Title

The Impact of China on the Steel Industry value chain in South Africa and the Role of Government's Industrial Policies

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Research Project (MECN 7018)

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A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Masters in Engineering (MECN 7018).

Date: 17 June 2015

Declaration

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Acknowledgement(s)

I would like to express my deep gratitude to my research supervisor, Dr. Emwanu, for his patient guidance, enthusiastic encouragement and useful critiques of this research work.

I would also like to thank Mr. Richard Amlima, for his assistance and valuable technical support on this project.

My grateful thanks are also extended to my wife and my family for their support throughout the duration of the research.

Abstract

China has recently been seen as the most dominant and the fastest growing economy in the world. There has been a lot of pressure on South African Steel products to compete with Chinese steel products in South Africa and the rest of the world market', and so far South Africa is trailing behind China. Given this poor performance, concern is raised whether government policies may have a role to play in the prospects of the steel industry value chain in South Africa. It is of interest to define what role government policies have on the steel industry value chain and their ability to compete with China, and to suggest how these policies could be refined so that they can boost the South African Steel Industry and its value chain. This study aims at investigating the Impact of China on the Steel industry value chain in South Africa and the role of Government policy. In this study, data is collated through literature from previous studies, electronic surveys and interviews with relevant personnel within the steel industry value chain, and then analysed through SPSS and content analysis. The study considers the challenges faced by the steel industry value chain in South Africa, which also prevents this industry to compete better with China, both in the domestic market and abroad including the relative ease of importing and exporting steel and steel related products between South Africa and China, the impact of increased imports on the South African Steel Industry value chain and whether government policies play any role in averting the likely negative impact. The conclusion of this study is that South African policies do not effectively support the steel industry and its value chain, and the main problem is in implementation rather than the policies themselves. Factors deterring the successful implementation of South African policies are also highlighted in the report.

Table of Contents

List of Tables

List of Figures

Acronyms/ Abbreviations

AIS - Automotive Investment Scheme
AMSA – ArceloMittal South Africa
ANC – African National Congress
ANOVA – Analysis of variances
APDP - Automotive Production and Development Programme
ASGI-SA – Accelerated and Shared Growth Initiative – South Africa
B-BBEE - Broad-Based Black Economic Empowerment
BRICS – Brazil, Russia, India, China and South Africa
CCMA – Commission for Conciliation, Mediation and Arbitration
CIA - Central Intelligence Agency
CIACM - Competitiveness Improvement of Automotive Component Manufacturers
CIF - Cost, Insurance and Freight
CIP - Critical Infrastructure Programme
DCCs - Duty Credit Certificate Scheme
DTI – Department of Trade and Industry
EAF - Electric Arc Furnace
ECOWAS - Economic Community of West African States
EPP - Export parity price
EU – European Union
FDI – Foreign Direct Investment
FOB – Free on Board
FOCAC - Forum on China-Africa Cooperation
FRIDGE - Fund for Research into Industrial Development Growth and Equity
FTA – Free Trade Agreement
FTZ/IPZ - Free Trade Zone/ Intellectual Property Zone - Export Processing Zone, also called foreign- trade zone
FYP – Five Year Plan
G20 - The Group of Finance Ministers and Central Bank Governors from 20 major economies in the world.
GATT – General Agreement on Tariffs and Trade
GDP – Gross Domestic Product
GIBS – Gordon Institute of Business Studies
HRC – Hot Rolled Coil
IDC – Industrial Development Corporation
IMF – International Monetary Fund
IPAP – Industrial Policy Action Policy Plan
IPP - Import parity price
IRCCs - Import Rebate Credit Certificates
ISCOR – Iron and Steel Industrial Corporation SA
ISI - Import-Substitution-Industrialization
ITAC - International Trade Administration Commission of South Africa
JSE – Johannesburg Stock Exchange
MCEP - Manufacturing Competitiveness Enhancement Programme

MFN – Most Favoured Nations
MIDP - Motor Industry Development Program
MIP - Manufacturing Investment Programme
MOFCOM - Ministry of Commerce People's Republic of China
NAAMSA - National Association of Automobile Manufacturers of South Africa
NAFTA - North American Free Trade Agreement
NDP – National Development Plan
NEDLAC - National Economic Development and Labour Council
NGP – New Growth Plan
NIPF - National Industrial Policy Framework
NRF – National Research Foundation
NUMSA – National Union of Metal Workers of South Africa
OEM - Original equipment manufacturer
OECD - Organisation for Economic Cooperation and Development
PI - Production Incentive
PTA - Preferential Trade Agreement
RSA – Republic of South Africa
RTAs - Regional Trading Arrangements
R&D/T - Research & Development / Tax
SASSDA - Southern Africa Stainless Steel Development Association
SACU - Southern African Customs Union
SADC – South African Development Countries
SAFPI – South African Foreign Policy Initiative
SAIIA – South African Institute for International Affairs
SAISI - South African Iron and Steel Institute
SALDRU - Southern Africa Labour and Development Research Unit,
SARS – South African Revenue Services
SCM - Subsidies and Countervailing Measures
SEDA – Small Enterprise Development Agency
SEIFSA – Steel and Engineering Industries Federation of South Africa
SEZ - Special Economic Zones
SME – Small and Medium Enterprise
SOE – State Owned Enterprise
SPII - Support Programme for Industrial Innovation Incentive
SQAM - Standards, Quality Assurance, Accreditation and Metrology
SPSS – Statistical Package for the Social Sciences
SSA - Sub-Saharan Africa
SWAC – Sahel and West Africa Club
TDCA – Trade, Development and Cooperation Agreement
TPSF - Trade Policy and Strategy Framework
TRIMS - Trade related Investment Measures
TRIPS - Trade-related Aspects of Intellectual Property
WSJ – Wall Street Journal
WTO – World Trade Organisation

Chapter 1

Introduction

1.1. Introduction

Steel plays a vital role in the manufacturing sector and the economy of many countries. A strong and efficient steel industry characterises major industrial nations. Steel is vital for use in a wide range of products and structures such as domestic appliances, construction, automotive components and other structures using steel. Different types of steel are used for different applications and the steel Industry value chain includes: mining, smelting/ metallurgical process, conversion/ fabrication and manufacturing/ end using industry. The steel industry value chain in South Africa is faced with a challenge to compete with low cost manufacturing countries like China, and the need to improve the plant's technologies to increase efficiencies.

Any country requires strong policies to facilitate trade both domestically and regionally in order to attain the desired developments and growth. The government takes measures aimed at improving the competitiveness and capabilities of domestic firms and promoting structural transformation through industrial policies. Industrial policies are sector specific, unlike broader macroeconomic policies. They are sometimes labelled as interventions as opposed to just guidelines for a particular industry. Many types of industrial policies contain common elements with other types of interventionist practices such as trade policy and fiscal policy. An example of a typical industrial policy is import-substitution-industrialization (ISI), where trade barriers are temporarily imposed on some key sectors, such as manufacturing. By selectively protecting certain industries, these industries are given time to learn and improve. Two key national strategies/ policies that affect the manufacturing sector at all levels of government are the New Growth Path (NGP) and the Industrial Policy Action Plan II (IPAP II).

Some policies might invite retaliation from trading partners or competing countries and might not be welcomed by the relevant governing bodies (Mohr and Fourie, 2008, p382). Countries may sometimes enter into free trade agreements [e.g. North American Free Trade Agreement (NAFTA) and other Regional Trade Agreements (RTA's)] and other types of agreements to promote trade between them which would also form part of the country's trade policy. Often, before policies are amended or implemented, consultations have to be held with concerned parties to ensure that the issue of unfairness is eliminated and that the changes are welcomed by interested parties. The changes to policies are expected to be in line with WTO guidelines and/or agreements, otherwise they get challenged by this international regulatory body.

1.2.   *Background of the Research*

Since 1994, South Africa has removed a lot of protectionism and tariffs were reduced drastically (TPSF, May 2010, p xiii). The decision by government at that time was that tariffs would be re-installed on products where it could be proved that there is a negative impact on the local manufacturers and that justification could be forwarded to International Trade Administration Commission of South Africa (ITAC) with an application to review those tariffs. South Africa has witnessed a significant increase in the number of imports from China into South Africa since this decision was taken (Jenkins and Edwards, 2012, p1). According to Jenkins and Edwards (2012, p1), the result of the increased imports into South Africa is the decline in manufacturing within South Africa and increased unemployment. China has dominated in its exports to South Africa and the rest of the world (Jenkins and Edwards (2012, p1). The balance between what South Africa exports to China and what it imports from China is increasingly tipping in favour of China (MacDonald, 2012). The main interest in this regard is to determine whether the same situation is true for the steel industry in South Africa. In line with this, it is worth investigating whether the current tariff policy and the other trade policies support the steel industry and its value chain in South Africa and whether these policies play a positive role in the growth of the steel industry and the promotion of downstream beneficiation of steel as called for in government's policy documents (NGP, 2011).

It has been highlighted by Engineering-News[1] that a large number of jobs are being lost in South Africa as businesses move towards importing cheaper products from China, as compared to manufacturing locally. In 2013, the official unemployment rate was around 25% with estimates of up to 34% if discouraged work seekers are included. This could have a detrimental effect on the South African economy as a whole, if it is left to continue (MacDonald, 2012). The expectation is that SA government should intervene and implement measures that would turn the situation around and minimise the negative impact of China on South African economy. This expectation emanates from the obvious reason that South Africa is rich with mineral resources, and that should work to the country's competitive advantage.

Jenkins and Edwards (2012) conducted a study on the "Chinese Competition and the Restructuring of South African Manufacturing" which gives a good basis in understanding the impact of Chinese imports on the manufacturing sector in general within South Africa. However, they did not investigate whether this impact is witnessed in the steel industry and its value chain. This study aims to fulfil this gap, taking into consideration whether there is a role that government' trade policies play in trade between South Africa and China, and whether these policies in particular assist the Steel Industry and its value chain. Previous studies did not specifically focus on the role of South Africa's government policies

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[1] Issue of 12 August 2012

with regards to the steel industry and what should be done to alleviate the possible negative impact that China might have on South African steel industry value chain.

1.3.   Problem Statement

China has recently been seen as the most dominant and the fastest growing economy in the world. There has been a lot of pressure on South African Steel products to compete with Chinese steel products in the world market', and so far South Africa is trailing behind China. Given this poor performance, concern is raised whether government policies may have a role to play in the prospects of the steel industry value chain in South Africa. It is of interest to define what role government policies have on the steel industry value chain and their ability to compete with China, and to suggest how these policies could be refined so that they can boost the South African Steel Industry and its value chain.

1.4.   Objectives of the study:

To:

1. Confirm the impact of the increased imports of Chinese steel products on the manufacturing of steel product's within South Africa;
2. Investigate the reasons why China is apparently dominant with regard to inter-trade in steel products between the two countries whereby exports of steel products from China into South Africa seem to dominate compared to the other way round;
3. Investigate whether there is a role that government' trade policies play in trade between South Africa and China, and whether these policies in particular assist the Steel Industry and its value chain. (Effect of SA policies on the performance of steel industry value chain);
4. Investigate the possible reasons why government policies in South Africa are not assisting the steel industry value chain as expected if that is a case;
5. Establish whether government policies in South Africa can be modified and accepted by the relevant international bodies which include WTO, BRICS and China; and
6. Table recommendations to policy amendments to improve the status of trade in the steel industry value chain in South Africa.

1.5.   Research question

What effect has china's participation in SA steel market had on the Steel Industry's Value Chain in view of existing Government policies and the connection to un-competitiveness of South African manufactured steel products?

1.6. Hypothesis

He hypotheses considered are listed below as follows:

- 1H0 - Chinese imports are not rated by South African manufacturers within the steel industry chain, as one of the top two constraints to better performance of the Steel Industry in the South African market.

  1H1 - Chinese imports are rated by South African manufacturers within the steel industry value chain, as one of the top two constraints to better performance of the Steel Industry in the South African market.

- 2H0 - There is no decline in production of steel related products in South Africa due to imports from China.

  2H1 - There is a decline in production of steel related products in South Africa due to imports from China.

- 3H0 – South African policies do not contribute to the un-competitiveness of the locally produced steel products in South Africa.

  3H1- South African policies contribute to the un-competitiveness of the locally produced steel products in South Africa.

- 4H0 - Chinese steel products are not superior to South African steel products in both international pricing and quality when compared in the South African market.

  4H1 - Chinese steel products are superior to South African steel products in both international pricing and quality when compared in the South African market.

- 5H0 – Imports do not affect the downstream steel industries more than the up-stream industries.

  5H1 - Imports affect the downstream steel industries more than the up-stream industries.

- 6H0 - Small companies within the steel industry value chain are not more affected by imports than large companies.

  6H1- Small companies within the steel industry value chain are more

affected by imports than large companies.

- 7H0 – There is no difference in perception between categories of steel manufacturers that Chinese steel products in South Africa are a serious threat to their survival.

  7H1 – Not all categories of steel manufacturers perceive Chinese steel products in South Africa as a serious threat to their survival.

- 8H0 – There is no difference in the way that Government agencies overseeing the Steel Industry, Steel Manufacturers and the Industry Associations perceive the challenges to Steel Industry.

  8H1 – Government agencies overseeing the Steel Industry do not perceive the challenges to Steel Industry in the same way as Steel Manufacturers and the Industry Associations.

- 9H0 - There is no difference in views between Government agencies, Steel Associations and Manufacturers regarding the suitability of policies and priorities for the steel industry.

  9H1 – Government agencies do not have similar views with Steel Associations and Manufacturers regarding the suitability of policy and priorities for the Steel Industry.

- 10H0 – There is no difference in views of Government agencies, Steel Associations and Manufacturers, regarding the threat of Chinese products to South African Steel Industry.

  10H1 - Government agencies do not have similar views with Steel Associations and Manufacturers regarding the threat of Chinese products to South African Steel Industry.

1.7.   Research Motivation

The main reason for undertaking this study is to understand what contribution, government policies have towards minimizing the impact of China on the steel industry value chain in South Africa. The results of the study could be used by policy makers to amend current policies or develop policies that would assist in growing the steel industry in South Africa and making them competitive in the global market.

1.8.   Scope of the research

This research focuses mainly on the Steel industry value chain in South Africa, and role of policies related to the steel industry and its value chain. This study was undertaken between January and November 2014.

1.9.   Limitations (prior to starting the study)

Limitations included:

- Lack of funds – the researcher could not distribute questionnaire by paper and also not able to have a face to face surveying due to lack of funds. Electronic survey was selected for that reason.
- Access to information – some information requires that a researcher pays the subscription fees in order to access that information. This includes a list of all the industry participants within the steel industry value chain, for which the survey could be distributed to. This led to a researcher using only available contacts or information through industry association's websites and a few other websites which would have such list.

1.10.   Layout of the chapters

Chapter 1 deals with the introduction to this study, the rational for the study, objectives and the hypothesis for the study. The chapter includes research questions and scope of research. Chapter 2 deals with literature around the South African economy, effects of China on the African continent, trade between China and South Africa, steel industry specifics and government policies applicable. It represents the literature around the steel industry value chain within South Africa and identifies the gap in the existing knowledge. Chapter 3 covers research methodology. It highlights primary and secondary sources used in the research and the methods used to collect relevant data. Chapter 4 discusses the results and the analysis of the research. Chapter 5 brings in discussion based on the findings of the research. Chapter 6 covers recommendations and way forward. Chapter 7 covers the conclusion of the research.

Chapter 2

Literature Review

2.1. South African Economy

2.1.1 Economic performance

South Africa is among the developing countries and classified by the World Bank as an upper middle income country (WorldFactBook, 2013). It is considered an emerging market (WorldFactBook, 2013) and is a member of the G20 as well as BRICS. South Africa's gross domestic product (GDP) comprises less than 1% of the world's total and is ranked 26th in the global market (JSE, 2013, p1). The country's GDP can be subdivided as follows: 64.9% is contributed by the services sector, 32.1% by manufacturing, and 2.4% by agriculture (JSE, 2013, p1). South Africa is rich with natural resources, well-developed financial, legal, communications, energy, and transport sectors and modern infrastructure supporting a relatively efficient distribution across the country (WorldFactBook, 2013). In addition, South Africa had a healthy growth between 2004 and 2007 due to its stable macroeconomic policies and an increase in overall global demand, but began to slow in the second half of 2007 due to electricity crisis and the subsequent global financial crisis' impact on commodity prices and demand (WorldFactBook, 2013).

South Africa is the world's largest producer of platinum, gold and chromium (WorldFactBook, 2013). Gold, diamonds, platinum, other metals and minerals, along with machinery and equipment are the country's key exports (JSE, 2013, p1). Metals, metal products, machinery and equipment sub-sectors are the largest employers in South Africa (estimated at 25% of total employment), (Jwali, 2012, p26).

Like many others, South Africa's economy was partly constrained by the slow economic activity in some of its major trading partner countries, as well as moderate domestic demand in the years during and subsequence to the global recession mentioned. In addition, South African economy has been weakened by a series of strikes in different manufacturing sectors including mining, and the depreciation of the country's currency (OECD, 2013, p17). The rand weakened from about R6 per US dollar in 2005 to around R10/$ in 2013 (see Figure 2.1 below).

Figure 2.1 - SA's exchange rate

Exchage Rate R/$
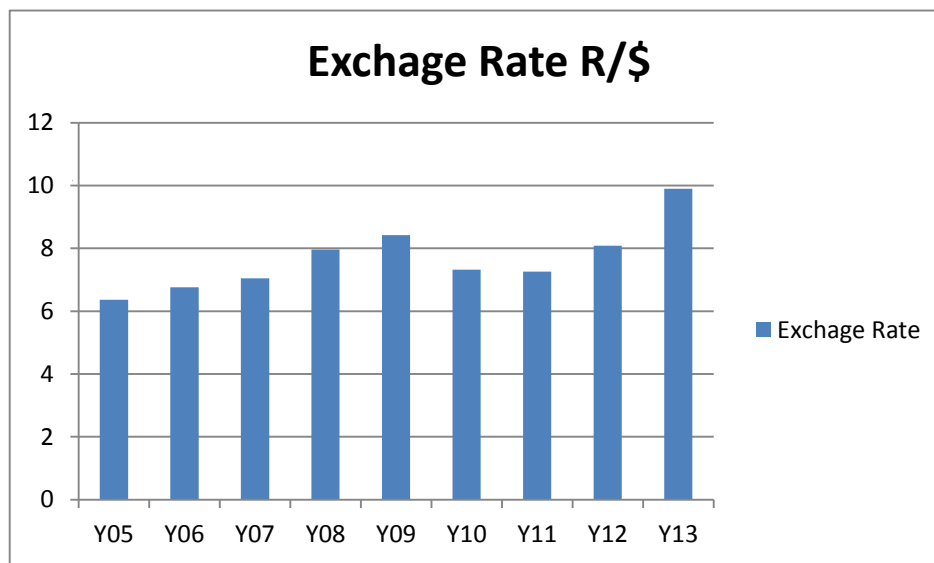
Source: World Bank, World Development Indicators online Database.

According to JSE (2013, p4), depreciation of the rand plays a bigger role than any other factors, in the increase on South Africa's inflation. A high oil price, whether the result of exchange rate depreciation or an increase in USD oil prices translates into higher transport costs which when sustained for some time ultimately impact on the general level of prices (JSE, 2013, p4). As a result of pressure on exchange rates, productive sectors of the economy involved in importing raw materials and exporting finished products, such as the manufacturing sector, are directly affected. The pressure on manufacturing sector in particular is in addition to other challenges it is facing as the unstable nature of the South African manufacturing sector has been worrisome for a lot of investors around the world (JSE, 2013, p5 and OECD, 2013)

South Africa has had a very slow recovery since the recession in 2008-09 as compared to other BRICS countries (OECD, 2013, p11). Imports grew at a very high rate than exports since the recession in 2008 and 2009 mainly due to the overvaluation of the rand, resulting in negative contributions of the net exports to real GDP growth in 2010 and 2011 (OECD, 2013, p17).

A review of the exports and imports composition gives a closer perspective on the South African Economic thrust into foreign markets and is considered next.

2.1.2 Exports and imports composition over the years

According to Kaplan (2008, p3), all sectors of South African economy are overcrowded by imports except the mining and minerals sector. This implies that South African manufacturing sector is also affected, and being a significant contributor to the economy this does not bode well for the country. On the other hand a strategy of increasing exports manufacturing as compared to increased

imports should help improve the economy. Kaplan (2008, p3), said "increasing manufacturing growth and manufacturing exports will both increase employment since manufacturing is more labour intensive (and especially more unskilled labour intensive) than other sectors and raise output growth, since this will have pecuniary and technological spill-overs through the economy".

South African imports grew from about R41 billion in 2009 to about R100 billion in 2013 (WorldFactbook, 2013 and Trading Economics, 2013) as indicated in Figure 2.2 below. The main imported commodities include fuel (24% of total imports), motor vehicles (10%), electronics (3%), pharmaceuticals (2%), food and scientific instruments, and machinery and equipment (Trading Economics, 2013). The origin of these imports (imports partners) include China 14.3%, Germany 11%, US 8%, Japan 6%, Saudi Arabia 6%, India 4%, UK 4% (2011), United Kingdom, Iran and Angola (Trading Economics, 2013). These Figures indicate that Chinese products were the most imported by total value to South Africa, hence Chinese products dominate all other imports into South Africa.

Figure 2.2 - South African Imports
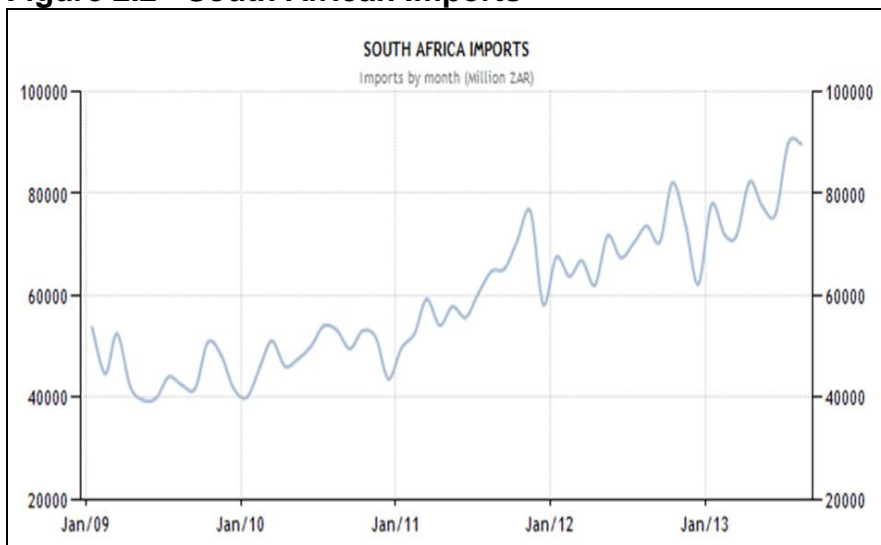
Adopted from: Trading Economics, 2013.

South Africa's exports have also increased over the years from around R45 billion in 2009, to about R85 billion in 2013 (see Figure 2.3). South Africa is the world's biggest exporter of chromium and platinum which accounts for 8% of the total world's exports (Trading Economics, 2013). Other exports with their share of the world's market include: gold (8%), coal (6%), iron ores (7%), motor vehicles and car parts (5%) and diamonds. The main export partners are: Japan (10% of South Africa's total exports), United States (10%), Germany (7%), United Kingdom (6%), China (13%), Netherlands (4%), India and Belgium (Trading Economics, 2013). The Figures indicate that South Africa exports most of its products by value to China.

Figure 2.3 - South African Exports
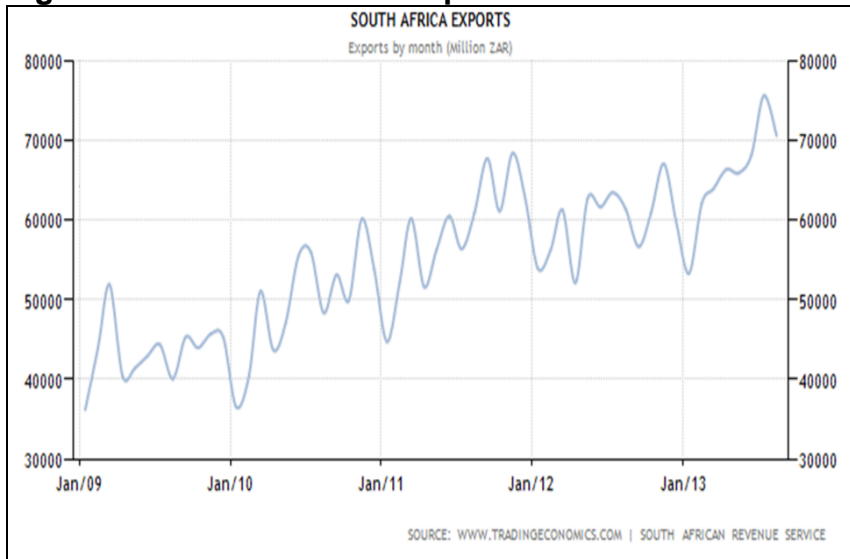
Adopted from: Trading Economics, 2013.

Considering both imports and export trade Figures provided, China is therefore by the time of this study effectively South Africa's biggest trade partner by value of products. Given this significant level of trade and its implication of the South African economy, it is worth considering how balanced the trade between China and South Africa is. The sections that follow explore this point. The next section considers China's trade in Africa in general, followed by China's trade with South Africa in particular.

2.2. China in Africa

It is well known that the African continent is a market that South Africa aspires to dominate given its presence in the continent and compared to other African countries, its relatively advanced economy which gives it a competitive advantage. It will be informative to understand the participation of China in Africa, in order to ascertain prospects for South Africa in competing for the African market.

Jenkins and Edwards (2013, p4) note that in the past, South Africa had a considerable participation in African countries with a steady growth, but most of these businesses are starting to fade away and South Africa's market share in Africa is declining due to the presence of China. Figure 2.4 below shows that South Africa's share of exports into Sub-Sahara (SSA) countries steadily declined, while China's share of exports in the same countries rose. The countries representing SSA markets imported more consumer products from China, compared to imports from South Africa, between 2007 and 2010, indicating that China has overtaken South African in market share in SSA.

Figure 2.4 - Changing share structure of 10 Sub-Saharan African (SSA) countries manufacturing imports, 1997 - 2010
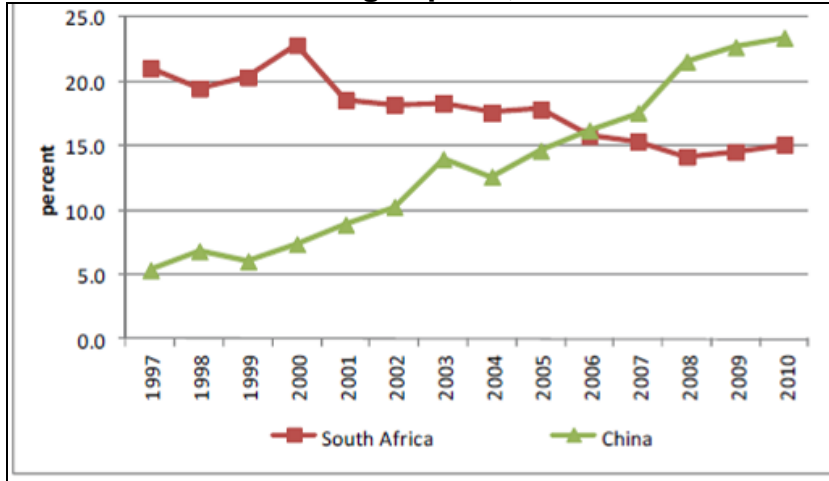
Adopted from Jenkins and Edwards, 2012.

According to a study conducted by Jenkins and Edwards (2013, p23), "on average, SA exports to the 10 fastest-growing African countries would have been almost 10% ($900 million) more had it not lost market share to China between 2001 and 2010, costing the country more than 77 000 jobs over this period". Keet (2007) noted the Chinese operations in Africa have raised a lot of questions to most economists, on whether African countries are benefiting from these operations. Some of these economists, according to Keet (2007), are of the opinion that even if the African countries might be benefiting, the Chinese government gains extraordinarily from these operations than the African countries themselves. This involvement is likely to see businesses in the African countries, including South Africa suffering as China's wide ranging associated incentives increase its accessibility to African markets. It is common knowledge that African countries accept these offers due to better terms provided by Chinese as compared to most western countries including the United States. The financial and other support that China offers to African countries gives China some economic power over these countries, and will see these countries being more lenient or abiding in terms of installing policies that will be seen as overpowering the Chinese. Davies (2010) says the aid pronouncements that China offers to Africa are clearly included to "sweeten the deal for recipient governments". Analysts see this situation as a sign for lack of ability for African economists to negotiate better terms for their home countries.

Renard (2011, p23) states that trade with China does not, on balance, encourage the expansion of Africa's manufacturing and processing goods industries. Until 2007, China's share of manufactured goods was skewed with comparatively much higher magnitude of exports of finished goods to Africa than imports of finished products from Africa (see Table 2.1 below).

Table 2.1 - Chinese trade in manufactured goods by origin and destination

	Exports			Imports		
	Share		Annual percentage change	Share		Annual percentage change
	2000	2007	2007	2000	2007	2007
World	100	100	27	100	100	17
North America	31.9	27.6	15	11.8	8.7	16
South and central America	2.5	3.3	15	0.3	0.8	16
Europe	21.5	26.6	30	17.5	15.5	21
CIS	1.3	4.0	74	1.9	0.7	23
Africa	**2.0**	**3.0**	**41**	**0.2**	**0.4**	**40**
Middle East	2.5	3.7	51	0.7	1.0	19
Asia	38.3	31.7	25	67.6	72.9	16

Source: WTO International Trade Statistics, 2008.

Adopted from Renard, 2011.

This should be of major concern to South Africa, which is expected to develop strategies to counteract this threat of China dominating the African markets. To do so, it is useful to understand China's competitive advantages and the strategies it uses to gain market share in Africa.

2.2.1. Competitive Advantages for China

Renard (2011) argue that most Chinese companies receive enormous support from the government in different ways which helps them achieve lower prices on manufactured products. He further claims that support from the Chinese government is in the form of incentives to promote exports and the imposition of high import duties, tariffs and quotas on incoming finished goods, but lower duties on imported components and raw materials into China which are aimed for re-exports. This trade was further boosted by foreign investments (see Figure 2.5 below) into the country, and other policies designed to improve exports and relations to other nations (Renard, 2011, p9).

Figure 2.5 - China's financial commitments in infrastructure projects in major countries (2001 – 2007)

Source: World Bank, 2009
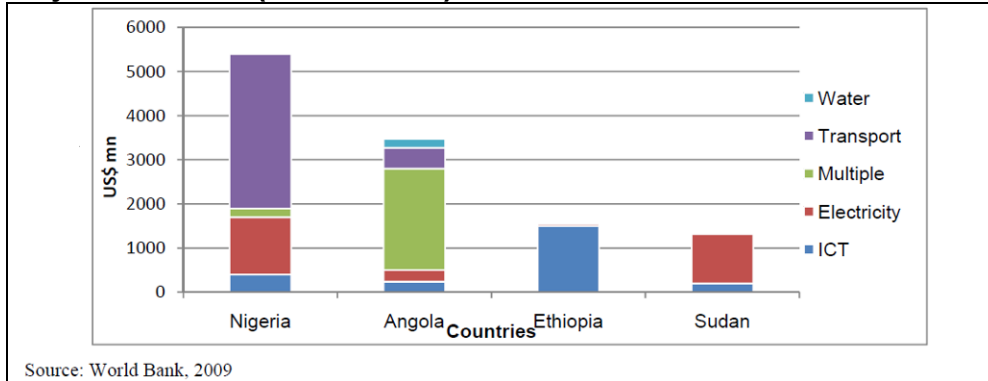
Adopted from Renard, 2011, "China's Trade and FDI in Africa".

Chinese imports from African countries are mainly in a raw material or components form, and these are converted or assembled into finished products through efficient processes supported mainly by cheap labour, and exported to the rest of the world at very low prices (Renard, 2011, p10). According to Renard (2011), off-shoring, the cheap labour, government subsidies, lower import costs, weaker currency and the efficient production methods helps the Chinese companies to achieve lower production and selling costs than any other country especially African countries. In addition, China's support from the government, through subsidies and other methods is very complex and is not open to public knowledge (Renard, 2011). All these support systems give Chinese companies an advantage over African countries, such that their prices are far cheaper and in some instances they manufacture highly advanced and sophisticated products with complex technology that cannot be easily replicated. One of the criticisms levelled against Chinese companies operating in Africa is that they employ more Chinese labourers than the locals (Davies, 2010).

Further, China came in and offered to finance some of the strategic African projects, which were failing because of bankrupt companies due to recession (see also Figure 2.5), and that gave them a foot into these businesses and the African market (Davies, 2010, p13). With assistance from Chinese government, Chinese companies would win contracts in African countries due to the fact that they would still bid at a lower price than local construction companies. Davies (2010) claims that, the lower prices emanate from imports of machinery, equipment, semi-finished materials used for construction, which are imported from China at lower prices and some kind of subsidies received from their Chinese government. In these projects, Chinese companies would bid at lower prices than locals, due to their use of low cost Chinese labour and Chinese subcontractors. The other challenge for African countries is that, most of these development projects are negotiated by the project owner himself (who might be a private company) with Chinese companies, and in most cases would benefit from achieving their projects or capital investment at a lower cost, therefore would prefer Chinese bidders than the locals (Liu and Stocken, 2012).

In an attempt to explain the relationship with China, Keet (2007) suggest that African policymakers lack the necessary tools to be able to negotiate beneficial trade deals with their major trading partners, including China.

It is apparent that if South Africa aspires to compete with China in the African continent, then it needs to come up with better deals than what the Chinese are offering the African countries. The next section looks at trade between South Africa and China.

2.3. Trade between SA and China

In South Africa, it is a norm to hear people and the government promoting the purchase of local products and/or brands, with a slogan "Buy Proudly South African". Local manufacturers favour this drive and openly appeal to South Africans to support locally manufactured products. However, the China effect is being felt in South Africa as well with the rest of the world, where businesses increasingly look towards China to source products rather than supporting local manufacturers because goods manufactured in China are cheaper. South Africa has felt the effect most predominantly in the clothing, textile and motor industries (Jenkins and Edwards, 2012, p2), and also in the local electrical manufacturing industry where the appeal of cheaper, mass produced electrical components has resulted in an increasing number of imports at the expense of locally produced products (MacDonald, 2012).

The increase in the number of Chinese imported products has led to Chinese manufacturers shipping the goods themselves, so that local suppliers can take advantage of their cheap products. According to MacDonald (2012), "It is far easier to place an order with a Chinese manufacturer and sell it when it arrives than deal with unions and the complexities of the labour laws". In contrast, MacDonald (2012) argues "flooding the country with cheap imported goods does nobody any good in the long run, and could cause the local economy to stagnate and grind to a halt if it is not dealt with in the near future".

Trade between South Africa and China grew dramatically over the past decade, with China dominating in the trade of finished products. It may be argued that the raw materials exported to China from South Africa are converted to finished products and sold back to South Africa and the rest of the world. Table 2.2 below indicates the profile of trade between the two countries between the years 2000 and 2010.

Table 2.2 - SA Trade with China by Type of Product (% - Trade Imbalance)

	Exports		Imports	
	2000	2010	2000	2010
Raw materials	43%	81%	3%	1%
Intermediate goods	45%	17%	21%	16%
Consumer goods	2%	0%	52%	40%
Capital goods	10%	1%	24%	42%

Adopted from: Jenkins and Edwards, 2012.

South Africa, exports mainly raw materials to China, while importing mainly finished or semi-finished goods from China. This trade has grown in a way that creates a huge imbalance in trade between the two countries as shown in Figure 2.6 below.

Figure 2.6 - China's Share in SA's Imports and Exports of Manufactures, 1996-2010 (%)
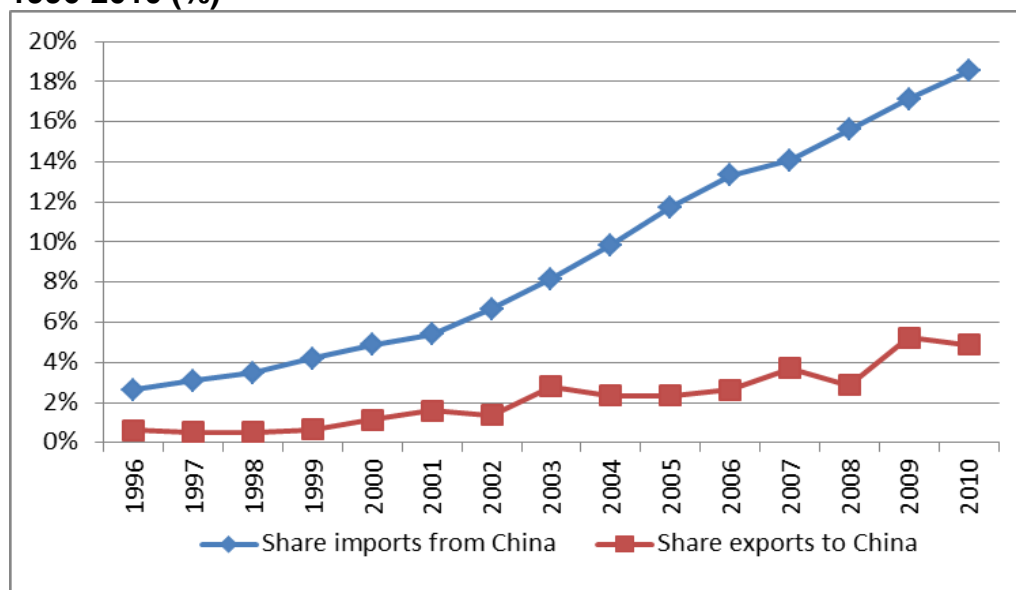
Adopted from: Jenkins and Edwards, 2012.

From Table 2.2, South Africa's exports of raw materials were 43% compared to 3% imports of raw materials from China in year 2000, and this changed to 81% and 1% in 2010, respectively. On the other hand, South Africa exports were 2% compared to 52% imports of consumer goods from China in year 2000, and this

changed to about 0% and 40% in 2010 respectively. Clearly the proportion of value added goods traded between the two countries increased in favour of China during the intervening period. Combining the information in Table 2.2 and Figure 2.6, it may be adduced that the level of trade between South Africa and China greatly increased from 2000 to 2011 and is projected to increase further. However the trade in value added goods is greater from China compared to those from South Africa which supplies mainly raw materials to China, and the overall share of the growing trade is tipped in favour of China. It may be argued that China benefits more from this trade relationship than South Africa.

As imports of these products have generally grown, it is expected that the local firms, will experience loss of market share, which ultimately leads to laying off employees to reduce production costs. Another effect of increased imports, in particular products from China has been described by several authors (e.g. Renard, 2011; Edwards and Jenkins, 2013; Davies, 2010) as an overall price reduction to the concerned consumer products. They claim that since China can afford to export their finished products at lower costs than most countries, the products come in at lower prices in the market which forces competitors to drop their prices as well.

It is apparent from this section that the general trade between SA and China has increased over the years and growing rapidly with products from China gaining market share in South Africa disproportionately more than the reciprocal trade. As the domestic environment between the two countries has been noted to be different by authors mentioned in this section, the different setting may be contributing to the favourable trading situation for China in the South African market. The next section looks at the situation regarding the steel industry in South Africa within the context of the general trading environment with China.

2.4. The Steel Industry in South Africa

The previous sections dealt with South African economy, in a context in which the Steel Industry is operating and the general challenges facing manufacturing in the country. It was necessary to first look at the general conditions of the South African economy and manufacturing since the steel industry is linked with other sectors and affected by what transpires in for example: the motor industry, building and construction, mining industry, and other manufacturing sectors, which are in most instances, customers to the steel industry. This section looks at the Steel Industry and how this sector is performing in relation to China.

Steel industry in South Africa represent an estimated 33% of the country's manufacturing (Jwali, 2012, p116). South Africa is the largest steel producer in Africa (almost 60% of Africa's total production) and a net exporter, positioned 10th in the world, to more than 100 countries (Jwali, 2012, p116 and SAISI, 2013).

2.4.1. Steel Production

Broadly, steel industry value chain includes smelting via blast furnace and shaping, fabrication, and final processing/ manufacturing. South Africa produces two main kinds of steel which are plain carbon steel and alloy steel. Primary steel products and semi-finished products include billets, blooms, slabs, forgings, reinforcing bars, railway track material, wire rod, seamless tubes and plates (Kumba, 2011). Jwali (2012, p117) explains that, production of steel requires large capital which involves heavy investment in machinery. The running cost of this operation is also exorbitant. Input materials in steel manufacturing are iron ore and/ or scrap, coking coal, manganese and ferrochrome (in a case of stainless steel). The most expensive component in this process is coking coal (mainly imported into South Africa), which is used to produce coke, needed both as the chemical reductant and as the source of energy in the process and ferrochrome in a case of stainless steel. An alternate technology to coking coal for energy source is the electric arc furnace (EAF) and the process uses scrap metal and a small quantity of iron ore, but higher electricity consumption compared to coking coal.

The cost of producing steel can be subdivided as follows, and also shown in Figure 2.8 below: Iron ore contributes between 11% and 13% of the total cost, coking coal up to 27%, and electricity cost (as indicated in Figure 2.7 below) between 20 and 40% (WorldSteel Association factsheet, 2008; Deloitte & Eskom, 2013), labour amounts to 12% and the greater part of the remaining cost (+/- 20%) is logistics costs (Kumba, 2011, p6). Scrap metal is also used in certain grades of steel and helps reduce the overall cost of steel (Jwali, 2012, p117). From this breakdown, it is clear that energy cost is the highest at 57% (electricity at 30% and coking coal at 27%), followed by logistics costs at 20% which contribute the biggest portion of the total costs of the final steel produced.

Figure 2.7 - Electricity costs as a % of total operational costs – various metal manufacturers

Source: (Deloitte& Eskom, 2009)
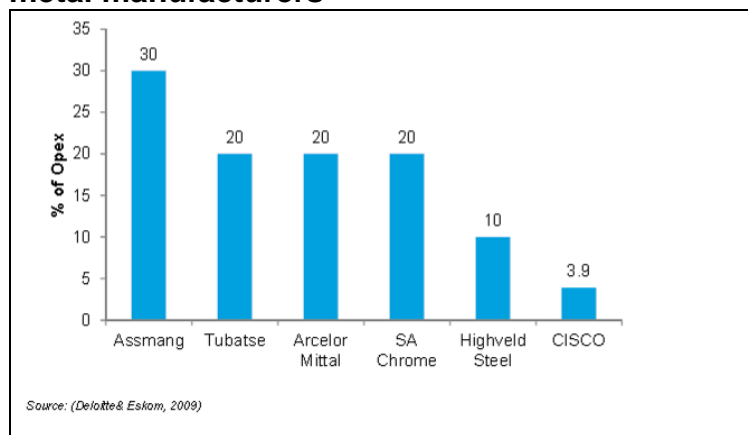
Source: Deloitte & Eskom (2013)

Figure 2.8 - Steel production Cost breakdown as percentage of total costs

Steel production Cost breakdown as percentage of total costs

- 11% Iron Ore
- 27% Coking Coal
- 30% Electricity
- 12% Labour
- 20% Logistics

Source: Researcher's Own diagram from multiple sources, 2014
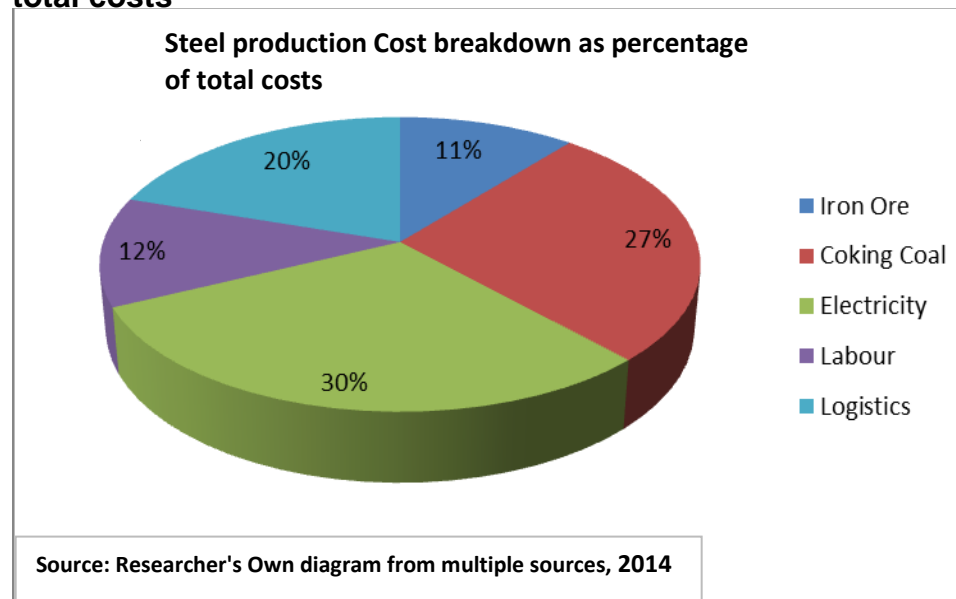
Iron ore is produced locally, while coking coal is imported because it cannot be made competitively within South Africa. This is due to the excessive amount of electricity required for the production process. It is worth noting that the same scenario can be observed with the production of stainless steel within South Africa, where ferrochrome is a major cost contributor. South Africa is currently a leader in the production of ferrochrome in the world. This position is however, under the threat of China, as they are beginning to import high volumes of chrome from South Africa, and producing ferrochrome at a cheaper price due to their low cost electricity. Transportation of steel is normally done by road which is also expensive. It would be much cheaper to transport steel by rail if the network exists or was efficient compared to road transportation (Kumba, 2011, p14). An alternative source of energy or cheaper electricity, and cheaper means of transportation would make steel in South Africa more competitive. Nevertheless, the report by the Competition Commission (2010) argues that production of steel in South Africa is actually competitive compared to other countries producing the same type of steel, except China. The challenge is in the transport/ logistics costs mainly for export markets, which is higher than most competing countries. A good example is that of China's where their logistics costs amount to about 11.2% of the total steel cost, on average, compared to South Africa's 20% (Ernst & Young, 2013, p29)). A 25% discount on iron ore is offered to metal producers like ArcelloMittal South Africa (AMSA) and others for local beneficiation, which helps boost the competitiveness of the South African steel, otherwise they would find it difficult to sell steel in the export market (Kumba, 2011, p9). This is illustrated in Figure 2.9 below which compares the cost of production of wire rods in SA and China, other variables being kept constant. It shows that the production cost of wire rods in SA with the 25%

discount compares favourably with the production cost in China before shipping to SA

Figure 2.9 - Steel Usage in Converting and Fabrication (Wire Rod example)
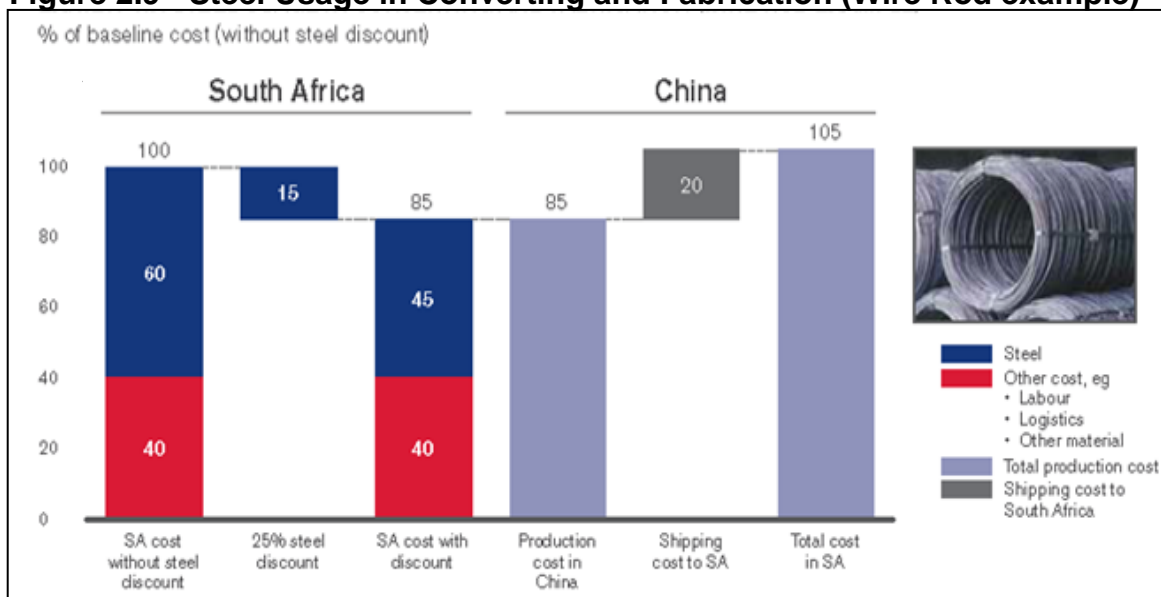
Adopted from Kumba Iron Ore, 2011

Steel prices to South African consumers are based on the import parity prices (IPP), which are international prices. The report by Lundall et al (2008) is in agreement in that AMSA actually charges different prices for local markets and export markets, with local prices charged at about 40% more than export prices (see Table 2.3 and Figure 2.10). AMSA can do this as there is minimal or no competition from local manufacturers. In addition, AMSA receives subsidies or better prices on raw materials (Kumba, 2011, p17) and electricity due to their strong bargaining powers, giving them advantage over other manufacturers or importers, who do not receive the same benefits as AMSA.

Table 2.3 - Mark-ups of basic metals prices 2003/04(US$/t)

	Carbon steel	Stainless steel	Aluminium
SA net export price	100	100	100
EU (European Union) price	122	120-139	107
East Asian price	101	113	104
SA buyer price	146	130	105-109

Adopted from: Lundall, et al, 2008.

AMSA charges prices equal or closer to import prices to domestic market (i.e. IPP – Import Parity Prices) or even higher with the justification that their product is of a higher quality than imports (lundall et al, 2008). This gives AMSA an

advantage and a whopping 54% profit margin on some of their steel products (Competition Commission, 2010). In the export market however, competition from China and other low cost producing countries limits profit margins.

Figure 2.10 – Hot rolled coil steel prices - an example, US$/t (2004 prices)
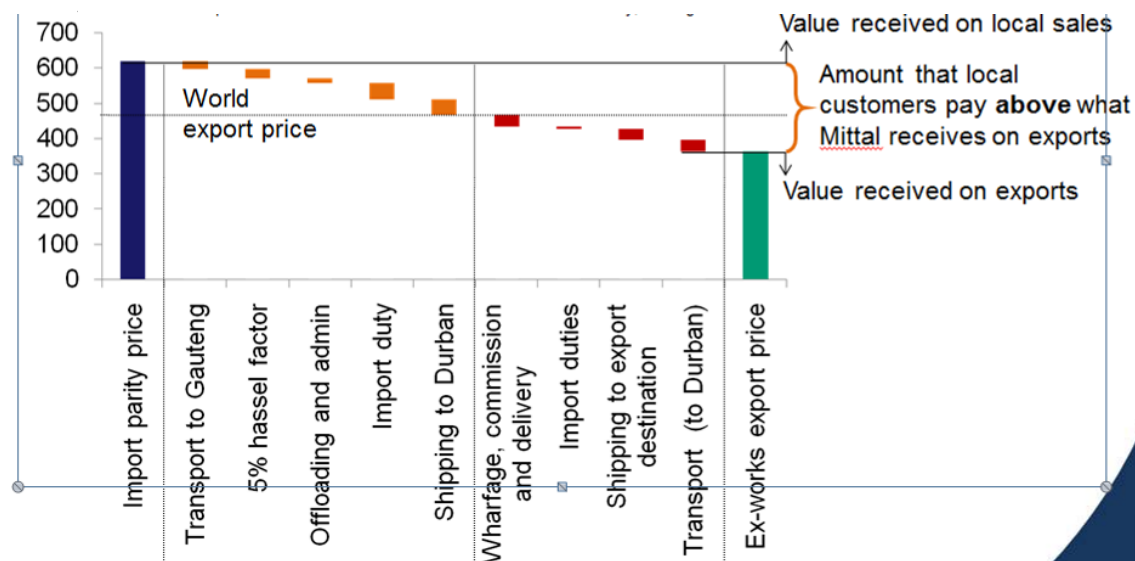
Source: DTI presentation 24/08/2010

AMSA has negotiated cost plus 3% only on the prices of iron ore with Kumba which is expected to help local convertors to be able to match the competition prices from China (competition commission, 2010). Nevertheless, local steel prices are still higher despite the concessions made to AMSA. A report by the Competition Commission (2010) found that South African prices have, for the most part, been at the same level with those charged in the high price countries such as the US, Canada and the EU even though costs in SA are likely to be far lower than in these countries and closer to those in the lower price countries (see Figure 2.11 below).

Figure 2.11 - Hot Rolled Coil Prices (US $/t – 2004 – 2010)

Hot Rolled Coil Prices (US $/t 2004 - 2010)
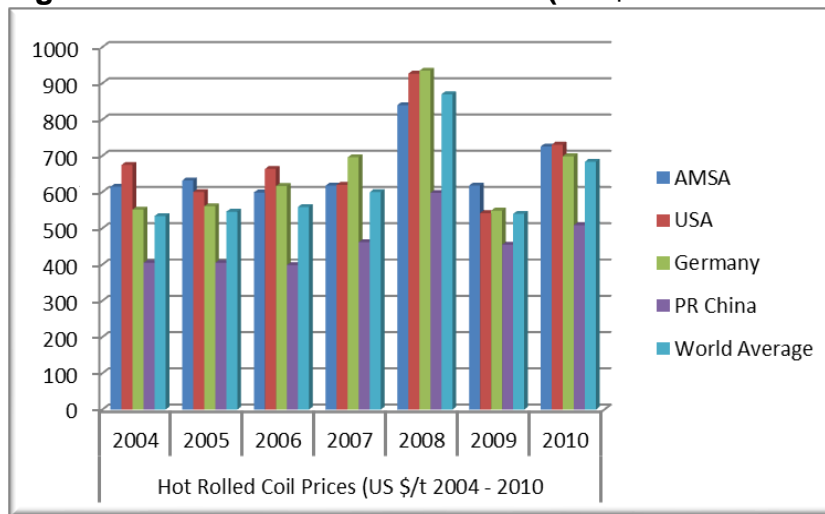
Source: DTI, 2010.

Steel at IPP is relatively expensive according to the competition commission (2010), particularly if prices are at their peak, making the downstream manufacturers' products un-competitive. In 2012, the Mail and Guardian[2] reported that AMSA and others in this category enjoyed benefits of cheaper iron ore, but it is claimed that the discounts are not passed on to the downstream producers. Apparently, it is difficult for government to ensure that the benefits of cheaper iron ore and discounted electricity are passed on to downstream industries in the form of cheaper steel prices (Kumba, 2011). According to the same Mail & Guardian, AMSA has been accused by the government for many years of not passing on the cost benefit in the form of cheaper steel, although the company has consistently denied this. This is despite the findings by the Competition Commission (2010) that AMSA can produce steel cheaper than most countries producing the same kind of steel, and that AMSA's profit margins are exorbitant by which they can clearly afford to drop their prices. Mining Weekly[3] noted that it is clear that South African manufacturers are missing the competitive advantage they would have gained from buying steel at reduced prices if they are charged at IPP which is the same price they would pay if they had to import steel. Government has suggested steel to be priced at EPP (Export Parity Price), which according to Competition Commission (2010), in comparison would be 40% cheaper than the price at IPP.

The majority of South Africa's steel operations (particularly the mini mills) are currently either marginally profitable or in a loss making position (Kumba, 2011). These mills do not enjoy the same benefits as AMSA, therefore meaning that the option of selling their steel at lower steel prices as suggested by government is likely to have an adverse impact on the viability of these plants (Kumba, 2011, p6). According to Kumba (2011), the structural lack of export competitiveness of

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[2] Issue of the 14th December 2012
[3] Issue of the 25 January 2013

South Africa's steel manufacturing industry limits growth opportunities for the industry. This is also emphasised by Gilmour (2011), saying that the major impediments to achieving the objective of finding more export market are decent logistics (mainly rail and port infrastructure) and availability of energy and water resources. Figure 2.12 below shows the cost comparison of the South African steel with Brazil and Ukraine delivered to two destinations which are North West Europe and China. It is apparent from this graph that South African steel is more expensive than the selected competitors in export markets due to higher structural costs.

Figure 2.12 - Cost Comparison of South African exports with international competitors (HRC full cost Q1 2010, US$/t
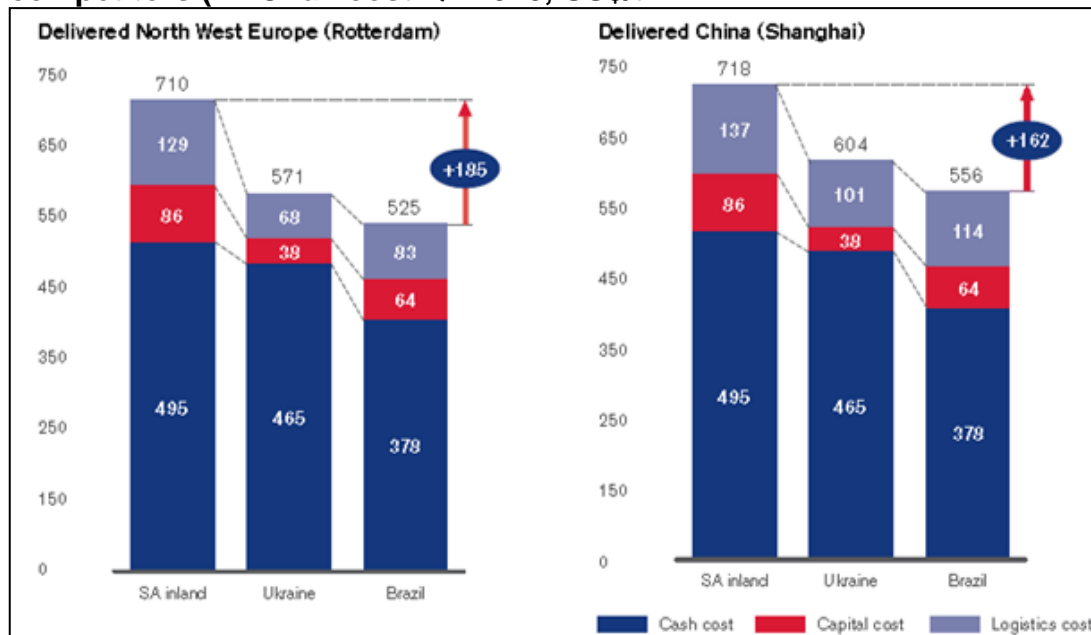
Adopted from Kumba Iron Ore, 2011

2.4.2. Steel Industry Outlook

"The primary steel industry is a significant contributor to the South African economy and earns considerable amounts of valuable foreign exchange. South Africa is ranked 20th in terms of crude steel producing countries in the world producing about 1% of the world's crude steel" (SAISI, 2013). In 2014, total South African crude steel production was about 10 million tonnes per year, while the primary steel producers' manufacture about 8 million tonnes of finished steel products per year of which about 5 million tonnes was consumed domestically (SAISI, 2013).

According to SAISI (2013), steel manufacturing in South Africa has declined tremendously, whereas imports of primary carbon and alloy steel products have increased from 50 000 tonnes per quarter in 2000, to 220 000 tonnes per quarter

in 2012 as shown in Figure 2.13 below (SAISI, 2013). Figure 2.13 also shows that imports of primary carbon and alloy steel products (excluding semis, stainless steel and drawn wire) during the twelve months, July 2012 to June 2013 amounted to 1 146 301 tonnes, an increase of 17,5% compared with 975 840 tonnes of primary carbon and alloy steel products imported during the previous corresponding twelve month period (SAISI, 2013).

Figure 2.13 - Imports of Primary Carbon and Alloy steel products (1998 to Q4 2012)

Source: Customs & Excise
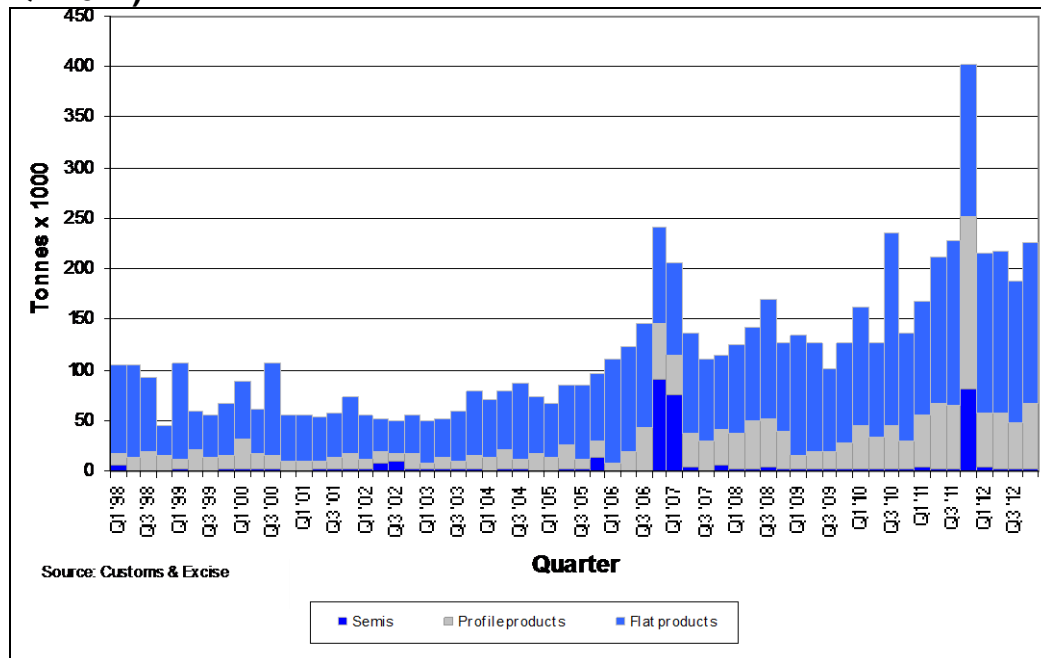
Adopted from SAISI, 2013

Ironically, Figure 2.14 depicts that imports of value added steel in South Africa exceeds the domestic sales, and that more sales of steel products manufactured in South Africa is in export market. Stainless Steel consumer goods over recent years, has been driven by the cookware and cutlery sector (Jwali, 2012, p118). However, the downstream industries are dominated by imports. According to Jwali (2012), no less than 75% of stainless steel consumer goods are imported, mostly from Asia. There is thus a great potential for growth in this sector, but in the face of tough competition (Jwali, 2012, p118). Southern Africa Stainless Steel Development Association (Sassda) on the other hand argues that the stainless steel industry cannot compete with cheap Chinese imports, if the playing field is not level, reported in the Engineering-News[4]. A further claim by Sassda is that Chinese manufacturers obtain government subsidies, while South African manufacturers do not get. The Association believes that the playing field could be levelled by increasing import tariffs on finished stainless steel products to WTO bound rate of 15% instead of 0% and that there are situations where some

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[4] Issue of the 25 October 2013

imported raw materials for the industry are subjected to tariffs, while finished products are subjected to 0% tariff. Another challenge noted by Sassda is tariffs being bypassed through the practice of waiving tariffs from products imported into South Africa for projects[5].

Figure 2.14 - Steel Sales: domestic sales, exports, imports and embodied in value-added exports, tons '000.
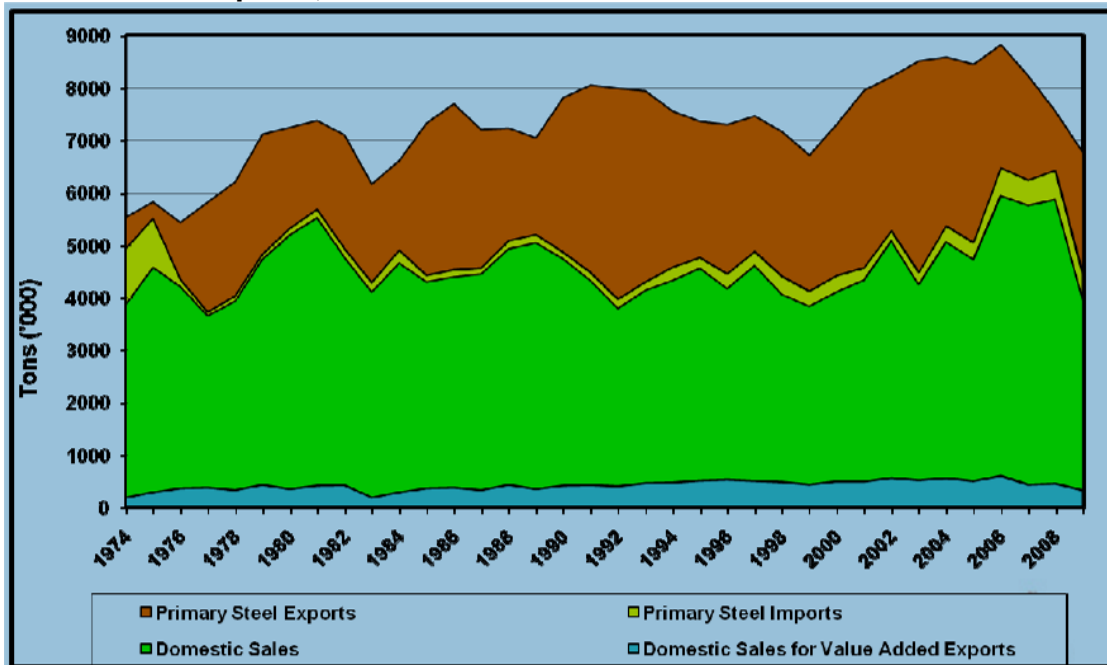
Adopted from: DTI, 24/08/2010.

Contrary to the view that the decline in manufacturing in South Africa is related to a slowdown in consumer spending (IDC, 2013, p11), SAISI (2013) states that the consumption of steel in South Africa has increased, with the increase being compensated by the rise in imports rather than local manufacturing. The domestic market for the steel and engineering sector represents about 44% of the total market for SA steel (Statistics SA), and the breakdown is illustrated in Figure 2.15 below as comprising of 7% consumed by mining sector, 51% consumed by the manufacturing sector in general, 2% by agriculture and 40% by building and construction sector (SAISI, 2013; Langenhoven, 2014).

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[5] Issue of the 25 October 2013

Figure 2.15 - South African Steel Consumption by Industry
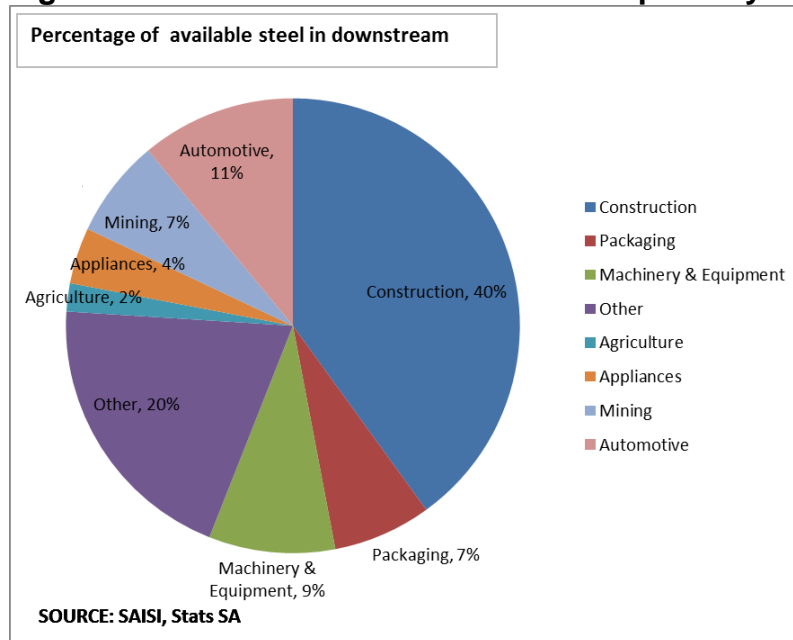
It is clear that the manufacturing and construction sectors have the biggest impact on the performance of the steel industry and whatever affects them will have a ripple effect on the steel industry. That means if there is a decline in the level of activities in these two sectors, the same results will be seen in the steel industry as well. According to Langenhoven (2014), the main drivers of the steel industry growth are the auto sector, investment products going to the mining and construction sectors, and public sector investment. The public sector investment is expected to grow at 5% over the next two years (i.e. 2015 and 2016) and the private sector investment at 3% (Langenhoven, 2014).

There is potential for growth for the steel industry in South Africa and in Sub-Saharan Africa. Countries in Sub-Saharan Africa are expected to register positive growth rates of above 5% in 2015 (Mhango, 2011). Increased activity is therefore expected, especially in the roads, housing, hydro-power, oil & gas, and rail network across the entire Sub-Saharan region in Africa which will boost construction in the region (Mhango, 2011), and hence the use of steel. To take advantage of this prospect, there is a need for South African steel producers to focus on getting the cost of steel lower to be able to compete with the Chinese and other steel producing countries in this market. From the information given previously in this section, it is apparent that government policies should consider logistics networks and sourcing of alternative or cheaper energy to support the industry. However, there are challenges in this regards, as the electricity prices in South Africa increased sharply from 2008 to 2013. Langenhoven (2014) states that there were significant upward pressure on steel and production prices in 2013 and 2014 emanating from currency weakness, fuel and electricity price increases and wage increases.

2.4.3. Market Structure

Figure 2.16 - Market Structure

	Flat steel products	Long steel products
AMSA	80%	52%
Highveld	20% (incl. imports)	15%
Scaw		15%
Cape Gate		12%
Cisco		6%
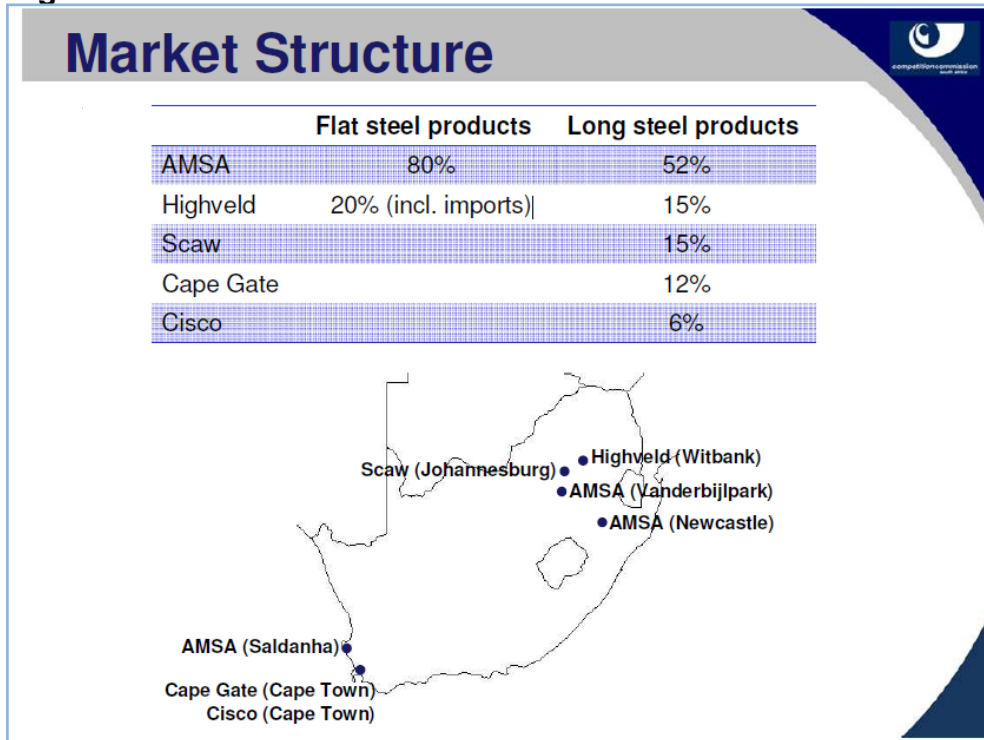
Source: Competition Commission, 2010.

The major players among the producers in the steel industry are AMSA, Highveld Steel, Scaw metal, Cape Gate and Cisco (see Figure 2.16). The next level of the steel industry that is fabricators are not covered in detail in this study. According to the competition commission (2010), AMSA holds the biggest share of the market with about 80% share in the flat steel and 52% in the long steel production. AMSA can therefore be a monopoly in terms of pricing and controlling of the markets. Metal beneficiation and value chain

Figure 2.17 below shows different stages of steel value chain and the flow of material from one stage to the other. This is shown to also explain the effect of imports in the steel industry value chain.

Figure 2.17 - Steel Industry Supply Chain

| 100% Iron Ore to Steel - Materialc | 30% Iron Ore processes and 70% exported | 30% fabricated | 15% of Iron Ore Finished Off, rest exported |

2. Steel Manufacturing Companies

3. Steel Fabricators

4. Final Steel Processing

1. Iron Ore Producers

Competition with Imports

End Users

Export Market

Imports

Competition from imports increases towards the final stages of steel processing. More competition from imports on finished products.

Increased imports in competition with stage 3 and stage 4 of the value chain will mean less production/ low demand of steel on stage 2.

In stage 1 involves the extraction of raw ore which is used to produce steel and bigger players in this stage are Kumba with the biggest market share, followed by Assmang. A portion of Iron ore from stage 1 is transferred to stage 2 for smelting, while the balance is exported.

Stage 2 comprises the steel manufacturing companies or mills which process the raw iron ore. This market also has few players, with Acellormittal SA being the dominant, followed by HighVeld Steel, Scaw Metal, Cape Gate, Cisco, Columbus Stainless, Billiton, and other small players. Steel processed at this level is transferred to stage 3 for fabrication, while a certain amount is exported in this form.

In stage 3 are the steel fabricators or engineering shops. They normally take steel in a standard form from stage 2 producers and customise it for specific purpose. There are a lot of players in this field, from large scale fabricators to medium and small scale companies. It is important to include these players in the study, since the bulk of what is produced in stage 2 is meant for this market. The decline in demand from this stage would negatively impact on the steel production, unless the export market grows drastically.

Stage 4 are the manufacturers (e.g. motor industry, components manufacturers, packaging industry, welding rod manufacturers, locomotive assemblers,

construction companies and other final users of steel), or mostly the last part of the steel industry supply chain. There are many companies in this field, and that is where China has the biggest impact. The premise taken in this study is that growth in imports from China displaces these manufacturers and at the end of the day jobs are lost, and ultimately a decline in the demand of steel. Understanding the challenges at this stage will allow one to suggest better alternatives to improve the demand of steel.

Table 2.4 - Stages of Beneficiation and Levels Achieved

Material	Stage 1 - % Raw	Stage 2 - % Processed	Stage 3 - % Fabricated	Stage 4 - % Finished
Iron ore to steel	100	30	30	15
Chrome to stainless steel	100	85	9	3
Aluminium	0	100	30	11
Zinc	100	100	90	60
Manganese	100	50	25	22
Titanium	100	15	4	Small
Copper	100	100	65	50

Lundall et al, 2008.

Table 2.4 above, shows that only a small percentage of raw materials or commodities are beneficiated within South Africa, and that the bulk of iron ore is exported. As illustrated in Table 2.4, while 100% of iron ore is extracted from the mines, only 15% reaches the final stage in the beneficiation process. It should be noted that the biggest competition is at stage 4 where high volumes of imports are observed. This implies that there is potential for downstream manufacturers to grow at stage 4 of the steel value chain if properly supported. However, most of the steel in stage 1, 2 and 3 is exported, and sometimes brought back as final products, which in most cases is found to be cheaper than the locally produced products. Given the unfavourable position of South Africa in the steel export market and low beneficiation in the sector, these factors can be considered major contributors to the decline in employment in the sector over the last decade. In summary, the structure of the steel industry in South Africa is dominated by a few major players of which the most dominant player enjoys monopoly status that has distorted the price structure making it unfavourable to the rest of the players in the industry.

2.4.4. Competition from China

China is the largest steel exporter in the world. It's dominance in steel exports imposes a ceiling on domestic prices for most countries at the receiving end (Ernst & Young, 2013, p26). From previous sections, it was noted that the cheaper prices are as a result of a number of aspects including subsidised electricity and extensive support from their government. Another notable aspect on the nature of competition from China is with regard to environmental

compliance. In many countries, environmental compliance and remediation substantially increase capital requirements and operating costs as environmental laws and regulations raise costs. While standards in South Africa, Japan, Australia and other countries in the West are similar and governments have imposed demanding operating regulations, regions such as China and India, have substantially less requirements that may give competitors in these nations a competitive advantage (DataMonitor, 2011, p15). To counter this effect, governments in some countries employ support strategies, for example via tariffs, subsidies, loans and import restrictions, to ensure that their domestic market remains competitive (DataMonitor, 2011, p15). Such strategies have allowed the local steel market to continue operating even when better quality and cheaper steel could be imported from another country. According to NEDLAC (2006), state funds were used to upgrade and expand SOE (State Owned Enterprise) melt- shops and mill facilities, while foreign steel firms were attracted by favourable investment policies to establish operations and transfer technologies to China. While there is no access to accurate information on the extent of incentives, it is widely accepted for example, that the incentives include various municipal rates and taxes, as well as some more significant corporate tax – related benefits (Nedlac, 2006). The study also notes that tariffs in South Africa and in China are low on primary and intermediate stainless steel products (Nedlac, 2006, p13). Non-tariff barriers on trade also exist in China (Nedlac, 2006, p13), which imposes unfavourable restrictions on foreigners exporting to China, but the most emphasis for the Chinese is to undercut South Africa and other competing countries in terms of pricing of their steel products.

According to NEDLAC (2006), the Chinese government intervenes in the economy in a way inconsistent with free market principles, for example subsidies are non-transparent and investment practices lead to the creation of unsustainable and surplus capacity. Pricing is also non-transparent and divorced from market discipline because of interventions and support from the government (Nedlac, 2006, p14).

In conclusion, it is apparent that Chinese manufacturers receive substantial backing from government in many ways that gives Chinese manufacturers key advantages over their South African counterparts. From the findings of the Nedlac (2006) study given above, it is apparent that it would be difficult for South African steel industry to compete with China, given the highly favourable Chinese trade conditions as discussed. The rise in imports of beneficiated steel products, especially from stage 2 up to stage 4 (see Table 2.4) of steel value chain means that there is a demand of steel that can still be tapped into, which will ultimately increase steel production in this industry. The challenge is to get these stages in the steel value chain to be competitive from the cost perspective. It is therefore pertinent to consider the policies that the government of South Africa has put in place to ensure a stable future for manufacturing in the country, and the next sub-section looks at some of these overarching plans and policies.

2.5. Government Policies

This section explores government policies (industrial policies in particular) of South Africa and China to identify the differences between the two policies and to highlight the gaps and/or failures in the South African policies.

Any country requires strong policies to facilitate trade both domestically and regionally in order to attain the desired developments and growth. Edwards and Lawrence (2012, p20) calls it "a multi-faceted complementary approach which allies microeconomic (industrial) and macroeconomic (real exchange rate) policies". Macroeconomic policies play an important role in the economy in that they deal with the management of the country's currency, inflation, country's income and expenditure, economic growth, aggregate employment, balance of payments and general price levels to prevent excessive appreciation of the currency and helps accumulate fiscal surpluses when the economy is at its peak, to act as a relief when there is a sharp decline (Mohr & Fourie, 2008, p10).

One needs to understand if the policies employed by South African government with respect to steel manufacturing are achieving what they were intended to do hence the role of these policies on the steel industry and the entire value chain will be explored, while verifying whether they have reduced or aided this industry compete better with China. The measures which will be applied to determine whether the applicable policies are having an impact in growing the steel industry or not are: that jobs are created or current ones retained in this sector; growth in production and profits can be registered; and imports into South Africa need to be reduced, as a result of their implementation.

South African government has put in place the Industrial Policy Plan (Edwards and Lawrence, 2012), the New Growth Path (NGP) and the latest being the National Development Plan (NDP). The Industrial Policy Plan (IPP) is a policy by government to encourage the development and growth of the manufacturing sector of the economy. In the IPP, government takes measures aimed at improving the competitiveness and capabilities of domestic firms and promoting structural transformation (IPAP 2, 2013). A country's infrastructure in particular transportation, telecommunications and energy industry are a major part of the manufacturing sector (IPAP 2, 2013) and has a key role in the IPP. Industrial policies are sector specific, unlike broader macroeconomic policies. They are sometimes labelled as interventions as opposed to just guidelines, for a particular industry (Edwards and Lawrence, 2012). Many types of industrial policies contain common elements with other types of interventionist practices such as trade policy and fiscal policy. An example of a typical industrial policy is import-substitution-industrialization (ISI), where trade barriers are temporarily imposed on some key sectors, such as manufacturing. By selectively protecting certain industries, these industries are given time to learn and improve (Edwards and Lawrence, 2012). Non-tariff barriers are also applied in certain cases and used as policy tools to achieve certain objectives in the economy.

The World Trade Organisation (WTO) is an international body which provides guidelines or frameworks on how all country's trade policies should be if they want to trade fairly in the international markets. The role of WTO on the development of any country's trade policies and how China has dealt with requirements of WTO are explored briefly in the next section.

2.5.1   WTO and China

According to Keet (2007), investment conditions were applied by many governments during the 1960s and 1970s in various combinations to suit the host country and ensure that host countries are not disadvantaged as a result of trade partnerships with foreign countries, skills transfers to local technicians and management, and the reduction of imports into the host country. Those policies included tariff policies to support the 'infant industries' and economic development and diversification required in order to improve the benefits of foreign investment in Africa. These measures were seen as temporary to assist local businesses to develop and become competitive.

The establishment of the WTO, previously known as GATT (General Agreement on Tariffs and Trade), and the role of IMF, saw a lot of these regulatory investment conditions being removed and replaced by laws that in fact forced African countries and other nations to open up trade to anyone in the world and not apply discriminatory conditions (Keet, 2007). The new trade conditions saw African countries suffer from imports into their respective countries and the increased dominance by Europe, US and other economies, followed by China and most of the Asian countries (Keet, 2007). Chinese government has not yet fully adopted most of these IMF and/or WTO policies while they are promising to slowly comply, and in the meantime China benefits from some of the economic advantages over many countries (Nedlac, 2006, p15). China's accession to the WTO allowed cheap Chinese products to flood global markets and affected the status of manufacturing in the recipient countries. In effect, membership to WTO is to the benefit of China since its exports have easier and more secure entry into foreign markets (Nedlac, 2006, p24).

2.5.2   SA Trade Policy

Trade policies are there to facilitate trade between different countries and assist in growing the country's GDP. Further objectives of trade policies include, amongst others, inclusive economic growth and development, industrial upgrading, poverty reduction through sustainable employment and the provision of decent jobs (DTI, 2013).

In 2013, the Minister of trade and Industry, Rob Davis mentioned that South Africa is moderately protected by tariffs and the country's tariffs are more transparent and "less complex" as compared to some of the country's trading

partners (DTI, 2013). In most instances, policy makers are bound by existing agreements between trading countries which create barriers or reducing freedom in changing some of the policies to assist the domestic market, and this is also supported by Kaplan (2008). Heavy protection of domestic industries against imports, can sometimes call for competing countries to apply retaliatory measures against South African exports, which will make it difficult for these products to enter some markets. The challenge in this case is to find the correct balance between creating opportunities for domestic market and obtaining a common market opening (Edwards and Lawrence, 2012, p5).

A comparison of tariffs charged by different countries is shown in the table below.

Table 2.5 - Import Duties per country (Applied to Most Favoured Nations - MFN)

IMPORT DUTIES PER COUNTRY (APPLIED MFN)		% Average of AV Duties					Republic of South Africa
HS code description	HS code	Brazil	China	South Africa	United States of America	Bound Duty AV for RSA▲	
IRON AND STEEL	72	10.50	5.02	0.01	0.31	5.00	
Non-alloy pig iron in pigs, blocks or other primary forms,	720120	4.00	1.00	0.00	0.00	5.00	
Alloy pig iron and spiegeleisen, in pigs, blocks or other primary forms	720150	4.00	1.00	0.00	0.00	5.00	
Waste and scrap of stainless steel	720421	0.00	0.00	0.00	0.00	5.00	
Semi-finished products of iron or non-alloy steel	720719	8.00	2.00	0.00	0.00	10.00	
Flat products of iron or non-alloy steel	721070	12.00	4.00	0.00	0.00	10.00	
Bars and rods, hot-rolled, in irregularly wound coils of iron or non-alloy steel	721310	12.00	3.00	0.00	0.00	10.00	
Wire of iron or non-alloy steel, in coils, not plated or coated, whether or not polished (excl. bars and rods)	721710	8.67	8.00	0.00	0.00	10.00	
Wire of stainless steel.	7223	14.00	10.00	0.00	0.00	10.00	
Other alloy steel in ingots or other primary forms; semi-finished products of other alloy steel.	7224	8.00	2.00	0.00	0.00	10.00	
Bars and rods of alloy steel other than stainless	722860	14.00	3.00	0.00	0.00	10.00	
Wire of alloy steel other than stainless, in coils (excl. bars and rods and wire of silico-manganese steel)	722990	14.00	5.00	0.00	0.00	10.00	
Source: WTO Tariff Analysis Online (TAO)							

From Table 2.5, it is clear that imports of steel products (mostly semi- finished) into South Africa, attract minimal or no duties on MFN (Most Favoured Nations) as compared to other countries like China and Brazil within the BRICS grouping. China in fact charges imports from South Africa, an average of 8% duty and also subjected to 17% vat used in China (see Table 2.6). China generally applies higher rates than South Africa on most of the imported finished products,

meaning higher protectionism for China and applies very low rates on imported raw materials (Nedlac, 2006, p34) (see also Figure 2.18 below). Engineering-News[6] quotes Eugene de Klerk, saying that South Africa needs to reconsider increasing tariffs on imports to protect the local steel industry and develop steel value chain. He adds that one of the key drivers for job creation in the steel industry is the level of protection the industry enjoys, saying "South Africa levies low import tax on steel, yet there are major steel-producing countries that levy 100% tax on imported steel to protect its domestic industry". South Africa's tariffs are applied on a FOB (Free on Board) basis on finished products while that of China are on a CIF (Cost, Insurance and Freight) basis. This means that the same applied rate will in the case of China amount to an effective rate of up to 3 percentage points higher than South Africa's effective rate. China generally also adds a 17% vat on all imported products, vs. South Africa at 14%. Interestingly, bound rates imposed by WTO are much higher and could be used by South Africa's to its advantage to protect its steel industry from cheaper imports, say from China. This agrees with a statement by Minister of Trade and Industry, Rob Davies quoted above, regarding the level of protection by South Africa. Another example is that of steel bars shown in Table 2.6 below. South Africa charges the lowest tariff compared to most of the BRICS countries, while access into these markets is difficult for South African exports (see Figure 2.18). Some analysts argue that the free trade policy hasn't generated the required levels of growth for South Africa, and that these policies and agreements need to be reviewed (Holden and McMillany, WP19, nd, Edwards & Jenkins, 2013, p4).

Table 2.6 - Import Duties on Steel Bars (MFN Duty Rates)

Import Duties on Steel Bars (MFN Duty Rates)			
Country	HS commodity Code	Import Duty	VAT
Brazil	7326.90.90	18%	19%
China	7326.90.90	8%	17%
Germany	7326.90.9890	2.70%	19%
Nigeria	7326.90.9099	20%	5%
South Africa	7326.90.907	0%	14%
United Kingdom	7326.90.9890	2.70%	20%
United States	7326.90.8588	2.90%	Depends on state
Source: WTO Tariff Analysis Online (TAO)			

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[6] Issue of 28 February 2014 – Eugene de Klerk is a consulting director at Deloitte

Since 1994, South Africa has undertaken significant tariff cuts and while exports in most sectors grew, manufactured exports continue to be heavily dominated by resource based products (TPSF, 2010, p13). In other words, "tariff reductions have not induced the necessary structural changes in the economy to significantly alter the export basket beyond the range of products that reflect South Africa's static comparative advantage" (TPSF, 2010, p13). In the early 1990s, South Africa's average tariff was around 23%. This has been reduced to an average of 8.2%. The trade weighted average is 7.4%; the average tariff for inputs is 5.4%; and the average tariff for final products is 20.2%. Most of these rates were imposed on South Africa to accept during the Uruguay Round of multilateral trade negotiations by the WTO (TPSF, 2010, p19). Compared to many other upper middle income countries, South Africa has a high WTO binding coverage (98%), (TPS, p15).

In particular, the WTO sets ceilings on tariff increases and while there are many tariff lines that could be increased (e.g. tariff on steel bars could be increased to 10%), there are many tariff lines where the scope for increases is constrained. The other challenge for South Africa, in making major changes to tariff policies, are the bilateral and regional trade agreements concluded with some of the trading partners. Some observers point out the negative implications of the Regional Trading Arrangements (RTAs) including the costs associated with trade diversion and the transaction costs of managing varying tariff reduction schedules, customs administration procedures and rules of origin (TPSF, 2010, p46).

Figure 2.18 - Simple average applied tariff rates on South African Exports, 2008

Simple average applied tariff rates on South African Exports, 2008.

Adopted from: Edwards and Lawrence, 2012.
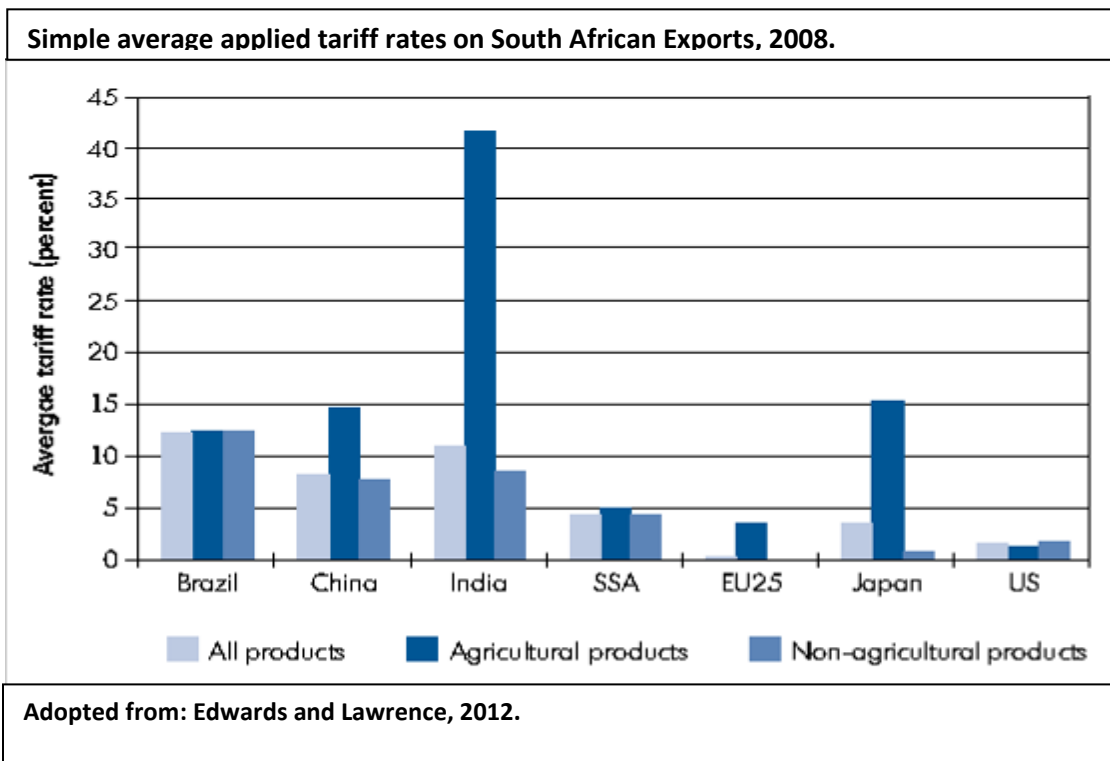
Normally, tariffs on raw materials should be reduced or eliminated to lower the input costs for the downstream, and increase competitiveness of the local manufacturers. Tariffs on downstream industries, particularly those that are strategic from an employment or value-addition perspective, may be retained or raised to ensure long-term sustainability and job creation in the context of domestic production capabilities/potentialities and raise global competitiveness (TPSF, 2010, p14). Recent experience has demonstrated the need to strengthen the implementation, administration and enforcement aspects of South Africa's trade policy. This includes strengthening the capacity to act expeditiously against both unfair trade (subsidised and dumped products) and surges in imports that threaten injury to local industries. It also requires the government to step up measures to enforce trade laws against illegal imports or counterfeit goods, customs fraud, transhipment, abuse of industrial support programmes, and under-invoicing. These practices are unacceptable and in various ways undermine the local economy and result in job losses (TPSF, 2010, p15). As compared to free trade agreements, more focused preferential trade agreements allows for a more strategic integration process among developing countries (TPSF, 2010, p15). It is also, increasingly apparent that tariffs are not always the most important barrier faced in foreign markets and hence negotiating outcomes must deal more effectively with non-tariff barriers. Criticism by Edwards and Lawrence (2012, p20) is that the current South African strategy on tariff policies is heavily focused on domestic concerns and has the danger of placing South Africa at a disadvantage as South African exporters seek access to the growing emerging economies.

Kaplan (2008, p4) argues that industrial policy in South Africa is constrained by limitations related to the domestic macroeconomic framework and the international agreements. Even though South Africa's Macroeconomic policy Framework is widely accepted, it has achieved mixed results. It has been successful in keeping the domestic inflation at a very low level, but has not brought stability in key prices that matter for investors, especially exporters, failed to stabilise interest rate and the exchange rate (Kaplan, 2008). The instability or high fluctuations in these important measures (interest rates and exchange rates) drive away investors.

In 2008, South African industrial policy had only two explicit targeted sectors – clothing and textiles, and autos and auto components (Kaplan, 2008, p4). The policy focused on retaining current jobs created by these sectors and protection against imports. The aim was to increase exports and decrease imports to achieve this objective. Support has been in the form of rebates on FOB for all the exports (Import Rebate Credit Certificates (IRCCs) in the automotive sector and the Duty Credit Certificate Scheme (DCCs) for clothing and textiles. The DCC and the IRCC were under review early 2013, since they were widely criticised by analysts and political parties for their biasness and their exclusive focus on the

exporting industries (Business-Day[7]). There was also the possibility of a challenge by WTO since these supports were discriminatory. According to Kaplan (2008, p5), state support can be more expensive if applied to all sectors, and less effective and much more difficult to monitor and control, than if firms are left to operate on their own to compete in the global market.

Trade policy needs to be complemented by other policies that enhance export diversification by fostering competitive manufactured exports (for example the change in the fiscal policy where a real rand that is 20% weaker is equivalent to a 20% tariff on all imports and a 20% subsidy for all exports). By successfully implementing the fiscal policies this would create more room for a less defensive trade strategy. South Africa does not have sufficient local demand for scale in the beneficiation of iron ore, while it is very expensive to export the finished products, and the trade-offs in promoting this sector are high (Edwards and Lawrence, 2012, p29). Profitability in the beneficiation of iron ore is adversely affected by high costs of significant factors (capital, labour, logistics and energy) and high cost of imported pellets and coking coal (Edwards and Lawrence, 2012, p29). Edwards and Lawrence (2012, p29) suggests that mineral beneficiation is often immensely capital-intensive, creates fewer jobs (particularly semiskilled and unskilled jobs) per dollar of output, has heavy demands for energy and is often highly polluting, and therefore does not really warrant extravagant assistance from government by providing costly incentives for beneficiation which could also draw on scarce resources that may be better used elsewhere (Edwards and Lawrence, 2012, p29). This suggests that policy makers need to be careful in deciding on the type of policy tools needed for this sector, to promote growth and not just move towards measures which could cost large amounts of state funds but produce little impact towards the country's economy.

Flatters & Stern (2007) argue that the change in trade policies in South Africa have mixed results, in which, in some instances, led to growth in the economy, while in others, resulted in contraction. The impact on employment was a loss of jobs in the downstream industry and a gain of jobs in the upstream. The net effect according to Flatters & Stern (2007, p6) is a slight gain in employment between the years 1990 to 2002. Their study does not support government subsidies like Motor Industry Development Program (MIDP) in that this does not induce growth as expected, and is costing the consumers more, and the reason is that the car prices are higher due to increased tariffs on imports of cars and higher car prices to subsidize South African exports through MIDP. MIDP is therefore not a good policy tool as it draws on scarce investment and is costly at the expense of consumers. Flatters & Stern (2007, p21) recommendations regarding trade policies are that change to trade policies in South Africa should concentrate on trade that does not need negotiations or approval at international levels, and these are the service sectors, and that South Africa should concentrate on reducing the whole range of regulatory constraints to investment and growth that serve little function other than to increase the cost of doing

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[7] Issue of 06/12/2012

business in South Africa. Their view is that policies should focus on economy-wide initiatives and reforms that are likely to have cross cutting effects on all economic sectors and households and these include continued government investment in infrastructure, education and essential services and further deregulation of telecommunication and transport services.

In conclusion, the information obtained from this literature indicates that current South African trade policies do not entirely favour local manufacturing and that tariffs in general are lower than competing countries. Elsewhere in the literature, it is noted that South Africa is moderately protected against imports as compared to China and other selected developing countries. It was also noted that countries like China, India and Brazil impose higher tariffs on imports from other countries as compared to South Africa to protect their local manufacturing. The study of Flatters & Stern (2007) differs vastly with the views of most analysts who advocate for government interventions which are sector specific as the needs of the sectors differ from one to the next, while Flatters & Stern (2007) believe in interventions that cut through all economic sectors.

The next section looks deeper into the two key South African trade policies and what the intentions of these policies are towards South African economy.

2.5.3   Key Policies in SA Industries

South Africa has developed a framework called the Trade Policy and Strategy Framework (TPSF) that supports growth and development of its economy. Within this framework, specific micro-economic policies were developed to facilitate the drive to industrial development in South Africa by addressing domestic structural challenges and responding to global competitive challenges.

Two key national policies that affect the manufacturing sector are the New Growth Path and the Industrial Policy Action Plan II (IPAP II).

2.5.3.1   *The New Growth Path*

The New Growth Path (2011) seeks to create an inclusive economic growth, by systematically encouraging labour absorptive economic activities. The main objectives of the NGP are to create new jobs and to find ways to sustain the current ones. This is done by supporting businesses that can absorb more labour or create employment at a large scale due to substantial structural changes in the South African economy. Six priority sectors are identified to support these objectives and one of these sectors identified by NGP is mineral beneficiation. The beneficiation strategy provides a framework that seeks to ensure that competitiveness is achieved in beneficiation of the country's mineral resources (Mineral Resources, 2011, p5). Greater employment, increased exports and

diversification of the economy are among some of the endeavours of this strategy.

The New Growth Path identifies key job drivers which are: Substantial public investment in infrastructure to create employment directly and indirectly by improving efficiency across the economy; The targeting of labour absorbing activities in the main economic sectors such as the mining value chains and manufacturing sectors and Transformation from largely exporting raw minerals to the establishment of value-adding facilities (i.e. beneficiation).

Among these, the efforts of beneficiation have resulted in increased revenues in certain steel sectors and the construction of a number of large scale resource-based investment projects, such as Columbus Stainless Steel, Saldanha Steel, Lion Ferro-chrome smelter and others, which indicates the country's state of readiness for value addition even though it is still at a smaller scale than anticipated (Mineral resources, 2011, p4).

Nevertheless, challenges to efforts at beneficiation through the New Growth Path have been identified and include the following;

> Slow transformation in some sectors from a raw material export oriented outlook to beneficiation due to the fact that raw material producers (e.g. Iron Ore) are tied to long term contracts with export markets (Mineral Resources, 2011, p5).

> The application of IPP (Import Parity Prices) renders most of the down-stream beneficiation uncompetitive, especially when steel prices are at their peak. This hampers development in the Steel industry and may be attributed to policy failure in this aspect (Mineral and Resources, 2011 and NEDLAC, 2006).

> Shortages of critical infrastructure such as rail, water, ports and electricity supply have a material impact on sustaining current beneficiation initiatives and a major threat to future prospects of growth in mineral value addition. The bulk of early-stage beneficiation programs require large and uninterrupted supply of energy. Outlying locality of mining operations to established manufacturing hubs and lack of infrastructure linking the two centres of economic activities also discourage growth of beneficiation activities (Minerals and Resources, 2011, p13).

> Access to international markets for beneficiated products is limited by trade barriers (both tariff and non-tariff) in some prospective recipients of South Africa's beneficiated products (Mineral and Resources, 2011 and Nedlac, 2006).

The challenges listed above are enormous and not easy to resolve. They require coordinated government efforts to work on eliminating these barriers in order to improve the current state of affairs.

According to a report by Minerals and Resources (2011), increasing competition in the local steel industry (e.g. establishment of new steel manufacturing facility) should be one of the interventions for countering anti-competitive pricing strategies. Other measures being considered by government are the inclusion of taxes on exports of iron ore and necessary changes or improvements to infrastructure and regulations (Minerals and Resources, 2011, p14). The Minerals and Resources report indicates that Government recognises the constraints in the current external trade agreements and internal infrastructural weaknesses which limit the potential for growth in the steel industry value chain in South Africa

From the perspective of taking advantage of membership in preferential trade blocks, the inclusion of South Africa into the BRICS grouping and the commitment given by the countries involved to increase investment in South Africa and provide access to markets in China could help fast track the implementation of the New Growth Path (Jwali, 2012, p161). Within BRICS, further opportunities for South Africa could be explored according to Jwali (2012, p161) including opportunities for technology sharing and export of value added products from SA, besides merely only the export of raw products and commodities. Nevertheless, there is criticism from a number of analysts that within the grouping, other members of BRICS countries will actually benefit more than South Africa (Edwards & Lawrence, 2012, p22) for example Keet (2007) is critical that the main objective of inviting South Africa into this grouping is not necessarily to benefit South Africa, but to have an improved access to the mineral resources that South Africa has, by negotiating better terms, and use South Africa as a gateway into Africa as a whole, without necessarily benefiting South Africa. With these contrasting views, it seems prudent that the government of South Africa should carefully assess its trade relationship with BRICS and other trade partners in general to determine whether the expected benefits to the economy are being achieved.

To measure success of the NGP, the main indicators according to government (NGP, 2011, p6), are jobs (the total number and quality of jobs created), growth (the rate, labour intensity and composition of economic growth), equity (lower income inequality and poverty) and environmental outcomes (less harm to the environment).

In summary, the NGP is one of the vehicles that the government is employing to grow South African economy through implementation of key objectives that include expanding the beneficiation of minerals produced within South Africa, and developing the labour absorptive economic sectors that create more jobs within the country. However, as noted there are challenges to this policy that

hinders its successful implementation and requires government's intervention to resolve.

The other key policy in South Africa that supports the initiatives highlighted in the New Growth Path is the Industrial Policy Action Plan (IPAP 2), which focuses on the industrial sectors of the economy.

2.5.3.2 *Industrial Policy Action Plan II (IPAP 2)*

The Industrial policy action plan (IPAP 2, 2013) aims to support key drivers and packages contained in the New Growth Path (NGP). The IPAP 2 (2013) is informed by the National Industrial Policy Framework (NIPF) adopted by Government in 2007, which in turn is informed by the NDP mentioned earlier. The NIPF provides the more general industrial policy framework for IPAP and the blueprint for Government's collaborative engagement with its social partners from business, labour and civil society (IPAP 2, 2013). A key priority of the IPAP is to coordinate the efforts of different government departments, agencies and state owned enterprises towards the goal of industry development and ultimately job creation.

The policy aims to ensure a restructuring of the economy to set it on a more value-adding, labour-intensive and environmentally sustainable growth path. Through this policy, South Africa should have an environment which promotes value addition to current minerals or raw materials available in the country, and ensuring that the locally manufactured goods can compete in export markets and with imports. The policy seeks to align skills, technology and innovation policies to sector priorities.

IPAP targets to achieve a robust industrial policy so as to strengthen the manufacturing side of the economy in general. The policies include: (i) incentives directed to key industry sectors to increase competitiveness, (ii) industrial financing, (iii) procurement policies, (iv) tariff policies, (v) interventions to prevent illegal imports and customs fraud, (vi) skills and innovation policies aligned to sectoral priorities, (vii) interventions designed to stimulate sub-regional growth, including growth in key sectors and value chains by way of the Special Economic Zones (SEZ) policy and programmes, (viii) strengthening of intra-Africa trade, and others aimed at developing a strong manufacturing base in South Africa, (IPAP, 2012). Another objective of this policy worth noting is the promotion of a labour-absorbing industrialisation path with particular emphasis on tradable labour-absorbing goods and services and economic linkages that catalyse employment creation (IPAP 2, 2013).

With regard to the steel sector, some of the challenges or threats towards successful implementation of the IPAP, are similar to those mentioned elsewhere in the text and include: high electricity prices in SA, monopolistic pricing by companies like AMSA, high port charges by Transnet for export of finished

products, imports brought in through the presidential public infrastructure investment programme, and labour unrest. Given these challenges, interventions by government are required to promote the growth of the steel industry in South Africa (IPAP 2, 2013).

In summary, the IPAP specifies the actions required to achieve the policies identified in the NGP (2011) for economic growth with regard to the industrial sector. Hence it addresses the "how" of achieving government's industrial strategies. IPAP considers the metal fabrication, capital equipment and transport equipment as the industry cluster that is at the centre of economic development because they produce products, applications and services used across the entire economy. These include applications in infrastructural programmes, construction, general engineering, mining, automotive and packaging. Therefore these cluster of industries, namely, the metal fabrication, capital and transport equipment, are according to government an important component of the industrialisation path and are a key driver of the manufacturing sector's competitiveness (IPAP, 2012). It follows that if the competitiveness is achieved in this cluster it is expected to result in growth in the entire industrialisation sector of the economy.

The next section explores some of the non-tariff barriers used as policy tools by South Africa, China and other countries to protect their economy. Some of South Africa's steel products are subjected to these restrictions when exported to partnering countries, thus implying that South African government also need to explore them and address with the countries involved. A brief overview of these non-tariff barriers is given below.

2.5.4   Non- tariff barriers as a policy tool

It is widely acknowledged that countries apply non-tariff barriers to restrict imports from entering their markets (TPSF, 2010, p xviii) or reduce the negative effect on their local manufacturers for various reasons which may include genuine concerns such as protecting their local industries from external competition, retaining jobs in the country and others. Non-tariff barriers are however discouraged by WTO and are often subjected to scrutiny (Nedlac, 2006, p31).

Nonetheless, non-tariff barriers are applied by countries in some way and in the case of South Africa have an impact on the performance of the steel industry. Non-tariff barriers identified by Nedlac (2006), which are applied by either South Africa or China include: import quotas applied by South Africa; certain imports prohibited by both countries, export duty rate (export tax) applied by China, but cannot be confirmed in South Africa; export subsidies and export rebate system applied by both countries (only MIDP in SA), Anti-dumping policy applied by both China and South Africa; and Price control of imported raw materials through import licenses is practised by both countries (Nedlac, 2006, p152 – 160).

2.5.5   Summary of government policies and their impact on the steel industry value chain

The IPP as a government policy to encourage the development and growth of the manufacturing sector of the economy hasn't had a big impact on the steel industry value chain as the infrastructure is lagging behind. Government spending is currently not at the expected levels, and as a result, does not stimulate the demand of steel as required. In addition, procuring steel from China and other countries does not help grow the local production of steel.

Import-substitution-industrialization (ISI) as another policy tool is not currently effective is South Africa, since government believes that most tariffs be removed in all sectors except where concerns are registered. The aim of ISI policy is to protect key sectors of the economy to allow for local manufacturing. Protection in the steel industry value chain is minimal since there is evidence of an influx of imported, finished manufactured steel products into South Africa. This might also mean that some of the RTA's, like for example with China, are not crafted to assist the local steel industry value chain. This also suggests that SA's tariff policy is not assisting the steel industry grow.

NGP identifies mineral (including steel) beneficiation as a strategy to ensure that competitiveness is achieved in beneficiation of the country's mineral resources. The aim is to achieve greater employment; increased exports and diversification of the economy. Literature suggests that efforts of beneficiation have resulted in increased revenues in certain steel sectors, however, overall results are that the full benefits of this policy are not yet realised in the steel industry value chain, since jobs are still being shed mainly at the downstream level, and therefore very little impact of this policy can be proven in this sector. There are challenges to this policy that hinders its successful implementation as highlighted in the literature and these requires government's intervention to resolve.

IPAP which is used to drive the objectives on the NGP and is aimed at strengthening the manufacturing side of the economy so as to absorb more labour has yielded mixed results according to the literature reviewed. On the positive side, this policy has enabled the creation of some additional demand in steel through the establishment of some steel manufacturing plants and has helped in the retention of employment within the motor industry and components manufacturers through the establishment of the MIDP within the motor industry. At the same time, on the other hand, there has been growth in imports of steel products which threatens jobs within the steel industry value chain. The challenges therefore threaten the successful implementation of the IPAP and require intervention by government, working together with the private sector to achieve the objectives of this policy within the steel industry value chain.

2.6. Summary of the literature review

Edwards and Lawrence (2012) argue that South African policies have not induced the necessary structural changes in the economy to significantly increase exports or give South African manufacturers an advantage over imports. Their view is that the policies have in fact, opened up an opportunity for more imports to flood the market, displacing the sporadic jobs that the country possesses. The current approach as outlined in the Trade Policy and Strategy Framework (TPSF) by the Department of Trade and Industry (DTI) does not really provide a convincing strategy for increasing South Africa's entry into emerging economies or enhancing participation in global industrial supply chains (Edwards and Lawrence, 2012). In the literature, it has been indicated that various authors share this general sentiment. In particular, the literature gives the greatest focus to China as both South Africa's most important trading partner and also its greatest threat to the local industry particularly the steel sector.

In general as noted in the literature review, South Africa is moderately protected by tariffs as compared to China. This is of concern as the two countries are important trading partners, in which case South Africa is put at a disadvantage. Elsewhere, it is noted in the literature that countries enter into trade agreements with each other or groupings such as BRICS or WTO which steers the countries policies. Within these arrangements, it was noted that countries advocate for preferential trade or free trade respectively. Notwithstanding the arrangement selected, it was considered prudent for South Africa to assess each trade agreement to ascertain whether it was in the best interest of the country or not. This needs careful consideration and a balanced approach as heavy protection of domestic industries against imports, can lead to retaliatory measures against South African exports, making it difficult for South African products to enter some markets. The challenge in this case is to find the correct balance between creating opportunities for domestic products to enter external market and protecting the local industries from disruptive imports.

With regard to the steel industry, the general view from the literature review is that South African policies have not really helped the steel industry grow. It is worth investigating whether the Industrial policies in place have achieved the required objectives in the steel industry, while the NGP and the IPAP2 are both aimed at creating a certain number of jobs in South Africa. It is noted in the Engineering-News[8] that the policies lack clear guidelines of how they are going to achieve the number of jobs promised, and moreover that the number of jobs promised in each of these policies (including the NDP) differ. Although the creation of sustainable jobs is currently of high priority in South Africa, the literature review indicates that an important view among the economists is that the correct policies can stimulate growth and achieve the intended government

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[8] Issue of the 05th November 2013

objectives. It is further noted in the literature that there is still a prospect for policy improvements within South Africa.

In conclusion, having reviewed the literature the role of the support to the steel industry by government policies cannot be ascertained in any of the previous studies. Even though government has clearly stipulated its policies through the NGP and IPAP to grow the economy, assist companies to be competitive, create jobs and save existing ones, and has been implementing these policies since they were launched, the impact of these policies on the steel industry is unclear. This study seeks to fill this gap in the literature by investigating whether the policies have had an impact on the steel industry. Useful indicators derived from the literature reviewed for application in the study include an indication whether the policies has increased the demand of steel from local manufacturers, and whether jobs have been created or current ones retained in the companies surveyed. Through these indicators and others, an attempt will be made to determine the impact China has had on the steel industry value chain in South Africa and the role that government industrial policies have had in protecting the local South African steel industry from any adverse effects, arising from the current trade relationship between the two countries.

Chapter 3

Methodology
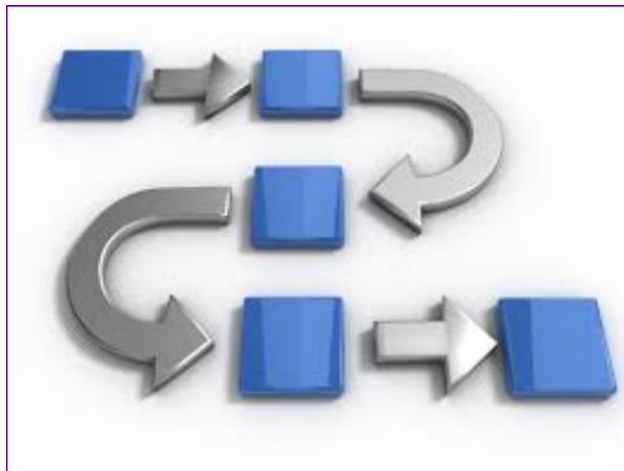
3.1.   *Research Strategy*

The research strategy specifies the method employed and tools used to answer the research questions and study objectives given in chapter 1.

This is achieved by using a survey questionnaire, followed by a semi-structured interview. The questionnaire was directed to manufacturers within the steel industry, steel industry associations and expert economists/ policy makers from the DTI specially dealing with steel industry policies and matters.
A survey has been utilised to obtain a shared opinion among key stakeholders regarding the factors that deter the implementation of policies designed to help the steel industry in South Africa. The approach starts by seeking the opinions of key stakeholders on whether the existing policies have the potential to help improve the situation of the steel industry. This is followed by seeking their opinion on how best the policies should be implemented. Lastly, their opinion is sought on what the challenges in implementing the policies are. It is worth noting that the researcher could not get hold of (did not have access to) more relevant prior research studies which are related to this study topic. An attempt was made to find out if there are prior related studies, and not much could be found from the literature available. Prior studies could help form the basis for the literature review related to this study and help lay the foundation for understanding the research problem being investigated. A few of previous studies, even though not sufficient according to the researcher, have, however being perused. These previous studies, in one way or the other, are linked to this study, and that helped in bringing forward some of the matters mentioned herein.

Both qualitative and quantitative methodologies are utilised to obtain primary data for this study. To a large extent qualitative research methods were used to gather information, and hence the study relies heavily on descriptive information. Quantitative data is obtained by counting the number of respondents who agree or disagree with the statements presented to them.

Questionnaires and interviews were used to obtain qualitative information that is not covered by the literature from respondents. A qualitative approach was selected because it lends itself to a deeper examination of observable behavioural trends and the capturing of new complex meaning, instead of numerical data (Creswell, 2009, p4). To obtain this information, open ended questions and comments in a questionnaire, and follow up interviews were used.

Follow up interviews with relevant managers from selected companies in the Steel Industry were conducted to ascertain data collected from questionnaires. In-depth interviews were used to obtain new information, and to confirm and clarify comments made by the respondents in the survey. In depth interviews are normally difficult to arrange due to interviewees tight schedules, geographical locations and costs associated with arranging the interviews (Miller & Brewer, 2003, p169). However, if successfully arranged, they can be the best method to

obtain relevant information because of the direct interactions, allows for open ended questions and provides an opportunity for follow up questions where there is a need. Saunders, et al (2003) advise not to rely solely on questionnaire data but to use questionnaires in conjunction with at least one other data collection instrument hence in depth interviews were conducted in this study.

During the interview, the researcher reiterated the survey questions in a more open ended manner to prompt more in-depth answers so as to further establish congruency with the survey questionnaire responses.
A combination of open ended and structured questions were used. Open ended questions were used to obtain new information and allow for respondents to elaborate on their answers, and structured questions were used to obtain their initial opinion on the given statement. The structures questions included yes/no type questions and agree/disagree, among others.

One shortfall with questionnaires is that some people may not respond to them for various reasons (Miller & Brewer, 2003, p303), which prompts the researcher to constantly make follow ups in order to obtain more responses. On the other hand, questionnaires are beneficial in that good information can be gathered using this method because people have more time to read and complete the forms at their own pace (Miller & Brewer, 2003, p303)and people who are geographically far from the researcher could be reached at low cost, e.g. via email. An online (electronic) questionnaire, via "Survey Monkey" was used to collect raw data. "Survey Monkey" software has several advantages (Pham, 2007, p75-76) including the flexibility to be amended after the questionnaire has already been sent to respondents. It is also able to draw more information through its ability to provide adequate text fields for comments if necessary, saves time to transcribe the data to electronic format which facilitates the analysis. Other features include: switching on/off questions depending on the first answer given in a response, e.g. Q1 – Do you own a car?, Q2 – How much do you spend on fuel a month?. If an answer to question 1 is "YES", then automatically, question 2 will be switch on. If the answer to question 1 is "NO", then question 2 will not be displayed.

The survey was constructed in such a way that it used both deductive and inductive approaches towards obtaining the required data, using structured questions with space for comments, and open-ended questions. The questions are drawn from the literature covering aspects required for the study. Questions are mainly to confirm information from the literature while new information is sought through open ended questions or comments.

3.2.   Collection of data:

Questionnaires were directed to relevant contact persons within the companies selected (i.e. directors or general managers in sales and marketing or business management), and policy makers at administration or management level within

the relevant government departments (mainly DTI). These individuals were contacted electronically via e-mail and some of them were phoned to ask for their participation in the survey. The individuals contacted were deemed to have good knowledge of the topic and thus considered experts in this subject area.

Interviews were also conducted with selected individuals within the surveyed organisations, including the relevant government department (i.e. DTI), while industry associations were contacted to verify information obtained and provide more information regarding the study

Data collected via questionnaires were transcribed into a format that can be analysed using excel spreadsheet and SPSS (Statistical Package for the Social Sciences) statistical software. As responses were received, telephonic interviews were arranged with the respondents where notes were written down during interviews, tape recorded, and then re-written in a more readable format immediately after the interview. The information was summarised and transcribed in an electronic format, and hard copies of the notes filed appropriately for later review if required.

3.3.   Sampling of Firms

Contact details of companies within the steel industry chain were obtained from Steel industry associations, the DTI, referrals and websites, according to the supply chain or manufacturing clusters. Cluster sampling was used for the following reasons: The steel industry value chain in South Africa is large and scattered all over the country, and processes in the steel industry differ from one company to the other depending on the level or stage in the steel processing value chain it is at. This makes it difficult and costly to survey all the companies in the steel industry value chain. Cluster sampling "is often employed to reduce the cost of sampling a population scattered over a large geographic area" (Leedy & Ormrod, 2004), or clustering companies by the type of the processes employed to produce a product or service. In this instance, it was logical to organise companies in clusters which best define their unique features and then study them, a reasonable number of companies within a cluster being selected where possible. Since it was difficult to establish the total number of the companies in the steel industry value chain and their names, it was easier to use a snow-ball approach to obtain a reasonable sample in each cluster. From the responses of the first few participants, additional contacts were obtained and also included in the invitations to partake in the study. The aim was to invite as many companies and respondents as possible to obtain more representative results. According to Patton (1990), "The sample should be large enough to be credible, given the purpose of evaluation, but small enough to permit adequate depth and detail for each case or unit in the sample". This is also recommended by Saunders et al (2003, p160).
The limitation in this case was that the sample size was limited to the information available on contacts of companies that could be surveyed and therefore normal

random sampling or any other sampling method could not be used in conjunction with cluster sampling. Clusters were organised by the type of manufacturing processes within the steel industry value chain, but not according to regions or locations, and this was mainly because the information available only allowed for this choice of sampling. The results are representative of the clusters in the steel industry value chain, but could have been more accurate and more reliable data could have been collected, if information was available.

A logical cluster for this study was considered to be manufacturers categorised by type of process used for processing steel. The first cluster in the processing of steel is iron ore extraction (was not included in the study), second is smelting into steel ingots/slabs, third is steel fabrication and lastly is the final users of steel to produce final product. Companies were selected at random in each cluster and included small, medium and large size organisations within each cluster. Small companies in this case are those companies that employ between 1 and 100 employees. Medium manufacturers are companies employing between 100 and 500 employees, and a large company is defined as one which employs more than 500 employees.

The clusters were as follows:

1. Cluster 1 - Iron Ore extractors (not included)
2. Cluster 2 - Smelters or Steel manufacturing companies
3. Cluster 3 - Steel Fabricators
4. Cluster 4 – Final steel processors or Manufacturers.

3.4.   *Data clean-up and coding*

The survey was sent to about 340 participants within the steel industry supply chain, and 82 responded to the questions as asked in the questionnaire, which is equivalent to 24% response rate. An attempt was made to pursue non respondents to participate by sending repeat reminders, but the efforts yielded minimal results. Some respondents were not willing to co-operate or participate in academic research as they saw no value in it for them. Some respondents indicated that they received similar requests in the past to participate in surveys and the studies wasted most of their valuable time. In summary, the reasons for the low response rate were: 1. Lack of interest, 2. Lack of incentives to participate, 3. the length of the survey or questionnaire, 4. Fear for breach of confidentiality, 5. and in some cases, prohibition by company rules. According to Nulty (2008), on-line surveys normally yield in general, a response rate of between 20% and 40%, which is lower than paper-based surveys (administered with face to face interaction). He further states that the question on "whether or not a response rate is adequate depends (in part) on the use that is being made of the data". This implies that the adequacy of the responses or data is not solely based on the percentage of the responses obtained, but can also be the purpose the data serves or intended for. In some instances, an additional response(s) in

the survey will not change the decision or conclusion to be made about a variable or a statement. On the contrary, higher response rate (say 70% and more) can depict higher reliability of the data obtained, and avoids the opportunity for sampling bias to affect the results (Nulty, 2008).

Companies' details were obtained from different databases and included companies from all 9 provinces within South Africa. Type of companies ranged from smelters/ steel producers, fabricators and final assembly plants within the steel industry value chain. Emails were forwarded to these companies requesting one or more participants to take part in the survey. The targeted respondents were senior managers within the selected organisations and any other person the companies deem fit to be able to contribute positively to this study. One or more respondents from a single company were allowed to complete the survey

The aim of conducting the survey was to verify information explored in the literature and obtain new information that would best explain the role of government policies on the impact of China on the steel industry and its value chain in South Africa. Questions were asked in two ways. First, the questions require a respondent to agree or disagree with the statement given and second, to give opinions on a given aspect, which is an open ended question. The questionnaire was divided into three sections namely: Steel companies, Steel industry associations and the government (DTI) (see questionnaire in Appendix C).

All questionnaires with incomplete responses were removed from analysis, and data were coded according to Appendix D.

Companies within a cluster were selected at random with no preference given to a company or participant in the study, as long as they fitted the criteria for legibility namely to belong to a cluster and be at the required level of management. This was done to avoid being biased in the selection.

Respondents targeted were senior level managers, preferably in marketing, sales, operations or supply chain management within companies, and this preference was explained in the introduction of the survey. These managers are likely to be familiar with the broader picture of the organisations they are working for and are likely to compare themselves with the outside world or the entire steel industry. Part of their main job entails interacting with a vast number of people outside their companies as compared to largely office based personnel. They are heavily involved in the drawing up of marketing or operational strategies which considers the challenges, threats and opportunities for their businesses. It was therefore deemed important to tap into their knowledge of the industry which would contribute positively to the study.

Within DTI and Industry Associations: personnel specialising in issues related to the steel industry and considered to have inside knowledge of policies and their

workings within the steel industry were invited to participate. To determine their knowledge base, participants were asked to specify the level of management they were at within their respective organisations and experience within the steel industry.

3.5. *Reliability of the Study.*

Reliability is defined as the extent to which the results of the study are consistent over. The results of the study should be repeatable or replicable under a similar methodology. The methodology used to conduct the study should be transparent and clear explanation of how the data was collected be provided. The raw data collected should be available for other researchers to use and scrutinise if needs be. Four threats to reliability need to be addressed, and these are: 1. Participant error, 2. Participant bias, 3. Observer error and 4. Observer bias (Saunders et al, 2003p100).

To address these requirements, a series of activities were undertaken which included giving participants more time to answer the questionnaire which will enable them time to source relevant information from the company materials or other sources, which helped reduce participant errors. In addition, follow up telephonic interviews with open ended questions were conducted to check for consistency, probe further the answers provided by the participants and to collect more data. To ensure that questions were as clear as possible, the use of language or terminology that may not be understood by respondents was avoided and questions were checked to ensure that there were no e.g. "two-questions-in-one". An independent person was used to recheck the questions and confirm that they met these objectives.
The researcher also gave the respondents as little information as possible and allowed them a chance to give their own opinions during interviews. This helped avoid undue influence from the researcher. In some instances, the researcher asked more than one respondent within the selected organisations to complete the questionnaire in order to conduct a retest and affirm information collected. Overall responses were aggregated to obtain results, instead of using a single response (one individual's views) which might lead to bias. To test for internal reliability, Cronbach's alpha was used, and this is a coefficient of internal consistency, often used for reliability test of a sample. A Cronbach's alpha of 0.7 and above is acceptable and indicates that the questions are measuring the same variable, and that the scale is reliable. In this study, items with Cronbach alpha values less than 0.7 were rejected, meaning the item is not consistent or reliable. To help with refining the questions, a pilot testing of the draft questionnaire was done before it was distributed to final respondents.

3.5.1 Pilot testing

The first draft of the questionnaire was compiled and sent to at least 8 respondents as a pilot, to verify if relevant information could be collected, pick up errors, and allow the researcher to correct before sending to the larger sample. The participants in the pilot study were senior managers and middle managers with more than 5 years' experience in the steel industry. The survey questionnaire was sent to the participants via email, asking them to access the electronic survey through the link attached. A pilot was done in order to assist in:

- Checking or testing the method to be used to collect the data
- Collecting data on which the actual sample size will be based, and
- Sorting out issues related to practicalities of the methods and validity of the data to be collected by the methods described above.
- Testing if the questions are clear and understandable, to ensure the correct and relevant information is collected.
- To have an idea of how many responses one will obtain after sending out the invite to participate in the study
- To evaluate if the data being collected by the questionnaire will be usable to deduce information required.
- Evaluate if the target group is relevant for the study and if they are familiar with the issues being explored
- To establish how long the survey would take to complete and if there are amendments required.
- To establish if the measurements are reproducible or repeatable, i.e. will the same results be obtained if taken at different times or using a different group of respondents?
- To establish if the questionnaires measure what they are intended to. By establishing the Cronbach's alpha for the questions, one will be able to conclude if the questions are measuring the same construct and decide if certain questions need to be retained or amended.

3.5.2 The questionnaire

A copy of a complete questionnaire used to obtain information related to the objectives of this study is given in Appendix C. For the questionnaire constructs were developed to measure the stated objectives of the study. A detailed elaboration of the approach used to develop the constructs is given in Appendix A. Copies of the questionnaire were subsequently distributed to different organisations as previously explained, with different sets of questions within the questionnaire for manufacturers, for the steel industry associations and for government (through its agency DTI), according to the sampling strategy explained.

It is worth noting that the questionnaire had different components including yes/no questions, questions on a sliding scale (e.g. likert scale), and a provision

for comments. To be able to compare the data collected as some questions applied different sliding scales being 1-10 for some, 1-5 for others, and still others 1-6, the sliding scales were standardised as indicated in Appendix D, on the other hand, comments were considered separately and are summarised in Appendix G.

Information from the questionnaire was obtained and analysed in various ways elaborated upon in later sections, and includes making comparison across the three major groups identified in the questionnaire, namely manufacturers, government (represented by DTI) and Industry associations (see Appendix H).

Most questions in the questionnaire have a provision for comments which supports the answers provided by the respondent, giving insight of the logic of the respondent when answering the question. This insight was useful in checking and confirming the responses.

3.6.   *Validity of the data*

Validity in qualitative research is defined as whether the data is believable, credible and reliable, and can be defended when challenged (Saunders et al, 2003).

Maxwell (1992) identified three types of validity that should be given attention in qualitative research. That is descriptive, interpretive and theoretical validity. The descriptive aspect refers to information provided by the researcher which should be accurate and able to be confirmed. The interpretive aspect refers to the extent to which the researcher can accurately interpret the opinions, thinking, feelings, intentions and experiences of subjects. Theoretical validity refers to the extent to which the theoretical explanations developed are congruent with the data and is reliable and can be defended.

To achieve this, the following steps were taken:

- Standardised questions were sent to all respondents who participated in the study. The same questions were posed to all respondents in the questionnaire and telephonic interviews followed by proper notes taken during the interview, for later review.
- Follow up telephonic interviews were conducted, as discussed above, with the respondents of the questionnaire to check whether the results of the study are valid.
- Notes were made as the interviews were being conducted and a tape recorder was also used to ensure that correct information was captured and transcribed properly. The advantage of a tape recorder is that it can be replayed or repeated to ensure accuracy of notes collected. First, detailed notes were written down immediately after the interview to ensure that explanations are not

forgotten, and to avoid mixing up the data or responses between interviewees, and then summarised.

- A record of all materials and data collected and everything the researcher did were kept for audit trail. These records were documented and organised appropriately for easy retrieval when required.
- The researcher checked for non-response bias and confirmed that the data collected was generally free of non-response bias.

3.7.   *Approach taken for data analysis*

3.7.1. *Quantitative data Analysis*

104 questions were asked in a survey subdivided into questions specific to the manufacturers; some to the steel industry associations and the rest were directed to the DTI. Questions were in the form of a likert scale, multiple choice questions or open ended to extract relevant information from the respondents. The likert scale was between 1 and 5, 1 being strongly disagree and 5 strongly agree (see Appendix D). Rating scales assess the behaviour of respondents. The respondent selects an appropriate response on a scale of a five rank –order points with two extreme ends of the scale being 'strongly agree and strongly disagree'. Each point on the scale is assigned a score of 1 to 5 or 5 to 1. By adding up the scores as represented by the reaction of the respondent and assessed by the researcher, the attitude towards a particular issue can be determined. Raw data was re-arranged in order to perform statistical analysis on the results, and questions measuring the same variable grouped together for ease of analysis. Missing data or empty cells were deleted from the data.
Once all the data were appropriately coded for entry into a spreadsheet, the appropriate procedure was used to process the data into a format that could be analysed to obtain, for instance, frequencies, tables and diagrams. For each question, a computation of each point in a scale was done, e.g. for question 1, a count or sum of respondents with selection 1 (strongly disagree), sum of 2's (disagree), sum of 3's (neither agree nor disagree), up to 5, were computed. The mean - $\bar{X}$, for each question was also calculated.

Hypothesis tests were done on the issues identified in chapter 1. This was followed by ANOVA analysis to compare the views of different groups (i.e. the manufacturers, the steel industry associations and the government agencies. The second comparison was between small companies, medium size companies and large companies, and the last comparison was between the smelters, steel fabricators and final assemblers).

Cronbach's alpha was calculated for groups of questions believed to be measuring the same variable or factor. As indicated earlier, a Cronbach's alpha of 0.7 and above is acceptable and indicates that the questions are measuring

the same variable, and that the scale is reliable. Cronbach's alpha α is calculated as:

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K}\sigma_{Y_i}^2}{\sigma_X^2}\right)$$

Where K is the number of questions being tested, σ_X^2 is the variance of the

observed total scores, and $\sigma_{Y_i}^2$ the variance of component i for the current sample of persons.

3.7.2. Qualitative data analysis

Descriptive data from comments were re-organised, analysed and summarised in Appendix G. For qualitative data that did not lend themselves to analysis using numerical quantifying methods, an inductive grounded approach was applied to explore linkages, relationships and explanations within the responses. The aim was to arrive at a logical conclusion that could be used to summarise the data collected and answer the research question(s) or address the research objectives.

Content analysis was done on the qualitative data and results are presented in Appendix F and G. Content analysis was done separately on comments received from survey questions, and on the interviews done. Details of the summarised analysis of comments received from the survey questions are in Appendix G while the results of analysis of interviews are found in Appendix F.

To make up the results as presented in Appendix F and G, the following steps of content analysis were followed:

- For Appendix G, (regarding comments received from the survey questions) the following steps were followed to analyse results:

  - Information was grouped according to objectives and constructs/ variables as defined in Appendix A
  - Data from comments received in the survey were collated into the groups indicated in the first step above
  - Common themes were then developed and re-written to summarise all comments within a group and sub-groups.

- For Appendix F (regarding information from interviews), the following steps were followed to analyse results:

- Copies of transcripts from interviews were read and brief notes were made on a separate page to capture the information that was outstanding against each question.
- The brief notes were then read again and categorised into groups of similar type information and those groups were labelled accordingly.
- Groups identified were linked and listed into major categories or themes and sub-categories or themes.
- The various major and sub-categories were compared and differentiated accordingly and this was done for all the transcripts.
- Once done with all transcripts, all categories were collected and examined in detail to check if they are relevant and where they would fit together in the data to be presented.
- An attempt was then made to group together and merge some of the categories, and some of them re-organised into similar sub-categories.
- These steps above were repeated several times to ensure that all the information from the transcripts was categorised and to check that a thorough job was done.

3.8.   Ethics matters

The University of the Witwatersrand's ethics requirements was followed in conducting this study. The following were done in order to meet the requirements for ethics clearance by the university:

A letter of consent was drawn and sent to the participants to ask for their permission to access their facility for the purpose of this project, permission to interview their employees and audio tape the interviews. The consent letter explained the interviewees' rights in terms of participation in this study and that they could withdraw at any time should they wish not to continue partaking in the study. An explanation of what the purpose of the study is was also furnished to the participants, including an explanation of what the results of the study will be used for. Participants were guaranteed anonymity, and that the results would be aggregated and their names not mentioned in the final report (see Appendix B for consent letter).

Another letter was drawn to invite participants to partake in the study (participation information sheet, Appendix J). The letter explained the purpose of the study, the researcher's assumptions or believes regarding the topic of the study, what was expected from participants and how the results of the study would be used. Participants were also assured of maintaining their confidentiality and also pointing out that participation is voluntary and that no compensation should be expected from their participation. Participants were also told in the same letter that they are free to decline to partake in the study.

To guarantee confidentiality and data protection, no names of companies or participants in the study are discussed in this or any other reports forwarded to the University or any third party. The survey was also conducted anonymously, meaning participants did not have to disclose their identity unless they would like to be contacted at a later stage. Details of any correspondence with participants or companies are filed and locked in a safe place, and will only be used for reference in case of an audit if required. Electronic Information can only be accessed by the researcher since it is protected by passwords.

On the introduction page of the electronic survey, purpose of the study, who should participate, length of the survey and confidentiality were explained. It was also emphasized that participation is voluntary and that participants could withdraw at any time should they wish not to continue with the study, and that there would be no monetary compensation for participation in the study. Participants were asked to agree if they have read and understood the terms and conditions to partake in the study, where if they did not agree, the survey would be terminated, and if they agreed, they would be able to continue with the survey.

Ethics clearance was obtained from the university with reference number MIAEC 005/14.

3.9.   Summary of the steps taken in the research

The steps taken in conducting this research were firstly to develop a survey questionnaire to cater for the three categories (i.e. Companies, DTI/ government departments and Industry Associations), and at the same time ensuring that ethics requirements are met. A draft questionnaire and the research strategy were then forwarded to independent persons to verify clarity, completeness and appropriateness of the study method and questions suggested. The feedback obtained from these persons was used to correct errors where necessary and refine the questionnaire. The researcher initially made attempts to confirm the list of the first 5 companies for the pilot study and the other companies were to be obtained by referrals from these. The researcher had to then decide on the acceptable mode of collecting the relevant data (email, telephonic interview or face to face) after which a pilot study is conducted. During the pilot study a further list from other sources and referrals was obtained for suggested companies to be included in the larger, actual study. Following the pilot study, there was a need to refine the study questionnaire further, before actual study commenced. Where necessary, the researcher did follow up interviews before starting with analysis of the data.

3.10. Study limitations (during and subsequent to the study)

Measure used to collect the data – during the analysis (after the field study), it was noted that some questions could have been included in the survey to extract more data from respondents, but were not included, and this important data was missed.

Self-reported data – it should be noted that the qualitative analysis has been summarised in such a way that the researcher understands the views as expressed by the respondents and the statements in a summary of interviews and comments are not the exact respondents words during the interviews or comments in a survey. There are chances that someone else might interpret the data differently, therefore meaning it may not be independently verified. The researcher has however, attempted to his level best to portray the respondents views by replaying the tape recordings over and over again to confirm the points noted in this report.

Selection of clusters studied – Only three clusters within the steel industry value chain were studied, which are steel smelters/ metallurgical process, steel fabricators and final manufacturers. The mining or extraction of iron ore was excluded in the study. The results of this study might have some bias of the steel industry value chain as a result of the choice of clusters.

Length of the survey and Survey instrument didn't capture all information especially from respondents who terminated the survey halfway. Most respondents did not complete the comments section if they have already used a rating scale. The survey instrument did not have a facility to force respondents to add comments to mixed type questions and a lot of information might have been missed from non-respondents. A face to face survey could have averted this limitation.

General access and confidentiality – There was a large number of respondents who declined to partake in a survey due to reasons that they are not allowed to share their company's confidential information and the fear that through the survey, their data may be accessed by competitors. This has a limitation on the number of responses obtained and the potential data that could have been obtained from these respondents.

Time limit – due to short time available to conduct the study and the deadlines to submit the final report, respondents might not have been given sufficient time to complete the survey. Respondents often feel that the time they are given to complete the survey is little, especially if they are overwhelmed by their own workload. As a result, most did not respond and some could have done a quick job to complete the survey, which might mean guessing the answers instead of thoroughly thinking through and properly responding.

Chapter 4

Presentation of results and Data Analysis

4.1.   Introduction

This chapter presents the results of the pilot study, survey and interviews conducted and described in Chapter 3. It also represents tests done on the hypothesis mentioned in chapter 1, on the reliability of the scale used, test on whether a cluster of questions measure the same variables, and presents a comparison of the views of different groups that participated in the study, regarding particular subjects of interest. Both quantitative and qualitative analyses are presented in this chapter.

4.2.   Results of the Pilot Study

The following are the findings of the pilot study:

Respondents suggested a number of changes to questions which were confusing or had errors in them. Amendments were made accordingly for a larger study.

Variations in some of the answers given were so wide, for example in one question 50% of the respondents would strongly agree with statement, while the next 50% strongly disagree. This would mean, either the respondents do not understand the question, or that they view the issue differently. Even though the pilot study was carried using a small sample, the responses should have a tendency to fall towards one side, i.e. 60/40, instead of 50/50. This suggested refining the question to deduce the correct information.

The length of the survey was an issue to most respondents and the number of questions was then reduced to make the survey shorter.

The field study was then carried after all the necessary changes were made as per suggestions from respondents. Revised questions are attached in the Appendix C.

4.3.   Results of the Demographics

Demographics define who participated in the study and their suitability for the study. This was done by first defining the types of organisations that participated in the study, followed by the position and years of experience of respondents within the selected organisations, steel contribution to the final product (the percentage of steel in the final product) and the number of employees employed by the organisation (used as a proxy for size of organization).

4.3.1. Type of Organisation

Different clusters of organisations participated in the study and the results are shown below. The clusters included Steel smelters, Steel fabricators, Assembly or final manufacturers, the government agencies (DTI) and the steel industry Associations.

Table 4.1 - Type of Organisation

Industry	Response Count	Response %	Manufacturers	% to total participants
Steel smelters	6	7%		
Steel fabricators	6	7%		
Assembly of steel parts	46	56%	65	79%
Other assembly type	7	9%		
DTI	4	5%		5%
Associations	13	16%		16%
Total responses	82	100%		100%

Table 4.1 above shows that out of the 82 respondents, 65 account for the respondents from the actual companies that manufacturer or use steel in the manufacturing processes (i.e. smelters/ producers, fabricators and final users/manufacturers), 13 were from the steel industry associations and 4 from the DTI. According to these results, all the 3 stages (i.e. smelters/ producers, fabricators and final users/manufacturers) of the steel industry supply chain were adequately represented by the data collected as intended, even though the response rate is low. 7% of respondents were from the steel producers, 7% from steel fabricators, and 65% (56 +9) from the final assembly plants. Based on this data and the consideration that there are relatively few players in both stage 2 and 3 of the steel value chain, the results were considered reasonable and acceptable. Non-respondents were scrutinised to check whether they differ systematically from those who responded. No differences between the non-respondents could be ascertained and respondents which would significantly change the results of this study as the processes their organisations use are similar, and all operate within a similar set up and environment within South Africa. The responses received were therefore considered free from non-response bias and could be used.

4.3.2. Position in the Organisation

Positions in the organisation were categorised into 4 groups, which are junior management, middle management, senior management and executive management. The results obtained from respondents are shown in Table 4.2 below.

Table 4.2 - Position in the organisation

Position of the respondents in the company	Response %
Executive Management	9.10%
Senior Management	48.50%
Middle Management	39.40%
Junior Management	3%

The majority of respondents were senior managers[9] at 48.5%, executive managers[10] were at 9.1%, middle management[11] were at 39.4% and junior management[12] at 3%. The views of high level management were fairly represented.

4.3.3. Years of experience

Respondents were asked to indicate how much experience they had in the steel industry and the results are shown in Table 4.3 below.

Table 4.3 - Years of experience

Answer Options	Response Percent
Less than 3 years	0.0%
3 to 5 years	0.0%
5 to 10 years	27.3%
More than 10 years	72.7%

72% of the respondents, which is the majority, had more than 10 years' experience working in the steel industry, and this indicates that they have a fairly

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[9] Senior management - Management level below the directors (e.g. business units managers, factory managers),

[10] Executive Management – highest level of management in an organisation empowered to make strategic business decisions within specified boundaries (e.g. directors of companies),

[11] Middle Management* - Management level below Senior management (e.g. Production Managers, sales managers),

[12] Junior Managers* - One level below middle managers (e.g. Foremen/ team leaders)

long experience in the industry and therefore are able to comment on the status in the industry.

4.3.4. Steel contribution to final product

The percentage of steel contribution to the final product being manufactured by a surveyed company and the consumption of steel per annum are indicated in Table 4.4 and Figure 4.1 below.

Table 4.4 - Steel contribution to final product

Steel contribution	Code	Response count	Response %
0 - 15%	1	2	3.1%
15% - 30%	2	11	16.9%
30% - 50%	3	18	27.7%
More than 50%	4	34	52.3%
Total responses		65	100.0%

Figure 4.1 - Consumption of Steel per annum
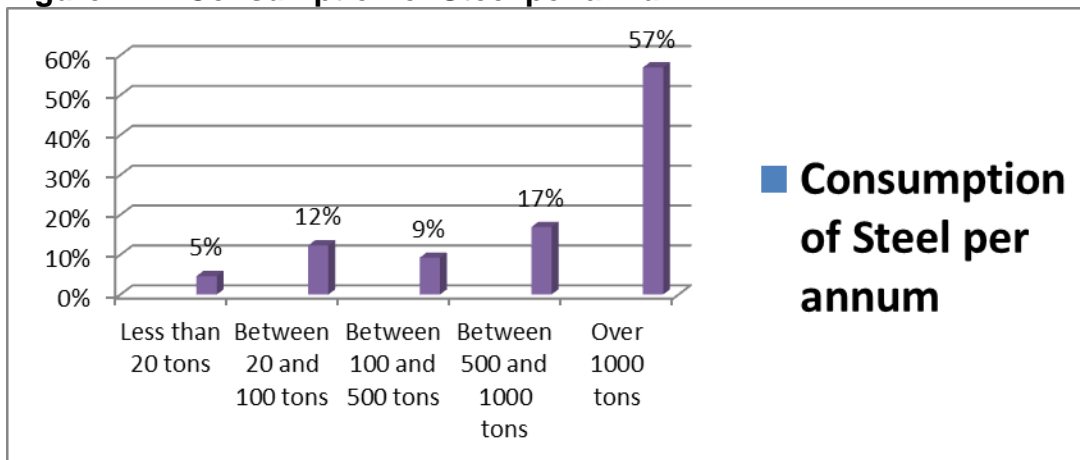
The results from Table 4.5 is that the majority (52%) of the respondents from companies surveyed, indicated that the contribution of steel to their final product is more than 50%, while the rest of the companies have steel contribution to the final product, of less than 50%. This means that the respondents are from a background of high steel consumption. Figure 4.1 show that 57% of these respondents' companies consume over 1000 tons of steel per annum. This indicates that most of the respondents represented by this study would have

more interest in the study on the steel industry and therefore their contribution is likely to be positive.

4.3.5. Number of people employed by company

The study represents participants from all sizes of companies and those are the small, medium and large organisations represented by the number of employed by their organisations as shown in Figure 4.2 below.

Figure 4.2 - Number of people employed by Company
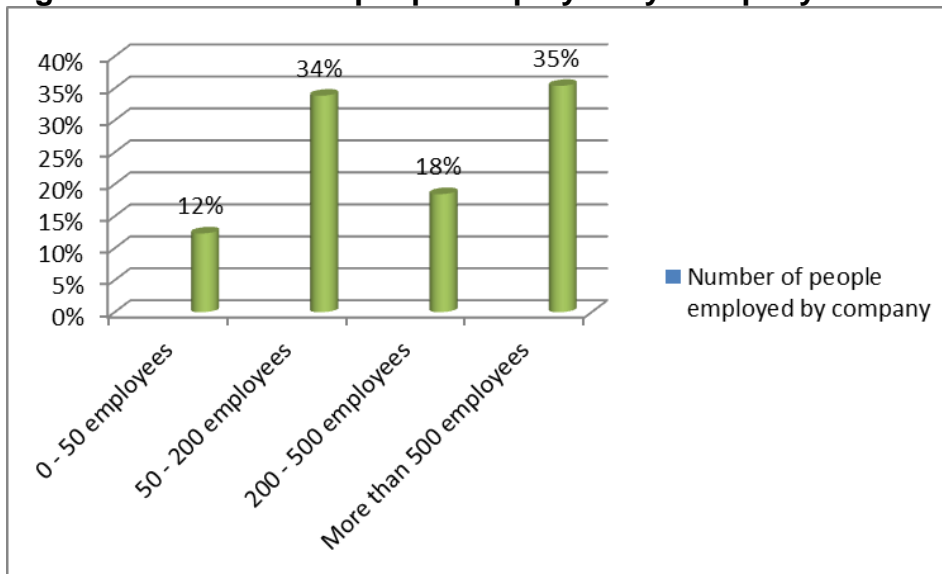
4.4.   Hypothesis testing

Hypothesis testing was done on the hypothesis provided in section 1.6, using the statistical software SPSS version 22   and the results are presented below.

4.4.1.   Test for hypothesis no.1
Hypothesis no.1 was tested to check whether Chinese imports are rated by Steel manufacturers in South Africa among the top two constraints to better performance of the Steel Industry in the South African market. The null hypothesis and the alternative hypothesis were earlier given respectively as follows:

1H0 - Chinese imports are not rated by South African manufacturers within the steel industry chain, as one of the top two constraints to better performance of the Steel Industry in the South African market

1H1 - Chinese imports are rated by South African manufacturers within

the steel industry value chain, as one of the top two constraints to better performance of the Steel Industry in the South African market

To test this hypothesis, a one sample t-test is conducted on question 20 at CI (confidence interval) of 0.95, and the results are shown below:

Table 4.5 - One-Sample Statistics, T-test for Hypothesis 4.4.1

	N	Mean	Std. Deviation	Std. Error Mean
Q20	65	3.88	1.206	.150

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q20	5.864	64	.000	.877	.58	1.18

The mean for one sample t-test on question Q20 is found to be 3.88 $\pm$ 1.206, which is higher than the test value score of 3. The 95% confidence interval estimate for the difference between the population mean and test value of 3 is (0.58, 1.18). Statistical significance (p-value) ("**Sig. (2-tailed)**") of the one-sample t-test $p < .05$ (the level of significance usually used for the test), is $p = .000$). This indicates that the population mean is statistically significantly different from test value of 3 at 95% confidence level, and thus we reject the Null hypothesis and accept the alternative hypothesis. Therefore the alternative hypothesis that Chinese imports are rated by South African manufacturers within the steel industry value chain, as one of the top two constraints to better performance of the Steel Industry in the South African market is accepted.

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4.4.2. Test for hypothesis no.2

Hypothesis no.2 was tested to check whether there is a decline in production of steel related products in South Africa due to imports from China. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

2H0 - There is no decline in production of steel related products in South Africa due to imports from China

2H1 - There is a decline in production of steel related products in South

Africa due to imports from China

To test this hypothesis, a one sample t-test was conducted on question 69 at CI of 0.95, and the results are shown below.

Table 4.6 - One-Sample Statistics, T-test for hypothesis 4.4.2

	N	Mean	Std. Deviation	Std. Error Mean
Q69	65	4.38	1.168	.145

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q69	9.553	64	.000	1.385	1.10	1.67

The mean for one sample t-test on question Q69 is found to be 4.38 $\pm$ 1.168, which is higher than the test value score of 3. The 95% confidence interval estimate for the difference between the population mean and test value of 3 is (1.10, 1.67). Statistical significance (*p*-value) ("**Sig. (2-tailed)**") of the one-sample t-test *p* < .05 (the level of significance usually used for the test), is *p* = .000). This indicates that the population mean is statistically significantly different from test value of 3, at 95% confidence level, and thus we reject the Null hypothesis and accept the alternative hypothesis. Therefore the alternative hypothesis that there is a decline in production of steel related products in South Africa due to imports from China is accepted.

4.4.3. Test for Hypothesis no.3

Hypothesis no.3 was tested to check whether South African policies contribute to the un-competitiveness of the locally produced steel products in South Africa. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

3H0 – South African policies do not contribute to the un-competitiveness of the locally produced steel products in South Africa

3H1- South African policies contribute to the un-competitiveness of the locally produced steel products in South Africa

To test this hypothesis, a one sample t-test is conducted on question ORIG88 (scale reversed to the original values which are actual values) at CI of 0.95, and the results are shown below

Table 4.7 - One-Sample Statistics, T-test for hypothesis 4.4.3

	N	Mean	Std. Deviation	Std. Error Mean
ORIG88	13	3.69	.751	.208

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
ORIG88	3.323	12	.006	.692	.24	1.15

The mean for one sample t-test on question ORIG88 is found to be 3.69 $\pm$ 0.751, which is higher than the test value score of 3. The 95% confidence interval estimate for the difference between the population mean and test value of 3 is (0.24, 1.15). Statistical significance (*p*-value) ("**Sig. (2-tailed)**") of the one-sample t-test $p < .05$ (the level of significance usually used for the test), is $p = .006$). This indicates that the population mean is statistically significantly different from test value of 3, at 95% confidence level, and thus we reject the Null hypothesis and accept an alternative hypothesis. Therefore the alternative hypothesis that South African policies contribute to the un-competitiveness of the locally produced steel products in South Africa is accepted.

4.4.4. Test for hypothesis no.4

Hypothesis no.4 was tested to check whether the Chinese steel products are superior to South African steel products in both international pricing and quality when compared in the South African market. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

4H0 - Chinese steel products are not superior to South African steel products in both international pricing and quality when compared in the

South African market

4H1 - Chinese steel products are superior to South African steel products in both international pricing and quality when compared in the South African market

To test this hypothesis, a one sample t-test was conducted on question Q11 and Q24 to check whether Chinese products are superior in pricing when compared to South Africa, and question Q25 and Q28 to check if Chinese products are superior in quality when compared to South Africa. The tests were done at CI of 0.95, and the results are shown below.

Table 4.8 - One-Sample Statistics, T-test for hypothesis 4.4.4 Price Q11

	N	Mean	Std. Deviation	Std. Error Mean
Q11	65	4.48	.640	.079

One-Sample Test

	Test Value = 3				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q11	18.605	64	.000	1.477	1.32	1.64

Table 4.9 - One-Sample Statistics, T-test for hypothesis 4.4.4 Price Q24

	N	Mean	Std. Deviation	Std. Error Mean
Q24	65	4.08	.816	.101

One-Sample Test

	Test Value = 3				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q24	10.640	64	.000	1.077	.87	1.28

The mean for one sample t-test on question Q11 and Q24 is found to be 4.48 $\pm$ 0.640 and 4.08 $\pm$ 0.816 respectively, which are both higher than the test value score of 3. The 95% confidence interval estimate for the difference between the

population mean and test value of 3 is (1.32, 1.64) and (0.87, 1.28) for Q11 &
Q24 respectively. Statistical significance (*p*-value) ("**Sig. (2-tailed)**") of the one-
sample t-test for both questions is $p < .05$ (the level of significance usually used
for the test), and reported to be is $p = .000$) for both. This indicates that the
population mean is statistically significantly different from test value of 3, at 95%
confidence level, and thus we reject the Null hypothesis and accept an
alternative hypothesis for the two questions. Therefore the alternative hypothesis
that, Chinese steel products are superior to South African steel products in terms
of international pricing when compared in the South African market is accepted.

Table 4.10 - One-Sample Statistics, T-test for hypothesis 4.4.4 Quality Q25

	N	Mean	Std. Deviation	Std. Error Mean
Q25	65	1.82	1.333	.165

One-Sample Test for Quality

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q25	-7.163	64	.000	-1.185	-1.52	-.85

Table 4.11 - One-Sample Statistics, T-test for hypothesis 4.4.4 Quality Q28

	N	Mean	Std. Deviation	Std. Error Mean
Q28	65	2.40	1.058	.131

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q28	-4.573	64	.000	-.600	-.86	-.34

The mean for one sample t-test on question Q25 and Q28 is found to be 1.82 $\pm$
1.333 and 2.40 $\pm$ 1.058 respectively, which are both lower than the test value
score of 3. The 95% confidence interval estimate for the difference between the
population mean and test value of 3 is (-1.52, -0.85) and (-0.86, -0.34) for Q25 &

Q28 respectively. Statistical significance (*p*-value) ("**Sig. (2-tailed)**") of the one-sample t-test for both questions is $p < .05$ (the level of significance usually used for the test), and reported to be is $p = .000$) for both. This indicates that the population mean is statistically significantly different from test value of 3, at 95% confidence level, and thus we accept the Null hypothesis and reject the alternative hypothesis for the two questions. Therefore the null hypothesis that, Chinese steel products are not superior to South African steel products in terms of quality when compared in the South African market is accepted.

4.4.5. Test for Hypothesis no.5

Hypothesis no.5 was tested to check whether imports affect the downstream steel industries more than the up-stream industries. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

5H0 – Imports do not affect the downstream steel industries more than the up-stream industries.

5H1 - Imports affect the downstream steel industries more than the up-stream industries.

To test this hypothesis, a one sample t-test was conducted on question Q10 at CI of 0.95, and the results are shown below

Table 4.12 - One-Sample Statistics, T-test for hypothesis 4.4.5

	N	Mean	Std. Deviation	Std. Error Mean
Q10	65	3.80	.538	.055

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q10	14.495	94	.000	.800	.69	.91

The mean for one sample t-test on question Q10 is found to be 3.8 $\pm$ 0.538, which is higher than the test value score of 3. The 95% confidence interval

estimate for the difference between the population mean and test value of 3 is (0.69, 0.91). Statistical significance (*p*-value) ("**Sig. (2-tailed)**") of the one-sample t-test $p < .05$ (the level of significance usually used for the test), is $p = .000$). This indicates that the population mean is statistically significantly different from test value of 3, at 95% confidence level and thus we reject the Null hypothesis and accept an alternative hypothesis. Therefore the alternative hypothesis that Imports affect the downstream steel industries more than the up-stream industries is accepted.

4.4.6. Analysis for hypothesis no.6

One way ANOVA analysis was done to compare how small companies in the steel industry are affected by imports as compared to medium and large companies. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

6H0 - Small companies within the steel industry value chain are not more affected by imports than large companies

6H1- Small companies within the steel industry value chain are more affected by imports than large companies.

One way ANOVA analysis was done on question 3, 4, 5 & 6 to compare the **Mean - μ** of the different sizes of companies and the results are presented in 4.4. 6.1; 4.4.6.2 and 4.4.6.3.

4.4.6.1 Performance of company vs. size of the company (Q3 & Q5) – size determined by quantity of steel consumed per annum.

Table 4.13 - Oneway ANOVA Analysis for hypothesis 4.4.6.1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Small Company	11	3.36	1.804	.544	2.15	4.58	1	5
Medium Company	6	2.83	1.169	.477	1.61	4.06	2	5
Large Company	48	2.85	1.288	.186	2.48	3.23	1	5
Total	65	2.94	1.368	.170	2.60	3.28	1	5

ANOVA Peformance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.396	2	1.198	.633	.534
Within Groups	117.358	62	1.893		
Total	119.754	64			

Post Hoc Tests: Multiple Comparisons - Dependent Variable: Performance Tukey HSD

(I) QtyOfSteel	(J) QtyOfSteel	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Small Company	Medium Company	.530	.698	.729	-1.15	2.21
	Large Company	.509	.460	.513	-.59	1.61
Medium Company	Small Company	-.530	.698	.729	-2.21	1.15
	Large Company	-.021	.596	.999	-1.45	1.41
Large Company	Small Company	-.509	.460	.513	-1.61	.59
	Medium Company	.021	.596	.999	-1.41	1.45

The results of the Turkey post-hoc test shows that there is no statistically significant difference between performance of Small companies and Medium size companies with p = 0.729 which is higher than the level of significance of p >0.05 usually used for the test. The results also show that there is no statistically significant difference between performance of the small companies and the performance of large companies with p = 0.513. Similar results are shown for Medium companies and large companies with p = 0.999. This means that the null hypothesis can be accepted, and the alternative hypothesis rejected. Therefore the hypothesis that, Small companies within the steel industry value chain are not more affected by imports than large companies is supported.

4.4.6.2   Impact of imports vs. size of the company (Q3 & Q6) – size
determined by quantity of steel consumed per annum.

Table 4.14 - Oneway ANOVA Analysis for hypothesis 4.4.6.2

ImpctOfImpts	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Small Company	11	3.18	1.079	.325	2.46	3.91	2	5
Medium Company	6	3.17	1.169	.477	1.94	4.39	2	5
Large Company	48	3.38	.937	.135	3.10	3.65	2	5
Total	65	3.32	.970	.120	3.08	3.56	2	5

ANOVA - ImpctOfImpts

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.496	2	.248	.257	.774
Within Groups	59.720	62	.963		
Total	60.215	64			

Post Hoc Tests - Multiple Comparisons: Dependent Variable: ImpctOfImpts Tukey HSD

(I) QtyOfSteel	(J) QtyOfSteel	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Small Company	Medium Company	.015	.498	.999	-1.18	1.21
	Large Company	-.193	.328	.827	-.98	.59
Medium Company	Small Company	-.015	.498	.999	-1.21	1.18
	Large Company	-.208	.425	.876	-1.23	.81
Large Company	Small Company	.193	.328	.827	-.59	.98
	Medium Company	.208	.425	.876	-.81	1.23

The results of the Turkey post-hoc test shows that there is no statistically significant difference on the impact of imports between Small companies and Medium size companies with p = 0.999 which is higher than the level of significance of p >0.05 usually used for the test. The results also show that there is no statistically significant difference on the impact of imports between the small companies and large companies with p = 0.827. Similar results are shown for Medium companies and large companies with p = 0.876. That means that the null hypothesis can be accepted, and the alternative hypothesis rejected. Therefore the hypothesis that Small companies within the steel industry value chain are not more affected by imports than large companies is supported.

4.4.6.3   Impact of imports vs. size of the company (Q4 & Q6) – size determined by number of employees within a company

Table 4.15 - Oneway ANOVA Analysis for hypothesis 4.4.6.3

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Small Company	8	2.75	.707	.250	2.16	3.34	2	4
Medium Size Company	34	3.62	.985	.169	3.27	3.96	2	5
Large Company	23	3.09	.900	.188	2.70	3.48	2	5
Total	65	3.32	.970	.120	3.08	3.56	2	5

ANOVA - ImpctOfImpts

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.860	2	3.430	3.986	.024
Within Groups	53.355	62	.861		
Total	60.215	64			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: ImpctOfImpts - Tukey HSD

(I) NoOfEmployees	(J) NoOfEmployees	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Small Company	Medium Size Company	-.868	.365	.053	-1.74	.01
	Large Company	-.337	.381	.652	-1.25	.58
Medium Size Company	Small Company	.868	.365	.053	-.01	1.74
	Large Company	.531	.250	.094	-.07	1.13
Large Company	Small Company	.337	.381	.652	-.58	1.25
	Medium Size Company	-.531	.250	.094	-1.13	.07

These results are comparable with the results from 6.2 and indicate that the null hypothesis can be accepted and the alternative hypothesis rejected. Therefore the hypothesis that Small companies within the steel industry value chain are not more affected by imports than large companies is supported, based on the number of employees within a company.

4.4.6.4   Performance of company vs. size of the company (Q4 & Q5) – size determined by number of employees within a company

Table 4.16 - Oneway ANOVA Analysis for hypothesis 4.4.6.4

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Small Company	8	3.13	.641	.227	2.59	3.66	2	4
Medium Size Company	34	3.09	1.485	.255	2.57	3.61	1	5
Large Company	23	2.65	1.369	.285	2.06	3.24	1	5
Total	65	2.94	1.368	.170	2.60	3.28	1	5

ANOVA - Performance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.926	2	1.463	.776	.464
Within Groups	116.828	62	1.884		
Total	119.754	64			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Performance - Tukey HSD

(I) NoOfEmployees	(J) NoOfEmployees	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Small Company	Medium Size Company	.037	.539	.997	-1.26	1.33
	Large Company	.473	.563	.680	-.88	1.83
Medium Size Company	Small Company	-.037	.539	.997	-1.33	1.26
	Large Company	.436	.371	.471	-.45	1.33
Large Company	Small Company	-.473	.563	.680	-1.83	.88
	Medium Size Company	-.436	.371	.471	-1.33	.45

These results are comparable with the results from 6.1 and indicate that the null hypothesis can be accepted and the alternative hypothesis rejected.

4.4.7.   Analysis for hypothesis no.7
One way ANOVA analysis was done to check whether all categories of steel manufacturers perceive Chinese steel products in South Africa as a serious threat to their survival or if the views are different from one category to the other. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

7H0 – There is no difference in perception between categories of steel manufacturers that Chinese steel products in South Africa are a serious threat to their survival.

7H1 – Not all categories of steel manufacturers perceive Chinese steel products in South Africa as a serious threat to their survival

One way ANOVA analysis was done on question 1, 5, & 6 to compare the **Mean - µ** of the different categories of manufacturers and the results are presented below in 4.4.7.1 and 4.4.7.2.

4.4.7.1   Category of manufacturer vs. performance - Question 1 & 5

Table 4.17 - Onway ANOVA Analysis for hypothesis 4.4.7.1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Steel Manufacturers / smelters	6	2.33	1.366	.558	.90	3.77	1	4
Steel fabricators	6	2.50	1.049	.428	1.40	3.60	1	4
Manufacturers/ Final step of steel processing	46	3.11	1.320	.195	2.72	3.50	1	5
Other	7	2.71	1.890	.714	.97	4.46	1	5
Total	65	2.94	1.368	.170	2.60	3.28	1	5

ANOVA - Performance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.035	3	1.678	.893	.450
Within Groups	114.718	61	1.881		
Total	119.754	64			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Performance - Tukey HSD

(I) LevlOfManf	(J) LevlOfManf	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Steel Manufacturers / smelters	Steel fabricators	-.167	.792	.997	-2.26	1.92
	Manufacturers/ Final step of steel processing	-.775	.595	.565	-2.35	.80
	Other	-.381	.763	.959	-2.40	1.63
Steel fabricators	Steel Manufacturers / smelters	.167	.792	.997	-1.92	2.26
	Manufacturers/ Final step of steel processing	-.609	.595	.737	-2.18	.96
	Other	-.214	.763	.992	-2.23	1.80
Manufacturers/ Final step of steel processing	Steel Manufacturers / smelters	.775	.595	.565	-.80	2.35
	Steel fabricators	.609	.595	.737	-.96	2.18
	Other	.394	.556	.893	-1.08	1.86
Other	Steel Manufacturers / smelters	.381	.763	.959	-1.63	2.40
	Steel fabricators	.214	.763	.992	-1.80	2.23

Manufacturers/ Final step of steel processing	-.394	.556	.893	-1.86	1.08

The results of the Turkey post-hoc test shows that there is no statistically significant difference between the views of Steel manufacturers and Steel fabricators with p = 0.997 which is higher than the level of significance of p >0.05 usually used for the test. The results also show that there is no statistically significant difference between the views of Steel manufacturers and downstream manufacturers (final step) with p = 0.565. Similar results are shown for Steel manufacturers and a group "Other" with p = 0.959, and the rest of the groups as shown in the table above. That means that the null hypothesis can be accepted, and the alternative hypothesis rejected. Therefore the hypothesis that there is no difference in perception between categories of steel manufacturers that Chinese steel products in South Africa are a serious threat to their survival is supported.

4.4.7.2 Impact of imports vs. category of manufacturers (Q1 & Q6)
Alpha @ 0.05

Table 4.18 - Oneway ANOVA Analysis for hypothesis 4.4.7.2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Steel Manufacturers / smelters	6	3.17	.983	.401	2.13	4.20	2	4
Steel fabricators	6	2.83	.753	.307	2.04	3.62	2	4
Manufacturers/ Final step of steel processing	46	3.41	1.002	.148	3.12	3.71	2	5
Other	7	3.29	.951	.360	2.41	4.17	2	5
Total	65	3.32	.970	.120	3.08	3.56	2	5

ANOVA - ImpctOfImpts

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.968	3	.656	.687	.563
Within Groups	58.247	61	.955		
Total	60.215	64			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: ImpctOfImpts - Tukey HSD

(I) LevlOfManf	(J) LevlOfManf	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Steel Manufacturers /	Steel fabricators	.333	.564	.934	-1.16	1.82

smelters	Manufacturers/ Final step of steel processing	-.246	.424	.937	-1.37	.87
	Other	-.119	.544	.996	-1.55	1.32
Steel fabricators	Steel Manufacturers / smelters	-.333	.564	.934	-1.82	1.16
	Manufacturers/ Final step of steel processing	-.580	.424	.525	-1.70	.54
	Other	-.452	.544	.839	-1.89	.98
Manufacturers/ Final step of steel processing	Steel Manufacturers / smelters	.246	.424	.937	-.87	1.37
	Steel fabricators	.580	.424	.525	-.54	1.70
	Other	.127	.396	.988	-.92	1.17
Other	Steel Manufacturers / smelters	.119	.544	.996	-1.32	1.55
	Steel fabricators	.452	.544	.839	-.98	1.89
	Manufacturers/ Final step of steel processing	-.127	.396	.988	-1.17	.92

These results agree with the findings of ANOVA test in 4.4.7.1.

4.4.8. Analysis for hypothesis no.8

One way ANOVA analysis was done to check whether government agencies overseeing the Steel Industry perceive the challenges to Steel Industry in the same way as Steel Manufacturers and the Industry Associations or if these institution's perceptions are different. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

8H0 – There is no difference in the way that Government agencies overseeing the Steel Industry, Steel Manufacturers and the Industry Associations perceive the challenges to Steel Industry.

8H1 – Government agencies overseeing the Steel Industry do not perceive the challenges to Steel Industry in the same way as Steel Manufacturers and the Industry Associations

The analysis was done comparing question Q44, 76 & 96 and that is done by calculating ONEWAY ANOVA using rating5 BY group5 (Ratings of the three groups which are Manufacturers, Steel Industry Associations and the DTI). The

results are presented below.

Table 4.19 - Oneway ANOVA Analysis for hypothesis 4.4.8

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Manufacturer	65	4.28	.992	.123	4.03	4.52	2	5
Association	13	3.92	.760	.211	3.46	4.38	3	5
DTI	4	3.50	1.291	.645	1.45	5.55	2	5
Total	82	4.18	.983	.109	3.97	4.40	2	5

ANOVA - Rating5

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.318	2	1.659	1.749	.181
Within Groups	74.938	79	.949		
Total	78.256	81			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Rating5 - Tukey HSD

(I) Group5	(J) Group5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Manufacturer	Association	.354	.296	.459	-.35	1.06
	DTI	.777	.502	.274	-.42	1.98
Association	Manufacturer	-.354	.296	.459	-1.06	.35
	DTI	.423	.557	.729	-.91	1.75
DTI	Manufacturer	-.777	.502	.274	-1.98	.42
	Association	-.423	.557	.729	-1.75	.91

The post-hoc test results show that the views of all the three groups or institutions are the same regarding the challenges to Steel Industry. p > 0.05 between all groups. That suggests that the Null hypothesis can be accepted and alternative hypothesis rejected. Therefore the hypothesis that there is no difference in the way that, Government agencies overseeing the Steel Industry, Steel Manufacturers and the Industry Associations perceive the challenges to Steel Industry.

4.4.9.   Analysis for hypothesis no.9
One way ANOVA analysis was done to check whether Government

agencies have similar views with Steel Associations and the Manufactures regarding the suitability of policies and priorities for the Steel Industry. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

9H0 - There is no difference in views between Government agencies, Steel Associations and Manufacturers regarding the suitability of policies and priorities for the steel industry.

9H1 – Government agencies do not have similar views with Steel Associations and Manufacturers regarding the suitability of policy and priorities for the Steel Industry.

Suitability of policies and priorities for steel industry worked out by comparing question Q43, Q74 & Q98 and that is done by calculating ONEWAY ANOVA using Rating4 BY Group4 (Ratings of the three groups which are Manufacturers, Steel Industry Associations and the DTI). The results are presented below.

Table 4.20 - Oneway ANOVA Analysis for hypothesis 4.4.9

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Manufacturer	65	2.37	.782	.097	2.18	2.56	1	3
Association	13	3.38	1.121	.311	2.71	4.06	2	5
DTI	4	4.00	.816	.408	2.70	5.30	3	5
Total	82	2.61	.966	.107	2.40	2.82	1	5

ANOVA - Rating4

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19.297	2	9.648	13.559	.000
Within Groups	56.215	79	.712		
Total	75.512	81			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Rating4 Tukey HSD

(I) Group4	(J) Group4	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Manufacturer	Association	-1.015*	.256	.000	-1.63	-.40
	DTI	-1.631*	.435	.001	-2.67	-.59

Association	Manufacturer	1.015[*]	.256	.000	.40	1.63
	DTI	-.615	.482	.413	-1.77	.54
DTI	Manufacturer	1.631[*]	.435	.001	.59	2.67
	Association	.615	.482	.413	-.54	1.77

The results of the Turkey post-hoc test shows that there is statistically significant difference between the views of Manufacturers and Industry Associations with p = 0.000 which is lower than the level of significance of p < 0.05 usually used for the test. The results also show that there is statistically significant difference between the views of Manufacturers and the DTI with p = 0.001 which is lower than the level of significance of p < 0.05, suggesting that the null hypothesis should be rejected. However, there is no statistically significant difference between the views of Steel Industry Associations and the DTI with p = 0.413 which is higher than the level of significance of p > 0.05, suggesting that the null hypothesis can be accepted. Overall however, because there is significant difference, the null hypothesis is rejected and the alternative hypothesis accepted. Therefore the alternative hypothesis that Government agencies do not have similar views with Steel Associations and Manufacturers regarding the suitability of policy and priorities for the Steel Industry is accepted.

4.4.10.   Analysis for hypothesis no.10

One way ANOVA analysis was done to check whether Government agencies have similar views with Steel Associations and Manufacturers regarding the threat of Chinese products to South African Steel Industry or the views of these groups are different. The null hypothesis and alternative hypothesis were earlier given respectively as follows:

10H0 – There is no difference in views of Government agencies, Steel Associations and Manufacturers, regarding the threat of Chinese products to South African Steel Industry.

10H1 - Government agencies do not have similar views with Steel Associations and Manufacturers regarding the threat of Chinese products to South African Steel Industry.

4.4.10.1   Analysis done by comparing the groups using questions Q20, 71, 96 (ONEWAY Rating2 BY Group) and the results are shown below.

Table 4.21 - Oneway ANOVA Analysis for hypothesis 4.4.10.1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Manufacturer	65	3.88	1.206	.150	3.58	4.18	1	5
Association	13	4.54	.519	.144	4.22	4.85	4	5
DTI	4	2.50	1.291	.645	.45	4.55	1	4
Total	82	3.91	1.188	.131	3.65	4.18	1	5

ANOVA - Rating2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.156	2	6.578	5.133	.008
Within Groups	101.246	79	1.282		
Total	114.402	81			

Post Hoc Tests Multiple Comparisons - Dependent Variable: Rating2 - Tukey HSD

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Manufacturer	Association	-.662	.344	.139	-1.48	.16
	DTI	1.377	.583	.053	-.02	2.77
Association	Manufacturer	.662	.344	.139	-.16	1.48
	DTI	2.038*	.647	.006	.49	3.58
DTI	Manufacturer	-1.377	.583	.053	-2.77	.02
	Association	-2.038*	.647	.006	-3.58	-.49

The results of the Turkey post-hoc test shows that there is no statistically significant difference between the views of Manufacturers and Industry Associations with p = 0.139 which is higher than the level of significance of p > 0.05 usually used for the test. The results also show that there is no statistically significant difference between the views of Manufacturers and the DTI with p = 0.053 which is higher than the level of significance of p > 0.05. However, there is statistically significant difference between the views of Steel Industry Associations and the DTI with p = 0.006 which is lower than the level of significance of p < 0.05. Overall, that means that the null hypothesis can be accepted, and the alternative hypothesis rejected. Therefore the hypothesis that there is no difference in views of Government agencies, Steel Associations and Manufacturers, regarding the threat of Chinese products to South African Steel Industry, is supported.

> 4.4.10.2   Analysis by comparing the groups using question Q20, Q71 & Q97 by calculating ONEWAY ANOVA using Rating6 BY Group6.

Table 4.22 - Oneway ANOVA Analysis for hypothesis 4.4.10.2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Manufacturer	65	3.8769	1.20556	.14953	3.5782	4.1756	1.00	5.00
Association	13	4.5385	.51887	.14391	4.2249	4.8520	4.00	5.00
DTI	4	2.5000	1.29099	.64550	.4457	4.5543	1.00	4.00
Total	82	3.9146	1.18843	.13124	3.6535	4.1758	1.00	5.00

ANOVA - Rating6

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.156	2	6.578	5.133	.008
Within Groups	101.246	79	1.282		
Total	114.402	81			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Rating6 - Tukey HSD

(I) Group6	(J) Group6	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Manufacturer	Association	-.66154	.34395	.139	-1.4831	.1600
	DTI	1.37692	.58319	.053	-.0161	2.7700
Association	Manufacturer	.66154	.34395	.139	-.1600	1.4831
	DTI	2.03846*	.64729	.006	.4923	3.5846
DTI	Manufacturer	-1.37692	.58319	.053	-2.7700	.0161
	Association	-2.03846*	.64729	.006	-3.5846	-.4923

4.4.10.3 Comparing question Q6, Q71 & Q96 ONEWAY Rating7 BY Factor.

Table 4.23 - Oneway ANOVA Analysis for hypothesis 4.4.10.3

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Manufacturer	65	3.32	.970	.120	3.08	3.56	2	5
Association	13	4.54	.519	.144	4.22	4.85	4	5
DTI	4	3.50	1.291	.645	1.45	5.55	2	5
Total	82	3.52	1.021	.113	3.30	3.75	2	5

ANOVA – Rating7

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.005	2	8.003	9.236	.000
Within Groups	68.446	79	.866		
Total	84.451	81			

Post Hoc Tests - Multiple Comparisons - Dependent Variable: Rating7 - Tukey HSD

(I) Grouping7	(J) Grouping7	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Manufacturer	Association	-1.215[*]	.283	.000	-1.89	-.54
	DTI	-.177	.480	.928	-1.32	.97
Association	Manufacturer	1.215[*]	.283	.000	.54	1.89
	DTI	1.038	.532	.131	-.23	2.31
DTI	Manufacturer	.177	.480	.928	-.97	1.32
	Association	-1.038	.532	.131	-2.31	.23

The results of ANOVA analysis in 4.4.10.1, 4.4.10.2 and 4.4.10.3 show that there are no differences between the three groups, and therefore conclude by accepting the null hypothesis. Therefore the hypothesis that there is no difference in views of Government agencies, Steel Associations and Manufacturers, regarding the threat of Chinese products to South African Steel Industry, is supported.

4.5.   Test for reliability and validity

Reliability tests were done by computing Cronbach's alpha using SPSS, version 22. This is done mainly to check if the scale is measuring the variables and if the scale is reliable. The results of the analysis are shown below:

4.5.1. Reliability test was conducted on questions Q68 & Q100 to check if the two questions are measuring the same variable "Can policies be changed without a challenge" and if the scale is reliable and the results are presented in the two Tables below:

Table 4.24 – Reliability Test for Questions 68 and 100

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation	Item	Mean	Std. Deviation	N
.889	.950	2	5.75	2.250	1.500	Q68	3.25	.957	4
						Q100	2.50	.577	4

Inter-Item Correlation Matrix			Item-Total Statistics					
Items	Q68	Q100	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q68	1.000	.905	Q68	2.50	.333	.905	.818	.
Q100	.905	1.000	Q100	3.25	.917	.905	.818	.

The two items with Cronbach's alpha of 0.889 and standardized alpha of 0.95 are well above the acceptable range of 0.7. The results show the internal consistency and indicate that the scale is reliable.

4.5.2. Reliability test was done on questions Q11 & Q35 to check if the two questions are measuring the same variable "China's products are cheaper" and if the scale is reliable and the results are presented in the two Tables below.

Table 4.25 – Reliability test for questions 11 and 35

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation	Items	Mean	Std. Deviation	N
.065	.092	2	8.57	3.030	1.741	Q11	4.48	.640	65
						Q35	4.09	1.588	65

Inter-Item Correlation Matrix		Item-Total Statistics		

	Q11	Q35	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q11	1.000	.048	Q11	4.09	2.523	.048	.002	.
Q35	.048	1.000	Q35	4.48	.410	.048	.002	.

The two items with Cronbach's alpha of 0.065 and standardized alpha of 0.092 are well below the acceptable range of 0.7. The results show that the two items are not measuring the same variable and that the scale is not reliable.

    4.5.3. Reliability test was done on questions Q11, Q12 & Q24 to check if the three questions are measuring the same variable "Cost to manufacture products in SA is too high" and if the scale is reliable, and the results are presented in the two Tables below.

Table 4.26 – Reliability test for questions 11, 12 & 24

Reliability Statistics			Scale Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation
.551	.555	3	12.80	2.788	1.670

Inter-Item Correlation Matrix			Item Statistics			Item-Total Statistics				
	Q11	Q12	Q24	Mean	Std. Deviation	N	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q11	1.000	.246	.318	4.48	.640	65	8.32	1.785	.347	.124	.482
Q12	.246	1.000	.318	4.25	.830	65	8.55	1.407	.351	.124	.471
Q24	.318	.318	1.000	4.08	.816	65	8.72	1.360	.400	.162	.385

The two items with Cronbach's alpha of 0.551 and standardized alpha of 0.555 are below the acceptable range of 0.7. The results show that the two items are not measuring the same variable and that the scale is not reliable.

    4.5.4. Reliability test was done on questions Q65 & Q66 to check if the two questions are measuring the same variable "Do companies and

government work together" and if the scale is reliable and the results are presented in the two Tables below.

Table 4.27 – Reliability Test for questions 65 & 66

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation		Mean	Std. Deviation	N
.425	.436	2	5.83	1.549	1.245	Q65	2.92	.872	65
						Q66	2.91	.678	65

Inter-Item Correlation Matrix			Item-Total Statistics				
	Q65	Q66	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q65	1.000	.279	2.91	.460	.279	.078	.
Q66	.279	1.000	2.92	.760	.279	.078	.

The two items with Cronbach's alpha of 0.425 and standardized alpha of 0.436 are below the acceptable range of 0.7. The results show that the two items are not measuring the same variable and that the scale is not reliable.

4.5.5. Reliability test was done on questions Q67 & 91 to check if the two questions are measuring the same variable "Do companies believe in government" and if the scale is reliable and the results are presented in the two Tables below.

Table 4.28 – Reliability Test for questions 67 & 91

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation	Items	Mean	Std. Deviation	N
.664	.683	2	6.69	2.897	1.702	Q67	3.77	.832	13
						Q91	2.92	1.115	13

Inter-Item Correlation Matrix			Item-Total Statistics				
	Q67	Q91	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted

Q67	1.000	.518	2.92	1.244	.518	.268	.
Q91	.518	1.000	3.77	.692	.518	.268	.

The two items with Cronbach's alpha of 0.664 and standardized alpha of 0.683 are below the acceptable range of 0.7. The results show that the two items are not measuring the same variable and that the scale is not reliable.

4.5.6. Reliability test was done on questions Q9 Q16R Q15R Q13R Q14R to check if they are measuring the same variable which is: "Impact of Imports on local manufacturing" and if the scale is reliable, and the results are shown below.

Table 4.29 – Reliability Test for questions 9, 16R, 15R, 13R & 14R

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation	Items	Mean	Std. Deviation	N
.707	.704	5	20.86	3.934	1.983	Q9	4.00	.707	65
						Q16R	4.12	.484	65
						Q15R	4.37	.486	65
						Q13R	4.00	.707	65
						Q14R	4.37	.486	65

Inter-Item Correlation Matrix					Item-Total Statistics				
	Q9	Q16R	Q15R	Q13R	Q14R	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q9	1.000	.046	.136	1.000	.227	16.86	2.152	.618	.	.585
Q16R	.046	1.000	.600	.046	.335	16.74	3.196	.290	.	.719
Q15R	.136	.600	1.000	.136	.472	16.49	3.004	.411	.	.680
Q13R	1.000	.046	.136	1.000	.227	16.86	2.152	.618	.	.585
Q14R	.227	.335	.472	.227	1.000	16.49	3.004	.411	.	.680

The five items with Cronbach's alpha of 0.707 and standardized alpha of 0.704 are above the acceptable range of 0.7. The results show that the five items are

measuring the same variable and that the scale is reliable.

4.5.7. Reliability test was done on questions Q74, Q88 & Q90 to check if they are measuring the same variable which is: "impact of government policies on steel industry" and if the scale is reliable, and the results are displayed below:

Table 4.30 – Reliability Test for questions 74, 88 & 90

Reliability Statistics			Scale Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Variance	Std. Deviation		Mean	Std. Deviation	N
.583	.638	3	7.92	5.744	2.397	Q74	3.38	1.121	13
						Q88	2.31	.751	13
						Q90	2.23	1.301	13

Inter-Item Correlation Matrix				Item-Total Statistics				
Items	Q74	Q88	Q90	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q74	1.000	.343	.163	4.54	3.436	.253	.120	.687
Q88	.343	1.000	.604	5.62	3.423	.632	.426	.277
Q90	.163	.604	1.000	5.69	2.397	.411	.367	.481

The three items with Cronbach's alpha of 0.583 and standardized alpha of 0.683 are below the acceptable range of 0.7. The results show that the three items are not measuring the same variable and that the scale is not reliable.

4.5.8. Reliability test was done on questions Q63, Q64 & Q95 to check if they measure the same variable "China applies methods that are in line with normal trade and fair trading practices", and if the scale is reliable, and the results are shown below.

Table 4.31 – Reliability Test for questions 63, 64 & 95

Reliability Statistics				Scale Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items		Mean	Variance	Std. Deviation	N of Items

| | .907 | | .969 | 3 | | 9.75 | 3.583 | | 1.893 | | | 3 |

	Item Statistics			Inter-Item Correlation Matrix			Item-Total Statistics				
	Mean	Std. Deviation	N	Q63	Q64	Q95	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q63	2.75	.500	4	1.000	1.000	.870	7.00	2.000	.943	.	.833
Q64	2.75	.500	4	1.000	1.000	.870	7.00	2.000	.943	.	.833
Q95	4.25	.957	4	.870	.870	1.000	5.50	1.000	.870	.	1.000

The three items with Cronbach's alpha of 0.907 and standardized alpha of 0.969 are well above the acceptable range of 0.7. The results show that the three items are measuring the same variable and that the scale is reliable.

4.5.9. Challenges/ issues in the steel industry

The study shows that most challenges or issues preventing the growth and success of the steel industry in South Africa are:

Table 4.32 - Challenges/ issues in the steel industry

Issue	Question #	Mean	Rank
Increase in imports	Q71	4.5	1
Cost to manufacture in South Africa is high	Q12	4.2	2
Competition with China (Q73)	Q73	4.2	2
Input costs high - High Steel Price	Q14	4.2	2
- Material cost	Q19	4.1	3
- High electricity price	Q16	4.0	4

From Table 4.32 above, it is clear that increased imports are a threat to the growth of the steel industry in South Africa. The next biggest challenges are competition with China, high steel price and high cost to manufacture products in South Africa.

4.5.10. Factors preventing the effectiveness of government policies in South Africa's steel industry

The factors preventing the effectiveness of government policies related to the steel industry in South Africa are listed in Table 4.33 below:

Table 4.33 - Factors preventing the effectiveness of government policies in South Africa's steel industry

Issue	Question #	Mean	Rank
Lack of systems to monitor the implementation (checks/ audits	Q56	4.2	2
Inefficiencies at borders (poor border control)	Q57	3.8	3
Corruption	Q61	4.4	1

Corruption is listed as the most important factor (mean of 4.4) influencing the effectiveness of government policies within South Africa, followed by lack of systems (mean of 4.2) to monitor the implementation of policies.

4.6. Suggestions for improvements

The study suggests that improvement to the following will assist the steel industry in South Africa to grow:

Table 4.34 - Suggestions for improvements

Issue	Question #	Mean
Steel at subsidised price to downstream	Q52	4.5
Reducing electricity prices	Q47	4.5
Protection from imports	Q44	4.3
Access to export markets	Q54	4.2
Strengthening the local procurement policy to support local producers	Q78	4.2
Subsidizing exports	Q45	4.1
Free trade agreement with potential export markets	Q48	3.7
Improvement to rail transportation	Q49	3.6
Reducing port charges to promote exports	Q51	3.6
Increased efficiency in SA ports	Q50	3.5

Subsidies to steel prices for downstream manufacturers, reducing the electricity price and high protection from imports are rated high in terms of improving the current performance of the steel industry value chain, with a means of 4.5 for the first two and 4.3 for the latter. Other suggestions for improvements are listed in Table 4.34 above in their order of importance.

4.7. Ease of implementation of policies

Information regarding the ease of implementation of policies was extracted out of questions 68, 100, O33 and O34, and is collated in Appendix G, 5.1. The results show general agreement suggesting that it is difficult to implement policies in South Africa. This is explored further in the next chapter.

4.8. Results of the interviews

Results of the interviews were extracted from questions presented in Appendix E, and summarised using content analysis approach as presented in Appendix F. The results represents mainly the views of the representatives from the Industry Associations and the manufacturers regarding the challenges facing the steel industry value chain, views on the working of policies related to the steel industry, and suggestions for improvements (to resolve issues facing the industry). The two groups view these issues more or less in the same way.

4.9. Summary of comments from the survey

An analysis of comments given in the survey, extracted from the questionnaire, was done via the content analysis approach and a summary is presented in Appendix G where comments are grouped according to the study objectives and question numbers. The comments augment or clarify the results obtained from the questionnaire as indicated in sections 4.3 up to 4.7. A further note on the comments is made in the next chapter.

4.10. Comparison of different groups

Views of different groups used in a survey were tabulated to see if there is any difference in how each group viewed the issues raised in this study and the results are presented in Appendix H. These views are extracted from comments provided by respondents in the survey. The three groups are the manufacturers, industry associations and the DTI. The results indicate that the groups agree on several issues, nevertheless there are some differences between the views of these groups. The similarities and differences are explored further in the next chapter.

Chapter 5

Discussion and Recommendations

5.1.   Introduction

This chapter deals with discussion of results presented in chapter 4, and links the results with the literature, and gives recommendations at the end of each section or sub-section. An explanation of what the results mean is given first, followed by a comparison to the literature. Following the challenges faced by the steel industry and the downstream firms, improvements to avert these challenges and grow the industry are suggested.

5.2.   Analysis of results

5.2.1. Demographics

The results in this sections show that the respondents who participated were suitably qualified and all stages of the steel industry value chain were considered fairly represented with no bias from non-respondents indicated. In particular, the views of high level management were well represented. This is beneficial to the study considering that respondents from high level management are able to give better views of the state of current position of their organisation and to give a good comparison of the entire industry, due to their job requirement to interact with individuals outside their organisations. Moreover, the majority of these respondents have a fairly long experience in the steel industry and are therefore in a good position to comment on the industry issues. It was noted that the majority of the respondents' companies consume large amounts of steel per annum and the steel contribution to their final cost is high. Given this high involvement in steel contribution, it is anticipated that respondents from such companies are likely to comment better on the issues related to steel and have a keen interest in the affairs of the steel industry for example steel price reduction which can contribute to their competitiveness, as steel is the largest input into their processes (over 50%). Further, the study represents participants from all sizes of companies, including the small, medium and large organisations by considering the number of people employed in their organisations. In general therefore, the information gathered from respondents may be said to be fairly representative of the Steel Industry value chain in South Africa.

5.2.2. Results of hypothesis testing

As presented in chapter 4, all ten hypotheses provided in chapter one were tested to check if the null hypothesis could be accepted and the alternative hypothesis rejected, or vice versa. Rejecting the null hypothesis means that the statement described in that hypothesis is not true and that the statement in the

alternative can be accepted as true. The results for the first hypothesis indicate that Chinese imports are rated by steel manufacturers in South Africa as among the top two constraints to better performance of the Steel Industry in the South African market. This clearly indicates that the attention of policy makers is expected to be directed towards addressing this challenge as it affects the majority of companies within the steel industry value chain. It is indicated from the results of hypothesis no.2 that there is a decline in production of steel related products within South Africa, as the movement is more towards importing than manufacturing locally. It is also noted that South African policies contribute to the un-competitiveness of the locally produced steel in South Africa by not protecting the steel industry as expected, while imports of steel related products flood into South Africa. The expectation in the industry, indicated by the results of hypothesis no.3, is that government policies should be assisting local producers grow and compete better.

The test in 4.4.4 indicates that Chinese imports of steel products are cheaper compared to South Africa manufactured products when sold in South Africa and any other markets across the globe, but are not necessarily superior in quality. The perception from the test results obtained is that South African products are better in quality than Chinese products.

There is consensus among respondents, according to test results in 4.4.5 that increased imports affect the downstream steel industries in the value chain more than the up-stream industries. This corresponds with the observation that more jobs are lost at the later stages of manufacturing compared to earlier stages.

The test in hypothesis 4.4.6 was done to compare if small companies in the steel industry value chain are affected by imports more than the medium and/ or large companies, and the results were that they are all being affected in the same way. It doesn't matter what size the organization is, as all of them feel the impact of increased imports into South Africa. The problem of imports is therefore of equally great concern to all sizes of companies in the steel sector that they would like addressed.

The next tests were reliability tests aimed at checking whether a set of selected questions are measuring the same variable, therefore indicating whether the scale is reliable or not. Results show that there are questions which are not measuring the same variables and therefore the scale should be rejected for those variables, and some are observed to be reliable. The data from questions which showed to be unreliable were ignored and not presented in the results.

5.3.   Elaborating on the results

A number of challenges are highlighted in Chapter 4 and are discussed in detail below. The challenges have been extracted from Table 4.32 and the questions related to these are displayed in the same Table. Challenges are listed as: 1, Competition from China, 2, high input costs as a result of increased electricity price, raw material costs and high steel price as input into down-stream processes, 3, Increase in imports of finished and semi-finished steel products into South Africa, and 4, labour issues. The intention of this section is to link these challenges to current South African policies and discuss what role these policies have in averting them and assisting the steel industry and its value chain to create the required employment as highlighted in the New Growth Path (2011).

5.3.1.   Challenges in the steel industry and its value chain and the role of policies

Challenges affecting the performance of the steel industry and its value chain in South Africa and why South African firms cannot compete with China are listed below:

5.3.1.1.   Increase in imports of finished and semi-finished steel products

The results of the survey shown in 4.4.2 indicate that most companies within the steel industry chain are not performing as expected and a lot of them are losing business to imports. Information collated in Appendix F. 15, tells us that imports in this case are not particularly from China only but also from other countries seeking markets in South Africa. The survey results shown in 4.4.4 reveal that companies in the steel industry value chain cannot compete with imports from China and other low cost manufacturing countries, and the reason is not necessarily inefficiency, but because it is impossible to achieve the cost competitiveness that imports from China and these countries bring about. The increase in cheap imports from China is seen by South African manufacturers in the steel industry value chain as a threat to their survival, and it seems apparent to them that a lot of imports from China do not attract any import duties, which encourages a lot of consumers to rather import than buy the more expensive similar articles manufactured locally (see Appendix G, 1.2). This support the literature reviewed in chapter 2, section 2.5.2, which indicates that a lot of tariffs have been removed on steel related products imported, and this decision seems unwelcomed by manufacturers in the steel industry value chain.

The literature also indicates that South Africa has the flexibility to increase tariffs to WTO bound rate which are higher than currently applied tariffs on most imports, and at the moment, the policy for South Africa is that if the local manufacturers can prove beyond reasonable doubt that imports are negatively affecting their operations and that more jobs will be lost as a result, then ITAC (International Trade and Administration Commission) which is the government department looking after tariff policy), will review those tariffs of articles being complained about, and maybe increase them if justifiable[13]. This statement was re-iterated by the response from one of the representative from the DTI given in Appendix G, 5.2, indicating that companies are welcome to ask for protection if they find imports are negatively affecting their business, and those tariffs can be adjusted if justified. The problem with this process is that it can take a very long time(up to 2 years) to come to a conclusion (see Appendix G, 5.1), whereby the damage might already be enormous by the time the conclusion is reached, and in some instances, the application is declined based on the impact of proposed tariffs on, amongst other things, economic output and employment across the value chain (i.e. employment that will be lost as a result of these imports or employment that will be saved or created as a result of increased tariffs[14]).

The other issue with imports is that they can be brought in without any tariffs if they are brought in for projects (see Appendix G, 1.2), and that places the local manufacturers at a disadvantage. These developments defeat the purpose of the policy on government procurement to support locally produced articles, and yet the same support is expected from the private sector. The case of removal of import tariffs on most finished steel related products is a good example of a policy failure by government.

Recommendations: Consideration should be given to review some of the tariffs and where necessary, increase them to WTO bound rates to limit the influx of imports (See Appendix F, 3 & 6).

Perhaps the removal of import tariffs could prove to yield positive results on imports of raw materials used as inputs to produce other products and also aimed for re-export, instead of removal of tariffs on finished products. This will likely add value to the manufacturers and assist them to be competitive.

Import substitution industrialization is one policy that government needs to drive in order to replace major consumer imports by promoting the new developing manufacturers and growing existing domestic industries and therefore, minimize

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[13] For examples see http://www.itac.gov.za/media_releases.asp, for items being approved and some rejected and reasons provided by ITAC.
[14] See http://www.itac.gov.za/media_releases.asp

the impact of imports on the economy. Objectives of Import substitution industrialization are explained in detail in Chapter 2, section 2.5. These obviously need to be carefully crafted to ensure compliance to RTA's/ FTA's and WTO requirements where necessary or negotiate with trading partnering countries to achieve this. Mineral beneficiation is one such strategy highlighted by the IPAP II and it is an area of work that presents much untapped opportunity in the steel manufacturing, but has lagged in terms of policy development and implementation.

5.3.1.2. Competition from China

From the literature, it is said that China has dominated the market both within South Africa and the rest of the world. The results of this study indicates that it is very difficult to compete with products made from China, and this is mainly because they are cheaper than South African's in almost every market that South African companies try to explore (see Appendix G, 2.1, Appendix F, 8, 4.4.1 and Table 4.32 (Q73). According to the study (results shown in 4.4.5, and Appendix G, 1.4), the level or stage of companies affected heavily by the increase in imports in the steel industry value chain are the manufacturers who are the final users or processors of steel. Feedback from the study (mainly from open-ended questions shown in Appendix G, 2.1) is that the dominance by China is boosted by a favourable environment by Chinese government policies that helps these companies compete better. On the contrary as indicated by Appendix G, 2.1, South Africa does not have all the benefits that Chinese companies are enjoying, and as a result it becomes difficult to compete with China when the playing field is uneven. The case of China and their policies gives an impression to the respondents within the South African steel value chain that China's policies are better and working for them (see Appendix G, 3.2) and they suggest that the same policies could be applied by South African government. Information collated in Appendix G, 3.3 & 3.4, tells us that South African policies do not address this challenge (competition from China) at this stage and this is supported by the results in 4.4.3, in which the hypothesis test indicate that South African policies contribute to the un-competitiveness of the locally produced steel in South Africa.

This study indicates that export markets even though available are not easily accessible (see Appendix F.14), as there are sometimes unwritten barriers (e.g. higher import duties into most developing countries) to entry into some markets, that make it difficult for South African products to compete in those countries, and succeed. Appendix G, 2.3, shows that the price of South African products and

trade barriers in the export markets (particularly China) are some of the factors preventing growth in South African exports.

Recommendations: Efforts are required from South African government to lower barriers in the export market, by continuously re-negotiating with prospective markets, and further amending the current agreements that are not favourable for local manufacturing and export development. Negotiations should include better access into the BRICs grouping, both developed and developing countries, and current trading partners. Export market development is mentioned in a number of policy documents and government strategies, but, it is not clearly convincing that this is embraced fully by South African government or policies.

It will be beneficial for the South African government to re-negotiate with trading partners, the need to raise import tariffs on products where negative preference margins are experienced, and where it can be proven that competition with locally manufactured products is unfair.

5.3.1.3. High input costs as a result of increased electricity price, raw material costs and high steel price as input into down-stream processes

Table 4.32 shows that input costs to manufacture steel products in South Africa are high, and this is due to high electricity price for steel producers, high cost of raw materials and high steel prices as inputs to downstream processes (Also shown by Appendix F, 4). This means that South African manufacturers in the steel industry value chain would find it difficult to price their products competitively if their input costs are already higher than the competitor's (in this case China) final product price and that is confirmed by the results from 4.4.4, hence this would put South African manufacturers at a competitive disadvantage. What makes steel more expensive is mostly electricity, labour, outdated technology which is inefficient and the model used to price steel (i.e. IPP), (see Appendix G, 2.6). From the above, it can be deducted that if the electricity cost and steel prices increase, then the input costs to the downstream industries automatically increases. The so-called 'knock-on' impact of higher electricity prices, inefficiencies and prices at IPP is significant for the downstream industries within the steel value chain and as a result they become more expensive than imports within South Africa and the competition abroad.

In short, the effect of higher electricity prices, inefficiencies and pricing at IPP defeats the purpose of government policy, which is to promote the downstream beneficiation of steel for maximum creation of employment within South Africa.

As noted by the Mail and Guardian[15], government attempted to negotiate a review of this pricing model with AMSA, with no success. In 2012, according to Mail and Guardian[16], government announced plans to provide preferential electricity tariffs and cheaper iron ore for the steel industry, in order to exploit the intended benefits of this policy, and the implementation is yet to be witnessed. According to the companies surveyed and the literature provided in the same newspaper, there are some companies already benefiting from reduced electricity prices or pricing flexibility, and discounted iron ore prices, but the knock-on effects, are not yet noticed by the downstream industries. The challenge for government is to get these steel manufacturers who benefit from either discounted electricity and/or iron ore prices to pass the discounts on to the downstream industries (See chapter 2, section 2.4.1).

Recommendations: efforts should be taken to change the pricing from IPP to EPP and this can be achieved by a number of measures that need to be taken which include but are not limited to:

> increasing state shares or ownership in the steel manufacturing companies so as to influence pricing and/or acquiring a state owned steel manufacturer who will mainly be focused on creating employment and assisting the downstream industries, and not necessarily high profit making, and also forcing other South African companies to compete in pricing;

> Subsidizing electricity supplied to steel manufacturers;

> Selling iron ore to steel manufacturers at lower prices possible like in the case of AMSA buying iron ore from Kumba at cost plus 3%; and installing mechanisms to assist these companies to become more efficient and invest in technologies that will eventually reduce their reliance on government's assistance in the long term.

> Limit exports of scrap metal and finding mechanisms to give locals an advantage to access scrap metal at cheaper prices than when exported.

> Limiting exports of raw minerals as a means to increase beneficiation of these locally and make it difficult for foreign companies to compete (See Appendix F, 13 and Appendix G, 3.5).

More efforts need to be directed at inviting foreign direct investment into South Africa which would see the demand of steel increasing and jobs being created within the country. If possible, these types of investments need to be incentivised

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[15] Issue of the 14th December 2012
[16] Issue of the 14th December 2012

or boosted in a certain manner to encourage more investments and beneficiation of steel within the country. At the end of the day, skills and technology need to be transferred to South African's to ensure they can stand on their own and not rely on imports.

5.3.1.4. Labour issues

Most of the companies surveyed indicated that they are facing enormous challenges with issues related to labour as shown by Appendix F,1 and Appendix G, 2.1 & 2.6. The issues include inefficiencies, absenteeism, labour cost, skills levels and strikes or labour unrest. As a result of these issues, most manufacturers surveyed indicated that they cannot compete with many low cost manufacturing countries. It is apparently difficult to manage these from a company level if the country's labour laws do not adequately address them. At the end of the day, production suffers and productivity levels remain low as many employers fail to deal with these issues decisively, while at the same time employers do not want to be on the wrong side of the law, and having to deal with the unions and CCMA (Commission for Conciliation, Mediation and Arbitration) afterwards. The bargaining failures accompanied by strikes result in high costs and lower profitability for the firms, which leaves firms with more uncertainty after such negotiations or labour disputes. Thus, labour becomes a high cost and uncertain production factor for South African manufacturers. Most firms cannot afford to bear the costs of strikes and non-production, if they are to remain competitive. These issues affect the competitiveness of South African firms and as a result stand little chance to compete with countries where labour is more stable presumably like China. It was ironical that labour cost as suggested by the literature, was the least of concerns to manufacturers, more specifically at the upstream level compared to downstream. The mean for question 31 was 2, 7. Instead, respondents mostly at the upstream level highlighted the issue of labour unrest as the main problem as opposed to labour cost. The unstable nature of the South African economy due to these issues is undesirable. At the same time, these issues cannot be addressed by trade or industrial policies, but at a different level of government.
Recommendations: A tangible solution need to be devised to deal with these dilemmas, and need not to be overlooked as it is currently the case. This should also call for a re-look into labour laws in order to design an environment that will see more employment and increased efficiencies within businesses.

5.3.1.5. Policy Matters

Appendix F, 11, shows that there are policies in South Africa, e.g. MIDP, that have assisted the economy, and that proves that South African trade policies are not all that bad as many may articulate. They have in some instances induced growth in the economy and helped to fight competition from imports.

The exporting of raw minerals to China at discounted rates is seen as one of the policy failures in that by doing this, South Africa is helping China to be competitive. The increase in un-beneficiated metallurgical ore exports from South Africa has contributed to a decline in exports of ferrochrome from the world's biggest ferrochrome producing region (South Africa) to the world's biggest market (China), (Xstrata submission paper and Engineering-News[17]). The challenge is that the mining industry benefits extensively from these exports, but the overall results are negative to South African economy. How would one achieve a balance in which the restriction of these exports does not massively affect the local mining companies and boost the economy? Export duties were applied by 65 out of 128 WTO member countries over the period 2003-2009, an increase on 1997-2002 (Kim, 2010). Kumba (2011) advocates that export restrictions would discourage investment in extracting and producing raw materials - potentially reducing the overall supply of materials in the long term, and therefore a different policy model should be investigated as opposed to export restrictions, for example, export duties or taxes. This report by Kumba (2011) overlooks the fact that although steel industry by itself does not create a lot of jobs, the downstream firms when aggregated add to these numbers and the results would be the creation of jobs required. In addition, beneficiation of these minerals would contribute to foreign exchange earnings and further employment growth. This view is supported by DTI (2010), in that a policy tool that would give a reduction of steel price for example by 10% would yield about 21% employment, and if steel price is reduced by 30%, the results would be 57% employment creation in the downstream. A good example of the application of export taxes is that of Botswana which applies taxes to minerals, encourage investments to beneficiate minerals within the country and re-directs the earnings from taxes to other sectors that would create more jobs (Korinek, 2014). This might be the best model to be copied by South Africa to receive extended value from their enriched mineral resources. The aim of this will be to collect revenue for government, that can be used elsewhere required, and not necessarily to prohibit exports of these items, meaning the tax amount or percentage should be reasonable for this purpose. Currently, export taxes are applied to unpolished diamonds and the proceeds used to develop skills and domestic industry (Sandrey, 2014, p2). Countries like Indonesia, Ethiopia, Malaysia, and Egypt which have similar export profile as South Africa, do collect significant tax revenue through export taxes (Sandrey, 2014, p3), and the same could be done by South Africa. There have been talks from the DTI and a number of

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[17] Issue of the 25th October 2013, supports the Xstrata submission paper on beneficiation, in that South African producers' market share in ferrochrome has declined by 16% in one year from 50% in 2004 to 42% in 2005 and this has led to a decline in this industry's capacity utilization, with a swing to favouring China

newspapers on implementation of this suggestion, but progress cannot be ascertained thus far.

The results of the survey suggest that there are good policy tools in place, but the implementation is not adequate. An explanation may be that either individuals find a way to bypass the rules defeating the purpose of policies advocated (that include corruption and inefficiencies within government and industry), or that collaboration and engagement between industry and government is non-existent or very weak, and as a result, these policies fail to yield desired outcomes. There is a need for these institutions to work together as issues of growth and development of the steel industry value chain cannot be achieved by government alone, but with the assistance of the industry as well. Inefficiencies in government also contribute to decisions and implementations taking ages before finalization as indicated by Appendix G, 5.1. There have been lots of talks around the challenges facing South African economy and a lot of recommendations on how to avert these challenges as articulated by many government policy documents, e.g. TPSF (2010), but little action has been observed. This is a view supported by some respondents in the steel industry value chain as shown in Appendix G,4.1. The results of poor implementation bring about the feeling that South African policies do not positively contribute to the growth of the country's economy instead, especially in the steel industry. It is therefore incumbent on government to look into the problem of implementation. In doing so, there is a need to continuously review and refine the policies to address current challenges and economic dynamics.

The feeling from companies in the steel industry value chain is that, perhaps government is not really prioritizing this sector in their policy development (see Appendix G, 4.1), and that is why there is little action seen to support this industry. The views of manufacturers are that they should get subsidies for exporting and subsidies on electricity and iron ore, and cheaper steel as a result (see Appendix F, 13 and Appendix G, 2.6), which is in contradiction to the believe by Edwards and Lawrence (2012p21), in that "Providing costly incentives for beneficiation could draw on scarce resources that may be better used elsewhere".

Appendix G, 5.1 shows that for new policy developments in South Africa, considerations should be given to the commitments the country has undertaken in the WTO and in other bilateral trade agreements (e.g. EU under the TDCA and SADC countries under the SADC Trade Protocol). There are boundaries or parameters expressed within the WTO framework which constraints some adjustments to policies, e.g. WTO bound rates on tariff increases. The feeling from respondents as indicated in Appendix G, 5.1, is that where there is injustice

in trade and where the damage to local production is severe, these agreements or considerations should be ignored, and decisions that would support local production and economic growth should be taken. According to TPSF (2010, p40), "trade remedies, including anti-dumping, countervailing and safeguard measures, should also be used as instruments to ensure that domestic producers and employment are protected from unfair trade and from surges in imports that can damage the national and regional economy, leading to job losses and hamper efforts to create decent work". There has been very little debate around this issue from the feedback of the survey (only 7 respondents gave comments to question 64 as shown in Appendix G, 4.4). From the survey and interviews conducted, it was picked up that dumping is a very sensitive issue and perhaps individuals do not want to involve themselves in such a discussion.

While manufacturers advocate for increased tariffs and protection from Chinese imports, they are also concerned about the concessions given to Chinese imports into the country.

The findings of this study differ with the views of Kumba (2011), in that the manufacturers believe there are still opportunities for growth in the steel industry and its value chain, especially within the South African market and in the rest of Africa if Chinese imports could be substituted by locally produced products, and this could be achieved by getting steel to be cheaper as an input to downstream. Kumba (2011), on the other hand says steel price reduction up to cost would still see the downstream being about 36% more expensive than China, mainly due to South African labour cost, hence the idea of substituting imports by locally produced steel articles is a misconception.

In general, trade policies would not function alone. They need to be supported by other measures at macro-economic level to enhance investment and productivity improvement. Currently in South Africa, there is no coherence between macroeconomic policies and microeconomic policies to support industry objectives and that need to be addressed. At the same time, growth and development would not be achieved by a document that is sitting in a government department.

Recommendations: The study suggests that improvement to the following top 5 policy items will assist the steel industry value chain in South Africa to grow as listed in Table 4.34 in Chapter 4: Steel at subsidised prices to downstream industry, which was rated high with a mean of 4.5, reducing electricity price to industries that are reliant on high energy use was the next on the top of the list with a mean of 4.5 as well, protection from imports for downstream industries being the third highest with a mean of 4.3, improved access to exports markets, being the fourth with a mean of 4.2, and the fifth being strengthening the local procurement policy to support more the local industries than importing goods that could be produced locally.

There needs to be actions taken and a system to allow continual feedback loop that will enable rapid responses to emerging problems and this is also stipulated by the New Growth Path (2011). Implementation of key strategies needs to be fast tracked and a system to monitor and evaluate progress of implementation, identifying issues and rapidly remedy them as they arise is required.

A co-ordinated effort between government and the industry, and perhaps the universities to carry out research on particular topics of interest to allow facilitation of discussions necessary to deal with industry issues and grow the economy, is required.

To deal with capacity issues, the DTI might need to employ more personnel, train them and assign individuals or teams to look at specific sectors and see projects being carried through until implementation. A number of similar strategies like the ones above have been highlighted by NEDLAC and also in the New Growth Path, but little progress or results are seen in the industry. The DTI's intention is to establish "an Industrial policy think tank" that will work on specific projects, review progress on a regular basis and advice the Minister of Trade and Industry on industrial policy issues. If suggestions as tabled in the New Growth path (2011) are implemented, which include intensive development and recruitment of staff to increase capacity, and collaboration with universities to draw on existing sector expertise can be achieved, it would see a lot of improvements and changes in the way policies are developed and implemented. This capacity within government is also required to clamp down on fraud, illegal imports and substandard imported goods, and that will assist in growing production locally.

5.3.2. Factors preventing the effectiveness of government policies in South Africa's steel industry

The following are listed as the top three factors preventing the effectiveness of government policies related to the steel industry and its value chain in South Africa:

Corruption is listed as the major factor (mean of 4.4) influencing the effectiveness of government policies within South Africa, followed by lack of systems (mean of 4.2) to monitor the implementation of policies, tabulated in Table 4.33.The third factor being inefficiencies at the borders (poor border control) with a mean of 3.8. These three factors are seen as the stumbling block towards realizing the fruition of policies being implemented by South African government. For example Appendix G, 4.1, shows that more and more Chinese companies are being set up within South Africa due to the reason that these Chinese are connected to the right individuals within South African government. The second reason linked to corruption is that individuals within government or certain departments are seen importing goods from China, instead of supporting local companies, which shows that the government is breaking their own rules. Emphasizing local procurement as a policy and ensuring that all government departments comply, (especially on major government projects), can also contribute positively to growth in the industry value chain, and the same effects can be realized with any other sector

within South Africa. If infrastructure development within South Africa is fast tracked and locally manufactured products are used in projects like construction of roads and government buildings, capital and rail transport equipment and energy sectors, it will provide opportunities to increase demand for steel products. Infrastructure development within South Africa is currently moving at a slow pace and does not fully support locally produced steel. As much as there are lots of talks around the cost of transporting goods within South Africa and Africa as a whole by road, it is a challenge to address this without heavy investment into rail network as an alternative. South Africa could increase their efforts into improving rail network within the country and ensuring that it is efficient, but they have minimal or no influence on what should happen in the rest of Africa. A coordinated effort between African countries is required to adequately deal with this matter.

The study also shows that policies are not implemented properly and followed through to the end where anomalies can be picked up, so that policies are refined accordingly to address the latest challenges within the industry. It might be that there is lack of capacity within government to deal with the issues raised by the steel companies and its value chain, or that government does not have much interest in this industry hence less attention is given. The same applies to poor controls at borders where illegal products are allowed into the country and tariffs are not charged accordingly as per custom's rules. An example of the lack of the means to enforce agreements with foreign investors is prevalent with the sale of the then ISCOR to Arcellomital. Most of the agreements signed during the sale of ISCOR are not honored and little effort seems to be made to re-enforce these agreements. From the above, it is apparent that these issues are key towards success of policies and are ought to be addressed.

Literature shows that, the South African economy is faced with a rapid and increasing growth in illicit trade – illegal imports characterized by undervaluation, false declarations (origin and tariff), rerouting via third countries and misuse of duty rebates and credits (TPSF, 2010, p22). These practices have a strong negative impact on the economy as they continue to erode the country's manufacturing capacity and its revenue base. Given the complex nature of customs fraud, IPAP highlights the critical need to develop a sophisticated and integrated approach to the problem. It is said that during the 2012/13 financial year, a number of interventions were implemented by SARS. Accordingly, it was indicated that a comprehensive Customs Modernization Programme is being rolled out, both domestically and in the SACU region (IPAP 2, 2013).

Recommendations: Issues mentioned above as affecting effective implementation of policies which are: Corruption, lack of systems to monitor the implementation of policies and inefficiencies at the borders (poor border control), are currently being addressed through different programs within government as mentioned above. All that is required is to increase capacity within the relevant departments and intensify efforts to ensure effective implementation and where

necessary, refine strategies as need arise. Competent leaders with the right mentality and attitude would be able to carry this out effectively.

5.3.3.   Comparison of different groups

Views of different groups used in a survey were tabulated as in Appendix H, to see if there is any difference in how each group view the issues raised in this study. The three groups are the manufacturers, industry associations and the DTI. Slight differences are noticed between views of these groups as shown in Appendix H, meaning they agree on many issues.

On objective 1, the following is observed: The views of the manufacturers and the steel industry associations are the same in that Chinese imports and imports from other countries do have negative impact on the production of steel related products within South Africa, and more so for the downstream manufacturers than the upstream. Government agencies have a different view on the same aspect, stating that the local steel producers enjoy monopoly and that they do sell all steel they produce, implying that imports from China and anywhere else are not a problem (see Appendix H, item 1.1 and 1.2).
On objective 2, the following views are noted between the three groups: the manufacturers within the steel industry value chain and the industry associations agree with the view that South Africa cannot compete with China due to the phenomena that China receives extensive support from their government in many ways to support their local manufacturers. Government agency holds a different view in that South African steel is more competitive within South Africa, and it will not be possible for China to ship their steel to South Africa and still get it cheaper than the local manufacturers (see Appendix H, item 2.4). While manufacturers and their Associations are calling for support in different forms from government, government feels the manufacturers need to improve on their aging infrastructure to be competitive.

On objective 3, the following is noted: The three groups agree that China's policies do assist their manufacturers, but government agency cannot confirm if South Africa policies are supporting and having a positive impact on the steel industry and its value chain. The view of manufacturers and the Associations is that current South African policies do not contribute much to assisting the local production.

On objective 4, the following is noted: the manufacturers and their Associations agree that government lacks control over illegal imports and that government does not work with the industry (Appendix H, item 4.1 and 4.2), while government are of the view that the problem is rather AMSA, lack of skills within government, and the capacity to deal with industry issues, hence failure in implementation.
On objective 5, the following is noted: The three groups agree that most policies can be amended and implemented within the steel industry value chain, but they will be challenged by WTO and other international groupings, but South Africa

needs to disregard those contests and continue with implementation where necessary (Appendix H, item 5.1). The difference is seen in the issue of suitability of policies, where the industry believe current policies are not suitable, while government agency believes that they are suitable, but they need to be given time before results can be realized.

The problem with differing views of these groups on some of the issues is that solutions to averting these problems may not be priority in the policy implementation. It is noted that the processes that have to be followed before implementation of any policy is longer and also that the industry does not want to work with government, and AMSA was particularly mentioned as a culprit. The industry holds a different view in that there is a lot of red tape in getting their proposals implemented by government; hence the trust is lost between the two sides.

The next chapter gives the conclusion to this study. An effort is made to bring all the factors discussed in the literature and the findings of the study results, into few meaningful statements.

Chapter 6

Conclusion

and way forward

6.1.   Outcomes of the research

The South African Steel industry, like other manufacturing sectors in the country, has been hard hit by Chinese imports. This research confirmed that China is regarded by the steel manufacturers within the steel industry value chain as the major threat to their survival and the prospects of this industry in creating jobs as expected by different government policy documents. China has been the most dominant and the fastest growing exporter of different types of steel and steel related products all over the world including South Africa, and the manufacturers in the country cannot compete with cheap Chinese imports due to the reason that the playing field is uneven between the two countries. The expectation is that SA government should intervene and implement measures that would turn the situation around and minimise the negative impact of China on South African Steel industry and its value chain. This expectation emanates from the obvious reason that South Africa is rich with mineral resources, which should work to the country's competitive advantage. The research reveals that government policies do not contribute much to the competitiveness of steel products manufactured in South Africa. There are challenges mentioned in this report, which hamper the successful implementation of policies within the steel industry value chain, and those need government interventions, together with the industry. In short, this research has successfully answered the question "What effect has china's participation in SA steel market had on the Steel Industry's Value Chain in view of existing Government policies and the connection to un-competitiveness of South African manufactured steel products?". Aspects of the research question addressed are further elaborated upon in section 6.2 and 6.3 below.

6.2.   Effects of China and the competitiveness of the steel industry value chain in South Africa.

The study confirms that there has been a significant loss of jobs in South Africa, as a result of increased imports from China and other competing countries. Manufacturers and the Industry Associations are of the view that Chinese government assists their manufacturers in different forms and that the assistance boosts China's economy better than South Africa's. The study further confirms that Chinese products are cheaper compared to South African manufactured products as a result of the assistance given by their government to their manufacturers, and that this is also supplemented by cheap labour. Given the above, it is clear that South African steel products will not be able to compete with Chinese in every market they do business. Competitiveness of South African products is hampered by expensive labour, inefficiencies, outdated technology, high steel prices as inputs into downstream processes, and high electricity prices. South African policies need to be directed at addressing these issues so as to assist the steel industry to be competitive.

6.3. Effects of government policies on the competitiveness of the steel industry value chain

This study reveals that South African government policies have played a little role in assisting the steel industry to avert the negative impact of China. With a closer look at the policies ascribed by a number of government documents, the intentions of the South African government with regards to the steel industry and its value chain are clear and straight forward. The aim of these policies is to strengthen the downstream manufacturers and create employment within South Africa. However, the results are opposite to this proposition. Instead, these manufacturers are shedding jobs instead of creating them, mainly due to the apparent reason that they cannot compete with China within South Africa and abroad. Investigations by this study reveal that there are a number of challenges within the steel industry value chain and that current government policies do not address these challenges adequately. In the policy documents, one hears of the plans to address most of these issues, but actions and results out of these plans are yet to be realised. This suggests that, perhaps the issue is not necessarily the policies, but implementation which is not carried out as expected. If implementation is carried out effectively, the expectation is that anomalies would be picked up and highlighted promptly and corrections made timeously to deal with current issues facing the industry. To address this government needs to look at issues of capacity within the relevant departments dealing with policy implementation and involvement of the industry itself in developing proposals and addressing the issues hampering growth in this sector.

6.4. Study objectives

The study has achieved the objectives highlighted in chapter 1 which are to:

Confirm the impact of the increased imports of Chinese steel products on the manufacturing of steel product's within South Africa. The impact of increased imports of Chinese products has been confirmed to be the shedding of jobs within the steel industry value chain, and reduced growth in this industry.

Investigate the reasons why China is apparently dominant with regard to inter-trade in steel products between the two countries whereby exports of steel products from China into South Africa seem to dominate compared to the other way round. The reasons for China's dominance is stated as the extensive support by their government, which is not received by South African manufactures, and that China's products are given some concessions when exported to South Africa, while South African exports are subjected to high tariffs into China, and therefore skewing the results.

Investigate whether there is a role that government' trade policies play in trade between South Africa and China, and whether these policies in

particular assist the Steel Industry and its value chain. Government policies seem to be playing little role in assisting the South African steel industry value china, while China's policies are seen as contributing positively to growing the steel industry in their country. In fact, South African policies are seen as assisting China, instead of the other way round.

Investigate the possible reasons why government policies in South Africa are not assisting the steel industry value chain as expected if that is a case. The failure of South African policies is caused by inability to implement rather the policies themselves. Some of the decisions and agreements taken by South Africa during negotiations with trading partners are negatively affecting the steel industry, and needs to be reversed, but little efforts are seen in correcting these mistakes.

Establish whether government policies in South Africa can be modified and accepted by the relevant international bodies which include WTO, BRICS and China. This study reveals that policies can be amended, even though there are possibilities that they could be challenged by international groupings. What is important is to go ahead with implementation of policies which will help the industry grow and ignore some of the noise from these groupings.

Recommendations to policy amendments to improve the status of trade in the steel industry value chain in South Africa are encompassed in Chapter 5.

6.5. Summary and conclusion

The role of government policies on the steel industry and its value chain is a complex subject to explore. Particularly due to the reason that the performance of this industry, like any other industry, whether negative or positive, does not solely depend on government policies but many other factors like the economic conditions of a country in which the industry operates, and that includes the world economic conditions, demand of products in general and affordability, level of technology and skills required to produce the products, availability of resources and many more factors that may not be influenced by policies. Depending on the expectations from policies, it may be difficult to establish a link between performance results of the steel industry value chain and the impact or role of policies, since the outcome may be the outcomes of other factors than policies. In addition, it is clear that trade policies cannot function alone. They need other macro-economic policies and also dependent on global economic situation.

In conclusion, it is apparent that South African policies do not effectively support the steel industry and its value chain. Successful implementation of policies in South Africa is hampered by current agreements signed between trading partners (countries), restrictions imposed by WTO, pressure from IMF to conform

to Doha Round agreements and lack of capacity within government departments to effectively implement, monitor progress and refine interventions required to deal with new evolving challenges, and poor collaboration between government and the steel industry. Other factors deterring the successful implementation of South African policies are corruption which is deep rooted in the country, labour issues, and high cost of manufacturing within the country. The study further establishes that South Africa has good policies, but these have insignificant impact in growing the country's steel sector due to poor implementation. Government and the private sector are working in silos and their objectives are sometimes not aligned, which contributes to the failure of some policies. South Africa had a chance in the last sitting at the Doha Round, to challenge some of the agreements concluded by countries involved in trade with the country, but did not voice their concerns and missed the opportunity.

The example of China and the current growth of its economy can be taken as a good example of the positive effect government policies can have in a country. Whether China's strategies can work in another country or whether they are sustainable, is unclear at this stage. South Africa needs to investigate some of the policy tools used in China, and assess whether they can be used locally. Further initiatives should include re-negotiating with trade partners on the trade barriers subjected to South African exports, and implementing tariffs that should be charged to imports which are negatively affecting local manufacturing.

This study was generally successful in that it has achieved the objectives highlighted and has answered the research question.

6.6.   Way forward

The South African government through the DTI and other agencies need to fast track the implementation of suggestions tabled by respective government policy documents and other relevant research which have been conducted in relation to the steel industry and its value chain. Involvement of the private sector and universities, and establishment of focused groups may be able to yield the desired results, and pave a way for effective implementation of policies.

Further research may include a more in depth study, covering a bigger sample size for study into the steel industry and its value chain where enough resources need to be provided to be able to get to the bottom of those issues that this study did not cover in detail, like progress on implementation of suggestions by the NGP, IPAP II, NDP, ASGI-SA, and other studies by NEDLAC and other concerned parties. The aim being to identify gaps in the implementation of policies, identifying new challenges within the industry in the context of new or emerging economic and global developments, and devising strategies that can grow the steel industry and its value chain within South Africa, and ultimately creating the required employment.

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Appendices

Appendix A: Data requirement Table.

1	Research Objective	Confirm the impact of the increased Chinese imports of steel products on the Steel production in South Africa.

The purpose of this is to check if Chinese imports of steel products have really affected the production of steel in SA.

#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Measurement	Question(s)
	1. Check if production of steel in the country has declined or current status of companies in the steel industry	Current state of production of steel in SA	Scale – Agree/disagree, 1 - 5	5, 7, 8, 71, 14R
	2. Confirm impact of imports on local manufacturing of steel	Opinion on impact of imports	Scale – Agree/ disagree, 1 - 5 Rate 1 – 10 Open ended question	6, 9, 72, 97, 13R, 15R, 16R 20 75
	3. Is the impact of China on a company dependent on the size of the company?	Size of companies most affected	Scale 1 - 4	2, 3, 4, 6,
	4. Which level or stage of steel value chain is most impacted by competition from China?	Level most affected	Scale 1 - 4	1, 10
	5. Is China a problem?		Scale – Agree/disagree, 1 - 5	69, 73
2	Research Objective	Investigate the reasons why China is dominant compared to South Africa with regards to: 1. steel exports to South Africa rather than the other way round, 2. In other exports markets	

The purpose if this is to understand if China is doing something different from what SA is doing in order to be the leaders in the steel manufacturing industry. What makes China the best and where is SA failing? Are there things SA can copy from China?

#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Measurement	No. of questions
	1. Reason for China's dominance in South Africa and everywhere-else	Why China is dominant	Rate 1 to 10 , 1 less significant and 10 most significant Open ended question	11,12,13,14, 15,16,17,18, 19, 26, 27, 28, 29 O20, O23, O30, O1

#	Investigative question(s)	Construct/variable(s) required	Measurement	No. of questions
			Scale – Agree/ disagree, 1 - 5	93
	2. **Reason for decline or Poor- growth of business in South African Market**	Why steel is not growing as expected	Rate 1 - 10, (with 10 being the most significant cause or strongly agree)	21, 22, 23, 24, 25
			Open-ended question	17, O24, O37
			Scale – Agree/ disagree, 1 - 5	92, 96
	3. **Reasons South Africa cannot sell equal or more quantities of steel products in China**	Difficulty in selling SA products in China	Rank from 1 to 7, 1 being significant issue and 7 = not an issue	35, 36, 37, 38, 39, 40, 41
			Open ended questions	O4
	4. **Comparison of China and SA**	Can SA compete with China?	Scale – Agree/ disagree, 1 - 5	42
	5. **Why is SA expensive and why they cannot compete**	What contributes to high cost	Rank from 1 to 5, 1 being the highest cost	30, 31, 32, 33, 34
			Open ended question	O2, O27, O28
	6. **Suggestions for improvements for SA to compete with China**	Opinion on what to improve	Open ended questions	O3, O5, O18, O21, O38
			Rate impact from 1 - 10	76,77,78,79, 80,81,82,83, 84,85,86 87
3.	**Research Objective**	**Investigate if government policies play a role in helping China dominate over South Africa. (Effect of SA policies vs China policies)**		
The purpose of this is to find out if there are any governments interventions currently employed by South Africa and what role they have in the importing of Steel related products into South Africa, exporting of steel to China, and identify the barriers or challenges in growing the manufacturing of steel in South Africa. Second if China policies are better than SA's			
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**Measurement**	**No. of questions**
	1. **How does China help their manufacturers**	Effect of China's policies	Open ended question	O8
		Are China's policies sustainable	Yes/ No	94

#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Measurement	No. of questions
	2. Government assistance to trade with China	Government assistance to trade with China	Scale – Agree/ disagree, 1 - 5 Open ended question	43 O6
	3. SA Government intervention	Role of SA government's policies	Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree Scale – Agree/ disagree, 1 - 5 Open ended question	56, 57, 58, 59, 60, 61 98 O25, O26, O31, O35, O36
	4. Suggestions for improvements on policies	What companies think can be done	Rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist Open ended question	44, 45, 46, 47,48, 49, 50, 51, 52, 53, 54, 55, O7, O18
	5. Perception of SA government in terms of assisting steel industry	What companies believe government is doing	Scale – Agree/ disagree, 1 - 5 Open ended question	74, 88, 90, O32
4.	Research Objective		Investigate the cause of failure of government policies in South Africa	

The purpose of this is to understand what causes the failures in implementing government policies in SA. At the same time one needs to understand if companies do engage government to assist in growing the steel industry in the country. The reason for government policy failures might be that there is no communication or collaboration between government and the companies. Other reasons might be counterfeit products, dumping of products to shut SA manufacturing or failure to implement and monitor effectiveness of policies. It is also possible that companies are not aware of what the government should do, hence no contact with the government is made.

#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Measurement	No. of questions
	1. Causes of failures of policies	Causes as per companies' perception of failures of policies	Open ended question Scale – 1 to 5, Agree/ disagree	O9 89
	2. Possibility of illegal trade as a reason for SA policy failure	Does illegal trade influence the effective implementation	Scale – 1 to 5, Agree/ disagree	62

		of policies?		
		Is China trading fairly	Scale – 1 to 5, Agree/ disagree Open ended question	63, 64, 95 O10
		Is there dumping of products	Open ended question	64
	3. **Understanding of responsibilities**	Understanding of companies and what they believe who must do what	Open ended question	O11, O19
	4. **Collaboration of companies and government**	Do companies and government work together?	Yes/No Scale – 1 to 5, Agree/ disagree	65, O12, 66
		Do companies believe in government		67, 91
5.	**Research Objective**	**Establish whether government policies can be modified and accepted by the relevant bodies which include WTO, BRICS and China**		

The purpose of this is to investigate if it possible to amend government policies, if there are barriers preventing government to amend and if China, WTO and BRICS grouping will accept those amendments. This questionnaire will be directed to the policy makers and expert economists who have got more insight into the subject matter.

#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Measurement	No. of questions
	Can these changes be made without challenges by WTO, BRICS or China?		Scale, 1 to 5, Agree/ disagree – elaborate Open ended question	68, 100 O33, O34
		Why policies are not amended	Open ended question	O29
		Need to change policies	Scale, 1 to 5, Agree/ disagree	99

Appendix B – Consent Letter for collecting data

SCHOOL OF MECHANICAL,
INDUSTRIAL & AERONAUTICAL
ENGINEERING

Jacob Thulare
22 Dageraad Street
Groeneweide
Boksburg
1459
05 May 2014

Dear Sir or Madam

RE: Application for Consent to Conduct Academic Research Study

This is a letter kindly seeking your consent to partake in a research study towards partial fulfilment of a Master's degree in Industrial Engineering at the University of Witwatersrand. The industry of choice is the South African component or steel manufacturing sector. The Study survey will be conducted online (https://www.surveymonkey.com/s/MJ9MPLQ) ensuring utmost confidentiality, anonymity and ensuring no harm be-falls any respondent. The study sample is confined to the Directors, Senior Management and Middle management of your organisation and open to four (4) additional key employees in your company at your discretion not falling within the above criteria. Please note all respondents have the liberty to decline partaking in the survey should they wish so.

The details of the research topic are as follows:

Research Topic: The impact of China on the Steel Industry value chain in South Africa and the role of government policy.

The Aim: The aim of this study is to understand the impact of China on South Africa's Steel Industry value chain and define the role of government policies in that regard.

Problem Statement: China has recently been seen as the most dominant and the fastest growing economy in the world. There has been a lot of pressure on South African Steel products to compete with China's, and so far they are trailing behind. The biggest interest in this regard is to define what role the government policies have in this business environment, and to suggest how these policies can be refined so that they can boost the South African Steel Industry.

In conclusion, the researcher would like to kindly request for an interview session (either face to face or telephonic) once the questionnaire issued is completed at your most convenient moment and at your liberty to further aid in a more precise industry survey.

Should further details be required, please contact me on the numbers below. Please respond to the email below if you are in agreement to partake in the survey. Supervisor for this research is Dr. Bruno Emwanu, and can be contacted on 011 717 7343 or Bruno.emwanu@wits.ac.za.

Kind regards

Jacob Thulare.

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Appendix C – Survey Questions

Question #	Questions	Scale
	Questions intended for Manufacturers	
1	From the list below, which cluster does your organization belong to	1 to 5
2	What is the contribution of steel to your final product cost?	1 to 4
3	What quantity of steel do you consume per annum?	1 to 5
4	How many people are currently employed by your organization?	1 to 4
5	Your company has performed well (increased demand - qty) in the last 5 years?	1 to 5
6	What impact do imports have on your business?	1 to 5
7	Production of steel or steel products in the country is generally on a downslide?	1 to 5
8	Utilization of your plant capacity has grown over the last 3 to 5 years	1 to 5
9	Consumers buy imported steel products more than locally manufactured products	1 to 5
10	Which level of the steel value chain is the most impacted by imports of steel products?	1 to 5
11	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Imports are cheaper	1 to 10
12	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Generally, cost to manufacture in SA is high	1 to 10
13	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Inefficiencies	1 to 10
14	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - High steel prices	1 to 10
15	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Logistics costs	1 to 10
16	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - High Electricity prices	1 to 10
17	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Illegal imports/ easy access for imports	1 to 10
18	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Shortage of skills	1 to 10
19	Rate on a scale of 1 to 10. 1 = less significant and 10 = Most significant: If applicable, The reason your company cannot compete with imports is that: - Input materials expensive	1 to 10
20	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Increase in imports of steel products into SA	1 to 10
21	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Steel consumption in SA has declined	1 to 10
22	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Lack of local capacity to manufacture the required steel products	1 to 10
O1	In your opinion, what is the reason for the increase of steel product imports from China into SA? - Open-Ended Response	1 to 10
23	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Lack of capability of the local manufacturers to produce the same steel products currently being imported	1 to 10
24	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Cost of manufacturing in SA makes the steel products more expensive compared to imports	1 to 10
25	Your company have suffered a loss of sales within the South African market due to (rate 1 to 10, with 10 being the most significant cause or strongly agree): - Quality of products being manufactured locally is inferior compared to imports	1 to 10
26	Chinese government has sound and perfect industrial policies that have the effect of (rate 1 to 10, with 10 being the most effect): - Removing barriers for Chinese steel products to enter African and South African market with ease	1 to 10
27	Chinese government has sound and perfect industrial policies that have the effect of (rate 1 to 10, with 10 being the most effect): - Making it difficult for South African manufactured steel products to enter Chinese markets	1 to 10
28	Chinese government has sound and perfect industrial policies that have the effect of (rate 1 to 10, with 10 being the most effect): - Ensuring Chinese manufactured steel products are of better quality than South African's	1 to 10
29	Chinese government has sound and perfect industrial policies that have the effect of (rate 1 to 10, with 10 being the most effect): - Reducing the cost of manufacturing steel products in China	1 to 10
O2	If cost of manufacturing is an issue to your company, what makes up the highest costs within manufacturing of steel or steel components? - Open-Ended Response	

30	Which of the following contributes the highest cost in the manufacturing and selling of steel products in South Africa and abroad? (Rank from 1 to 5, 1 being the highest cost) - Steel cost	1 to 5
31	Which of the following contributes the highest cost in the manufacturing and selling of steel products in South Africa and abroad? (Rank from 1 to 5, 1 being the highest cost) - Labour	1 to 5
32	Which of the following contributes the highest cost in the manufacturing and selling of steel products in South Africa and abroad? (Rank from 1 to 5, 1 being the highest cost) - Electricity	1 to 5
33	Which of the following contributes the highest cost in the manufacturing and selling of steel products in South Africa and abroad? (Rank from 1 to 5, 1 being the highest cost) - Logistics cost	1 to 5
34	Which of the following contributes the highest cost in the manufacturing and selling of steel products in South Africa and abroad? (Rank from 1 to 5, 1 being the highest cost) - Other	1 to 5
35	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - SA products are expensive	1 to 7
36	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Cost to transport products to China	1 to 7
37	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Lack of capacity in SA	1 to 7
38	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Cannot make the same products	1 to 7
39	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Import duties into China are high	1 to 7
O3	What can be done to reduce the cost contributing to the uncompetitiveness of your company's products? - Open-Ended Response	
40	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Access into China's market is difficult	1 to 7
41	What are the issues preventing SA from exporting more steel products into China? (Rank from 1 to 7, 1 being significant issue and #7 = not an issue. If the statement is not true, please indicate so in your comments) - Other	1 to 7
O4	In general, what are the challenges SA companies face when selling steel products in China? - Open-Ended Response	
42	South Africa's manufactured steel products can compete with China's products if they are sold in China or any export market	1 to 5
O5	What needs be done to improve sales or access of South African manufactured steel products into China's market? - Open-Ended Response	
43	SA government does assist in obtaining access for SA's steel products into China?	1 to 5
O6	How does government currently assist in resolving the challenges with access to export markets and competitiveness of SA's steel industry? (If you disagree with the statement, please indicate so in your comments) - Open-Ended Response	
O7	How can SA government intervene to assist the SA's steel industry in general (if possible, also please list the policy interventions required)? - Open-Ended Response	
44	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Protection from imports	1 to 10
45	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Subsidies to local manufacturers	1 to 10
46	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Strengthening the local procurement policy to support local producers	1 to 10
47	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Reducing electricity prices	1 to 10
48	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Free trade agreement with potential export markets	1 to 10
49	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Improvement to rail transportation	1 to 10
50	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Increased efficiency in SA ports	1 to 10
51	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Reducing port charges for exports	1 to 10

52	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Steel at subsidized prices/ cheaper steel to downstream beneficiators	1 to 10
53	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Interest free loans/ cheaper financing for new investments	1 to 10
54	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Access to export markets	1 to 10
55	Which of the following do you believe will assist in growing the local steel industry in S.A the most (rate 1 to 10, 1 = Do not believe or 10 = Strongly believe will assist). - Regulation to scrap metal to prevent exporting	1 to 10
O8	What is it that Chinese government is doing to help their manufacturers compete better, that our government is not doing? - Open-Ended Response	
O9	Where is SA government failing in terms of assistance expected to grow the steel industry? (If government is not failing as per this statement, please indicate so in your comments) - Open-Ended Response	
56	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Lack of systems to monitor the implementation (checks/ audits)	1 to 10
57	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Inefficiencies at borders (poor border control)	1 to 10
58	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Too many entry points (borders) into SA	1 to 10
59	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Current agreements with Trading partnering countries	1 to 10
60	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Lack of capacity in government	1 to 10
61	Kindly rate the following below based on which has the greatest impact or influence on the effectiveness of government policies. (Rate 1 to 10 - 1 being no effect/ strongly disagree, 10 being strong effect/ strongly agree) - Corruption	1 to 10
62	Counterfeit products also play a major role in the decline of production in the steel industry in South Africa	1 to 5
63	Chinese companies apply fair and legal business practices to compete with SA manufacturers	1 to 5
64	Chinese companies are dumping their products into South Africa	1 to 5
O10	Have you or your company had an experience of companies that are dumping their products in SA?	Yes/ No
O11	Whose responsibility is it to investigate whether products are being dumped or not?	3 options
65	Companies normally approach government to assist in overcoming challenges they are facing in the industry?	1 to 5
O12	Have you or your company engaged government in the last 5 years about assistance of some sorts to your company or industry?	Yes/ No
66	If answered yes above, the results of the engagement with government on your query(ies) were positive	1 to 5
67	It is important to engage government from time to time to assist where possible with matters related to the steel industry	1 to 5
68	The proposed changes to policies you have listed above can be made without challenges by WTO, BRICS or China?	1 to 5
O12R	What are the challenges in implementing or introducing new policies that would help steel industry grow in SA. - Open-Ended Response	
69	If China was not in the picture, would your company do better than the current status quo?	Yes/ No
70	The questions in this survey are clear and easy to understand	1 to 5
O13	Can you please provide 2 companies/ participants within the steel industry that you would recommend to participate in this study (Please provide Name of company, contact person(s), email address and telephone numbers - Open-Ended Response	
O14	I don't mind being contacted for a telephonic or face to face interview?	
	Questions intended for Steel Industry Associations	
O15	Describe the type of companies associated with your institution (products, number of companies) - Open-Ended Response	
71	There is a decline in steel manufacturing (steel manufactured products) in SA due to increased imports	1 to 5
72	Steel manufacturing companies in SA are not sufficiently protected against imports	1 to 5

73	China is rated amongst the highest countries exporting the most steel related products into SA	1 to 5
74	Government is doing enough to assist the steel industry grow in SA	1 to 5
O16	What else can government do to assist in growing the steel industry in the country? - Open-Ended Response	
O17	What are the main challenges for the steel industry in SA? - Open-Ended Response	
O18	How can these challenges be overcome or addressed? - Open-Ended Response	
75	Is there a relationship between the current performance of the steel industry in South Africa and the increase in imports of steel related products into the country? (please elaborate) - Open-Ended Response	
76	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Protection from imports	1 to 10
77	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Subsidies to local manufacturers	1 to 10
78	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Strengthening the local procurement policy to support local producers	1 to 10
79	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Reducing electricity prices	1 to 10
80	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Free trade agreement with potential export markets	1 to 10
81	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Improvement to rail transportation	1 to 10
82	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Increased efficiency in SA ports	1 to 10
83	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Reducing port charges to promote exports	1 to 10
84	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Steel at subsidized prices/ cheaper steel to downstream beneficiators	1 to 10
85	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Interest free loans/ cheaper financing for new investments	1 to 10
86	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Access to export markets	1 to 10
87	Improvements to the following will help the steel industry grow in South Africa (rate impact from 1 - 10) - Regulation to scrap metal to prevent exporting of scrap metal, but supply to locals	1 to 10
88	Current government policies do not support growth in the steel industry	
89	The main reasons for policy failures in the steel industry is because they are not implemented properly (if not true please indicate so in the comments box)	
90	Government policies need to be modified to assist the steel industry grow	1 to 5
91	Government is effective in addressing the issues faced by the steel industry	1 to 5
O19	Do the issues or challenges in the steel industry require government intervention, or can they be resolved by companies themselves without government's assistance? (Please elaborate) - Open-Ended Response	
O20	What would be the main reasons for China's dominance in the steel industry over South Africa? (if you do not agree with this statement, please indicate so in comments) - Open-Ended Response	
92	There are claims that access to exports markets for SA's steel industry is limited, do you agree?	1 to 5
O21	What could be done to address the challenges in the steel industry - Open-Ended Response	
O22	Would you like to be contacted for a telephonic or face to face interview?	
	Questions intended for the DTI	
O23	Why is China dominant with exports to South Africa as opposed to the other way round? (If you do not agree with this statement, please indicate so in comments) - Open-Ended Response	
93	China supports their manufacturers extensively through various methods to help them become competitive.	1 to 5
94	In your own opinion: Are China's policies towards manufacturing and industrialization sustainable?	yes/no
95	There are allegations that China does not follow the normal trade system and that the Chinese government support of the trade system pursued is not in line with WTO agreements. Do you agree with this statement?	1 to 5
96	One of the main reasons for the decline of manufacturing of steel or steel related products in South Africa is that imports have increased and displaced some of the manufacturers	1 to 5
O24	What would be the main reasons why manufacturing of steel products is declining in South Africa? (if you do not agree with this statement, please indicate so in comments) - Open-Ended Response	
97	If imports can be reduced, it will give the local manufacturers a chance to stabilize and be able to compete - Comments	1 to 5

98	Policies implemented by the DTI have contributed positively towards growing the steel industry in South Africa	1 to 5
O25	Are there other measures that the DTI or government could do to assist the steel industry in SA? (Please elaborate) - Open-Ended Response	
O26	What has government done so far with regards to the high prices of steel for local(downstream) manufacturers? - Open-Ended Response	
O27	Can you please provide your views on the port charges for exports and their impact on the steel industry? (Claims are that they are high and that they contribute to the uncompetitiveness of SA's local manufacturers in the export market) - Open-Ended Response	
O28	Can you please give your views on the transport costs of steel in the country and their impact on the steel industry (claims are that the transportation costs of steel within the country is very high, and that an efficient rail system will be better) - Open-Ended Response	
O29	Why can't import tariffs on steel related products be increased to the WTO bound rates? (if not true please indicate so in comments) - Open-Ended Response	
O30	Why is China charging most of South African manufactured products heavy import duties when exported to China than what South Africa would charge China's imports? (If not true please indicate so in comments) - Open-Ended Response	
O31	What are some of the current agreements between SA and China, that are aimed at helping SA's steel Industry grow. (If none, please indicate so in comments) - Open-Ended Response	
O32	How many jobs have been created or saved in the steel industry, due to some of the recent implementation of policies in the steel industry? - Open-Ended Response	
O33	Is it possible to negotiate for changes to some of the agreements concluded at the last Doha Round with WTO (this will be in order to implement policies that would grow the steel industry, and scrap those that are adding to the disadvantages in this industry)? - Open-Ended Response	
99	There is a need to amend some of the policies related to the steel industry to help the industry grow	1 to 5
O34	How easy is it to change policies that would support the steel industry in SA? - Open-Ended Response	
O35	What are the current government intentions or initiatives aimed at growing the steel industry and improving beneficiation of steel in SA - Open-Ended Response	
O36	Is there some evidence to show that the current interventions by government have assisted the steel industry since implementation (e.g. employment, demand of steel, and imports of the same products - before and after) - Open-Ended Response	
O37	What are the challenges hampering the growth of steel industry in SA? - Open-Ended Response	
O38	How can these challenges be addressed? - Open-Ended Response	1 to 5
100	It is easy or possible that a different agreement between China and SA, than the existing one can be concluded, which would see SA growing the steel industry	
	Repeated questions	
13R	Consumers buy imported steel products more than locally manufactured products	1 to 5
14R	There is a decrease in local production and increase in imports?	1 to 5
15R	Many jobs are lost in South Africa due to an increase in imports	1 to 5
16R	Many factories have closed down in the South Africa due to an increase in imports into the country	1 to 5

Appendix D – Code Book

Code book			
Selection/ response	**Question**		**Code**
Data set 1			
Strongly Disagree			1
Disagree			2
Neither Agree nor Disagree	General questions		3
Agree			4
Strongly Agree			5
Data set 2			
0 – 15%			1
15% – 30%	Contribution of steel to final product		2
30% – 50%			3
More than 50%			4
Data set 3			
Less than 20 tons			1
Between 20 and 100 tons			2
Between 100 and 500 tons	Quantity of steel consumed per annum		3
Between 500 and 1000 tons			4
Over 1000 tons			5
Data set 3			
0 to 50 employees			1
50 to 200 employees	Number of people employed by company		2
200 to 500 employees			3
More than 500 employees			4
Data set 4			
Just stable/ no change			1
Minimal impact/ less than 10% of the market lost to imports			2
Somewhat average/ between 10% and 20% business lost to imports	Impact of imports on business		3
Slowly overtaking my company/ between 20% and 40%			4
Taking over the market/ over 40% lost to imports			5
Scale adjustment			
Scale/ rating of 1 to 10			
Adjusted to 1 to 5 by dividing the answer by 2 and rounding			
the number up			
Ranking 1 to 6			
Adjusted by subtracting the answer from 6	Adjustment		
e.g. answer of one (1)	= 6 –1 '= 5		
If answer is 6 (six) then	=6–6 = 0 then '=1		

Appendix E - Interview Questions

Respondents	Question #	Questions
DTI/ government	1.	Why is China dominant with exports to South Africa as opposed to the other way round? (If you do not agree with this statement, please indicate so in comments)
	2.	Do you believe China's support to their manufacturers is better than our current support in SA? How?
	3.	Can we copy what China and India are doing towards assisting the steel industry? What needs to be copied?
	4.	Do imports in SA have an impact in manufacturing of steel products in the country?
	5.	What do you believe are the problems facing the manufacturing of steel products in SA? How do we fix those?
	6.	Do you believe policies implemented by the DTI/ government have contributed positively towards growing the steel industry in South Africa?
	7.	Are there plans in place currently being reviewed to help with stimulating growth in SA? Can you please list?
	8.	Why can't import tariffs on steel related products be increased to the WTO bound rates? (if not true please indicate so in comments)
	9.	Why is China charging most of South African manufactured products heavy import duties when exported to China than what South Africa would charge China's imports?
	10.	Will increasing protection against imports help? How can it be done better?
	11.	Are changes to any policies restricted by current agreements with any trading partners? Which countries and which policies?
	12.	How easy is it to change policies that would support the steel industry in SA? What are the challenges in amending?
	13.	How is the relationship with manufacturing companies? How do you engage?
Steel manufacturing Companies		What are the issues and challenges restricting the steel industry from growing
		Is there a potential for the steel industry to grow?
		How do we fix the problems that we currently have in the steel industry?
		Is steel price an issue for downstream manufacturers?
		Are imports of steel products a problem to SA manufacturers?

		Must we stop imports of steel products from coming into SA?
		Can we compete with China and other countries in terms of steel manufactured products in SA?
		If we cannot compete, what are the reasons?
		Do you believe China is doing everything by the books?
		What can we copy from China and India for us to excel?
		Does our government help in any form in the steel industry for growth, and how?
		In your opinion, if you agree, where is our government failing in terms of helping the steel industry?
		What more can the government do to assist the steel industry? Your expectations
		Is it easy to access the export market? What are the barriers?
Industry Associations		What is causing a decline in the steel industry?

Appendix F: Summary of interview questions

	Summary of responses from Interview questions	
	13 interviews all in all. (0 from DTI, 2 from Associations and 11 from manufacturers).	
Item #	**Interview questions**	**Summary**
1	What are the issues and challenges restricting the steel industry from growing	Structural issues - electricity, rail network, access to export markets (only large companies can afford to market their products overseas). Raw materials and all inputs expensive. Steel price is high to down stream. Labour issues/ unrest. Cheap imports + Illegal imports - cannot compete with them. Cost to produce in SA. Little protection from imports. Labour Cost in SA not a major issue, since comparable to other countries, except China and India (+ other low cost countries). Some raw materials attracts high tariffs than finished products. Logistics costs is high in SA but not a major issue
2	Is there a potential for the steel industry to grow?	Yes there is a market for steel, if issues listed above are resolved, customers will stop importing and buy from local. Replacement of imports by local products will create demand for locals
3	How do we fix the problems that we currently have in the steel industry?	State owned mills, increase tariffs, more support to industry by government (incentives/ export rebates, etc.)
4	Is steel price an issue for downstream manufacturers?	Steel is expensive for down stream, but not a big issue for motor industry as they don't complain about price but quality. Steel is regarded as the biggest part of production cost and if expensive, manufacturers cannot be competitive
5	Are imports of steel products a problem to SA manufacturers?	Mixed feelings, imports bring competition, but must be fair. If imports are high, jobs are lost in SA and affects economy
6	Must we stop imports of steel products from coming into SA?	Some say cheap imports must be stopped. Some imports cannot be made locally
7	Can we compete with China and other countries in terms of steel manufactured products in SA?	Cannot compete with China due to their advantages given by government assistance, cheap labour and efficient manufacturing processes, plus their economy of scale gives them advantage over SA. The problem is at downstream mostly and not really steel making
8	If we cannot compete, what are the reasons?	Pricing. China does a lot more to help their industry compared to SA
9	Do you believe China is doing everything by the books?	Yes and no. Some agree that China does everything by the book while some are saying they do cheat and not following normal standards.
10	What can we copy from China and India for us to excel?	Some of the policies can be copied. Same methodology to protect local industry and promote exports
11	Does our government help in any form in the steel industry for growth, and how?	Rand dollar exchange helps with exports and restricts imports if Rand is weaker. They are focused on many things and do not achieve much. MIDP in motor industry creates steady demand of steel from motor industry and jobs created at components producers due to localization policy. Some encouragement to buy local products from government. Mixed reaction - some say government is helping while majority say they are not
12	In your opinion, if you agree, where is our government failing in terms of helping the steel industry?	Some believe government is doing a lot, while some say they can't see how government helps. Long process required to pass policies
13	What more can the government do to assist the steel industry? Your expectations	Export taxes on raw materials (Iron ore, chrome, scrap metal), Backward integration and state to own some of the strategic resources. Discount on ore to all steel producers. SA to produce their own coke and not import. Increase tariffs or duties on imports to WTO bound rates. Assist steel producers to be competitive - electricity price reduction, iron ore, subsidies. incentives on all exports of finished products. Incentives for companies promoting local procurement/ content - must have a threshold to pay incentives.
14	Is it easy to access the export market? What are the barriers?	Export market is accessible, but not really easy. Pricing is an issue, plus barriers in some markets (tariffs and discrimination from other countries even though not written). Will only succeed if you have good contacts in overseas markets
15	General comments	The problem is not only China, but there are more other countries exporting to SA at cheaper prices than SA. Government does not work together with industry, hence they don't understand all the challenges facing the industry

Appendix G: Summary of comments from survey

Summary of views expressed in comments and Open ended Questions					
1 **Research Objective**			**Confirm the impact of the increased Chinese imports of steel products on the Steel production in South Africa.**		
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**Question(s)**	**Summary of Comments**	**Summary**
1.1	1. **Confirm if production of steel in the country has declined or current status of companies in the steel industry**	Current state of production of steel in SA	5, 7, 8, 71, 14R	4 out of 9 said their production hasn't changed, meaning they are stable, 1 out of 9 said they have picked up production/ grown and 4 out 9 said they have declined. 3 said the decline is due to competition from China, while the 1 said it is due to general economic conditions, and the rest said it is due to cheap imports. Out of 27 comments, 18 confirms production in general has dropped and these are downstream organizations	9 comments from question 5, 8 from Q7, 4 from Q8, 3 from Q71, 0 from Q14R
1.2	2. **Confirm impact of imports on local manufacturing of steel**	Opinion on impact of imports	6, 9, 20,72, 75, 97, 13R, 15R, 16R, 14R	General - impact is negative or loss of business, move is towards importing than manufacturing due to local high prices. 1 mentioned "Project imports are allowed into RSA without import duties being levied". 2 says there is little support from government. Comment from 4 : Labour unrest pushes the move to China. DTI + 2: China manipulates system. DTI: Current local producers are making money as they are priced higher than imports	9 comments from question 6, 13 from Q9, 2 from Q72, 6 from Q75. 2 from Q92, 0 from Q20, Q13R,15R & 16R
1.3	3. **Is the impact of China on a company dependent on the size of the company?**	Size of companies most affected	2, 3, 4, 6,	There were no comments from question 2, 3 and 4, and 6 comments from question 6. To answer the question whether the impact of China is dependent on the size of the company, statistical analysis can be used. No conclusive statement about this question can be deducted from comments provided.	0 Comments from question 2, 0 from Q3, 0 from Q4, 6 from Q6
1.4	4. **Which level or stage of steel value chain is most impacted by competition from China?**	Level most affected	1, 10	4 respondents feel the most hard hit are the final processors of steel, while 2 feel all levels are affected, the last two are not sure. Statistical analysis can give much clearer results in this case	8 comments from question 10 and 0 from question 1
1.5	5. **Is China a problem?**		69, 71, 73, 97	All respondents indicated that if China was not in the picture, they could easily grow their business by a bigger margin. 3 indicated that China is not the only problem but, there are many other countries exporting cheap products into South Africa.	2 comments on Q69, and 3 comments from question 73, 4 comments from Q97
2 **Research Objective**			**Investigate the reasons why China is dominant compared to South Africa with regards to: 1. steel exports to South Africa rather than the other way round, 2. In African markets**		
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**No. of questions**	**Summary of Comments**	**Summary**
2.1	1. **Reason for China's dominance in South Africa and everywhere-else**	Why China is dominant	11,12,13,14, 15,16,17,18, 19, 26, 27, 28, 29, O20, O23, O30, 93, O1	Comments from 38 is that Chinese products are cheaper than SA, that is why they are dominant. 5 indicated China's manufacturers are subsidised, 2 indicated China is more efficient, and not unionized. 3 Comments depicts that China is more protected than South Africa. 3 indicated China uses unfair trade, and that it is difficult to compete with such a country as such. Comment from 1 is that China is growing their economy while SA is fighting for survival. 1 mentioned the agreement between SA and China is the cause	No comments from Q11, Q12, Q13, 14, Q15, Q16, Q17, Q18, Q19 , Q26, Q27, Q28, Q29, 13 Comments from O20, 4 Comments from O23 and 4 from Q93. 34 Comments from QO1
2.2	2. **Reason for decline or Poor growth of business in South African Market**	Why steel is not growing as expected	21, 22, 23, 24, 25, 17, O24, O37, 92, 96	2 Comment is that the blame should be put on AMSA for high pricing, 1 indicated growth is not in local market but mainly export, 1 indicated the reason being low investment within SA	No comments from Q21, Q22, Q23, Q24 & Q25. 4 Comments from QO24, 4 repeated comments on QO37, 4 Comments for Q92, 2 Comments from Q96
2.3	3. **Reasons South Africa cannot sell equal or more quantities of steel products in China**	Difficulty in selling SA products in China	35, 36, 37, 38, 39, 40, 41, O4	26 Commented that South African products are far expensive as compared to China. 4 - There are trade barriers/ protectionism to get into China, and the rest indicated that China can support itself and does not need imports from South Africa, as such applies unfair trade barriers.	No comments from Q35, Q36, Q37, Q38, Q39, Q40 and Q41. 33 Comments from O4
2.4	4. **Comparison of China and SA**	Can SA compete with China?	42	4 disagree that SA can compete, mainly due to the reason that Chinese products are cheaper, 3 are not sure because South Africa produces products of better quality than China, but are expensive. 3 agree only on the basis of better quality from South Africa	10 comments
2.5	5. **Why is SA expensive and why they cannot compete**	What contributes to high cost	30, 31, 32, 33, 34, O2, O27, O28	Steel price as an input and electricity represents most views on what contributes to the highest costs. 13 also added labour cost. Only 3 indicated that cost is not the biggest issue. 1 indicated port charges are high, 1 that they are in a process of being reduced, was also done in the recent past. Transport by road is more expensive and will be better if rail system is used according to DTI	No comments from Q30, Q31, Q32, Q33 and Q34, 53 Comments from O2. 4 Comments from DTI on QO27 and QO28
2.6	6. **Suggestions for improvements for SA to compete with China**	Opinion on what to improve	O3, O5, O18, O21, O38, 76,77,78,79, 80,81,82,83, 84,85,86 87	Majority (50) suggested efforts to be invested on reducing steel price (government to scrap IPP pricing method), subsidize electricity for steel makers. 6 suggested labour laws to be changed to productivity based remuneration. 14 suggested government to buy steel mills and sell steel at cost to local and profit on export. 8 - Improve efficiencies at steel mills, investment and technology improvements required. 19 - Incentivize manufacturing and exports, and restrict cheap imports, Negotiate with China for ease of exports and for them to stop subsidizing their products. Collaboration between government and Industry. Government to increase efforts to grow export market	61 Comments from QO3, QO5, 13 from QO18, QO21, 0 from Q76 up to Q87

3	Research Objective			Investigate if government policies play a role in helping China dominate over South Africa. (The effect of SA policies vs. China policies)	
#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	No. of questions	Summary of Comments	Summary
3.1	1. How does China help their manufacturers	Effect of China's policies	O8	40 suggest China subsidizes their manufacturers, protects industry against imports, and that most companies are state own, therefore supplying steel to downstream at cost. 7 - Cheap labour assists China. 25- Export rebates. 6- Heavy duties on exports of raw goods. 3 - availability of scrap metal at low costs	56 Comments from QO8
3.2		Are China's policies sustainable	94	China policies are currently helping their economy, and they will still be able to carry them for the next 20 years. Yes they won't last for ever as the support from government is slowly being reduced, and their competitive advantage through labour is beginning to fade away due to double digit wage increases annually. By then, they would have found a way to compete better.	4 Comments from DTI
3.3	2. Government assistance (SA) to trade with China	SA Government assistance to trade with China	43, O6,	Most (53) are not aware of any assistance provided by government. Some indicate the evidence of any assistance is not seen. 11 indicated there are many programs developed by DTI to assist, and the problem is that local producers do not take up those opportunities.	17 Comments from Q43, 64 Comments from QO6
3.4	3. SA Government intervention	Role of SA government's policies	56, 57, 58, 59, 60, 61, 98, O25, O26, O31, O35, O36	2 indicated that SA policies do assist industry, but more work is still required. AMSA is a challenge to manage. 2 indicated a lot of programs have been installed to deal with issues of high steel prices and that includes promoting development of new steel mills to compete with AMSA, 1 is not sure of what has been done on the steel price issue, while 1 says nothing has been done. 4 Indicated there no agreements in place between China and SA to help SA steel. All 4 agree that measures implemented have not shown fruits yet (too early to measure)	No comments from Q56 up to Q61. 4 Comments from DTI on Q98, QO25, QO31, QO35 and QO36
3.5	4. Suggestions for improvements on policies	What companies think can be done	44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, O7, O18	38 - Subsidies and/ or incentives to manufacturers, 40 - steel price reduction, 23 - improving on communication to industry, 12 taking over AMSA or have state owned steel mill, 39 - Stop Chinese imports, 9 - taxes/ duties on exports of raw ore, 21 - increase import duties on finished products, 8 - taxes on scrap metal exports, 6- open up export market more, 2 - Allow industry to run itself with less government intervention	0 Comments from question 44 up to Q55, 64 Comments on QO7, 13 comments from QO17
3.6	5. Perception of SA government in terms of assisting steel industry	What companies believe government is doing	74, 88, 90, O32	5 -Very little assistance, 3- mixed feeling, 2 - government has little powers on steel pricing hence manufacturers charge what they like. DTI cannot quantify jobs created by policies implemented,	8 comments from Q74, 5 comments from Q88, 2 comments from Q90, 4 Comments on QO32

4	Research Objective			Investigate the cause of failure of government policies in South Africa	
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**No. of questions**	**Summary of Comments**	**Summary**
4.1	1. **Causes of failures of policies**	Causes as per companies' perception of failures of policies	O9, 89, O12R	23 - (Corruption) [more support for China, China opens new companies in SA every year, contracts given to overseas friends, government bypassing their own policies and imports instead of supporting local], 18- Less involvement by government, 9 -Steel industry not their priority (No commitment), 16 - lack of implementation (too much talking and less action), 7 - No communication to Industry - less consultation (not working with industry), 4 - scared to tackle labour issues or change labour laws, 3 - weak regulations on imports - lack of controls, 6 - structural impediments (lack of adequate infrastructure - rail, energy). 15 - It takes long to implement policies - when implemented, many companies are already closed, 10 - lack of capacity and continuity within government. 5- Lack of understanding of issues by government. 3 - current agreements with China and other countries. 2 - shortage of skills within government	64 Comments on Q09, 1 Comment on Q89, 64 Comments from QO12R
4.2	2. **Possibility of illegal trade as a reason for SA policy failure**	Does illegal trade influence the effective implementation of policies?	62	30 Agree that illegal imports have negative impact on SA business and that accounts to about 30% of total business. Government fails to control illegal imports. 3 - no effect	33 Comments on Q62
4.3		Is China trading fairly	63, 64, 95, O10	7 Confers China does use illegal methods to grow their economy, 4 - not all of them follow the fair trade system,	11 Comments on Q63, 7 comments on Q64
4.4		Is there dumping of products	64	Not all companies from China dump their products, however some of them do	7 Comments on Q64
4.5	3. **Understanding of responsibilities**	Understanding of companies and what they believe who must do what	O11, O19	8 say government should take care of all factors out of control of companies, 6 say both must work together, 2 Say government must create an environment that allows industry to run itself	4 Comments from QO11, 13 comments from QO19
4.6	4. **Collaboration between companies and government**	Do companies and government work together?	65, O12, 66	13 say people lost hope and trust in government, if they do approach government, there is no guarantee that a solution will be obtained. 3 say companies should work through associations, Few companies engage government on their issues.	18 comments from Q65, 13 from QO12, 4 Comments on Q66
4.7		Do companies believe in government	67, 91	Majority agree that government should be engaged, since they have powers and can influence the necessary changes. 4 indicated government is not doing what they are suppose to do, and are failing to address the real issues	1 comment from Q67, 4 comments on Q91
5	Research Objective			Establish whether government policies can be modified and accepted by the relevant bodies which include WTO, BRICS and China	
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**No. of questions**	**Summary of Comments**	**Summary**
5.1	Can these changes be made without challenges by WTO, BRICS or China?		68, 100, O33, O34	6 - There will be challenges, we have to learn to ignore those so we can protect and grow our industry. Many countries break these rules, and nothing much gets done to stop that (We might not publish exactly what we do). 5 Not sure if the changes will be challenged by WTO ..., 10 say there will be challenges from WTO, and others, 4 says it is not easy to change policies as they don't always favour everyone. Consultations have to be thorough, takes up to 2 years. We have to live with mistake made at Doha agreement or ignore this agreements as they are voluntary	15 comments from Q68, 4 comments from DTI Q100, 4 Comments from question O33 and O34
5.2		Why policies are not amended	O29	It is not true that tariffs cannot be increased to the bound rate. If the local manufacturers can prove to ITAC that they are suffering some of damage as a result of the tariffs not being bound, they would investigate and if warranted migrate the tariffs to an appropriate rate.	4 Comments on QO29
5.3		Need to change policies	99	Changes are required, they are slowly being changed	3 comments from Q99 (DTI)

Appendix H – Comparison of different groups

Comparisons between DTI, Associations and Manufacturers					
1	**Research Objective**	Confirm the impact of the increased Chinese imports of steel products on the Steel production in South Africa.			
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**Manufacturers**	**Associations**	**DTI**
1.1	1. Confirm if production of steel in the country has declined or current status of companies in the steel industry	Current state of production of steel in SA	Downstream manufacturers more affected than the upstream companies	Production of steel in general has declined and imports have increased	For steel manufacturers they do sell everything the produce
1.2	2. Confirm impact of imports on local manufacturing of steel	Opinion on impact of imports	Imports destroying manufacturing within South Africa	Agree with a statement that imports have got negative impact on manufacturing locally	Don't agree that imports have got impact on steel industry. Local manufacturers enjoy monopoly
1.3	3. Is the impact of China on a company dependent on the size of the company?	Size of companies most affected	Mostly small companies	-	-
1.4	4. Which level or stage of steel value chain is most impacted by competition from China?	Level most affected	4th stage/ level which is the downstream manufacturers	-	-
1.5	5. Is China a problem?		Agree that China is a problem even though there are some countries who are also fighting for the same pie within SA	Most agree, but it is not only China that is a problem	3 Disagree, while only 1 agrees that China is a problem
2	**Research Objective**	Investigate the reasons why China is dominant compared to South Africa with regards to: 1. steel exports to South Africa rather than the other way round, 2. In African markets			
#	**Investigative question (s) - Data/ Information Required**	**Construct/ variable(s) required**	**Manufacturers**	**Associations**	**DTI**
2.1	1. Reason for China's dominance in South Africa and everywhere-else	Why China is dominant	China's products are cheaper due to help from government, and advantage of cheap labour	Cheap products achieved through subsidies, cheaper electricity, high efficiency and cheap labour	China is supporting their economy to achieve growth, while South Africa is striving to survive
2.2	2. Reason for decline or Poor-growth of business in South African Market	Why steel is not growing as expected	It is expensive to manufacture products in SA, hence they cannot compete	High steel pricing and low demand for products. China preferred as compared to local products	The blame is on AMSA with high steel pricing (IPP). This affects the downstream heavily. Imports of steel by government departments and removal of duties, is to "teach AMSA a lesson".
2.3	3. Reasons South Africa cannot sell equal or more quantities of steel products in China	Difficulty in selling SA products in China	Cannot compete with China and trade barriers in China. China buys more raw materials than they would import finished products	South African products are expensive compared to Chinese	-
2.4	4. Comparison of China and SA	Can SA compete with China?	SA cannot compete with China in both local market and export market	Cannot compete on export markets. China is cheaper	SA can compete with China within SA. There is no way China can land steel in SA cheaper than local manufacturers
2.5	5. Why is SA expensive and why they cannot compete	What contributes to high cost	Steel price and electricity	Steel price and electricity	-
2.6	6. Suggestions for improvements for SA to compete with China	Opinion on what to improve	Reduce steel price and subsidize electricity to get steel cheaper for downstream. Heavy protection against imports	Reduce steel price and subsidize electricity to get steel cheaper for downstream. Heavy protection against imports	Improve aging infrastructure at steel mills to be efficient

3	Research Objective		Investigate if government policies play a role in helping China dominate over South Africa. (The effect of SA policies vs. China policies)		
#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Manufacturers	Associations	DTI
3.1	1. How does China help their manufacturers	Effect of China's policies	Suggest China subsidizes their manufacturers, protects industry against imports, and that most companies are state own, therefore supplying steel to downstream at cost	Suggest China subsidizes their manufacturers, protects industry against imports, and that most companies are state own, therefore supplying steel to downstream at cost	Subsidies along the value chain, subsidised wages, inputs like power water and export incentives and no environmental costs. China does not play by the rules - their intention is to destroy competition, then increase prices afterwards
3.2		Are China's policies sustainable	Seen as a way to go	Seen as a way to go	They will help them for the next 20 years, by then they would have found better ways to compete
3.3	2. Government assistance (SA) to trade with China	SA Government assistance to trade with China	Cannot see any assistance from government - Government does not understand their challenges - especially at downstream level	Very little assistance	No clear stand on whether policies do help or not
3.4	3. SA Government intervention	Role of SA government's policies	Removal of tariffs on imports destroying the industry	They don't contribute much to growth of steel industry	Too early to measure according to DTI
3.5	4. Suggestions for improvements on policies	What companies think can be done	Subsidies and/ or incentives to manufacturers, steel price reduction, improving on communication to industry, taking over AMSA or have state owned steel mill, Stop Chinese imports	steel price reduction, improving on communication to industry, Stop Chinese imports, government to leave industry to run by itself and stop interfering	Improve aging infrastructure at steel mills to be efficient
3.6	5. Perception of SA government in terms of assisting steel industry	What companies believe government is doing	No assistance from government	Very little assistance	Cannot say

4	Research Objective		Investigate the cause of failure of government policies in South Africa		
#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Manufacturers	Associations	DTI
4.1	1. Causes of failures of policies	Causes as per companies' perception of failures of policies	Corruption, Less involvement by government, Steel industry not their priority, lack of implementation, not working with industry, scared to tackle labour issues or change labour laws, weak regulations on imports - lack of controls	Less involvement by government, Steel industry not their priority, lack of implementation, No communication to Industry - less consultation (not working with industry), scared to tackle labour issues or change labour laws, weak regulations on imports - lack of controls, structural impediments (lack of adequate infrastructure - rail, energy). It takes long to implement policies - when implemented, many companies are already closed, lack of capacity and continuity within government.	It takes long too implement policies due to consultation required - when implemented, many companies are already closed, lack of capacity and continuity within government. current agreements with China and other countries. Shortage of skills within government. Industry does not want to work with government (AMSA)
4.2	2. Possibility of illegal trade as a reason for SA policy failure	Does illegal trade influence the effective implementation of policies?	Agree that illegal imports have negative impact on SA business. Government fails to control illegal imports.	China has little regard for laws, hence they can do what they like and no body does anything - in the mean time they are growing their economy	Agrees with associations that China does things illegally, but it helps them for now
4.3		Is China trading fairly	No	No	No
4.4		Is there dumping of products	Yes	-	-
4.5	3. Understanding of responsibilities	Understanding of companies and what they believe who must do what	Government should create an environment that promotes business within SA and exports	Agrees with manufacturers	-
4.6	4. Collaboration between companies and government	Do companies and government work together?	No	No	No
4.7		Do companies believe in government	No	No	-

5	Research Objective		Establish whether government policies can be modified and accepted by the relevant bodies which include WTO, BRICS and China		
#	Investigative question (s) - Data/ Information Required	Construct/ variable(s) required	Manufacturers	Associations	DTI
5.1	Can these changes be made without challenges by WTO, BRICS or China?		Yes they will be challenged and SA need to disregard those regulatory bodies	-	Yes they will be challenged and SA need to disregard those regulatory bodies
5.2		Why policies are not amended	No interest by government	Policies do not favour industry	ITAC does implement changes as suggested by industry if justified
5.3		Need to change policies	Yes	Yes	They are slowly been implemented

Appendix I – Letter of Consent for Interviews

SCHOOL OF MECHANICAL,
INDUSTRIAL & AERONAUTICAL
ENGINEERING

Letter of Consent

I, _____, agree to participate in the MSc research entitled The impact of China on the steel industry value chain in South Africa and the Role of government policies, to be undertaken by Jacob Thulare under the supervision of Dr Bruno Emwanu, and certify that I have received a copy of this letter of consent.

I acknowledge that the research has been explained to me and I understand what it entails, as follows:

1. I agree to allow access to my company and manufacturing facilities for the purpose of this research if there is a requirement for that.
2. There will be one or two interviews, which are expected to take no more than 30 min each.
3. The interviews will be audio taped, and transcribed for analysis by the researcher. (agree / disagree)
4. I have the right to withdraw my assistance from this project at any time without penalty, even after signing the letter of consent.
5. I have the right to refuse to answer one or more of the questions without penalty and may continue to be a part of the study.
6. I may request a report summary, which will come as a result of this study.
7. I am entirely free to discuss issues and will not be in any way coerced into providing information that is confidential or of a sensitive nature.
8. Pseudonyms will be used to conceal my identity, and that of my company, my employees, my suppliers and my customers. The information disclosed in the interviews will be confidential.
9. Audio-tapes and transcripts will be kept securely stored during the research and after the research has been completed.
10. This project was approved by the Faculty of Engineering and the Built Environment of the University of the Witwatersrand and the School of Mechanical, Industrial and Aeronautical Research Ethics Committee (non-medical) of the University.
11. If I have any questions or concerns about my rights or treatment as a participant, I may contact the Chair of the School of Mechanical, Industrial and Aeronautical Research Ethics Committee (non-medical) at 011 717 7343 or by Bruno.emwanu@wits.ac.za.

Signed: _____

Names: _____

Date: _____

Questions concerning the study can be directed to:

Jacob Thulare

Tel: +2711 841 3707/083572 2536 and Email: Jacob.thulare@afrox.linde.com

Or Dr. B. Emwanu on

011 717 7343 and Bruno.emwanu@wits.ac.za.

Appendix J – Information Participation Sheet

SCHOOL OF MECHANICAL, INDUSTRIAL & AERONAUTICAL ENGINEERING

Date: 28 May 2014

Dear Manager,

Re: Participation in Research on the Role of Government policies on the Impact of China on the steel industry in South Africa.

Thank you for offering to participate in the follow-up interview, via your response to the recent survey completed early in May.

I am currently studying Masters in Industrial Engineering (Msc. Industrial Engineering) on part-time at the University of the Witwatersrand, School of Mechanical, Industrial and Aeronautical Engineering, under the supervision of Dr Bruno Emwanu. My research title is: **The impact of China on the steel industry value chain in South Africa and the Role of Government Policies.**

My belief is that imports mainly from China have an effect on the decline of manufacturing of steel and steel related products in South Africa, and that government can play a role in assisting this industry grow. I would specifically like to understand what impact imports have on your company and how government has assisted in minimizing this impact, and also your views on how government can help in the future.

I would like to formally invite you to participate in this study. As a Manager in a steel manufacturing or steel related products in South Africa, your knowledge and experience would contribute significantly.

Interviews will be conducted between June and July 2014. Involvement in the study would entail a face-to-face or telephonic interview with you, as the Manager, at your convenience. During these interviews, I will ask similar questions to the ones you have answered in the survey, and this will be in order to obtain more in-depth information on particular issues of interest. The interviews would be conducted at your place of preference or convenience.

Participation in the study is voluntary, and you may withdraw at any time. Anonymity (regarding company name and any owner/manager/employee names) and confidentiality of information provided will be assured and respected. I would like to record the interviews, so I can later transcribe them. Your consent at the time of the interview will be requested. If you do not wish the interviews to be recorded this will be respected.

The results of the study will form part of my MSc dissertation report, and may also be reported in academic papers and at conferences. A summary of the results of the research will be made available to you on request.

Please contact me if you have any questions regarding the research and participation in the study.

I look forward to hearing from you.

Yours faithfully

....
Jacob Thulare

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