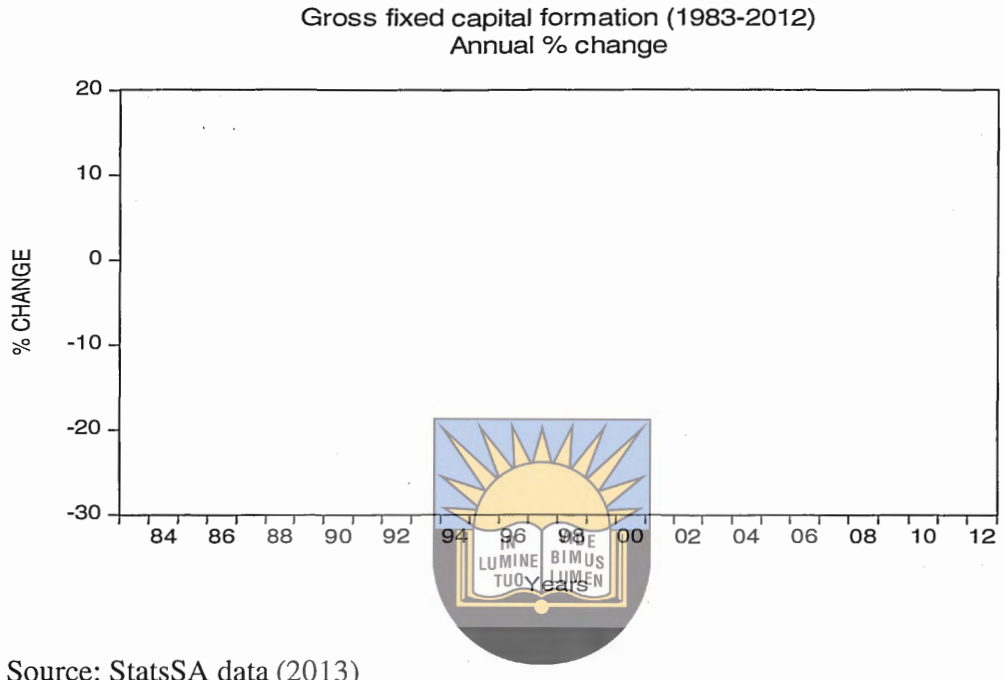
2.4.2 Gross fixed capital formation (GFCF) (1983-2012)

Gross fixed capital formation is a macroeconomic variable utilized in measuring the estimation of acquisitions of new or existing fixed assets by the business division, governments and "pure" household (not including unincorporated businesses) less disposals of fixed asset (Cohen, et al, 2012). GFCF is a part of the expenditure on GDP, and subsequently shows something about how a significant part of the new value added in the economy is contributed instead of consumed.It is can be called "gross" being that its measures does not exclude the consumption of fixed capital (depreciation of fixed resources or assets) from the investment figures. For the analysis of the delopment of the profitable capital stock, it is essential to measure the estimation of the acquisitions less disposals of fixed assets as a r[illegible]f and wear of existing asset that cannot be repaired.

Cohen, et al, (2012:16) postulated that GFCF is not a measure of aggregate venture, on the grounds that just the estimation of net augmentations to settled resources is measured, and a wide range of money related resources are prohibited, likewise supplies of inventories and other working expenses (the last included in middle of the road utilization). For example, if one experiences an organization asset report, it is effectively seen that settled resources are one and only segment of the aggregate yearly capital cost.

Most importantly,land sales and purchases are excluded from GFCF because when a"land is sold, the total amount of land already in existence, is not regarded as being increased thereby; all that happens is that the ownership of the same land changes. Therefore, only the value of land improvement is included in the GFCF measure as a net addition to wealth" (Cohen, et al, 2012:11).

Figure 2.3: Gross fixed capital formation trends (1983-2012)



Source: StatsSA data (2013)

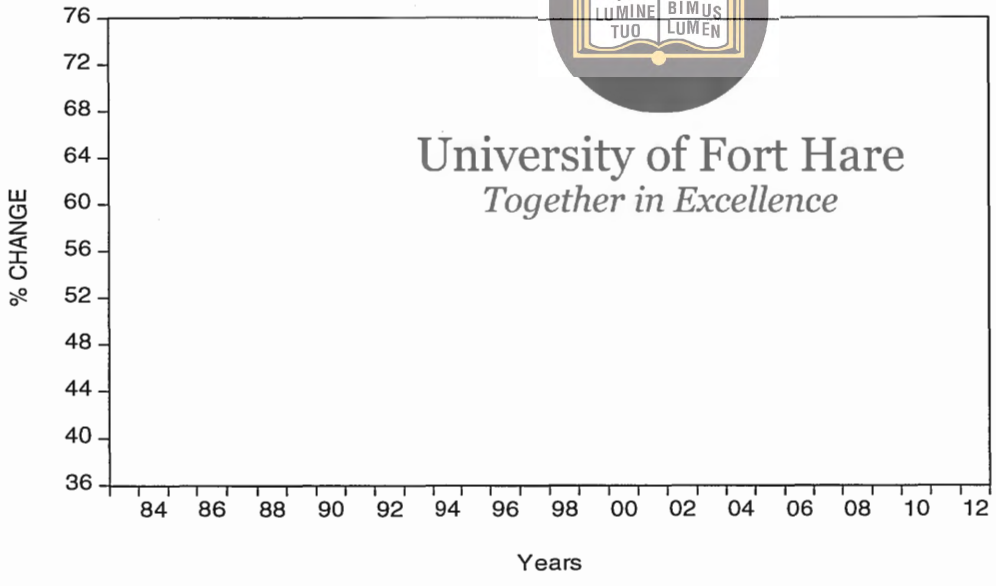
Figure 2.3 shows a gradual decrease in GFCF during the early 1980s to a record low of -22% but soon began to climb to a highest peak of 20% in 1988. This was a period of disinvestment and isolation in South Africa. The country during this period invested heavily in its infrastructure in order to weather the storm of disinvestments. However towards the 1990s GFCF began to decline to -10% by the third quarter of 1991 but soon started to move towards an upward trajectory reaching a peak of 14% by second quarter 1995 which was at the dawn of a new democratic South Africa. The implementation of RDP contributed a great deal towards GFCF during this period. However GFCF took a nose dive downwards to -10% by fourth quarter 1999 but it gradually increased afterwards reaching a peak of 16% by first quarter 2007. Nevertheless, mainly as a result of a global economic meltdown GFCF declined to a low of -13% by the fourth quarter 2009 and slowly began to increase reaching 7% by fourth quarter 2011. This increase can be attributed to the FIFA Soccer World Cup in 2010.

2.4.3 Trade openness in South Africa

Trade Openness (trade to-GDP) – This variable is ascertained as the basic normal (i.e. the mean) of aggregate trade (i.e. the entirety of exports and imports of products and services) in respect to

GDP that is X+M/GDP (Squali and Wilson 2006). Foreign trade openness influences productivity growth and manufacturing investment as wellas economic growth generally because it brings about creation of private sector thereby increasing the productivity base of South Africa.The Trade liberalisation became a central part of South Africa's post-Apartheid development strategy. Since 1994 trade policy has shifted towards achieving greater openness through removal of restrictive trade policies and promotion of some previously underperforming export sectors. Trade liberalisation began in earnest when the new government came into power. Some of the reforms introduced included the removal of import additional chargesthat were put on capital goods in 1994 and consumer goods in 1995.

Figure 2.4: The overview of the trend in Trade Openness 1983-2012



Source: StatsSA data (2013)

Figure 2.4 depicts a generally upward trend in trade openness in South Africa meaning that South Africa has ease of international trade across its borders. Trade liberalisation has been on the rise particularly since 1994. In 1985 trade liberalisation was 54.2% but gradually declined to a record low of 38.7% in 1992. This decline during the late 1980s can be attributed to disinvestments and isolation in South Africa. However since 1992, particularly after the release of the late first black President of South Africa, Mr Nelson Mandela, trade openness increased to

62.4% by 1992 and climbed further to a record high of 75.4% by 2008. However as a result of the global economic meltdown, trade openness declined to a level of 55% by 2010 but began to gradually increase to 60% by 2011 showing signs of an upward trajectory during this period.

2.5The Role of Exchange rates in South Africa

South African monetary markets (SARB, 2013). Given the openness of the South African economy, this business is an amazingly essential business sector. The forex business is basically an over-the-counter ("OTC") market (SARB, 2013). The essential point of the forex business sector is to encourage global exchange and worldwide cash and capital developments by giving a business where diverse monetary forms can be traded. In the South African forex showcase there are mostly two sorts of members: banks approved by the Reserve Bank to arrangement in outside trade, known as approved merchants, and intermediaries. The rand is an internationalized coin with the greater part of seaward exchanging occurring in London and New York. In April 2001 USD3.3 billion was exchanged between two seaward gatherings (seaward); USD3.5 billion was exchanged inland coastal and U[illegible]on was exchanged coastal seaward, i.e. between establishments in South Africa and those outside South Africa or seaward (SARB, 2013).

Exercises of the approved merchants are especially significant in the trade market. Approved merchants are approved to go about as principals in the forex market which implies that they can act in their own names and may likewise run positions in outside cash. Presumably the most critical purpose behind permitting them to run positions and to exchange their own name is to give liquidity in the business sector. Liquidity is an essential variable supporting the smooth working of the business sector (McCauley, 2013).Thus the approved merchants are business sector producers. Market producers in the remote trade business endeavor to make benefits by purchasing outside money at a lower value and offering it at a higher cost. The distinction, or the spread, is the bank's exchanging benefit. The approved merchants ensure themselves amid times of inordinate unpredictability in the forex market. Since high unpredictability is ordinarily connected with unverifiable and sharp cost developments, approved merchants will have a tendency to expand the crevice or spread between the purchasing and offering rates (McCauley, 2013). The banks are hesitant to exchange amid such circumstances by ethicalness of the way that the exchange rate could rapidly betray them, conceivably bringing about misfortunes.

Amid the previous decade, the turnover in the rand showcase in foreign exchange in South Africa has expanded fundamentally. Increments were especially detectable in 1995/6 and in 1998. Both those periods were described by emergencies in developing markets. The 1998 developing business sector emergency was extremely negative for South Africa from a financial perspective yet in any case brought about expanded turnover in the outside trade market(SARB, 2013). Since turnover gives a measure of business sector action, furthermore gives an unpleasant intermediary to market liquidity, the conclusion is that liquidity in the rand showcase in South Africa expanded altogether over the long run by righteousness of the increment in turnover.

According to SARB (2013) a number of developments in recent years contributed to a more market-orientated exchange rate system and increased volatility in the rand exchange rate:-

- Globalisation and the joining of world monetary markets had a significant effect on the methodology of conversion standard determination. The South African swapping scale got to be more presented and subjected to global advancements. In the period around 1995-1999, universal speculators gat[illegible]d thirty developing business sector nations together and advancements in one or a greater amount of those nations influenced others.
- Dramatic increments happened in private part worldwide capital streams. Volumes in the forex markets of the world accepted galactic measurements and the capacity of national banks to impact economic situations through mediation decreased.
- The slow abrogation of trade controls in South Africa presented a component of more prominent unpredictability in the nearby remote trade market.

The rand exchange market has the forward and spot exchange market. This means that the rand foreign exchange market is an over the counter market and this form of market trading does not happen at the marketplace center where sellers and buyers meet. Rather, "the rand foreign exchange market is a worldwide linkage of bankcurrency traders, nonbank dealers, and foreign currency brokers who assist in trades connected to one another via a network of computer terminals, and automateddealing systems" (Standard Bank, 2012). The rand exchange market operates under the influence of supply and demand for the rand and other currencies. Since foreign exchanges include the trading of one money for another, the conversion scale itself is dictated by the conditions encompassing demand and supply for the applicable coinage.

2.5.2 Significance of the rate of exchange in the manufacturing sector

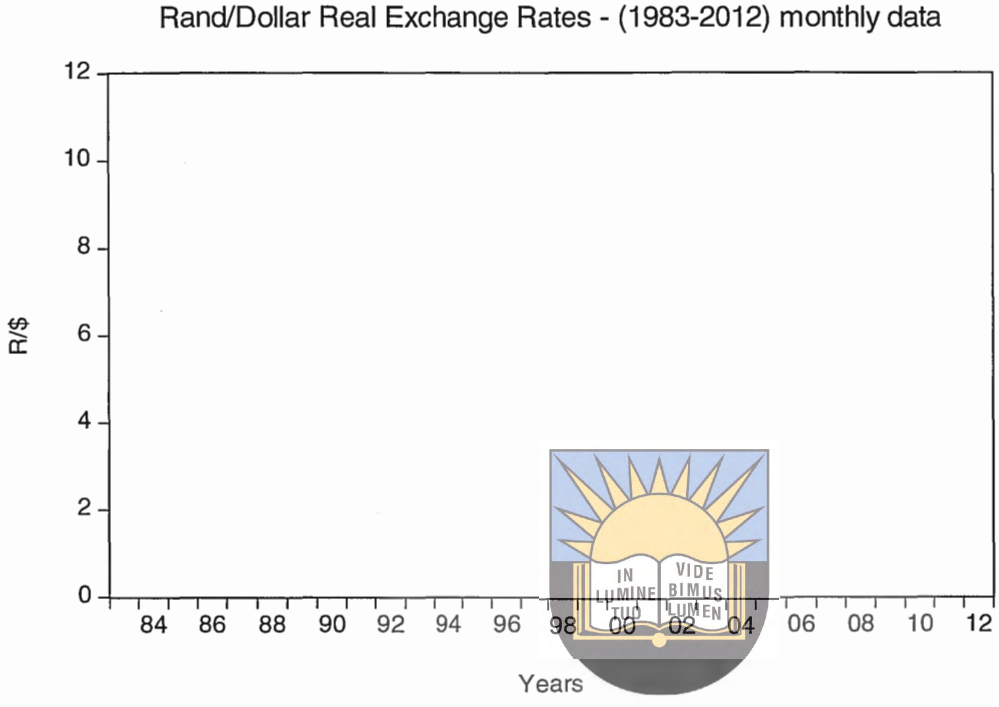
The nominal and real exchange rates are significant variables; however the nominal exchange rate has a tendency to dominate the real exchange rate due to its position in day to day exchange rate market. The nominal exchange rate is characterized as the cost of one national currency to the other; while real exchange rate is characterized to be the nominal exchange adjusted for relative inflation differentials (Takaendesa, 2006). The nominal exchange rate interfaces the price system and thus directly permits international traders to analyseprices.

Takendesa (2006) proposes that adjustments in the nominal exchange rates have an immediate effect on the imports and export trade (current account) and the capital flows (financial account) and consequently the balance of payment. Concerning its effect on exchange rate, currency appreciation renders a nation's products cheapand makes foreign goods expensive in that nation. A few Economists have contended that exchange rates have vital impacts not just on economic performance and universal competitiveness, but also on the diverse areas of the economy, employment and so on. In fact the exchange rate is crucial to competitiveness and international trade and what is traded is essentially from the manufacturing sector (Obadan, 1994; Edwards and Savastano, 1999 & Joyce and Kamas, 2003). It is therefore of great importance to analyse the trends of the real exchange in this study.

2.5.3 Exchange rate trends in South Africa (1983-2012)

The period after 1994 saw South Africa re-entering in the global financial markets. Fedderke et al (2007) noted that "prior to 1994 there were sanctions imposed on South Africa and this restricted global financial movements into South Africa. The re-entry of South Africa into the globalised financial markets and the opening-up to international competition led to a sharp increase in the participation by non-residents in the domestic financial markets". This has caused, among other things, the rand's exchange rate to be gradually more affected and thereby prejudiced by growths in the global markets. This has contributed significantly to the instability of the rand. Hodge (2005) held that the "real consequences of the volatility or instability of the rand are an example of what are called hysteresis effects. Hysteresis refers to any situation where a temporary change in a variable has a lagged effect. In other words, the equilibrium value of a variable depends upon its own recent history." The rand has not been stable in the period between 1983 and 2012. This is shown by the graph below.

Figure 2.5 Real Effective Exchange rate trends (1983-2012)



Source: South African Reserve Bank data (2013).

Figure 2.5 shows that the rand has been unstable as shown by its volatility during the period under review. The instability of the rand is apparent in all the years from 1983 until 2012. In all these years the rand has been fluctuating considerably. The rand depreciated sharply in 2002 reaching an all-time high of R12.00/US$. The Commission of Inquiry into the Rapid Depreciation of the Exchange Rate of the Rand (2002) contended that the disease emerging from Asian emergency hit every developing market in May 1998 and the rand was tangibly influenced, as with coinage of numerous other creating nations (Nowak and Ricci,2005).Considering the generally weak rand during the period under review, it stands to reason therefore to expect a rise in exports particularly from the manufacturing sector thereby creating jobs and contributing towards economic growth in South Africa.

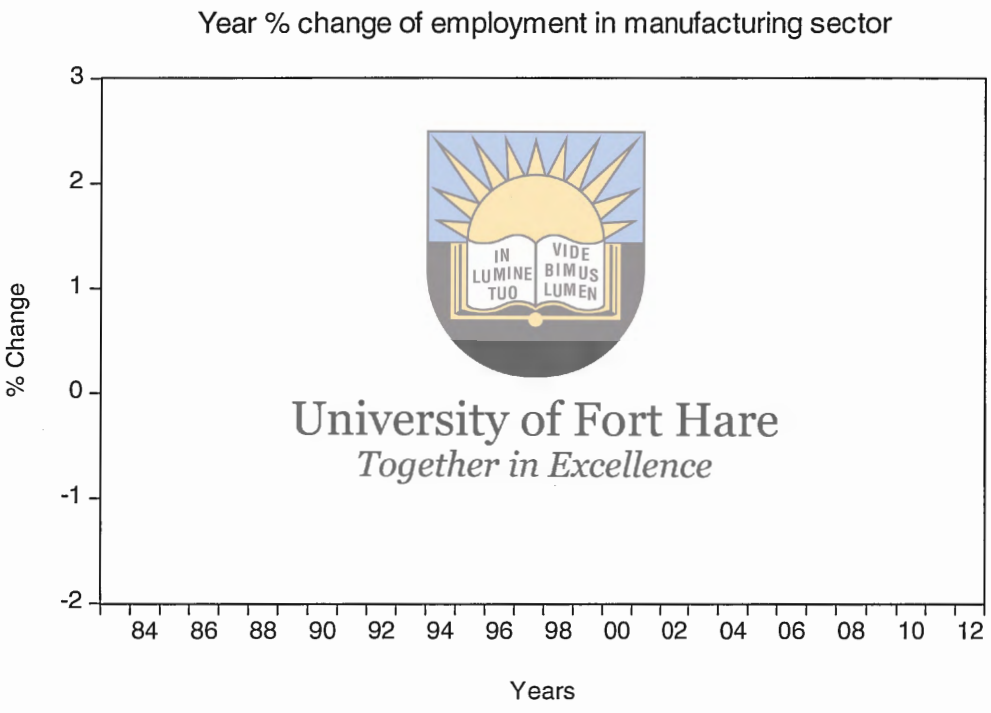
2.6Employment in the manufacturing sector

South Africa as a nation has advanced arecognised, broadened manufacturing base that has demonstrated its versatility and possibility to contend in the worldwide economy. The manufacturing sector gives a locus to fortifying the development of different exercises, for

example, administrations, and accomplishing particular results, for example, work creation and financial strengthening. Figure 2.6 below shows annual percentage changes in employment in the manufacturing sector.

Figure 2.6: shows the annual percentage variations in occupation levels in the manufacturing sector in the period under review.

Figure 2.6: Employment in the manufacturing sector (1983-2012)



Source: StatsSA data (2013)

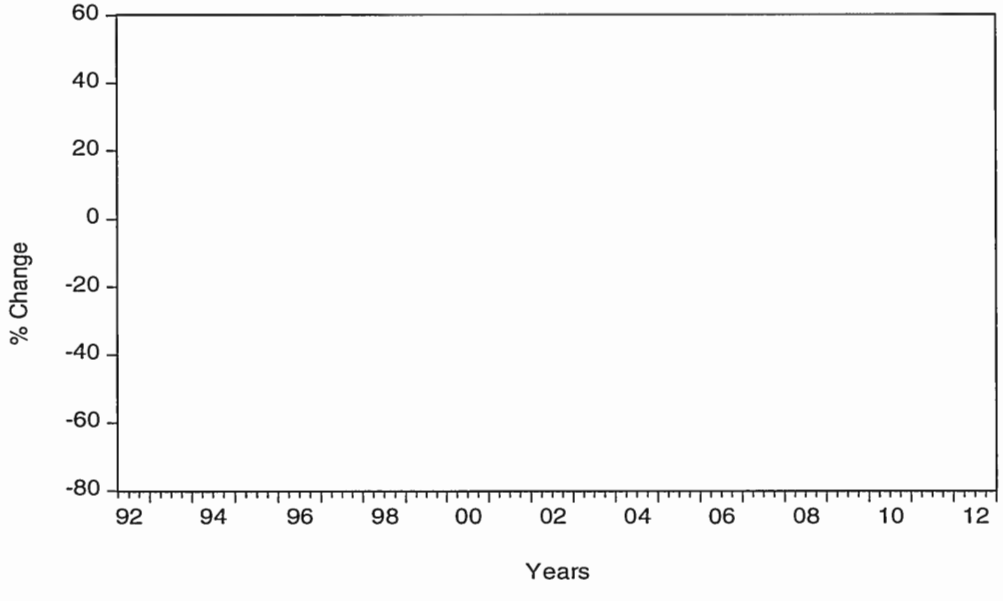
Employment in the manufacturing sector has been fluctuating throughout the period 1983 – 2012. Figure 2.6 shows a decline by 0.6 in second quarter 1985 but soon increased by 0.9% by the first quarter of 1988. However by the fourth quarter of 1994 employment increased by 0.6%. There was a slight decrease by 1.2% during the fourth quarter of 1997. From the year 2000 employment in the manufacturing sector was on an upward trajectory reaching an increase by 0.5% by second quarter of 2004. However there was a slight decline by 1.7% during the third quarter of 2005. In 2006 second quarter employment levels increased by an all time high 2.6%; an increase which was not realised again in this sector since 2006. From the beginning of 2007 through to 2012 changes in employment levels in the manufacturing sector has remained

negative. This means that the manufacturing sector has been shedding jobs during this period mainly as a result of the global economic meltdown amongst other reasons.

2.7 Export sales in the manufacturing sector

The manufacturing sector is a vital sector for boosting exports in South Africa. A number of industries falling under this sector are actively involved in exports of goods to other countries (Pan African Investment and Research Services, 2011). Assembling remains a critical segment inside the South African economy issued its capability to create positive and noteworthy overflow consequences for the economy and the way that the part reliably includes among the main three segments with the most astounding multiplier impacts as far as yield, work, trade income and monetary income. Figure 2.7 below portrays exports sales in the manufacturing sector during the period 1992-2012. Data for export sales in the manufacturing sector before 1992 could not be found during the time of this research.

Figure 2.7:Manufacturing sector export sales(1992-2012)



Source: Quantec data (2014)

Export sales in the manufacturing sector remained quite high and robust during the period 1992 to 2002. There seems to be a significant drop in export sales beyond 2002 and the sales remained in the negative figures until early 2010. The negative export sales was also aggravated by the global economic meltdown during 2008. "Despite the slow pick up in global demand post-recession, due to the economic uncertainty amongst the developed economies, export growth has risen firmly in emerging market peers (particularly East Asian economies), making a full come back from the losses of 2009. These economies not only strengthened regional trade, but benefitted from their already existing strong industrial policies which put great emphasis on driving manufacturing competitiveness" (Pan African Investment and Research Services, 2011). South Africa's inability to bounce back immovably post the retreat can be inferable the absence of accentuation on assembling aggressiveness. While South Africa's companion nations delighted in thriving assembling segments, sound mechanical approaches and appropriations, the local division, except for the car business, was left to market strengths. In the meantime, a solid rand was exceptionally supported, as it saw substantial capital inflows and expanded direct venture thrive into the nation. A solid and unstable rand, then again, was not good for manufacturing sector and for industrial development base of South Africa(Pan African Investment and Research Services, 2011).

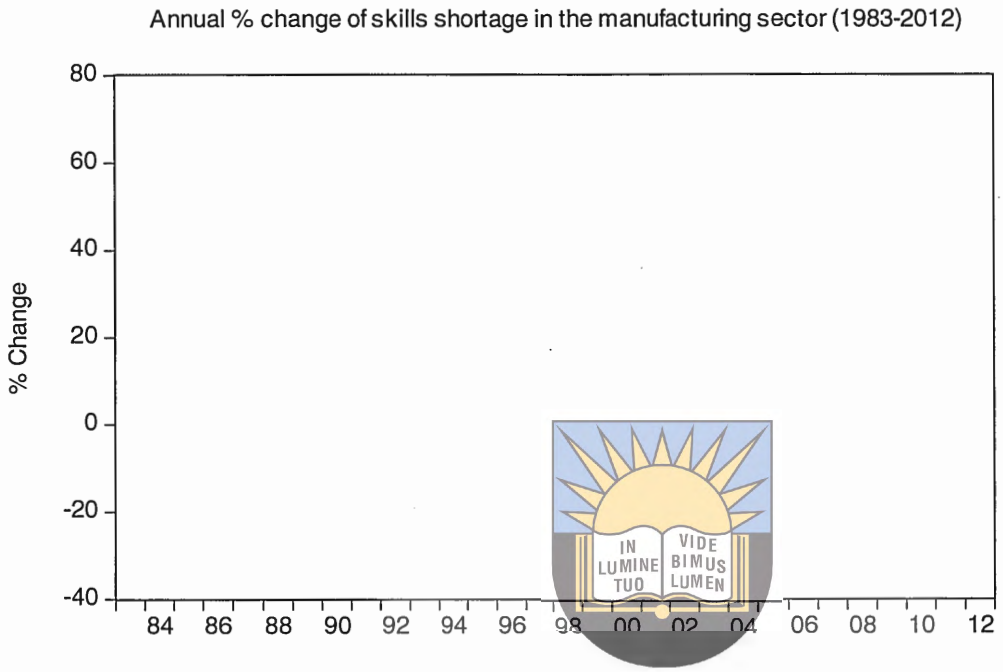
The "contractionary trend in manufacturing output observed from the mid-2000s has largely been attributable to poor macro-economic policies" (Dube, et al, 2007:33).The manufacturing sector of South Africa experiencessevere and obligatory structural restrictions. Such imperatives decrease the capacity for the part to harvest the full advantages of great economic situations e.g. devaluing money. Essentially, basic limitations additionally disintegrate the intensity of the segment.The following section of the chapter presents a discussion on selected biding constraints on the manufacturing sector in South Africa.

2.8 Constraints facing the manufacturing sector in South Africa

2.8.1 Shortage of skilled workers

A binding constraint facing the manufacturing sector in South Africa is shortage of skilled labour. Figure 2.8 below portrays the magnitude of the deficiency of experiencedworkforce in the manufacturing sector in South Africa.

Figure 2.8: Scarcity of experiencedworkforce in the manufacturing sector (1983-2012)



Source: Quantec data (2014)

As it can be noted in figure 2.8 above there was a huge reduction in shortage of skilled labour in the manufacturing sector during the early 1980s to mid-1990s. Although there seems to have been a significant drop in skilled labour shortages in the South African manufacturing sector, particularly during late1990s to late 2012; skilled labour shortage is still considered to be a huge problem hindering the growth of the South African economy. This is particularly due to emigration of highly skilled workers, immigration restrictions for highly skilled foreigners and a dysfunctional education system in South Africa (News24, 18 July 2014). The abilities deficiency is a component of both request and supply calculates. Interest components identify with the amount of occupations accessible, while supply elements identify with the amount of suitable candidates. There are at present an expected 470 000 opening in the privately owned businesses, which are positions that could be filled very quickly if the aptitudes were accessible (News24, 17 July 2014). More than a large portion of (52%) of these positions are in administration and the rest of are to a great extent expert positions in bookkeeping, law, medical practitioners, designing and accounting. The only way to finding a successful

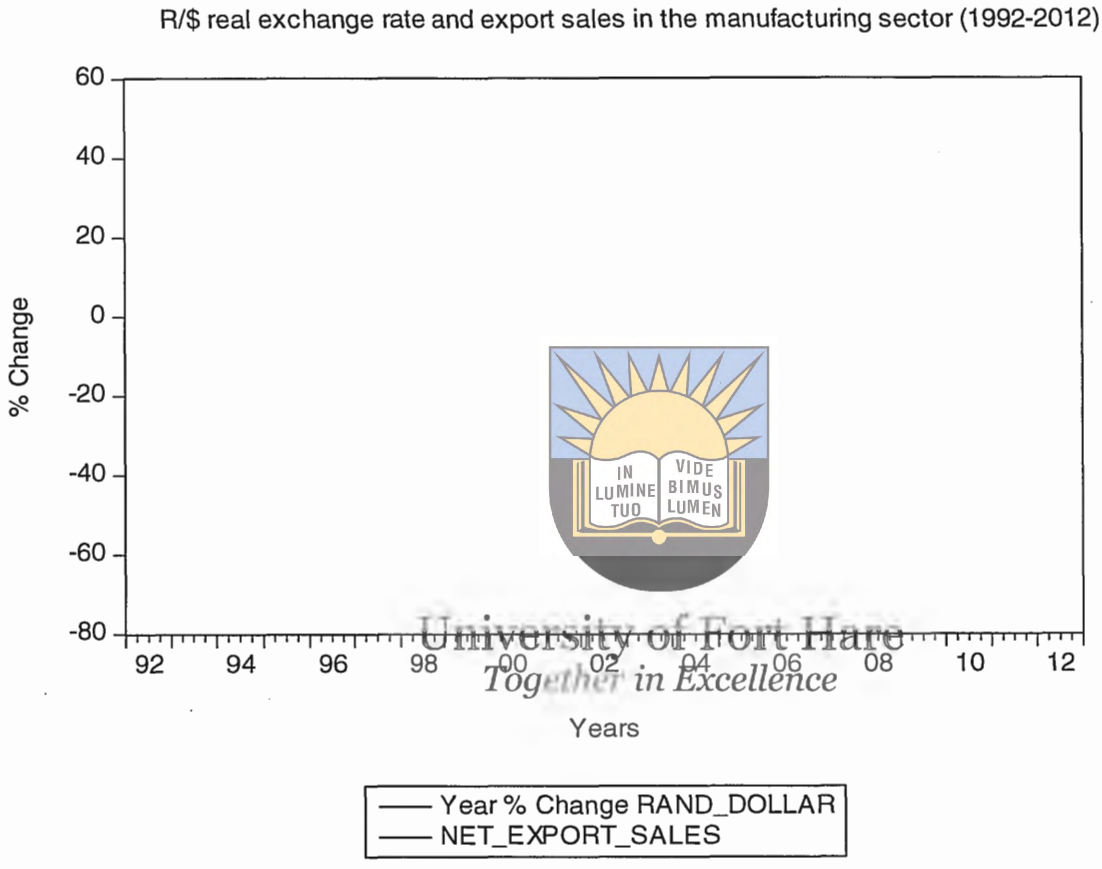
employment is when one possesses a tertiary education. Unemployment is thus as a result of lack of qualification looked for by the employers.

As tertiary institutions keep on producing humanities, arts, sociology and mid-level proficient graduates, educators, doctors and nurses. Employers thus look for supervisors and high level proficient graduates; bookkeepers, legal advisors, specialists and designers to be given employment. Up till now the South African government still find it exceedingly hard to convey training and educate people toward the South African economy's necessities (News24, 18 July 2014). South Africa has consistently been rated low when it comes to mathematics and science and education scores in general. (News24, 17 July 2014).

2.9 Exchange rate volatility

Notwithstanding, the recent rand deterioration, the unstable rand and persistently strong rand has through the years weaken the competitiveness in the manufacturing sector; this has especially been unsafe by various basic inefficiencies which hamstrung the segment (Pan African Investment and Research Services, 2011). Despite the fact that the domestic currency has deteriorated (from August 2011), the unpredictability in exchange rate movement driven by global risk remains hazardous to profit margin and overall revenues. The embedded inefficiencies of South Africarestrain the degree of the advantagesderived from weaker money (Pan African Investment and Research Services, 2011).Figure 2.9 below portrays the exchange rate between South African Rand and US Dollar and export sales in the manufacturing sector.

Figure 2.9 Rand/US Dollar rate of exchange and export sales inmanufacturing sector (1992-2002)



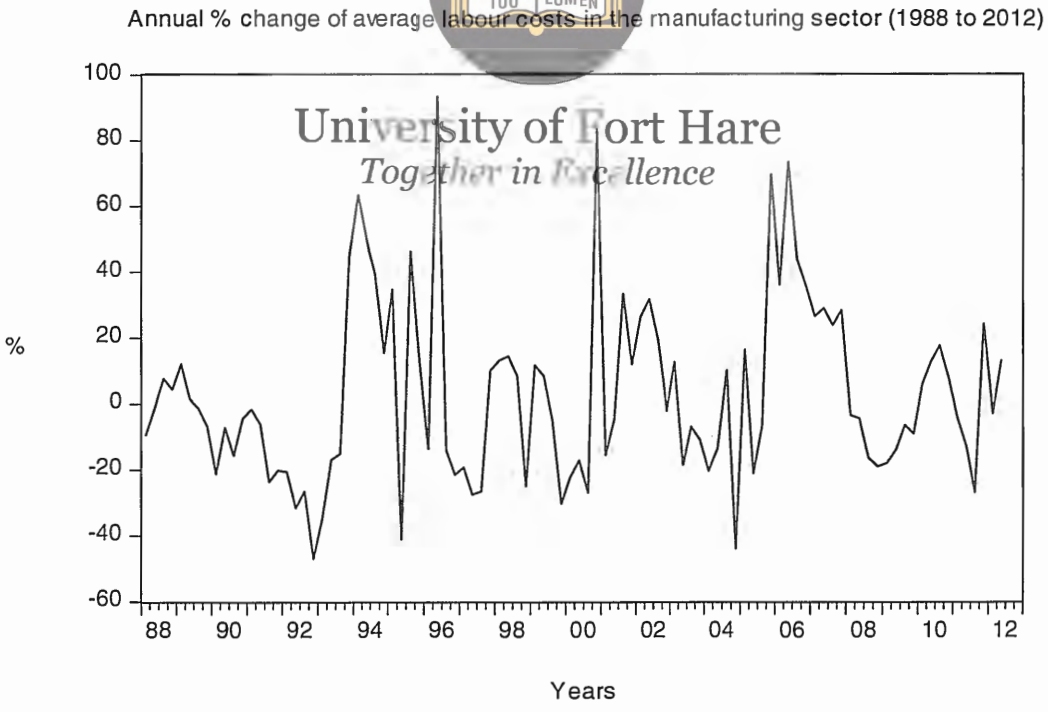
Source: Quantec data (2014)

As can be noted in figure 2.9 above, the rand has been very volatile during the period 1992 to 2012. Figure 2.9 depicts a trend whereby a depreciating rand leads to an increase in export sales particularly during the period 1992 to 2002. However the period 1999 to 2000 is characterised by a situation wherein the rand weakened yet the export sales dropped. Again this occurred during 2007 to 2009 where South Africa did not leverage from a weak rand. It is particularly in 2002 where a weak rand benefited the manufacturing sector in terms of export sales. Clearly the entrenched structural ineffectivenessof South Africa bounds the degree of the achievements derived from a weaker money.

2.10 Average labour costs

According to Business Day (2014) South Africa is missing out on business and chances to create more employments in view of heightening work expenses such as labour cost and other price increments.Employers find it hard to cope with higher labour costs. These employers were having goods produced elsewhere and brought into South Africa as finished products, which compromises local jobs (Business Day, 24 January 2014). This basically means that each product that is imported is jobs being exported. Increasing labour costs leads to manufacturers switching to capital means of production. Figure 2.10 below portrays average cost of labour in the manufacturing sector.

Figure 2.10: Annual % change of labour costs in the manufacturing sector (1988 to 2012)

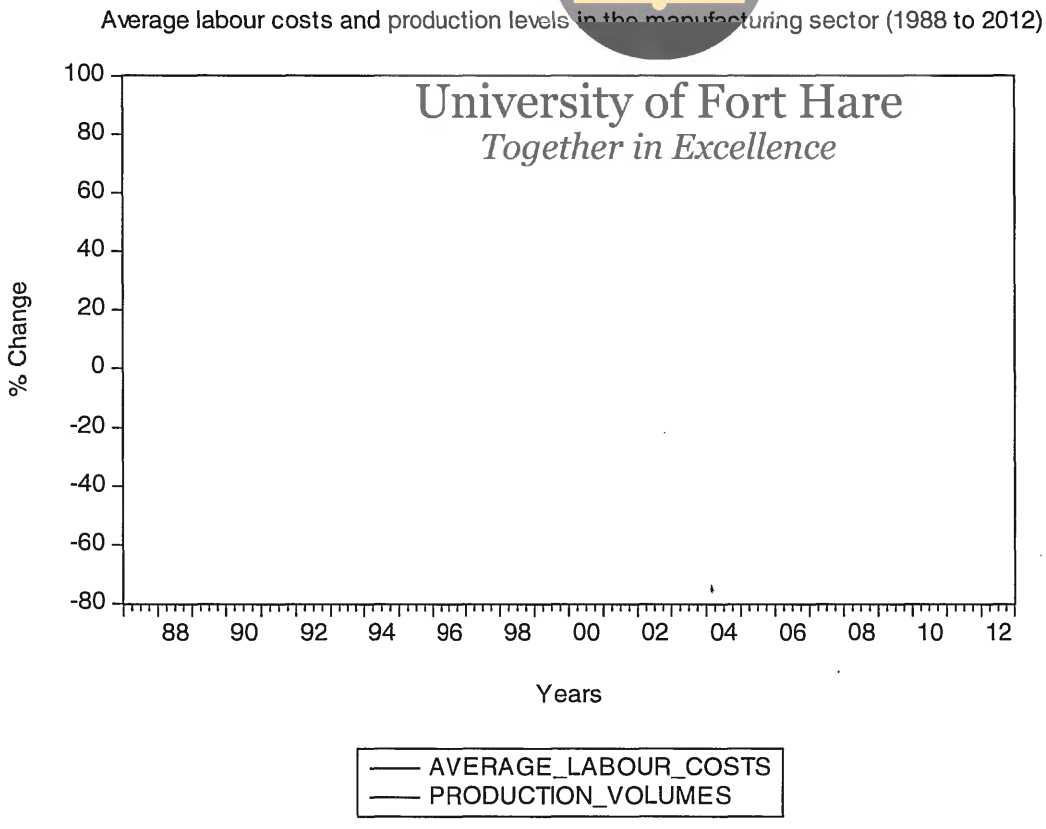


Source: Quantec data (2014)

As it can be noted in figure 2.10 above, the average labour costs decline during the late 1980s but soon began to climb in 1992 by almost 60%. Labour costs remained high during this period reaching almost 93% by 1996. This increase was followed by a decrease in labour costs by about

27% by the third quarter of 2000. There was another significant drop in avarege labour costs by about 44% in 2004 followed by a significant increase by almost 73% by the second quarter of 2006. During the period of 2008-2010 there was another drop in average labour costs mainly due to shedding of jobs as a result of the global economic meltdown. However during the recovery period average labour costs are again increasing due to rising prices and strikes for high wages in South Africa. According to Bernanke (2004), increase in labour costs which are not accompanied by increase in productivity results in inflationary pressures throughout the economy. Certainly evidence suggests that increase in average labour costs in the manufacturing sector has not been accompanied by an increase in production levels. This is shown in figure 2.11 below.

Figure 2.11: Average labour costs and manufacturing levels in the manufacturing sector (1988 to 2012)



Source: Quantec data (2014)

Throughout the period 1988 to 2012 the average labour costs have been above production levels in the manufacturing sector in South Africa. Strikes in manufacturing sector, particularly the automotive sector, severely dented output and curbed economic growth during the period under review. Accordingly, labour in South Africa had become too expensive and productivity does not match the steep wage increases.

2.11 SUMMARY

A general idea of the trends of the manufacturing sector and the real exchange rates in South Africa over the era of 1983-2012 was revealed in this chapter. Trends of variables that affect the manufacturing sector such as gross fixed capital formation, real interest rate and trade openness were also looked into. It was found that trends in the real exchange rates were unstable with many factors affecting it for example government policies, economic and political developments inside and outside South Africa. Followed by this chapter is the literature Review where theoretical and empirical studies will be analysed.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

A great number of debates were raised regarding the impact of the real exchange rate on manufacturing sector by various researchers and different conclusions had been made. The purpose of this chapter is to analyze the models and researches carried out in different countries and identify the set of variables that would be utilized in this field. This chapter is has three sections. Firstly the theoretical literature is evaluated followed by the second section which elucidates the empirical results on this topic and lastly the section which closes the chapter.

3.1 Theoretical Literature

Theories reviewed in this section include cha[illegible]ial profitability, the purchasing power parity (PPP) concept, the uncovered interest parity (UIP), Balasa Samuelson theory, the Salter Swan model, three good models, Mundell-Fleming, Export led growth theory, commercial policy, monetary policy as easily as traditional approach, nominal exchange rate policy and foreign exchange reserves.

3.1.1 Changing Sectorial Profitability

The immediate result of rate of exchange depreciation is the adjustment in the relative cost of the tradable leading to an increased requirement for the exports and the import competing goods(Leslie, 1988).“The foreign currency cost of exports fall results in a positive impact on demand and the domestic currency price of imports rise” (Leslie, 1988:16). As exports turn out to be more competitive in the worldwide market due to low costs, rise in the costs of imports has resulted to fall of their requirement. On this account local producers find it profitable to increase their investment in terms of capacity, equipment and new works. The hike in the quantity demanded of the exports, nevertheless, hinge on the elasticity of demand for the exports, market place and the nature of the merchandise. However, appreciation in exchange rate leads to loss of competitiveness of the exports and increased influx of imports and exports on the other side becomes more inexpensive. Leslie (1988) also explained that “this loss of competitiveness of the

exportable goods in the global market and cheaper imports makes investment in the tradable sector unattractive."

Clearly the aftermath of this contributes to a reduction in investment. Currency depreciation may also impose negative impacts as well (Leslie, 1998). An increment in the tolls of the exportable goods in the depreciating country leads to a contraction of demand (Edwards, 1986: 20). Therefore, the use of both exports and import competing goods in the domestic economic system may fall. Edwards (1986) opinionated that the contraction of local demand because ofthe hike in costs leads to a decrease in real income of the customers in conditions of the domestic currency which will be larger than the growth in foreign demand. So this can be argued that "a depreciating real exchange rate raises the relative price of exportable goods boosting more production of local goods and less use of import substitutes and exports" (Leslie, 1988: 88), while appreciation of the exchange rate depresses demand for goods passing to lower output. To the point of affecting investment in a negative way that is going to decrease in investment. Furthermore, if the localmanufacturers depend on imported intermediate inputs, the marginal cost of production rises as the real currency price of imported inputs increases. This hike in the price of manufacturing involves the supply of exportable goods negatively. Thus, the gross effects of exchange rate movement are higher prices and open-ended quantity response. This proposes doubt in the anticipatedinfluence of exchange rate movements on investment. The general equilibrium makes it possible for the industries in the tradables sector and other manufactures to be influenced by the exchange rate. Leslie (1988: 107) states that the existence and substitutes "in production between the tradable and the non-tradable and the hike indemand for the tradable caused by depreciation lead to the trend of capital away from the non-tradable to the tradable sector." Component inputs are scarce when it does to non-tradable sector because the elaboration in the tradable sector requires increased input.

Therefore, the production cost in the non-tradablesegment increases, thereby making it less good-looking and this seems like a supply shock to the nontradables sector. "It is eminent to know that the transfer of resources from the non-tradables to the tradables sector occurs when the comparative cost of tradables rise in the devaluing country" (Edwards, 1986). The magnitude of such reallocation of resources between the tradables and nontradables sectors in the economic system is strung-out on the monetary value of resettlement and the data capacity of the exchange

rate in response to exchange rate movements. In case the resource allocation is costly, resources would therefore not run from one sector to another. It has been found that the larger the measure of improbability surrounding exchange rate trends, the more grudgingly will resources be shifted from one sector to another (Edwards, 1986: 87). Consequently, indecision is anticipated to interactively diminish the responsiveness of speculation to swapping scale focuses.

3.1.2 The Purchasing Power Parity (PPP) Theory

The Purchasing Power Parity (PPP) essentially expresses that a unit of any given coin ought to have the capacity to purchase the same amount of merchandise in all nations (Cheun, Yin-Wong, 2009). Numerous financial analysts accept that the PPP depicts the powers that determine exchange rate in the long run. Subsequently, the nominal conversion standard between the currencies of two nations must mirror the distinctive value level in those nations (Cheung and Yin Wong, 2009:45).PPP, which forges a substantial element of the exchange rate determination approach, upholds that there exists a relative correlationamong the rate of exchange of the currencies of two nations and their comparative [illegible] inflation. The hypothesis is grounded on the jurisprudence of single price, which endorses that in the absence of trade barriers and shipping costs, spatial commodity arbitrage warrants that the cost of any product is balancedthrough different states. The purchasing power parityconcept can be worded in two ways: in absolute figures. The absolute configuration of purchasing power paritystresses that the balanced exchange rate balances the general buying power of a given income looking at the relative cost points. It therefore, "relates the level of the exchange rate to relative cost points. The relative form argues that changes in exchange rate measured from a base period reflect changes in relative price levels" (Krugman and obstfeld, 2009:115).

3.1.3 The Uncovered Interest Parity (UIP)

The Uncovered Interest Parity is the capital account equivalent of the PPP. This structures the assumption of the Capital Account Monetary Model exchange rate determination, which keeps up that the exchange ratemoves in such a route, to the point that the normal rates of return are evened out across the countries (Mishkin, 2006: 208).This implies that the spot rate and expected value are not different between the currencies where asset is been held with normal interest charge. The UIP presumes that capital is perfectly mobilenationwide, that is, there are no trade controls, no exchange expenses, and that little or no risk are in for investors (Baba et al,

2009: 11).This means that assets denominated in different currencies are considered by investors as perfect replacements. Hence, the jurisprudence of one price will hold for asset returns rather than prices of tradable goods. Under this scenario, if the anticipated changes in the nominal spot exchange rates reflect that expected inflation rate differential in two states which ensure that real exchange rate stays constant, UIP implies that the real interest rates will be the same in two countries (Baba et al 2009).

3.1.4 Balassa-Samuelson Model

The hypothesis is grounded on the discrepancy of output levels in terms of trade and non-traded products. Dimitar (2007) explains that rich nations focus on and produce commodities that are regarded to have greateroutput and that are easily traded globally. A spontaneous example of the Balassa-Samuelson effect at work, supposing that the home state is fertile because it is really adept at producing manufactured goods like automobiles, but it has no productivity advantage relative to the strange nation in conditions of a non-switched services like haircuts (Dimitar, 2007). Greater output of domesticworkers in the automobileindustry affords them a higher salary. But it also demands that the wage be high for haircuts, or else no worker would be willing to offer this service, preferring instead to work in the car manufacturing company. "Granted that a haircut requires the same quantity of labor time in each country, but the wage rate paid to the haircutter is higher at home, it is clear that the cost of haircuts will be higher at home. Since the purchase cost of autos isthe same acrosscountriesdue to arbitrage through trade, the higher the cost of haircuts makes the overall price of living higher in the home country" (Dimitar, 2007).

In addition the hypotheses also suggest that rural regions with rapid growth rates when it comes to trading would have real exchange rates that are appreciating over time.A case study is that of China or fast growing countries whereby pressure might be expected on the real exchange rates to appreciate as a result of the rapid growth on the productivity. Similarly, the speculation predicts that if new states joining the European Monetary Union experience a speedy development and they get up to richer European nations, they too ought to expect an appreciating exchange rate (Grabry, 2008).Meanwhile a monetary union viably infers that the substitution rate is determined, this pressure ought to be communicated in this order a higher inflation rate in nations with higher growth rates.The principle stays the same: greater degrees of

maturation are linked to a lift in the comparative price of enduring. From the analysis above, it can be said that Ballasa Samuelsons model faulted the purchasing power parity theory.

3.1.5 Salter-Swan-model

The Salter-Swan-model has been brought about by two Australian market analysts Salter and Swan in the1950s. Edmund (2012) held that it takes care of two reasons: to begin with, it serves to see the capacity and association of basic variables inciting full scale financial disequilibria, and second, it gives a structure in which the basis behind and the posssible results of policy intervention, including policy subsumed under 'adjustment', can be psychoanalyzed.At the heart of the mannequin is the differentiation between 'tradable' and 'non-tradable' products and services. Tradables can be referred to as all goods and services created in an economy which are really or possibly traded (imported or exported). Non-tradables are products and services which do not crosscountry, either in light of the fact that there is restriction on transporting such or because of the essentially non-treatable nature of the goods and services (for instance land, services, building, or good which are not been traded for in the world market except for perishable items) (Edmund, 2012). The most paramount contrast between tradables and non-tradables emerges from the procedure of price formation. In an open dependent economy (dependent implies that a nation is a price taker on the global market), the price of goods is thought to be squared up by globalmarket prices (r instance, in the US-$), "translated" through the exchange rate into domestic business costs. The costs of non-tradables are thought to be characterized by demestic supply and need.

3.1.6 One good (tradable) model

One good model holds that a single nutrient is presumed to be globally traded and is anticipated to match its cost in all markets – the law of single price. Undoubtedly, there can be no real exchange rate in such models, since the real exchange rate turn out to be the distinct between domestic and foreign goods. One good model is useful when analysing pure monetary phenomenon for instance increase in prices and certain methods to justify the determinants of the remainder of expenditures (Montiel 2003:313).

3.1.7 Three-good (exportable-importable-nontradable) model

The three-good modelvalidatesterms of trade; it is quite different from the Salter-Swan model as above which assumed that the terms of trade are exogenous. According to Hinkle and Montiel

(1999) this context consist of "exportable and importable goods (although the two may be developed and eaten at home), as well as non-tradable goods". This framework proposes two exchange rates, provided an alternate meaning of the terms of exchange, since there is two foreign goods. The primary meaning of the exchange rate is thereal exchangewhich also means the export exchange rate; this is refer to the ratio of the domestic currencyprice of the goods exported to the non-tradable goods price. Secondly exchange rate is termed the imports real exchange rate, which is the proportion of the local currency cost of products and service that can be imported to the cost of the non-tradable products, though the terms of exchange is characterize as the proportion of the domestic currency cost of the exportable products of the domestic currency cost of the importable products. Montiel (2003:314) point out that "this theoretical account is beneficial for studying the macroeconomic impacts of terms of trade changes, as greatly as the effects of changes in commercial policies that move the domestic relative prices of exportable and importable. This theoretical account is suited to developing countries that can easily influence their terms of trade unlike the Salter-Swan model which is most appropriate to small economic systems without an impact on their trade terms. The actual estimation of the internal real rate of exchange built on the Salter- Swan system theorystances empirically and conceptually. In principle, the real exchange rate by standard ought to be measured by using domestic price indices of tradable and nontradable goods. On the other hand, price value data are absolutely accessible for imports, locally produced goods although not for tradable and nontradable goods.

3.1.8 Mundell-Fleming (complete specialisation) model

The Mundell-Fleming modelpresumes that the domestic economic system and the repose of the world are each specialized in the yield of a single good and that these goods which are traded internationally are not impeccable replacement for the other. This is applicable to countries whose trade consists largely of factory-made commodities,instead of primary goods or unprocessed materials. According to Montiel (2003:313) "manufactured goods incline to be imperfect substitutes for what the remainder of the world gets. In this setting, thereal exchange rate is tenacious as the number of units of the domestically manufactured food that have to be compensated for each unit of the foreign good."The utilization ofthe real exchange rate in Mundell-Fleming model is to decide the composition of absorption between goods

produceddomestically and those that are abroad. This structure results in the real exchange rate coinciding with the terms of trade of a nation, even though the two notions are not the same. This is imputable to the premise of consummate specialization in production. Though this theoretical account is limpidly not pertinent to most developing markets whose exports are mainly not manufactured products, the real exchange rate determines the total demand for the local goods and is additionally a consequential determining factor of the nation's trade balance in the manufacturing.

3.1.9 Export led growth theory

The export-led growth theory suggests that export growth is a major component in boosting long-run economic development. Medina-Smith (2001) confirmed that export-led growth hypothesis is one of the primary causal factors of growth that by expanding exports countries economy will not hold to rely exclusively on increasing trade union movement and capital for growth. According to Schweicker et al (2006) exports can perform as an engine of development. Araujo and Soares (2011) contest that "stronger exposure to international competition by higher exports is seen to increase the pressure on the export industries to keep prices low and offer inducements for the presentation of technological change. The growth of exports therefore seems to have a positive impact on the productivity of an economy as a whole via externalities of exports on other sectors." However, Palley (2011) believes that export-led growth generates a win–win event for developing and industrialized economies. Both the exporter and importer benefit from the global application of the rule of relative advantage. This is so because export oriented strategies discourage the usage of trade barriers and boost free trade that will at the end benefit the nations affected. Liberal trade, on the other hand, comes with its own evils, for example, it can have an import boom and defeat the same use of export development that countries need to reach. If unregulated, free trade can lead to dumping whereby countries export poor quality products at

3.1.10 Commercial policy

Business or commercial trade policy is one of the variables that influence the real exchange rate in both Montiel's and Edwards' theories. An increment, for example, in an import duty can upsurge the domesticcost of imports, which are part of tradable goods. This, thusly, moves domestic demand towards those that are not tradables, and thereby contributes to an increase in

price of the cost for such goods resulting to an increase in substitution rate. The expanded necessity for remote cash, taking after an increment in the local cost of imports, likewise values the genuine conversion scale. Increase in export duty affects the balance of payment surplus which in effect necessitates an appreciation of the real exchange rate. (Montiel, 1999: 288). In this way, business liberalization (a more open monetary framework) is liable to be connected to a depreciating real exchange rate.

3.1.11 Monetary Policy

The effect of monetary policy on the real exchangerate relies upon the trend of the approach that is expansionary or contractionary. This in other words relate to the appreciation or depreciation of the real exchange rate. An expansionary fiscal arrangement, for case, embodied by a development of local credit and cash supply, applies upward weight on household money related qualities (for the most part on nontradable merchandise) and consequently energy about the real exchange rate (Edwards, 1994: 70). By the way, in Edwards' model money related variables have just a temporary effect on the real exchange rate.

3.1.12 Traditional Approach

The traditional approach to exchange rates embraces that depreciations have expansionary influence on manufacturing production. The depreciation ofmoney will lead to domestic products to be more frugal overseas and this will increase the demand of local goods prompting to an increase in exports, in so doing bringing up the trade balance and as a resultincreasing the output and use. In some cases depreciation of currency could work out in the short run, however, not supportable in the long run (Schiff and Winters, 2009). As it stands in this research project, the traditional approach holds this study.

3.1.13 Foreign exchange reserves

An adjustment in the stock of foreign exchange reserves is supposedlyanticipated toappreciate thereal exchange rate, steady with its share as a relativelyliquid indicator of national wealth (Aron et al., 1997: 16). Reservebank specifically has the ability to keep up the domestic currency considerably, an increase in reserves will appreciate the exchange rate and a decrease in reserve will depreciate the real exchange rate. Higher net foreign exchange reserve prompt bigger consumption on local products because of the wealth effect, subsequently raising the cost of

nontradable merchandise with respect to tradables and, thusly, appreciates the real exchange rate (MacDonald and Ricci, 2003).

3.1.14. Nominal exchange rate policy

An adjustment in the nominal exchange rate can influence the real exchange rate if prices are moderate (Joyce and Kamas, 2003: 159). Edwards incorporated this variable in his case to get short term variations in thereal exchange rate. Adepreciating nominal exchange rate depreciates the real exchange rate in the Edwards' concept. So also, an appreciating nominalexchange rate appreciates real exchange rate. Edwards (1994:88) (from eprints.ru.ac.za)is of the view that "the coefficient of a variable representing nominal devaluation is quite large, providing evidence to support the view that nominal devaluations can indeed be a powerful tool to manage the real exchange rate. Before attempting to estimate any of these theoretical models, a review of empirical literature may shed some more light on variables that have been empirically found to impact on the real exchange rate." The following section discusses empirical studies on the contributing factors and the conduct of the real exchange rate and manufacturing sector.

3.2 Empirical Literature

This section shall attend to several studies that sought to look into the relationship between currency and manufacturing sector.

3.2.1 Empirical literature from South Africa

David Faulkner and Konstantin Makrelov (2008) used investment, openness, interest rate and the growth differentials to study the equilibrium exchange rate for theSouth African manufacturing sector and endeavoured to analyse how competitive manufacturing secor is. It makes use of a PPP exchange rate measure for manufacturing sector established by the Groningen Growth and Development Centre (GGDC) and utilises single Engle Granger methods to define the drivers of the Manufacturing Equilibrium Exchange Rate (MEER). The outcomes show that over the period from 1995 to 2006 the MEER and economy wide exchange rate have generally been adjusted each other, but some misalignment was experienced amid the mid-2000s.Efficiency as well as unit labor cost have proved to be paramount contributing factors of the manufacturing rate of exchange along with openness and government spending. In line with the Ricardian framework, this implicatively insinuates that elevating productivity and declining unit costs of labor, are imperative for amending the sector's competitiveness.

The empirical papers evaluating the South African exchange ratehave brought to light the significant role of gold and various products (for instance, Aron et. al 1997; MacDonald and Ricci 2003; Frankel 2007). There has been an extensive group of writing that has considered the intensity of South African manufacturing and the effect competitiveness has on the manufacturing exports. Using relative unit work costs, Edwards and Golub (2002) noted that in respect to developed nations, the manufacturing sector of South Africa outwardly saw an increment in competitiveness in the 1990s, yet that it stayed considerably less focused in respect to engendering nations.The writers went on to denote that competitiveness has a statistically consequential positive influence on local export enactment. Golub and Ceglowski (2002) engender homogeneous outcomes when utilizing the real exchange rate to quantify competitiveness and reveal that manufacturing exports reactedpositively to ameliorationin the 1990s'competitions (the vigorous exchange rate devaluation of the 1990s). In another study, the decline in the relative cost of manufac[redacted]was modelled by Rodrik (2006) as an occasion of import rivalry, the real exchange rate, as well as the terms of trade. The notion of Rodrik (2006)puts it clear that manufacturing profitability exhibits a tight connection to trade competition and execution, he further maintains that "the story of the real exchange rate is a paramount causal factor of the health of manufacturing" (Rodrik, 2006).

Trust R. Mpho (2011) concluded that a depreciated exchange rate increases manufacturing growth when he used Autoregressive Distributed Lag (ARDL) cointegration technique to limit the influence of exchange rate volatility on manufacturing employment growth between the years 1995 -2010 in South Africa. He used investment, gross revenue, manufacturing exports and wages as determinant factors.

3.2.2 Empirical literature from developed countries

The empirical studies in this section are mostly based on data from manufacturing industries in the United State. The literature provides very limited evidence from other nations. A cross-country study by Campa and Goldberg (1999) compares the investment sensitivity in the United States, United Kingdom, Japan, and Canada for the period 1970-1993 using variables such as exchange rate, investment, GDP manufacturing and interest rate. It was discovered that despite

the high degree of openness in the Canadian manufacturing industries, According to himinvestment in Canada has the least responsiveness to exchange rate movement compared to other countries.

In Korea, Kim (2005) used OLS and Panel data analysis to examine the connection between the exchange rate and utilization in the manufacturing sector between 1970 and 1995. He revealed that usage increases when there is depreciation in the exchange rate.

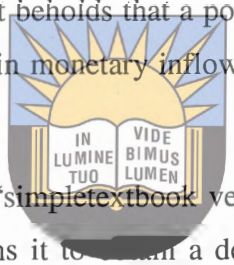
The finding of Galindo et al (2007) was that depreciation in exchange rate boost the growth of occupation in various nations that havegreat levels of trade openness when he used panel data method for nine Latin America in detecting the influence of rate of exchange on trade openness. Nevertheless, their solution is reversed as liability dollarization increases.

The indication of Thorbecke (2011) when he considered the influence of exchange rate on East Asian trade is that within the regional production network exports produce depends on exchange rate all over the region however, labor intensive exports depends on the exchange rates in the exporting nation. The value added generated from processed exports emanates from imported parts and components whereas the value added of labor intensive exports arises from the domestic economic system. Which means the exchange rate affected the manufacturing sector especially those manufacturing firms that is into an international craft.

In Japan, Thorbecke (2012) demonstrated that the appreciation of the yen caused exports to decrease significantly, especially for the auto sector. This is affirmed by the result from the World Bank that the strong yen caused yen export costs to descend significantly more than yen costs in the automotive and electronics sectors.

MacDonald (1998) used multivariate cointegration approach in a reduced form model with the exchange rate as the independent variable and dependent variables like terms of trade, production differentials, net foreign assets, financial balances and interest rates to reassess the causes of real rates of exchange in a comparatively long run. The framework is prompted for the real exchange rate of the Deutschmark, theUnited States dollar and Yen, for a time of twenty years (1974 to 1993). In his study it was clear that a critical and sensible long run correlation existed in his framework, recommending that the essentials specified above have a vital and huge bearing on the determination of both long and short runreal exchange rate. All the variables

proved to have a certainlink with thereal exchange rate; an increment in any of them prompts an appreciation of the real exchange rate. Antonopoulos (1999) assesses the purported "Shaikh speculation", which says that the real exchange rate is essentially affected by the proportion of relative real unit labour costs (as an intermediary for profitability differentials) of tradable products amid two nations. The model by Antonopoulos integrates capital flows to the "Shaikh hypothesis" and utilises cointegration approach on Greece's data covering the period 1960 – 1990. The survey offers confirmation that real exchange movement cannot be let off by the PPP assumption, that a vigorous role exists in the productivity of the export sector of Greece vis-à-vis that of the residue of the world and that less paramount purport of net monetary inflows exist. The proof in this research project beholds that a positive shift in the comparative production of the export sector of Greece and in monetary inflows appreciates the value of the nation's real exchange rate.



According to Kempa (2005), a "simpletextbook version of the Dornbusch model of exchange rate determination and transforms it to obtain a decomposition of exchange rate, income and price level data of the British-German, U.S.-Canadian, Japanese-U.S. bilaterals." The real exchange rate as well as relative labour cost and output drives, are broken down into factors associated with nominal shocks as well as shocks to aggregate supply and need. Similarly, Kempa (2005:440) recognizes "two distinct sources drivingexchange rates: one arising in financial markets and the other one in the real economic system.Nominal shocks are measured as changes in money supply and money demand and aggregate supply shocks are measured by a series on manufacturing output, while the pace of domestic absorption and elasticity of the current report is used as proxies for aggregate demand shocks." The decomposition proposes that nominal shocks constitute less than 33% of general authentic exchange rate variability, aggregate supply shocks expound less than 10% of the overall variability and the outstanding variability is accounted for by aggregate demand shocks, especially at longer forecast horizons. Thusly, this research project's confirmation proposes that the variations of the exchange rateseem to be mainlybalanced replications to authentic shocks, instead of volatility in monetary securities industries.

3.2.3 Empirical literature from developing countries

According to Acar (2000) depreciation in exchange creates a contractionary effect on output for the initial year, meanwhile an expansionary impact was exhibited in the following year when he examined the effects of depreciation on output growth in Less Developed Countries (LDCs). He employed data from 18 sample countries in a fixed-effect process. He divided the LDCs into two categories and two different regression analyses were carried out. Data from a group of 10 countries for both manufacturing, product exporters' behavior for a period of 25 years were used. Data (for a 20 year period) from two different groups of countries (8 manufacturing exporters, 8 agricultural and primary exporters) were examined to investigate if there exists a qualitative difference between different nations in terms of the essence as well as farming and primary product exporters to estimate a model of real output of devaluation on economic development.

Ndung'u (1995) examined the indirect and direct relationship between the real and norminal exchange rates and manufacturing development in Kenya for the period 1970 to 1996. Different techniques such as: single equation regression, VAR model test and a system of simultaneous equations, cointegration were used. The outcomes of the survey demonstrated no substantiation of a statistically significant strong direct relationship between variations in the exchange rates and manufacturing development, rather development generally responds to fiscal, monetary policy and foreign assistance.

Akpan (2008) employed the Ordinary Least Squares (OLS) technique to explore the tie between the economic development and the foreign exchange market in adevelopingof an economy which is mainly based on petroleum (Nigeria), for the period between 1970 and 2003. The report asserts that there exists a progressive relationship between the exchange rate, volatility and economic development in Nigeria. This research projectagreed with the assumption of Balassa-Samuelson Hypothesis.

3.3 Assessment of Literature

This section analyses both theoretical and empirical literature that sought to elucidateon the relationshipbetweenrate of exchange and manufacturing performance. On the theoretical division, it was found that there are a variety of models that expound the kinship amid the two variables. It was found that the changing sector profitability theory and the purchasing power

parity are the main hypotheses that explicate the association between exchange rate and manufacturing. The traditional approach theory shall underpin this work.

On the empirical part, it was found that there are mixed results as to the association between the manufacturing sector and the exchange rate. This makes the subject more interesting and challenging as there is no settled opinion on the relationship between the two variables.

3.4 Summary

This chapter reviewed theoretical literature that demonstrates the link between the manufacturing sector and the exchange rates. This chapter's began byfocusing on the theoreticalliterature that is, looking at what other scholars have put forward regarding the similar case in study. Theoretical literature encompassed the changing sectorial profitability which holds that the prompt result of exchange rate depreciation is the adjustment in relative cost of the tradable leading to an increased requirement for the exports and the import competing goods. The purchasing power parity (PPP) theory on the other side basicallydenotes that a unit of any specifiedmoney should be capable to purchase the identical amount of commodities in almost everynation, while the uncovered interest parity (UIP) is the money account correspondingto the PPP. Balsa Samuelson theory says there exist a progressive correlation between development and exchange rates and then the Salter Swan model which helps to see the function and interaction of critical factors inducing macro-economic disequilibria, it assumes terms of trade are exogenous and the three product models on the other hand consist of importable and exportable goods. Export led growth theory was also reviewed which holds that exports plays a major role not entirely in the manufacturing sector but in the development of a country as a whole as well as commercial policy,foreign exchange reserves monetary policy, traditional approach, and nominal exchange rate policy.

The second part revealed the empirical studies conducted by previous researchers on impacts ofreal exchange rate in the manufacturing segment in developed and developingareasas well as in South Africa. The studies reviewed, used several quantitative models to prove the impact of real exchange rate in the manufacturing sector. Most of the studies concluded that real exchange rate depreciations are expansionary to growth in developed and developing areas also in South Africa. Nevertheless, it is significant to remark that in South Africa, a great gap exists in

literature on the subject of the impact of real exchange rate in the manufacturing sector. The following chapter discusses the methodology used in this field.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 INTRODUCTION

This chapter enlightens the analytical framework used in this subject by providing the model applied to probe the influence of exchange rates on the manufacturing sector in South Africa from 1983-2012. This chapter also includes verification of information sources, research techniques and diagnostic tests utilized in this field.

4.1 MODEL SPECIFICATION

To study the exchange rates'impacton South Africanmanufacturing sectorthe dependent variable in this study is GDPmanufacturing a[illegible]natory variables are Rand (real) exchange rates, interest rates, gross fixed capital formation (GFCF) and trade openness (TO). The pattern of this work shall be adopted from Hodge (2012). Hodge (2012) used a Johansen vector autoregressive regression /vector error correction (VAR/VECM) cointegration method for theapproximation of the link between exchange rates and the manufacturing activities in South Africa. The study used quarterly data for the sample period 1983—2012. This study shall adopt Hodge's (2012) model and shall have the following model:

$$\underset{-/+}{} \qquad \underset{+}{} \qquad \underset{+}{} \qquad \underset{-}{}$$

$$GDPM = \beta_0 + \beta_1 REER + \beta_2 INT_t + \beta_3 GFCF_t + \beta_4 TOb_t + \varepsilon_t \quad \text{.....4.1}$$

Where,

GDPM is the GDP manufacturing,

GFCF is the gross fixed capital formation and

INT refers to the real interest rate,

REER is the real exchange rate,

TOb is the trade openness.

$\boldsymbol{\beta_0}$ is the intercept

$\boldsymbol{\beta_1}, \boldsymbol{\beta_2}, \boldsymbol{\beta_3}$, are beta coefficients and ε_t is the error term.

To achieve the elasticity coefficients and eliminate the influence of outliers, the variables have to be changed to logarithms. When presented in log linear formula the function turns out to be:

$$LogGDPM = \beta_0 + \beta_1 logREER_t + \beta_2 logINT_t + +\beta_3 logGFCF_t + \beta_4 logTOb_t + \varepsilon_t \quad \ldots\ldots 4.2$$

This therefore shows the application of the following notation:

LGDPTM = natural log of the GDP manufacturing

LREER = natural log of real effective exchange rate,

LINT = naturallog of interest rate,

LGFCF = natural log of gross fixed capital formation,

LTOb= natural log of trade openness,

ε_t= error term

4.2 DEFINITION OF VARIABLES

Logged GDP Manufacturing – This represents the natural logarithm of the GDP manufacturing sector. GDP in the manufacturing sector reflects the functioning of the sector as opposed to production meaning number of units made.

Logged Rand (real exchange rate) – This is the natural log of the real exchange rate (REER). It is the value of the rand compared against the US dollar.

Logged real interest rate – This is the natural logarithm of the real interest rate, which is the discounted rate at which a Reserve bank repurchases government securities from the commercial banks, contingent upon the level of financial supply it chooses to keep up in the nation's financial system.

Logged Gross fixed capital formation – This means the natural log of the Gross fixed capital formation incorporates land enhancements (conduits, fences, drainage system, etc.); plant, equipment, as well as equipmentsprocurements; as well as building of roads, railway lines, and

so forth, together with schools, government organizations, clinics, private residences, business and mechanical developments.

Logged Trade Openness (trade-to-GDP) – This variable is a criterion of openness degreeand is counted as natural logarithm of the simple average (i.e. the mean) of total trade (that is to say the total of imports and exports of products and facilities) relative to gross domestic product.

4.3. PRIORI EXPECTATIONS

The beta coefficient β_1 captures the influence ofreal exchange rate on manufacturing sector. For thisproject's purpose, the sign of this coefficient is uncertain. A positive sign will indicate an expansionary, provided that the coefficient is statistically significant while a negative sign will show a contractionary effect. When the real interest rateincreases the cost of capital increases and it mayalso be contractionary and therefore β_2 is expected to be below zero. β_3Gross fixed capital formation is expansionary to manufacturing sector increase in investment will lead to a positive effect on the GDP manufacturing. β_4 is expected to be less than 0, for example, an escalation in openness through exchange liberalisation – reduction in tariff or removal of quotas – raises the demand of products bought from other countries and deteriorates the current account balance of payments, in that waydecreasing the demand for local goods thus affecting the manufacturing sector negatively. A deleteriousmark is, hence, projected for the coefficient of trade openness.

4.4 DATA SOURCES

The study will use quarterly data from 1983 to 2012. The data on GDP manufacturing, Exchange rate, Interest rate, GFCF and Trade openness will be sourced from the SARBpublications and the Department of Trade and Industry's website and lastly quactec and Wold Bank websites.

4.5 RESEARCH TECHNIQUES

This study utilises the Johansen (1995) and Johansen and Juselius (1990) cointegration technique. The technique is easily recognized for establishment long runrelationship between variables. This approach applies maximum likelihood estimation to a VECM to concurrentlydetermine both the long run and short run relationship of the dependant variable in the model. The initial stage involves the stationary of data in the same order. This can be attained through the unit root tests that look atthe data sets' stationarity. In order to test the unit

root of the time series data, the Phillips-Perron unit root test and the Augmented Dickey-Fuller (ADF) test as well as Kwiatkowski-Phillips-schmidt-shin test will be considered.

4.5.1 Testing for stationary

As stated by Jongwanich (2006:23), basic econometric analysis is founded "on the premise that the data series are stationary."For that reason, it therefore implies that the data series develop as time goes on in a fairlysteady, unceasing mode, showingdeveloping economic forces. If the information that is used in the research is non-stationary, it would result in some problems in the regression for example the spurious regression problem, biased t-ratios and a high R-Squared. Columbus (2001:124) agrees with the aforementioned statement by way of indicating that "the direct application of OLS to non-stationary data produce regressions that are not specified and spurious in nature."

In the case where data are non-stationary, differencing is applicable to make a stationary series. Differencingfacilitates data with a trend (non-stationary data) to be changed into a stationary data. According to Charman and Malehorn (2005:357),"this is accomplished by subtracting successive values of a variable and then using the differences as a new variable." This field applies to conventional standards of unit root, which are the Augmented Dickey Fuller (1980) and the Phillips Perron tests (1988) also Kwiatkowski-Phillips-schmidt-shin (1982).

4.5.2 Augmented Dickey-Fuller (ADF) test

The augmented dickey fuller test modifies the study done by Dickey and Fuller (1979 and 1976 respectively). The aim of the Dickey Fuller theory was to examine the supposition that

$$\Delta yt = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta y_{p-1} \Delta y_{t-p+1} + \varepsilon_t \text{.....4.3}$$

in this caseα is a constant, β is the coefficient t is the time trend, Δ is the first difference operator, the lag order of the autoregressive process is represented by $p$and ε_t is the error term.

Gujarati (2004) is of the view that the amount of lagged variance terms to embrace is regularly defined by trial and error, the notion being to embracesufficient terms so that the error term in (4.3) is serially uncorrelated. Looking at the ADF (DF) asignificant presumption of the DF test is that the error conditions are independently and indistinctly distributedalso the ADF test trails the identical asymptotic distribution as the DF statistic, thus the similar critical values can be

applied. Comparison is therefore made between the critical value and the estimated value of ADF. In cases where the estimated value becomes higher as compared to critical value, null hypothesis will be rejectedthat the series have unit root, as a resultapproving that the series are stationary. The ADF test modifies the DF test to look at the potential serial correlation in the error terms by adding the lagged difference terms of the regression. The null hypothesis and the alternative hypothesis of the Augmented Dickey-Fuller t-test areshown below;

H_0 : Series comprehend a unit root

H_1 : Series is stationary.

When hypothesis rejection occurs, it then denotes that the series does not have a unit root problem.

4.5.3 Phillips-Perron (PP) Tests

The Phillips-Perron tests are a more comprehensive theory of unit root non-stationarity. Gujarati (2004) states that the Phillips-Perron use non-parametric statistical approaches to assume care of the serial correlation in the error terms without including lagged difference term. According to Brooks (2008) "the tests are similar to ADF tests, but they contain an automatic correction to the DF procedure to set aside for auto correlated residuals." The PP test and the ADF test have the same asymptotic distribution. Brooks (2008) explains that the "PP tests often yield the same conclusions as, and suffer from most of the same important limitations as, the ADF tests." Although the Phillips Perron tests are non-parametric but they are believed to be more potent as they use consistent estimators of the division.

4.5.4Kwiatkowski-Phillips-schmidt-shin Test

To test for a null hypothesis that an apparent time series is static around a deterministic trend, a Kwiatkowski-Phillips-Schmidt-shin test can be utilised. The KPSS tests are projected to complement unit root tests, for instance, the Dickey–Fuller tests. It was suggested by Alok Bhargava (1982).

4.5.5 Cointegration and Vector Error Correction Modeling (VECM)

If data series are stationary or co-integrated data therefore need to be checked for spurious regression analysis (Gujarati, 2010). If two series seem to be moving together over time, it points out that there is abalancedassociationdespite the fact that the variables are non-stationary

in the short run, but if they are co-integrated, they will run closer together over time and their difference will be static (Murwirapachena, Maredza & Choga, 2013).

The vector autoregressive (VAR) model is a commonoutline that is utilised to depict the vigorous inter-relationship betweenstatic variables. Dolado *et al.* (1999) posited that "if the time series are not stationary, then the VAR framework needs to be amended to allow consistent estimation of the relationships among the serial variables. The vector error correction (VEC) model is merely a particular instance of the VAR for variables that are stationary in their differences", for instance, I (1). The vector error correction can as wellconsider any cointegration associationsbetween the variables.

To determine the role of vector error correction model, there is a need to test for cointegration. A VECM is intended to be used with non-stationary series that are known to be co-integrated. Brooks (2008) argues that "the VECM has cointegration relations built into the spec so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics". Brooks (2008) also says that the cointegration term is referred to as the correction term as the divergence from long-run equilibrium is rectifiedslowly through a serial publication of partial short-run adjustment estimated. Thus, the existence of a cointegration relationship(s) forms the centre of the vector error correction model description.

The two major ways of testing co-integration are;

Engle-Granger approach which is residual based and the Johansen and Julius (1990) technique which is centred on maximum possibilityapproximation on a VAR system.

-The problems of the Engle-Granger approach include a deficiency "of power in unit root tests, simultaneous equation bias and the impossibility of performing hypothesis tests about the actual cointegration relationships" (Brooks, 2008).

Referable to the shortfall of Engle-Granger approach, the Johansen's (1991; 1995) the VECM shall be embraced in this study because this approach determines the short run and the long run of the dependent variable in the model. Themethodapplied similarly offers the speed of adjustment coefficient.

4.5.6 Johansen Technique Based on VARS

Greene (2000) reveals the following steps that are utilized when implementing the Johansen procedure:

1: Testing for the order of integration of the variables under examination. All the variables should be integrated of the same order before going on with the cointegration test.

2: At this stage setting of the suitable lag length of the model is done. Likewise in the measure is the evaluation of the standard and the determination of the social status.

3: With regards to the deterministic components in the multivariate system the choice of the appropriate model is made. An analysis of the normalized co-integrating vector(s) and speed of adjustment coefficients is made.

4: This includes the determination of the amount of co-integrating vectors. In the last step, the causality tests on the error correction model are done to recognise a structural model as well as determining if the projected framework is sensible.

Oncethe determination of the presence of co-integrating relationships is ascertained, the VECM is then projectedfor the examination of the short-run dynamics.

4.5.7 Impulse response analysis

The impulseresponse analysiscan trace out the receptiveness of the variable which is dependent in the vector autoregressive to shocks to each of the other variables as noted by Brooks (2008). In this study, therefore, it depicts the sign, the persistence and extent of real and nominal shocks to the manufacturing sector. Brooks (2008) further states that "impulse response analysis is used on the vector error correction model andon condition that the organization is unchanging, the shock should steadily go out. This research project applies the generalized impulse response analysis. Lutkepohl (1993) cited in Rusike (2007) explains that this approach fully considershistorical pattern of correlations between various shocks.

4.5.8 Variance decomposition analysis

After performing the impulse response analysis further information on the connectionbetweenthe manufacturing sector and the real rates of exchange are found using the variance decomposition analysis. As highlighted byBrooks (2008),"variance decomposition analysis gives the rate of

movements in the dependent variables that are due to its own shocks, against shocks to other variables."

4.6 DIAGNOSTIC CHECKS

With the purpose of analyzing the influence of real exchangerates on the South African manufacturing sector. The diagnostic checks become vital not only because it validates the limitapproximationresultsaccomplished by the projectedapproach but also stochastic properties of the framework such as outstanding autocorrelation, heteroscedasticity and normality are tested by the diagnostic checks. Theabovementioned tests are utilised in this research project, hence, they are deliberated conciselyin the subsequent sections of the study.

4.6.1 Heteroscedasticity

The OLS creates the hypothesis that $V(\varepsilon j = \sigma^2$ for all j. This is to say, the variance of the error term is stable a condition termed homoscedasticity. Conversely, heteroscedastic refers to the error terms whereby the variance is not constant. The study employs the White heteroscedasticity test. According to Greene (2000) "white test computes the White (1980) general test for heteroscedasticity in the error distribution by regressing the squared residuals on all distinct regressors, cross-products, and squares of regressors. The test statistic, a Lagrange multiplier measure, is distributed Chi-squared (p) under the null hypothesis of homoscedasticity." The null hypothesis for the White test is homoscedasticity and whenwe fail to reject of the null hypothesis, homoscedasticity will therefore be presence. When the null hypothesis is rejected, heteroscedasticity is achieved.

4.6.2 Autocorrelation LM Tests

Serial correlation happens when the errorterms from different time periods are correlated. In time series data autocorrelation happens when the errors connected with observation in a certain time period continue intheforthcoming time periods.Serial correlation (also called autocorrelation) in the residuals means that they hold information that should model itself. The Durbin-Watson statistic is used in the study to test for the presence of first order serial relationship in the residuals. In this case the null hypothesis is that no serial correlation. The Durbin Watsin (DW) statistic falls in the range of 0 to 4, having a value close to 2 indicating no initial order serial correlation. The Lagrangian Multiplier was utilised in testing for serial correlation.

4.6.3 Residual Normality Test

Residual normality tests are used by researchers to see if a set of data is well-modeled by a normal distribution as well as to determine how probablyit is for a random variable underlying thedataset to be normalized.In other words, the test is a form of modelselection, hence, can be construedin various methods, contingent on one's understandings of likelihood.

4. 7 Summary

Conclusively,this chapter presented the methodology utilised in carrying out this research project. The model which specified the impact of real exchange rate on the manufacturing sector in South Africa was determined using VAR technique and VECM by Johansen (1991, 1995) as the estimation technique. To insure data is stationary three different test are carried out; PP, ADF and KPSS unit root tests were employed. The variables used in the model specification include GDP manufacturing as the dependent variable and the explanatory variables are gross fixed capital formation, real interest rate, trade openness and the real exchange rate. To authenticate the estimated model diagnostic tests were carried out such as heteroscedasticity, autocorrelation and residual normality test.

Followed by this methodology is chapter five, which presents the estimation, presentation and analysis of the research findings.

CHAPTER FIVE

PRESENTATION OF DATA ANALYSIS

5.1 INTRODUCTION

The previous chapter was a discussion of the methodology used in this study, this one focus on data presentation and analysisof the impact of real exchange rate on manufacturing sector in South Africa within time frame of 1983 to 2012. This chapter consist of six sections whereby the first one looks at the unit root test followed by the co-integration tests. The third section presents theVECM then the diagnostic checks, impulsive response and variance decomposition respectively. The chapter ends with a conclusion that summarises the presentation and data analysis section of the research project.

5.2 UNIT ROOT/STATIONARITY TEST RESULTS

When using the Johansen procedure, the initial ... sting for the stationarity in time series. Formal and informal (graphical) tests are the two ways used for testing stationarity of time series. This study presents the informal test first which is the plotting of graphs and then the formal tests. The formal tests shown arethe Phillips-Peron tests, the Augmented Dickey-Fuller and Kwiatkowski-Phillips-schmidt-shin (KPSS) test."These tests are vital as they help to understand the structural breaks, trends and stationarity of the data set" (Brooks, 2008).Figure 5.1 (i) presents the results of stationarity test graphically showing data in level form as well as Figure 5.1(ii) for first differenced data. The Phillips-Peron test and the Augmented Dickey-Fuller and the results of the Kwiatkowski-Phillips-schmidt-shin test are also tabulated in the subsequent tables in their order from 5.1(i) through 5.1(iii).

The informal graphs are represented in figure 5.1(i) and 5.2(ii) graphs below.

Figure 5.1(i) Graphs in level forms

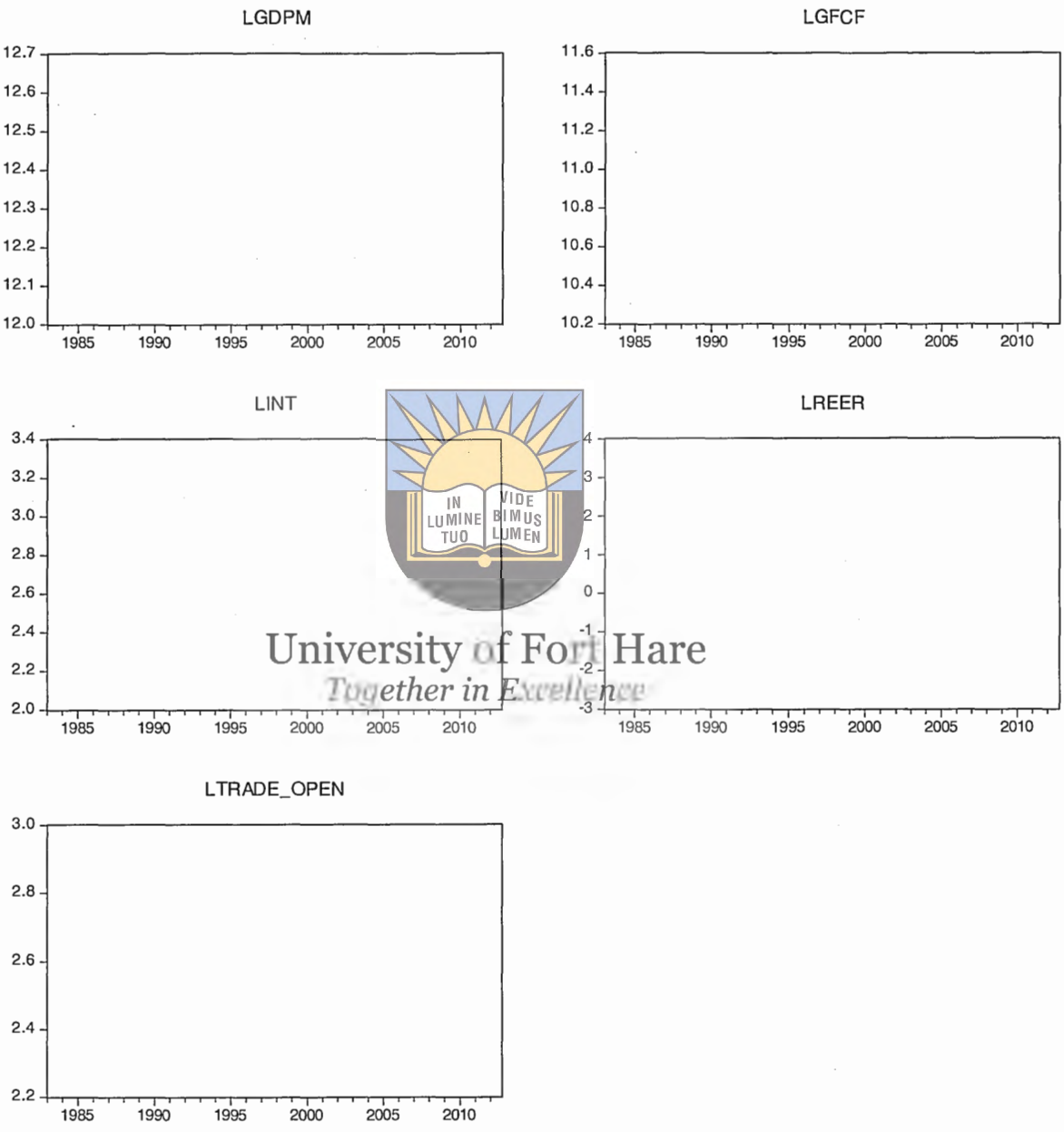


Figure 5.1(ii) Differenced Graphs

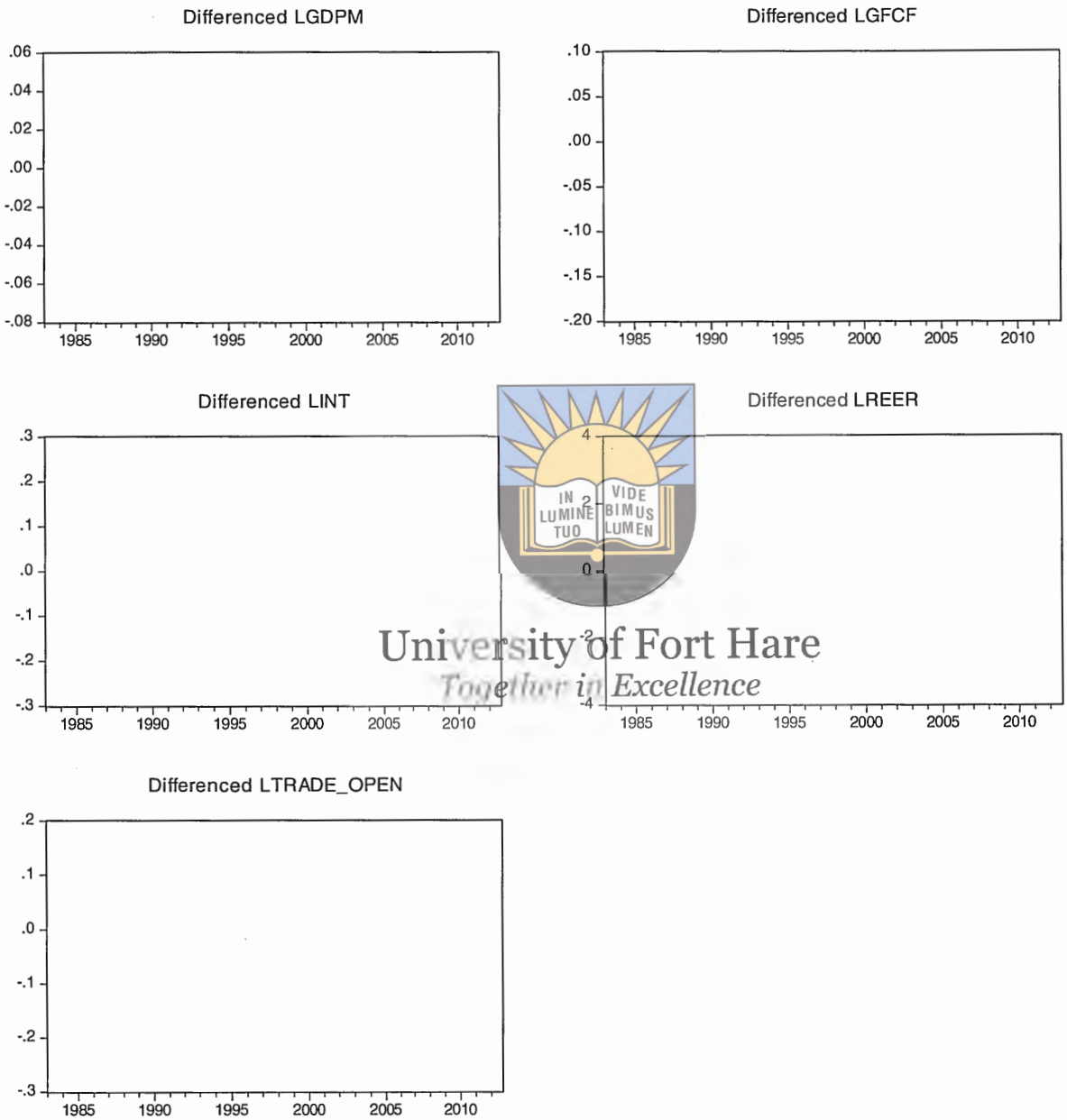


Figure 5.1(i) shows that GDP Manufacturing, Gross fixed capital formation investment (GFCF) Interest rates (INT) and Trade Openness (TO) have a trendy behaviour. However, real effective exchange rates (REER) show the absence of a unit root at levels. Figure 5.1(ii) shows that data became stationary after differencing. Next is to test formally test for the stationarity. The results are shown in the tables below.

Table 5.1(i): Stationarity results of the Augmented Dickey-Fuller test

AUGMENTED DICKEY-FULLER					
	VARIABLE	INTERCEPT	TREND AND INTERCEPT	NONE	ORDER OF INTEGRATION
Level	LGDPM	-0.362	-2.259	1.863	
1st Difference	DLGDPM	-6.923*	-6.917*	-6.596*	1
Level	LGFCF	-0.164	-2.843	1.068	
1st Difference	DLGFCF	-3.109**	-3.417**	-2.920**	1
Level	LINT	-1.940	-3.668**	-0.548	
1st Difference	DLINT	-5.931*	-5.997*	-5.944*	1
Level	LREER	-8.651*	-8.622*	-2.862*	0
Level	LTO	-1.769	-2.326	0.180	
1st Difference	DLTO	-10.789*	-10.742*	-10.817*	1
1%	Critical value	-3.487	-4.037	-2.585	
5%	Critical value	-2.886	-3.450	-1.944	
10%	Critical value	-2.579	-3.150	-1.615	

significant at 1%;significant at 5%; ***significant at 10%*

Table 5.1(ii) Stationarity results of the Phillips Perron Test

PHILLIPS PERRON	VARIABLE	INTERCEPT	TREND AND INTERCEPT	NONE	ORDER OF INTEGRATION
Level	LGDPM	0.150	-1.726	-3.019*	
1st Difference	DLGDPM	-6.665*	-6.599*	-6.481*	1
Level	LGFCF	0.502	-2.104	1.502	
1st Difference	DLGFCF	-10.657*	-10.890*	10.561*	1
Level	LINT	-1.424	-2.756	-0.702	
1st Difference	DLINT	-6.047*	-6.126*	-6.059*	1
Level	LREER	-9.061*	-9.027*	-7.229*	0
Level	LTO	-1.789	-2.376	0.193	
1st Difference	DLTO	-10.789*	-10.742*	-10.817*	1
1%	Critical value	-3.486	-4.037	-2.585	
5%	Critical value	-2.886	-3.448	-1.944	
10%	Critical value	-2.579	-3.149	-1.614	

significant at 1%;significant at 5%; ***significant at 10%*

Table 5.1(iii) Stationarity results of the Kwiatkowski-Phillips-schmidt-shin Test

PHILLIPS PERRON	VARIABLE	INTERCEPT	TREND AND INTERCEPT	ORDER OF INTEGRATION
Level	LGDPM	1.197	0.242	
1st Difference	DLGDPM	0.167*	0.087*	1
Level	LGFCF	1.061	0.276	
1st Difference	DLGFCF	0.394*	0.064*	1
Level	LINT	0.828	0.174	
1st Difference	DLINT	0.098***	0.026*	1
Level	LREER	0.133*	0.122**	0
Level	LTO	0.760	0.170	
1st Difference	DLTO	0.051*	0.050*	1
1%	Critical value	0.739	0.216	
5%	Critical value	0.463	0.146	
10%	Critical value	0.347	0.119	

significant at 1%;significant at 5%; ***significant at 10%*

Table 5.1(i) displays the results from the Augmented Dickey-Fuller test. For ADF, the test yields a null hypothesis of the unit root. A comparison is made between the estimated value of ADF and the critical value. For that reason, the null hypothesis is rejected when the estimated value is greater than the critical showing that the series have unit root, hence, revealing that the series are static (Mazenda, 2014). The ADF tests variables in (i) intercepts, (ii) trends and intercepts and (iii) no trend and no intercept. Intercepts results showed that all the variables were not stationary at levels except for LREER. For the trend and intercept, every other data in levels was not stationary as revealed by the non-rejection of the null hypothesis at all levels of significance. The results demonstrate that after the first difference, every variable wasstatic.

The Phillips-Peron (PP) results are presented in table 5.1(ii). Brooks (2008) stipulated that PP tests are same as the ADF tests;however theseintegrate aspontaneous correction to the DF test to give room for auto-correlated residuals. Just like the ADF result the result shown that all variables were not stationary at levels except for LREER. These were revealed by the non-rejection of the null hypothesis at 1%, 5% and 10% significant levels. It is clearly presented that all the variables were stationary after the first difference.

Table 5.1 (iii) shows the Kwiatkowski-Phillips-Schmidt-shin test.According to Alok Bhargava (1982), KPSS is a test that can be utilised to test a null hypothesis that an apparent time series is stationary around a deterministic trend. Hence, KPSS tests are projected to supplement unit root tests, such as the Dickey–Fuller tests. Through testing for both the stationarity hypothesis and unit root hypothesis, it allows one to separate series that seem to be stationary, series that seem to have a unit root as well as series that are not explanatory adequately as to either they are stationary or integrated. This test variables in [illegible]s, (ii) trends and intercepts only. The three approaches utilised to check for stationarity test shows that the data series were non-stationary at levels but stationary after first difference except LREER which was stationary at levels. For that reason, the data series are integrated of the similar order I (1).

5.3 TESTING FOR COINTEGRATION

If the variables are integrated of the same order, there is thus a need to confirm whether a long-run equilibrium relationship exist amongst them."The Cointegration test tells the existence of equilibrium or a stationarity relationship between two or more timeseries, each of which is individually non stationary" (Andren, 2007). As regards this research project cointegration looks at the long run relationship amongst the manufacturing sector and its contributing factors. Andren (2007) explains that the Cointegration approach permits researchers to integrate the long run and short run relationship between variables within a unified framework. Owing to the point that the Johansen cointegration method does not only determines both the long run and short run relationship of the dependent variable but also provides the speed of adjustment coefficient unlike the Engle and Granger residual-based methodology to test for cointegration. Hence makes the Johansen cointegration more preferable. However there is a need to test for multicollonearity using the pair-wise correlation matrix. These results are tabulated below (Table 5.2).

Table 5.2: Pair-wise Correlation matrix

	LGDPM	LGFCF	LINT	LREER	LTO
LGDPM	1.000000	0.945919	-0.717944	0.045779	0.**891508**
LGFCF	**0.945919**	1.000000	-0.668670	0.114252	**0.836319**
LINT	-0.717944	-0.668670	1.000000	-0.003972	-0.633406
LREER	0.045779	0.114252	-0.003972	1.000000	0.017749
LTO	**0.891508**	**0.836319**	-0.633406	0.017749	1.000000

Multicollinearity can be definedas a statistical occurrence where more than one predictor variables in a multiple regression model are greatly correlated that is, one can be linearly projected from those with a non-trivial degree of correctness. Table 5.2 above reflects some degree of multicollinearity (the numbers in bold) and to analyse the extent of the multicollinearity further tests namely variance inflation factor (VIF) test shall be carried out:

5.3.1 VIF TEST

The Variance inflation factor (VIF) test determines the rate at which the variances of the projected regression coefficients are inflated. The rule of VIF is that when the coefficient is greater than 5 then the multicollinearity is high. It is represented as:

$$VIF(\beta_i) = \frac{1}{(1-R_i^2)} \qquad \text{----------5.3}$$

Here $R^2{}_i$ is the coefficient of determination. The result of the VIF is as below.

Table 5.3 VIF test Result.

Variance Inflation Factor

Sample: 1983Q1 to 2012Q4

Included Observation: 119

Variable	CoefficientVariance	Uncentered VIF	Centered VIF
C	3.58E-06	1.593163	NA

D(LGFCF)	0.001736	1.163047	1.124507
D(LINT)	0.000589	1.092790	1.085879
LREER	1.74E-06	1.522776	1.017471
D(LTO)	8.21E-05	1.072062	1.069070

The above table confirms that none of the variables have a coefficient greater than 5,implying that there is lack of great multicollinearity amongst variables. Since this is settled the lag length need to be decided.

To determine the lag order and the trend theory of the VAR in Johansen technique, this research project used the information criteria method to select the lag order. Table 5.3 confirms the lag lengths selected by a number of information criteria. This is important because it helps to analyse the impact of previous values on current values.

Table 5.4 Lag lengths selected by different information criteria.

LAG	LOGL	LR	FPE	AIC	SC	HQ
0	111.7956	NA	1.02e-07	-1.907064	-1.785703	-1.857824
1	748.6012	1205.382	1.84e-12	-12.83216	-12.10399*	-12.53672
2	788.3396	71.67099*	1.42e-12*	-13.09535*	-11.76037	-12.55371*
3	801.8733	23.20068	1.75e-12	-12.89059	-10.94881	-12.10275
4	817.0948	24.73495	2.11e-12	-12.71598	-10.16739	-11.68193
5	841.5545	37.56314	2.18e-12	-12.70633	-9.550930	-11.42608
6	855.0385	19.50354	2.76e-12	-12.50069	-8.738479	-10.97424
7	875.0400	27.14495	3.15e-12	12.41143	-8.042413	-10.63878
8	894.3613	24.49668	3.71e-12	-12.31002	-7.334200	-10.29117

Notes

* shows lag order selected by the criterion

LR: progressiveadjusted 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

The time series are quarterly; as such, the selection is taken from a maximum of eight lags. This is important because it gives rooms for adjustment in the model as well as to attain well-behaved residuals. Table 5.4 shows the LR, FPE, AIC and the HQ select 2 lags, whereas the SC choose 1 lag for the VAR. Conclusion can therefore be reached since lag 1 is not well behaved but lag 2 brought about good diagnostic check result.

5.3.2 TRACE TEST AND MAXIMUM EIGENVALUE

Table 5.4(1) above displays the results for trace test based on Johansen cointegration model. In trace test the null hypothesis is that the number of co-integrating equations is bigger than the number of the variables involved. The null hypothesis would not be rejectedwhen the test statistic is lesser than critical values. Table 5.4(ii) displays the results for the maximum eigenvalue based on the Johansen cointegration test. The maximum eigenvalue test was carried on a null hypothesis of the number of cointegration equations (r) in contrast to the alternative hypothesis of a number of cointegration equations plus one ($r+1$). In maximum eigenvalue just like the trace test, there is no need ofrejecting the null hypothesis on the condition that the test statistic is lesser than critical values. Below are the tables for the Trace test and Max-Eigen value test;

Table 5.5(i) Unrestricted Co-integration Rank Test (Trace)

HYPOTHESIZED NO OF CE(S)	EIGENVALUE	TRACE STATISTICS	0.05 CRITICAL VALUE	PROB
None *	0.242804	81.78874	69.81889	0.0041
At most 1*	1.195238	49.24714	47.85613	0.0368
At most 2	0.142096	23.83365	29.79707	0.2076

At most 3	0.038653	5.901901	15.49471	0.7071
At most 4	0.010963	1.289803	3.841466	0.2561

Notes

Trace test indicates 2 co-integrating equation at the 0.05 level

*Indicatesthe rejection of the hypothesis at 0.05 level

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

Table 5.5(ii) Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

HYPOTHESIZED NO OF CE(S)	EIGENVALUE	TRACE STATISTICS	0.05 CRITICAL VALUE	PROB
None	0.242804	32.54161	33.87687	0.0715
At most 1	0.195238	25.41349	27.58434	0.0924
At most 2	0.142096	17.9	21.13162	0.1324
At most 3	0.038653	4.612098	14.26460	0.7898
At most 4	0.010963	1.289803	3.841466	0.2561

Notes

Max-eigenvalue test indicates no cointegrating eqn(s) at the 0.05 level

*Indicatesthe rejection of the hypothesis at 0.05 level

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

The above table (5.5 (i)) revealed that in the trace test at least 2 co-integrating equation occurs at 5% significance level. The null hypothesis of no co-integrating vectors is rejected since the trace (test) statistic of 81.78874 is higher than 5%critical value of 69.81889, the null hypothesis that at most 1 cointegration vector exists is rejected as the t-statistic of 49.24714 is greater than 5% of the critical value of 47.85613 but the null hypothesis that at most 2 cointegration vector exist cannot be rejected as the t-statistic of 23. 83365 is smaller than the critical value 29.79707. In the same way, the maximum eigenvalue test in figure 5.5 (ii) could not rejects the null hypothesis of no co-integration since the t statistics is less than critical values. The maximum eigenvalue does not make sense economically as it says there is no cointegration thus the trace

test is more preferred since it says there are two co-integrating vectors in the framework. A conclusion can therefore be made that there is a significant long run associationamong the selected variables. For the fact that variables can either have a short run or long run effect, the use of VECM to disaggregate these effects can therefore be applied.

5.3.3 THE VECTOR ERROR CORRECTION MODEL (VECM)

From the result above there exists a cointegration among the variables which means vector error correction model can henceforth be applied. The difference between the short run and the long run impacts on variables has to be established so as to know the degree at which the real exchange rate influences the manufacturing sector in South Africa. The vector error correction model was identified by the use of outcomes attained from the co-integration. The vector error correction model result is tabulated in the next page:

Table 5.6: Results from the vector error correction model

Vector Error Corrections Estimates

Sample (Adjusted): 1983Q1 2012Q4

Included observations: 116 after adjustment

Standard error( ) and t-statistics in [ ]

Cointegration Eq:	Coint Eq1	Coint Eq2
D(LGDPM(-1))	1.000000	0.000000
D(LGFCF(-1))	0.000000	1.000000
D(LINT (-1))	0.654234	1.456456
	(0.18452)	(-0.47982)
	[3,54562]	[3.03543]
D(LREER(-1))	0.031089	0.083118
	(0.01139)	(0.02962)
	[2.72974]	[2.80853]
D(L TRADE OPEN-1))	-2.437133	-6.057186
	(0.36036)	(0.93708)
	[-6.76297]	[-6.46387]

ERROR CORRECTION	DLGDPM,2	D(LGFCF,2)	D(LINT,2)	DLREER,2)	DLTRADE OPEN,2
COINT EQ 1	-0.689124	0.933425	-0.48381	-12.0333	-0.042676
	(0.13704)	(0.33537)	(0.45116)	(9.51216)	(0.40469)
	[-5.02852]	[2.78325]	[-1.07235	[-1.26505]	[-0.10545]
CCOINT EQ2	0.277223	-0.3825582	0.76177	2.174099	0.132128
	(0.05202)	(0.12729)	(0.17124)	(3.61038)	(0.15360)
	[5.32966]	[-3.02913]	[0.44485]	[0.60218]	[0.86020]

The Long run CointEq1 result above can be illustrated as below in equation 5.1(a):

D(LGDP)(-1) - 0.019984 + 0.654234*D(LINT(-1)) + 0.031089 *LREER(-1) –

2.437133*D(TRADE_OPEN(-1)) = 0 .....5.1a

This can be rewritten as follows:

D(LGDPM)(-1) = 0.019984 - 0.654234*D(LINT(-1)) – 0.031089*LREER(-1) + 2.437133*D(TRADE_OPEN(-1) 5.1b

From the table 5.6 above, the long run cointegration equation 1 shows that all explanatory variables have proved tobe statistically insignificant in the long run.

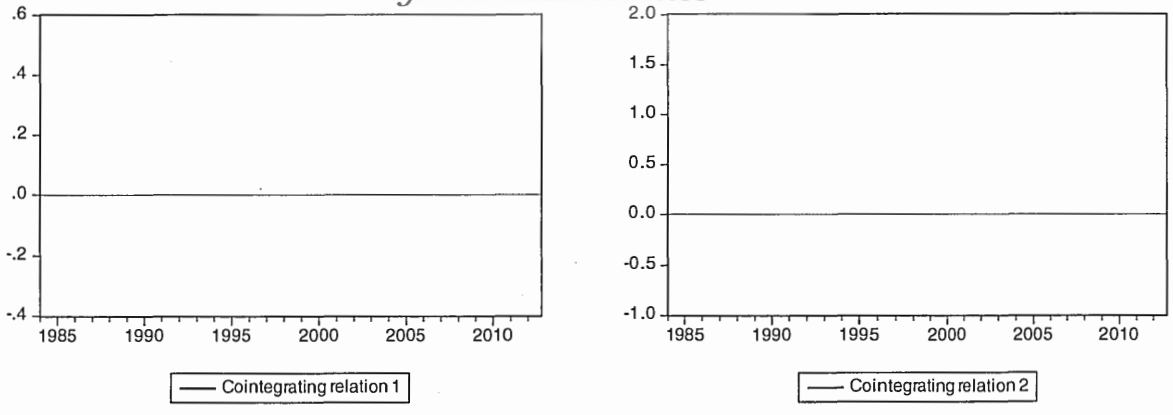
Long run Cointegration Equation 2 may be written as follows:

D(LGFCF)(-1) = 0.050974 – 1.456456*D(LINT(-1)) – 0.083118*LREER(-1) + 6.057186*D(LTRADE_OPEN(-1)) -------5.2

The long run cointegration equation 2 uncovers that every explanatory variable are factually huge over the long run. Figure 5.2 beneath demonstrates that over the period 1983-2012, the eccentricities of the manufacturing sectorequilibriurn were stationary and this is critical in its utilization as anerror correctionmodel.

THE CO-INTEGRATION GRAPH

Figure 5.2: Cointegration vector



5.3.4. ERROR CORRECTION MODEL

Table 5.6 (at the bottom) measures the speed of adjustment. Both short run cointegration equations are true cointegration equations because they both have the right signs, meaning negative signs and they are statistically significant. CointEq1 show that the first vector LGDPM an adjument t-value of -5.02852 and also that if there is one standard deviation from equilibrium, approximately 68% of LGDPM will be restored in equilibrium in one period. There are some variables that have either an erroneous sign or are less significant. In the Cointegration Equation

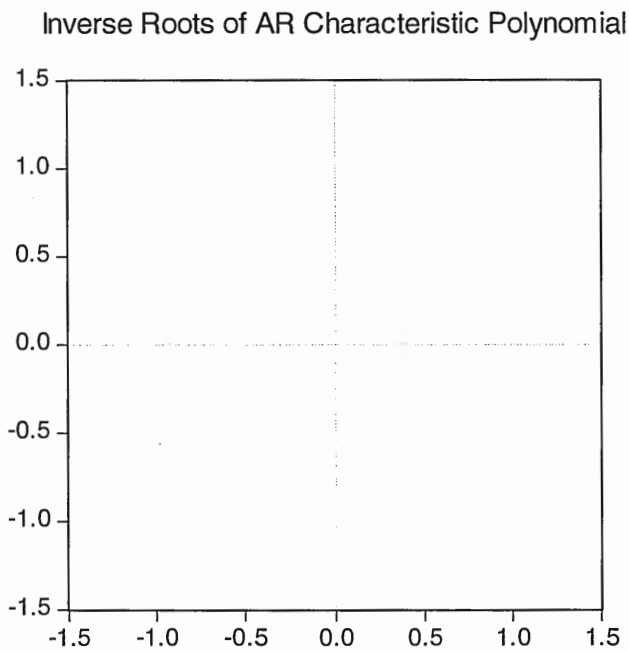
2 indicates that LGFCF has higher coefficient with a t-value of -3.02913 and that if there is a standard deviation from equilibrium in gross fine-tuned capital formation approximately 38% of gross fine-tuned capital formation will be renovated back to equilibrium in one period. Both short run cointEq1 and cointEq2 are statistically significant. As a result of this result, it can therefore be concluded that there exist a short run associationamongmanufacturing and the rate of exchange.

5.4 DIAGNOSTIC CHECKS

The manufacturing sector data underwent an in-depth diagnostics tests. For the significance of this study the manufacturing model was tested in for serial correlation, normality and autoregressive conditional heteroscedasticity. Diagnostic checks are carried out so as to substantiate the parameter evaluation of the result reached. On the condition that there is any error in the residuals from the estimated model it makes the model to be inefficient and as such, the projectedlimitations will be biased. Figure 5.6 and tables below presents the diagnostic test results. These diagnostic checks are predicated on the null hypothesis that: there is normality for the Jargue-Bera test, no serial correlation by the LM test and lastly that there is no heteroscedasticity for the White heteroscedasticity test.

5.4.1 Normality Test

Figure 5.3 Diagnostic checks



Results from Figure 5.3 above shows that all the dots fall within the circle. Therefore it can be concluded that the model is stable. Moreover, the histogram shows a bell-shape and as a result, the residuals are normally distributed and as a result the null assumption of a normal distribution was not rejected.

5.4.2 LM Test

Table 5.7 Serial Correlation Test

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	5.736560	NA*	5.786443	NA*	NA*
2	19.02147	NA*	19.30442	NA*	NA*
3	34.22228	0.7272	34.90879	0.6984	40
4	82.99206	0.0656	85.42035	0.0456	65
5	95.63569	0.3224	98.63351	0.2504	90
6	113.0754	0.5333	[illegible]45	0.4299	115
7	128.8264	0.7409	133.7870	0.6319	140
8	159.2732	0.6111	165.4891	0.4529	165
9	189.1875	0.5030	198.9196	0.3140	190
10	216.9022	0.4508	229.2489	0.2406	215
11	236.2702	0.5559	250.6459	0.3053	240
12	262.8187	0.5263	280.2577	0.2485	265

The table 5.7 above shows that the null hypothesis of no residual autocorrelation cannot be rejected using lag 2 it can then be concluded that there is no autocorrelation in the residuals.

5.4.3 Heteroscedasticity Test

Table 5.8 Heteroscedasticity test

Chi-sq	Df	Prob
1415.011	1350	0.1067

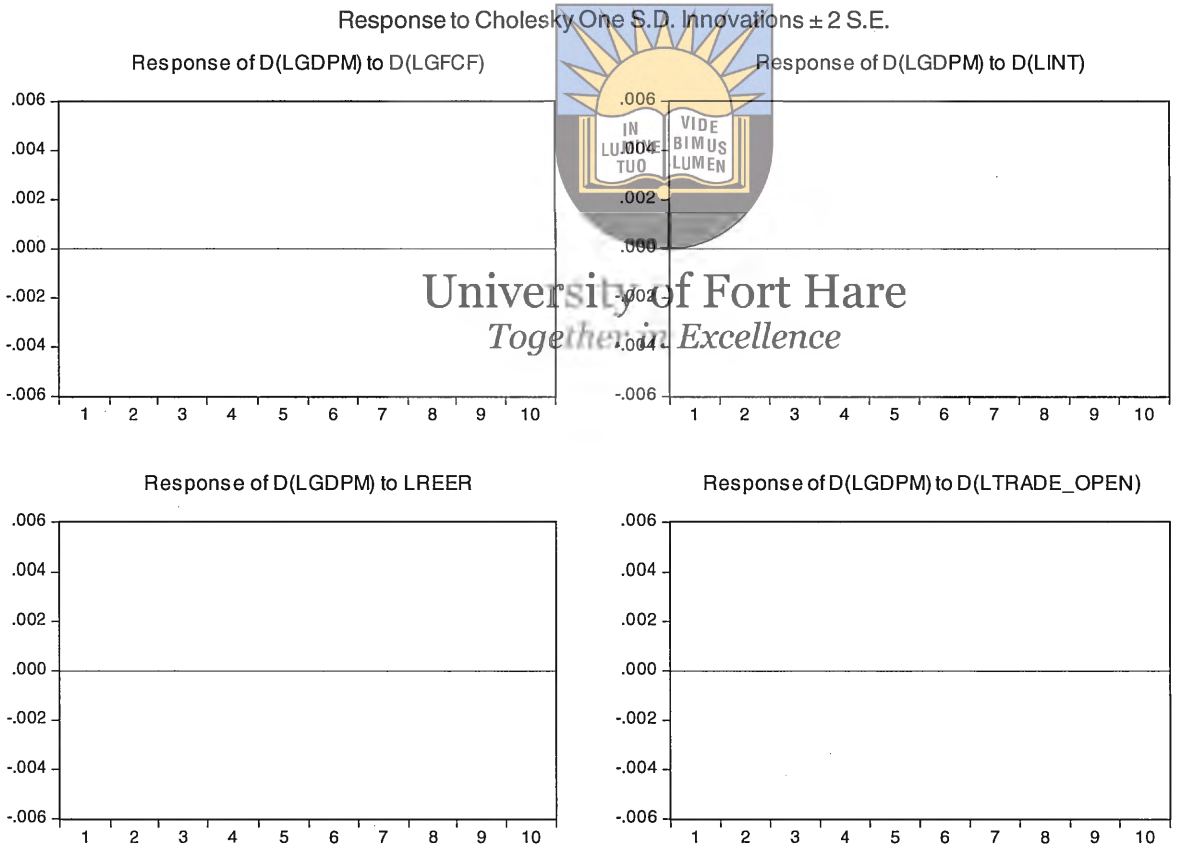
Heteroscedasticity test above with a probability of 0.1067 demonstrates that the null hypothesis of no heteroscedasticity was rejected. Since the outcomes for the demonstrative checks for serial connection (LM), Jarque- Bera and heteroscedasticity demonstrated that the data is well

behaved. The following step is to further check for impulse response and variance decomposition.

5.5 IMPULSE RESPONSE ANALYSIS

As aforementioned, the fifth step is the impulse response analysis whereby the responsiveness of the dependent variables in a VAR to shocks from each of the variables are traced out as Brooks (2008) puts forward. Figure 5.4 below present the results of the impulse replication analysis

Figure 5.4: Impulse response of GPD



To affirm the impact of real exchangerates on manufacturing sector in the above figure, only the responses of GDP manufacturing is depicted in Figure 5.4. These impulse respose functions helps to understand the reaction of the manufacturing sector to a one-period standard deviation shock to the inventions of the system, they also help to recognize the directions and persistence of the response to each of the shocks for a period of 10 quarters. Outstandingly, the impulse

response functions further confirms result from the short run analysis using an expected pattern. From the figure above shocks to all the variables are important. Shock to the LGFCF and REER have marginally appreciates and have impacted them but their impact lessen quickly on the average while LINT and LTRADE have ahugediminishinginfluence on manufacturing sector. In the short run this influenceappears to be inverted. LREER have a positive effect on manufacturing sector from 1st quarter to the 10th quarter although not persistence. LGFCF also has significant effect on the manufacturing sector in the short as depicted in the figure although this effect dies off quickly on the average.

5.6 VARIANCE DECOMPOSITION ANALYSIS

In line with Adren (2007) Variance decomposition aidsto discover the relative significance of shocks in explicating variations in the variable of interest. Variance decomposition offers a way of deciding the relative importance of shocks to real exchange rates in explaining variations in manufacturing sector. The outcomes of the variance decomposition analysis are tabulated in table 5.8 below.

Table 5.9: Variance decomposition of GDPM

Period	S.E	LGDPTM	LGFCF	LINT	LREER	LTO
1	0.015475	100	0	0	0	0
2	0.016942	98.74929	0.284843	0.003453	0.557749	0.404704
3	0.017619	94.48339	0.767240	2.540115	0.655740	1.553516
4	0.017838	92.31286	0.986179	3.945132	1.195194	1.560632
5	0.018028	90.42067	1.109034	4.892582	1.995103	1.582615
6	0.018149	89.37685	1.156407	5.221040	2.683111	1.562591
7	0.018228	88.71297	1.197841	5.329243	3.208299	1.551646
8	0.018269	88.35930	1.223231	5.350389	3.514490	1.552586
9	0.018291	88.16389	1.241135	5.353001	3.685956	1.556016
10	0.018301	88.06404	1.251807	5.352209	3.773023	1.558923

Since this research project concentrates on the impact of the rate of exchangeon South Africanmanufacturing sector, the research reports only the variance decomposition in

manufacturing sector, the relative importance of the real exchange in influencing the manufacturing sector is also analysed. The research project permits the variance decompositions for ten quarters (2.5years) so as to determine the effect at which the variables are allowed to affect manufacturing sector for a relativelylongerperiod of time. During the first quarter as stipulated by Brooks (2008) each and every variance in manufacturing sector is expounded by shocks of its own. For the 4th quarter aheadforecast error variance as presented in the second column of Table 5.8 under S.E., manufacturing sector itself expounds roughly 92.3% of its variation;despite the fact the other variables explain only the outstanding 7.7%. Of this INT explains 3.9 per cent, GFCF expounds 0.98 per cent, REER explicates 1.19 per cent, and TO expounds 1.56 per cent.

However, after a time period of 2 and half years, manufacturing sector expoundsaround 88% of its own deviation, while other variables elucidate the outstanding 12%. The impact of LINT increased close to 5.3%, GFCF increased to 1.25 percent, REER also increased to 3.77 percent but TO reduce to 1.5 percent. According to Pesaran (1997), 'these results are similar to those from the impulse response analysis in that all the variables have a significant impact on manufacturing sector in the short run and in the long run". Manufacturing sector expounds theutmost of its differences, next isthe real interest rates as well as REER. The LGFCF and LTO do not explicate a lot of the differences in manufacturing sector. From the variance decomposition in thisstudy it can be discerned that real interest rates (LINT) and REER are extremely a paramount variable in explaining manufacturing sector in South Africa throughout the research period.

5.7 SUMMARY

In conclusion this chapter had six segments. Firstly the unit root tests which include the Dickey-Fuller, Philips-Peronand the KPSS test were used to test for stationarity and the results were presented. The three tests showed that the data are non-stationary but became stationary when differenced for four variables and one of the variables was stationary at levels. Therefore, the series were integrated of the same order I (1).

Secondly the co-integration tests were carried out using the Johansen maximum likelihood approach. This segment also includes the pair-wise correlation matrix and the lag order

assortment criteria. Lag 2 was selected and was used to give room foradjustment in the model and accomplished well behaved residuals. The trace and maximum Eigen value cointegration tests were utilised for testing for the cointegration. The outcomes shows that there are 2 cointegrating equation for the trace test and the maximum eigenvalue indicated no cointegrating equation.The third section presented the VECM model, as the variables can also have longrun or short run impacts. All the variables had a statistically significant effect on the South Africa manufacturing sector.

The last section presented the results of the diagnostic tests carried in the study. The Diagnostic check revealed that the models are well behaved. And lastly the impulse response and variance decomposition were carried out and the results are found to be reliable thus, policy recommendations can be derived from this study. Followed by this chapter is the concluding part which encompasses policy recommendations and limitations of the study.

CHAPTER SIX

CONCLUSIONS, LIMITATIONSAND POLICY RECOMMENDATIONS

6.1 Summaryof theResearch and Conclusions.

This dissertation is being carried out with the intension to ascertain the influence ofreal exchange rates on the South African manufacturing sector during the years 1983 and 2012. Chapter one discussed the introduction and the background to the research which includes the objectives, hypothesis, statement of problem, methodology and the organisation of study. In chapter two the overview of the trends in the manufacturing sector and the real exchange rate was thoroughly analysed. The next was chapter three whereby applicable theoretical framework and empirical literature review wasdone. Followed by this chapter was chapter four which deliberated on the methodology aspect of the study. Chapter five presented the estimation, analysis and interpretation of the results. The last chapter presents the conclusion of the research project, recommendations for further studiesand the limitations of the study.

The study revealed the declining contribution of the manufacturing sectors to South Africa's GDP since 1983. "Manufacturing production reached its peak at 21.3% of the GDP in 1983 on the back of a closed economic system that operated in a sanction-burdened South Africa. Manufacturing production recorded the highest growth rate of 9.3% in 1983 as well, a period coinciding with the gold boom" (SEDA, 2013). Such occurrence focuses to the complementarity between the Mining and Manufacturing parts. "The contractionary trend in manufacturing productivity observed from the mid-2000s has largely been attributable to poor macro-economic policies and was also exacerbated by the 2008/09 economic recession. South Africa's Manufacturing sector faces serious and binding structural constraints compared to its counterparts in emerging economies such as China, the Philippines, Turkey, Brazil and India, to name but a few" (TIPS, 2013). Graphical illustration of the trends in real exchange rate under the period covered shows that the rand has been unstably depreciating as shown by its zig-zag trends. The instability of the rand is observant in all the years from 1983 until 1999. 1983 there was momentary closures of the forex market in the country because the apartheid government eradicated the financial rand exchange rate system and key international banks denied South Africa assess to renew credit. In all these years the rand has been fluctuating considerably. This

can be said to be domestic in nature. The Rand depreciated again sharply in 1998. The Commission of Inquiry into the Rapid Depreciation of the Real Exchange Rate of the Rand (2002) argued that the contagion arising from Asian crisis hit all emerging markets in May 1998 and the rand was affected alongside with currencies of many other developing Nations. The adoption of the inflation targeting regime in 2000 which compels the Central Bank to have minimal intervention in the real exchange rate market resulted to the instability in the forex market from the year 2000 to 2012. Currency depreciation continued after 2000, the real exchange rate in South Africa is not fixed by the government; it is determined by the forces and demand in the foreign exchange market. It was also observed that for over a decade (1983-1993) trade openness in South Africa was stagnant but just after trade liberation the trade openness in South Africa began to increase in 1994.

A thorough review of both theoretical and empirical literature revealed that real exchange rate is asignificant variable in explaining manufacturing sector. Theories well-thought-out in this study includes; the changing sectorial p[illegible], the PPP, the UIP, the structuralist and the traditionalist approach to the real exchange rates, the Balassa-Samuelson Hypothesis, salter swan hypothesis and the export led hypothesis. Despite difference in opinions and assumptions, the conclusion is that policy makers can use real exchange rates as an instrument to determine the manufacturing sector production and economic growth at large. According to the traditional approach there is a progressiverelationship between real exchange rates and manufacturing growth while the structuralist approach held that real exchange rates impacts growth negatively.

To accomplish the objective of this study, macro-economic variables in the economic model as suggested by both theoretical literature and empirical literature were employed. The selection of these variables was cognizant by an extensive review of literature on real exchange rates and manufacturing sector as well as data availability. The illustrative variables in this study were; real interest rates, real exchange rates, gross fixed capital formation and trade openness while the dependable variable is GDP manufacturing.

The Johansen co-integration and error correction methodology were used to determine both the long and short run relationships among the variables. This methodology was adopted because it is well detailed and has lots of benefits. When it comes to time series data, there is need to check if the individual time series are either stationary or that they are co-integrated. In order to do this, a primary test for unit root was implemented using the graphical method. Because of the

limits of the graphical system, the formal unit root tests were performed utilizing thePhillips-Perron, theAugmented Dickey-Fuller tests and the KPSS test. The tests demonstrated that four variables of all the time arrangement were non stationary in levels however got to be stationary after first difference, GDP Manufacturing (GDPM), gross fixed capital formation (GFCF) and Trade Openness (TO) have a trendy behaviour except for real exchange rate as a result of the volatility of the rate of exchange as illustrated by the graph in chapter five. The impulse response analysis was done to check the responsiveness of the dependent variable in the VAR to shocks to each of the other variables. It was noted that shocks to all the variables were importanteven though they are not persistent. Variance decomposition analysis was done to check for the variables that explain most of the variations in the dependent variable. It was observed that GDPM explains much of its variations followed by real interest rates. The residuals were further tested using Diagnostictests. This was to ascertain that the residuals were very well behaved. In the event that residuals are serially correlated and have no consistent error variance this may be an indication that the model is not efficient or [illegible] be biased. The short run results of the model showed that INT and TO have a progressivecorrelation with Gross Domestic Product manufacturing but negative in the long run, while GFCF have a long run positive relationship with GDP manufacturing.

6.2 POLICY IMPLICATIONS AND RECOMMENDATIONS

This research project's outcomes have a variety of policy inferences. This section explains them as below;

There are two main contrasting views regarding the impact of the real exchange rates on manufacturing. The first is the traditional view which holds that currency depreciation increases economic growth and on the other hand, the structuralist view holds that currency depreciation dampens growth prospects of a country (Salvatore, 2005). Empirical literature also presents mixed conclusions regarding this matter. The long run equation in the previouschapter postulated by Pesaran (1997) proposed that "real exchange rates have a negative (depreciation) impact on manufacturing sector. The coefficient of REER from the long run equation suggested by VECM results implies that adepreciation in South Africa's real exchange rates leads to a decrease in GDPM."The outcomesachieved from the short run CointEq1equation however,presents that the first vector LGDPM has a t-value of -5.02852 and also that if there is one standard deviance from equilibrium, roughly 68% of LGDPM will be restored in

equilibrium in one period. Also the result from the impulse response shows that in the short run LREER has a positive effect on manufacturing sector from 1st quarter to the 10th quarter and this effect is statistically insignificant although not stable. In order to support manufacturing sector in South Africa the real exchange rate policies are significant. South Africa has not significantly leverage from a depreciating currency. The sector has failed to create sufficient jobs through export-led growth.

The study's estimations uncovered that investment expenditure hasa positive effect on the economic growth in the long run inthe South African manufacturing sector. The VECM result demonstrates that an increment in gross fixed capital formation prompts an increment in the GDP manufacturing. The policy implication of this is that the governmenthave tospend more on investment so as to enhance manufacturing sector development in the nation. The government have to put resources into functioning such as good road, purchase of plant and equipment as well as their maintenance, hospital and so on. The government should also provide good education that is invest likewise inhu[illegible].In the Cointegration Equation 2 LGFCF has a t-value of -3.02913 and that if there is a standard deviation from equilibrium in gross fixed capital formation approximately 38% of gross fixed capital formation will be restored back to equilibrium in one period.

Real interest rate has a negative influence on the GDP in the manufacturing sector. The implication of this finding is that an expansionary monetary policy has a potential to boost the manufacturing sector in South Africa. However, considering the impulse response analysis and variance decomposition analysis, it can be seen that real interest rates clarify a significant part of the variable GDP producing. Interest rates in this way are a vital instrument in explaining the manufacturing sector in South Africa.

Approximationoutcomes in this research projectexposed that trade openness in the long run has a progressiveinfluence on the GDP manufacturing sector and it is statistically significant. However, the trade openness impacts negatively on the manufacturing sector in the short run. South Africa Manufacturing Sector particularly the clothing industry is continuously threatened by imports of cheap goods from China. In this regard it is important that South Africa applies trade liberalisation with caution.

6.3. LIMITATIONS OF THE RESEARCH AND AREAS FOR FURTHER STUDY

The secondary data utilised in this study was acquired from a great number of sources which in some instances different figures of the same variables were obtained without any appropriate sources to verify these figures.

The rand has been volatile in the recent past and this volatility has an effect on the manufacturing sector. Further research is recommended on the impact of the volatility of the real exchange rate in the South African manufacturing sector.

6.4 CONCLUSSION

The main purpose of this study was to investigate the impact of the real exchange rates on the South African manufacturing sector for the time frame between 1983 and 2012. The null hypothesis of this study was that real exchange rates do not have a significant influence on the South African manufacturing industry. Given the regression outcomes, the null hypothesis present in this study is rejected.However, it must be noted that the exchange rate is volatile and the impact of it on any other sector or even the manufacturing sector itself may differ simply because of other micro economic variables used in South Africa. Therefore a sectorial analysis of the impact of exchange rate on manufacturing could provide a more useful insight.

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APPENDIX A

SOUTH AFRICAN DATA USED FOR REGRESSION

PERIOD	LGDPM	LGFCF	LINT	LREER	LTO
1983Q1	12.05794	10.68084	2.751535	1.435085	2.43646
1983Q2	12.06129	10.7238	2.685577	1.223775	2.43646
1983Q3	12.07531	10.70185	2.852631	0.955511	2.43646
1983Q4	12.10324	10.72179	2.944439	1.386294	2.43646
1984Q1	12.13518	10.68295	3.012262	1.386294	2.521118
1984Q2	12.15989	10.68098	3.044522	0.336472	2.521118
1984Q3	12.13613	10.71562	3.178054	2.517696	2.521118
1984Q4	12.12995	10.68894	3.178054	1.94591	2.521118
1985Q1	12.12178	10.67336	3.218876	0.641854	2.606202
1985Q2	12.11555	10.61396	3.149883	0.530628	2.606202
1985Q3	12.09099	10.59985	3.020425	2.653242	2.606202
1985Q4	12.09304	10.58812	2.84297	2.76001	2.606202
1986Q1	12.08449	10.42052	2.74084	3.182212	2.569554
1986Q2	12.09844	10.38936	2.696877	1.386294	2.569554
1986Q3	12.10773	10.43238	2.639057	2.292535	2.569554
1986Q4	12.12412	10.41274	2.564949	2.747271	2.569554
1987Q1	12.12373	10.37608	2.525729	1.481605	2.538842
1987Q2	12.11424	10.31841	2.525729	0.993252	2.538842
1987Q3	12.13083	10.35609	2.525729	0.262364	2.538842
1987Q4	12.13352	10.39332	2.525729	-2.30259	2.538842
1988Q1	12.16036	10.42922	2.590267	0.641854	2.558196
1988Q2	12.16019	10.44479	2.685577	1.308333	2.558196
1988Q3	12.20914	10.53481	2.772589	0	2.558196
1988Q4	12.22328	10.50693	2.852631	-2.30259	2.558196
1989Q1	12.21144	10.49297	2.926739	1.163151	2.48574
1989Q2	12.22421	10.52605	2.978925	-0.10536	2.48574
1989Q3	12.19595	10.5623	2.995732	-1.20397	2.48574
1989Q4	12.19675	10.58767	3.044522	1.386294	2.48574
1990Q1	12.19133	10.56132	3.044522	1.280934	2.375138
1990Q2	12.18476	10.52318	3.044522	0.09531	2.375138
1990Q3	12.17988	10.49941	3.044522	0.262364	2.375138
1990Q4	12.1817	10.49147	3.044522	0.741937	2.375138
1991Q1	12.15176	10.47892	3.044522	0.916291	2.282382
1991Q2	12.14567	10.47042	2.995732	-0.35667	2.282382
1991Q3	12.13128	10.39173	2.995732	-0.69315	2.282382
1991Q4	12.12167	10.42629	3.008155	-0.22314	2.282382

1992Q1	12.11613	10.42904	3.008155	-1.60944	2.269287
1992Q2	12.10836	10.37963	2.957511	0.09531	2.269287
1992Q3	12.09773	10.37795	2.904165	-0.91629	2.269287
1992Q4	12.09491	10.36587	2.866951	0.262364	2.269287
1993Q1	12.09651	10.33838	2.808398	-1.20397	-2.59027
1993Q2	12.09622	10.40077	2.788093	1.064711	-0.32158
1993Q3	12.10805	10.36294	2.788093	0.530628	-0.85567
1993Q4	12.10915	10.42703	2.746202	0.641854	-0.74444
1994Q1	12.10825	10.40363	2.72458	0.587787	2.349946
1994Q2	12.11478	10.44987	2.72458	1.589235	2.349946
1994Q3	12.1328	10.45487	2.746202	-1.20397	2.349946
1994Q4	12.15876	10.5355	2.788093	0.262364	2.349946
1995Q1	12.17804	10.49902	2.838103	-0.51083	2.417029
1995Q2	12.19658	10.58489	2.862201	1.308333	2.417029
1995Q3	12.20051	10.56452	2.917771	1.386294	2.417029
1995Q4	12.19173	10.60321	2.917771	0.587787	2.417029
1996Q1	12.19658	10.59816	2.917771	-1.60944	2.482195
1996Q2	12.20661	10.65561	3.004031	2.261763	2.482195
1996Q3	12.20795	10.65658	2.970414	0.641854	2.482195
1996Q4	12.21073	10.68673	2.991557	-0.10536	2.482195
1997Q1	12.22764	10.66895	3.008155	2.292535	2.484698
1997Q2	12.23499	10.6841	3.008155	1.163151	2.484698
1997Q3	12.23396	10.70219	3.008155	0	2.484698
1997Q4	12.2334	10.77046	2.957511	1.029619	2.484698
1998Q1	12.23808	10.73394	2.940043	0.09531	2.530318
1998Q2	12.2373	10.72457	2.974679	1.098612	2.530318
1998Q3	12.22443	10.75323	3.218876	2.721295	2.530318
1998Q4	12.21909	10.79602	3.164068	1.609438	2.530318
1999Q1	12.21687	10.70255	3.044522	1.252763	2.486572
1999Q2	12.22416	10.64833	2.926739	0.993252	2.486572
1999Q3	12.24005	10.65408	2.823361	0.09531	2.486572
1999Q4	12.26039	10.68732	2.74084	-1.20397	2.486572
2000Q1	12.28575	10.67921	2.674149	0.09531	2.57889
2000Q2	12.30198	10.69229	2.674149	1.280934	2.57889
2000Q3	12.32267	10.71604	2.674149	0.182322	2.57889
2000Q4	12.34239	10.75577	2.674149	1.335001	2.57889
2001Q1	12.34779	10.73494	2.674149	1.098612	2.648123
2001Q2	12.34781	10.72709	2.656757	1.064711	2.648123
2001Q3	12.33706	10.73833	2.590267	1.029619	2.648123
2001Q4	12.34539	10.75677	2.564949	2.639057	2.648123
2002Q1	12.35344	10.73846	2.662588	1.648659	2.74663

2002Q2	12.37077	10.74188	2.730029	2.197225	2.74663
2002Q3	12.38194	10.77973	2.793208	0.875469	2.74663
2002Q4	12.38218	10.83177	2.833213	2.151762	2.74663
2003Q1	12.37282	10.83335	2.833213	2.174752	2.598421
2003Q2	12.36012	10.82919	2.80336	1.526056	2.598421
2003Q3	12.35022	10.88001	2.674149	1.609438	2.598421
2003Q4	12.34459	10.93809	2.47092	1.386294	2.598421
2004Q1	12.37382	10.95415	2.442347	1.568616	2.591142
2004Q2	12.39782	10.94803	2.442347	1.648659	2.591142
2004Q3	12.42143	11.00353	2.412933	0.788457	2.591142
2004Q4	12.42521	11.0593	2.397895	-0.91629	2.591142
2005Q1	12.42504	11.05689	2.397895	0.587787	2.623762
2005Q2	12.46306	11.06617	2.351375	1.335001	2.623762
2005Q3	12.48571	11.10472	2.351375	-0.22314	2.623762
2005Q4	12.48488	11.15512	2.351375	0.336472	2.623762
2006Q1	12.49862	11.1679	2.351375	1.589235	2.743739
2006Q2	12.51755	11.18115	2.367124	1.808289	2.743739
2006Q3	12.53692	11.22113	2.427748	2.014903	2.743739
2006Q4	12.55548	11.27097	2.4987	-1.60944	2.743739
2007Q1	12.56999	11.31467	2.525729	-0.51083	2.800477
2007Q2	12.57423	11.321	2.538974	0.788457	2.800477
2007Q3	12.57394	11.34143	2.590267	0	2.800477
2007Q4	12.59557	11.38848	2.650892	0.693147	2.800477
2008Q1	12.59502	11.42251	2.674149	2.459589	2.93638
2008Q2	12.63479	11.43911	2.7191	-1.20397	2.93638
2008Q3	12.61768	11.47631	2.74084	1.902108	2.93638
2008Q4	12.5692	11.51557	2.730029	2.4681	2.93638
2009Q1	12.50059	11.47321	2.639057	0.587787	2.644755
2009Q2	12.47338	11.43416	2.456736	2.60269	2.644755
2009Q3	12.49484	11.39396	2.367124	1.458615	2.644755
2009Q4	12.52143	11.37717	2.351375	-0.10536	2.644755
2010Q1	12.53752	11.40504	2.335375	0.405465	2.621402
2010Q2	12.55613	11.39077	2.302585	1.481605	2.621402
2010Q3	12.55013	11.39235	2.285778	0.641854	2.621402
2010Q4	12.56191	11.41101	2.215574	-0.10536	2.621402
2011Q1	12.5913	11.4257	2.197225	1.029619	2.709549
2011Q2	12.5789	11.42944	2.197225	-0.22314	2.709549
2011Q3	12.57727	11.44337	2.197225	1.131402	2.709549
2011Q4	12.58755	11.476	2.197225	2.140066	2.709549
2012Q1	12.60247	11.48502	2.197225	1.808289	2.688528
2012Q2	12.59977	11.48732	2.197225	0.993252	2.688528

APPENDIX B

EDITOR'S DECLARATION

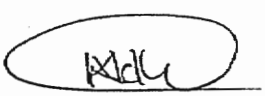
Dear sir/ madam

I Lieza Sami (B.A honours Linguistics UNISA) confirm that I edited Olamide Doris Ogunjobi's mastersthesis entitled:

IMPACT OF THE EXCHANGE RATE ON MANUFACTURING SECTOR IN SOUTH AFRICA (1983-2012)

During the process of editing, the following changes were amended; grammatical, sentence construction and structural among others. It is up to the candidate to effect these changes as she is the author of this thesis and thus remains in control of the writing process.

Kind regards



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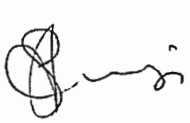

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Candidate's Signature Date