ASSESSING THE IMPACT OF GLOBALISATION AND POLICIES ON ARCELORMITTAL SOUTH AFRICA (AMSA)

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ABSTRACT

The dominance of China in the global markets and in particular the effects on the South African Steel Industry have caused concern around the topic of government intervention in the steel market through appropriate policies. The deterioration of the Steel Industry in South African due to cheaper imports has created a topic for debate. Protectionism and the required levels of trade remedies in order to protect local markets and ensure sustainability in the sector are being investigated by this research. The primary method of data collection used for this study was that of secondary data sources from credible and reliable databases. Statistical analysis was conducted through the use of both descriptive and inferential statistics to draw relevant findings and conclusions for the purposes of addressing the research questions. Research and literature reviewed from previous studies conducted on this topic were incorporated to provide a complete view. The key findings from the research focus on South African competitiveness and inability to compete with low cost countries such as China with a particular focus on the Steel Industry. The research shows a definite relationship between China imports and the decline in the downstream steel sector based on prices. In particular the subsequent relaxation of trade barriers through trade liberalisation policies have ensured that steel producers such as ArcelorMittal (AMSA) are challenged to compete in rapidly changing global landscape and demand for steel commodities.

Economic factors among other structural and political externalities including the lack of government intervention through policies create a challenging environment for ArcelorMittal (AMSA) and other steel producers in South Africa. In addition the inability for the steel manufacturing sector to innovate and use technology in South African to ensure their international competitiveness has ensured that they are lagging in the globalisation of their value chains. The impact of globalisation for emerging markets such as South Africa is unavoidable and the key message is that evolution, improvement and optimisation is a necessity for the long term survival of the steel industry.
DECLARATION

I, Taryn Maryse Lotz, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Taryn Maryse Lotz

Signed at .................................................................

On the ........................................... day of ......................... 20.....
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CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to assess and compare the impact of global steel producers’ influence on the South African steel industry. The focus of the study will consider the effect of the imports and trade tariffs between South Africa and other top steel producing countries. Another key focus of the study is to investigate the influence of the highly efficient and productive Chinese manufacturing sector in particular the steel markets and their influence on emerging economies such as South Africa. The purpose of this research is to understand the impact of globalisation of markets while considering the aspects of fair trade that is enabled by the World Trade Organisation (WTO). Further to this, the research will be considering the role the South African government’s policies as well as the level of required intervention required to ensure sustainability of the local steel sector as part of the South African government’s agenda to create jobs. The study will address South Africa’s competitiveness, its economic performance and various other factors that may have influenced the deterioration of the local steel industry in comparison to the global steel producers. The study will include a direct comparison of the China steel markets and the South African steel markets where China is considered to be South Africa’s largest trading partner for both imports and exports on various commodities.
1.2 Context of the study

Manufacturing strategies and the choice of strategy, in particular those in developing countries, play a very important role in competitiveness and performance of the industry (Ehie & Muogboh, 2016, p.237). Manufacturing strategy relates to the ability of a firm to compete in areas of competence, namely cost, quality, delivery and flexibility in order to achieve competitive advantage (Ehie & Muogboh, 2016, p.235). Strategies differ from country to country based on their available resources such as natural, labour, education and technology resources and its ability to allocate these resources optimally to achieve a desired outcome. Environmental factors and government policies may either make or break a country’s manufacturing sector (Ehie & Muogboh, 2016, p.237). In addition to the availability of resources, the external economic and environmental landscapes can either support manufacturing or hinder its performance through the reduction or increasing of tariffs. Government policies play a significant role in the trade-offs and ensuring the market operates in a fair and transparent manner without excessive intervention that may manipulate the environments or markets. The concept of state-driven economic development and growth is symbolised by China. The Chinese government plays a vital role in the domestic and international markets and has substantially advanced the Chinese agenda. China has grown to become a very powerful economy and is currently the fastest growing economy since the institution of its economic reforms. Globalisation has resulted in high levels of competition and in certain arguments it is considered modern day warfare, as countries strive to become more competitive in the global marketplace (Kaplan, 2003). The topic of competiveness and the evident concern around a country’s ability to compete globally has resulted in measures being
developed in order to rank and compare countries’ competitive position or rank to that of their peer group (Kaplan, 2003, p. 76). The results of these measures influence various stakeholders from policy makers, investors and create a sense of public perception both positive and negative of the country in terms of their ranking or improvements in rank (Kaplan, 2003, p. 76). South Africa is ranked 47th in the global competitiveness index (GCI) during the 2016/17 assessment period out of 138 countries globally (World Economic Forum, 2016). The global competitiveness index (GCI) considers and captures the fundamentals of an economy and ranks countries in accordance with the 12 key pillars outlined in the Global Competitiveness Index Framework (World Economic Forum, 2016). The metric provides an indication of the overall landscape of 138 countries providing insight into productivity of developed and emerging economies on an annual basis. South Africa’s financial market strength, good transport infrastructure, strong domestic competition on the African continent and its advancement in the Information, Communication and Telecoms (ICT) sector (WorldEconomicForum, 2016), were the main contributors to South Africa’s improvement from previous years. Areas which are hindering the South African economic performance and growth of its economy relates to structural limitations in terms of electricity supply and political instability. Contributors to the low levels of productivity impacting on its competitiveness are in the areas of labour and labour uncertainty, particularly in the manufacturing sector. South Africa has a strong union presence and this voice has asserted its position on many occasions, impacting industry through strike action and labour unrest. South African business has argued that the South African labour market is rigid and highly regulated hence creating challenges and constrains employment. These various factors influence and impact the steel industry which hinders its ability to become competitive.
Noteworthy research has been conducted on the comparison between performance and competitiveness of different countries and its economies. Comparisons across industry sectors from textiles to poultry have been extensively researched which undertook to investigate the impact of globalisation and international trade on the local markets. In the case of the South African Poultry Industry, the concern pertaining to the cheaper imports of chicken products from Brazil raised various issues around increasing tariffs and the competitiveness of the poultry sector (Hobbs & Draper, 2015). Similarly, the steel industry is under extreme pressure from cheaper imports sourced from China which is compounded by various environmental factors that inhibits the sectors’ performance and productivity. In the case of the poultry sector the decision to increase tariffs on certain products alleviated the problem for South African producers in the short term however the concern around the business model, lack of innovation in the production processes and the ability to ensure competititiveness within the local and global poultry sector remained (Hobbs & Draper, 2015). The steel sector can draw lessons learnt from the poultry case in that similarities exist between the scenario and outcomes. In the case of the poultry sector, anti-dumping measures were instituted in order to protect the local market (Hobbs & Draper, 2015). However, the concerns remain in terms of actual productivity and innovative approaches in that sector to ensure competetiveness at a global level. This demonstrates the extent of the problem which is not isolated to South Africa or a specific sector. The Group of 20 (G20) Summit held in Hamburg during 2017 had steel overcapacity and protectionism on the agenda for discussion by the World Leaders. The United States (US) President, Donald Trump, highlighted issues around dumping of Chinese imports and similar concerns were raised by other nations. Protectionism has been raised as a potential safeguard in the South
African steel industry in order to mitigate and reduce the effects of “dumping” cheap Chinese imports as a viable alternative solution to ensure the long term sustainability of local steel industry. Noteworthy research conducted provides a view that majority of people support the use of protectionism in order to secure jobs and the economy by limiting imports (Rodrik, 2011). However in highly educated countries there are tendencies for less protectionism and towards trade liberalisation (Rodrik, 2011).

The key focus of this research will be the South African Steel Industry, in particular, the efficiency and competitiveness of ArcelorMittal South Africa (AMSA) in comparison to Low Cost Countries (LCC) such as China. The intention of the study is to consider the impact of sourcing value-added products from LCCs and the consequences for the local South African producers in the long run (Wath, 2016).

**Background on ArcelorMittal South Africa**

ArcelorMittal has been in existence since 1928 when the company was known as Iscor, a statutory parastatal organisation (ArcelorMittalSA, 2017). Since its first operations at the Pretoria works, the company expanded due to the war time increase in demand for steel in South Africa and expanded to commission its second operations in Vanderbijlpark, South Africa in 1943 (ArcelorMittalSA, 2017). The main focus of the Vanderbijlpark operations was that of heavy plate production (mainly for ship repairs) and the manufacturing of armoured cars for the war. Iscor further expanded through the construction of its Newcastle production facility during 1971 which facilitated an integrated steelworks operation. In 1989, Iscor was privatised to become Iscor Limited. This privatisation enabled the Iscor Limited to list the company on the Johannesburg Stock Exchange (JSE) (ArcelorMittalSA, 2017). During the period 1996 until 2003, a series of corporate transactions took place
which lead to the unbundling of Iscor’s mining business. This resulted in the establishment of two entities, Kumba Resources and Iscor. Kumba Resources focused on the iron ore extraction and other mines such as coal, zinc and industrial minerals. In 2003, LNM Holdings took control of Iscor through a share buyout (ArcelorMittalSA, 2017). During 2004 Ispat International NV purchased LNM holdings and Iscor later changed its name to Mittal Steel South Africa. ArcelorMittal was formed in 2006, through the merger of Luxembourg-based Arcelor and Indian-based Mittal, culminating in ArcelorMittalSA becoming the largest steel producer globally and positioned in South Africa as the market leader claiming the largest portion of both flat steel and long steel products (Industry, 2014).

South African steel producers are challenged in the context of globalisation, as efficient and highly competitive producers are playing an increasing role in the global steel commodities markets. This is compounded by a low demand for steel products due to low economic growth globally and the slowdown in global markets. The phenomenon is a consequence of weak economic growth and the decline in the China markets creating a low demand scenario for steel products. Considering the highly competitive nature of the steel industry, South Africa’s steel sector is strained and under pressure to revisit their business model and cost base due to the entry of cheaper Chinese products. The assumption is that these reduced barriers of trade have negatively impacted on the local industry. Government has played a significant role in creating an operating environment in which there has been an increasing relaxation of trade barriers or no tariffs for certain steel products which is supported by specific trade agreements. The World Trade Organisation’s (WTO) mandate is to define the international rules of trade and facilitate the efficient functioning of
transactions between countries, which have been enablers of the present-day market dynamics consequently to the detriment of the South African steel industry.

This study will investigate options and provide recommendations for further study into longer term sustainability of the local steel industry. Determine whether the impact of cheaper Chinese steel imports has an influence on the local markets and compare this to other countries in the categories of top producers.

1.3 Problem statement

1.3.1 Main problem

The main problem is the competitiveness of the South African manufacturing sector (producers) in comparison to other countries that compete in the steel industry with a similar economic ranking, whether it be developing, emerging or well developed countries. The steel industry, with focus on ArcelorMittal SA, will be used as a specific case for assessment considering that ArcelorMittal is the largest steel manufacturer in South Africa.

1.3.2 Sub-problems

The first sub-problem is the impact of the reduced tariffs in the local markets for imported steel products from countries such as India, Japan, Sweden, Germany and South Korea currently being the major role players in the steel industry.
The **second sub-problem** concentrates on the role of government in defining policies that are enablers which protects the local economy given the important role that government needs to play in driving economic growth and job creation.

### 1.4 Significance of the study

The study will investigate the trends within the steel industry in terms of productivity and competitiveness and the overall influence of China on South Africa. Recommendations for further research to be conducted will be provided as outcomes of the study. The research will provide a platform to initiate conversations and debates around protectionism across sectors in South Africa.

The research conducted should provide guidance to government, industry and labour in order to stimulate growth of the manufacturing sector and support longer term sustainability of the steel sector. The intention of the study is to assess the current measures in place, determine the effectiveness of these measures and propose alternate solutions in order to manage the degeneration of the competitiveness in the South African Steel Manufacturing sector proactively. The main aim is to ensure sustainability in the long run taking into consideration the impact of globalisation, competition and relaxed trade barriers.

Due to the growing number of alternatives stemming from LCCs (Low Cost Countries) such as Indonesia, Vietnam and Thailand, the risk to South African efficiency, productivity and overall ability to compete on a global scale will remain in the longer term across sectors. It is therefore crucial from a management and economic perspective that the industry is understood and that the supply and
demand aspects are taken into account in terms of the South African competitiveness landscape (Wath, 2016). The study will also focus on Government’s role in the economy through the development of proactive policies and appropriate actions to ensure sustainability in the steel industry taking into consideration that manufacturing is a key contributor to Gross Domestic Product (GDP) both directly and indirectly.

1.5 Delimitations of the study

The scope of the study is the influence that global steel producers and impact of government policies in the South African have on the local steel manufacturing sector with a specific view on ArcelorMittal South Africa (AMSA).

Included

- Economic Analysis – Impact on Steel Sector
- South African and selected country comparison (China)
- Industry and sector (Manufacturing Export Analysis)
- Structural adjustments and economic reform through policies
- High level overview of the steel supply chain network
- High level overview of the legal framework/context of steel imports and exports
- Review of trade remedies, agreements and related policies.

Excluded

- Assessment of labour unions impact on AMSA cost and productivity
- Assessment of electricity cost and other raw materials cost
Detailed analysis of foreign government policy per industry or sector

Detailed analysis of non-steel industries or sectors.

1.6 Definition of terms

**Protectionism** – The safeguarding of local industry through the intervention of government policies which shield a fragile or weak sector of the economy by imposing higher duty tariffs, quotas or stricter inspection and quality regulations (Protectionism, 2016).

**Dumping or Overflow** – In international trade, this relates to the export of a product by a country into the foreign market at a price lower than the price charged in the domestic market. Due to the nature of the transaction which is based on volumes, the consequences of dumping impact on the importing country (financial viability of the manufacturers). It is the act of offloading a product with very little regard for price (Dumping, 2016).

**Low Cost Country Sourcing (LCCS)** – A procurement strategy followed by an organisation in which a company sources materials from countries with a much lower cost of production (Wath, 2016).

**Free Trade Zones (FTZs)** – Regulation enforced to ensure a free zone for the duty free importation of goods (Free-trade Zone, 2016).

**Global Value Chains (GVCs)** – Various stages of the production processes are located across multiple countries (OECD, 2017). Global value chains include the dispersion of value chain activities several countries from design, production, marketing and distribution (OECD, 2017).
1.7 Assumptions

- Data will reflect recent and accurate information available and sourced from reliable and credible databases
- Samples will representative of the population
- ArcelorMittalSA is representative of the South African steel manufacturing sector in South Africa
CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

The focus of this Chapter concerns the review of previous work or studies conducted to provide a framework for the research. Literature review encompasses previous research, findings and theories that support the topic. The literature review covers journals, books and other articles of relevance to substantiate the research area and position the research questions for further investigation. Globalisation and the impacts of an ever changing economic position for many countries has been undertaken by many researchers to understand the effects on countries and individual firms for both developed and developing nations.

The topic has been extensively researched at an aggregated level through various assessments conducted on the competitiveness between countries; however there seems to be very little research on the direct impact of globalisation on a specific firm or an industry in South Africa. This brings about the problem where the South African Steel Industry is facing a challenging time that is intensified by the economic downturn, striving to sustain operations while defending its market share from foreign competitors. These sequences of events have been brought about through the process of globalisation and relaxation of trade barriers towards a form of trade liberalisation. Business cycles are unavoidable and inevitably have an upside followed by a downside. The downside position in which many countries find themselves has moved the pendulum towards favouring a more protectionist approach in order to stimulate economic growth and boost job creation. This brings
about the second research question, pertaining to the influence that government has on international trade and whether the policies implemented support or hinder international trade. Government intervention differs from country to country and the role that government plays in stabilising trade or its markets is an important aspect or topic in economic theory.

The environment in which businesses operate can be expressed as a complex structure of policies, institutions, infrastructure, human resources and geographical locations that inevitably affect the efficiencies (Eifert, Gelb, & Ramachandran, 2005). Traditionally, emerging and developing countries were primary exporters of manufactured goods; however, this position has shifted (Eifert et al., 2005). The effects of globalisation require firms to think differently in terms of their operations and manufacturing strategies in order to secure market share. The impact of globalisation of economies and subsequent implementation of relevant structures such as the GATT and WTO to support the international rules of trade at a policy level however does not remove the accountability of the local government policy makers from their responsibility towards economic growth and sustainable job creation in industry (Rodrik, 2011).

Economists have different perspectives on globalisation and their views differ in terms of the understanding of what defines or measures globalisation. (Lall, 2004), provides various views on the definition of globalisation in his paper. The differences in views regarding globalisation or the lack of a clear definition of measures to quantify globalisation implies that there is a generalist approach and therefore suggests no meaningful relationship may exist between globalisation and employment. Globalisation is generally seen as the removal of trade barriers,
increased trade flows through the support of policies (trade liberalisation) and the expansion of multinationals across geographical boundaries (Lall, 2004). The collapse of trade barriers, the growth in global value chain for various multinational have been identified as an opportunity to streamline and create value by either offshoring or outsourcing activities (Lall, 2004). This leads to the discussion over another view on globalisation in which firms deliberately fragment their value chains in different countries to derive maximum benefit such as design, manufacturing, marketing, logistics and distribution functions (Lall, 2004).

Although the consequences of globalisation of value chains may have negatively impacted emerging economies, China has placed considerable effort in developing its export competitiveness through improving and upgrading technologies, investing in research and development and also developing high quality infrastructure in order to ensure its competitive advantage (Zhang, 2015). China’s export sophistication has mainly been taking place in the manufacturing sector, transitioning from low-value add products to high value-add products, boosting its export market (Zhang, 2015). This is evident in the exponential growth of the Chinese economy since its participation in the World Trade Organisation (WTO). The strategic relationship that South Africa has with China through its BRICS membership, positions SA as a strategic partner of China and vice versa. However the trends in exports from SA to the other BRICS nations have been less than fruitful or have not been exploited to the levels that benefit the South African economy, while SA struggles to navigate various tariffs with the BRICS countries. South Africa being the smallest member to the BRIC countries may need to be strategic in terms of its alliances in that China is
resource hungry and may advantage itself from South Africa natural resources rather than complement through the partnership (Kahn, 2011, p.45).

2.2 Background discussion

The main purpose of the background discussion is to explore the details and subsequent process of the decline in competitiveness of the local steel producer, namely, ArcelorMittal South Africa (AMSA), in comparison with highly productive nations such as China, India and other BRICS countries during a period of five years. The Minister of Trade and Industry, Rob Davies announced that the South African economy will not surrender its steel industry to global producers such as China which currently produces ±50% of the global steel production in the world. ArcelorMittal South Africa (AMSA) received tariff protection, indicating the South African government’s commitment to the steel industry (Cloete, 2016) which plays a significant role in the local economy and is a key strategic driver of economic development goals for South Africa. The sector has undeniably been impacted by many structural challenges such as electricity pricing, high cost of labour and labour instability relating to strikes as well as rail transport tariff increases which inhibit the competitiveness of the local steel players in comparison with the global steel majors (Cloete, 2016).

Globalisation has intensified competition at firm level, which requires them to become more competitive in the market place in order to survive (Kaplan, 2003). Through the globalisation of supply chains, supported by enhanced technologies, China has endeavoured to increase its sophistication of its production processes as well as improve simplification of exports, logistics and distribution channels.
The intensity of competition has ensured that China has maintained its low production cost per unit (Montalbano & Nenci, 2014). This has resulted in a subsequent overflow of cheaper Chinese steel exports into countries such as South Africa and reinforcing the assumption that China is dumping steel, forcing local industries and companies such as Highveld Steel to close their production facilities while ArcelorMittal (AMSA) is arguing that cheaper imports are impeding their revenues and ability to sustain operations. The global steel sector and, in particular, the South African steel sector has been under significant strain directly impacting productivity of the sector and the employment figures. The situation has been intensified by the relaxation of taxes and duties payable on steel products by the major exporting nations i.e. China value-added products exported into the South African market. Group of 20 leaders, pledged their support during the September 2016 summit to address the global oversupply and low demand in the steel sector to ensure trade tensions between China and other major producers are settled (Herbst, 2017).

The consequences of globalisation and the rapid growth of emerging markets such as China, which is considered to be a dominant and efficient producer, have amplified the effects of job losses directly within the steel manufacturing value chain by removing jobs from the economy through imports of cheaper value-added products. The assumption is that China is exporting steel at below market related prices in order to benefit the Chinese economy considering that it is the largest producer and consumer of steel globally. (Krugman, 1994) argues that while countries may become more or less competitive in the production of particular goods, it is meaningless to suggest that a country’s economy in aggregate has
become more or less competitive. Based on the view by (Krugman, 1994), at an aggregated level, countries’ competitiveness can be measured, however at a detailed level each country may have a comparative advantage or may be highly competitive in one product and to a lesser extent in another. In order to counter the effects of globalisation and threats from competition, countries can implement strategies around improved technology, innovation and harnessing the first mover advantage opportunity which will in turn leverage their competitive edge (Kaplan, 2003). Developing countries in particular find that exports improved their standing in the global markets through the increase in foreign exchange and with imports come the benefits of products, services and improved technology learnings which ultimately enhance countries competitiveness (Zhang, 2015, p.499).

ArcelorMittal South Africa (AMSA), which will be the focus of this study, has experienced challenges in maintaining production levels (output) as a result of low demand, weak commodity prices and a highly competitive market as a result of imports. The situation is deepened by the assumption that China is producing excess steel products below cost and selling excess capacity into alternate markets such as South Africa. Studies conducted analysed the entry of China and, to a lesser extent, the impact of India on the global market where export oriented countries such the sub-Saharan African countries have been impacted adversely (Montalbano & Nenci, 2014). In terms of economic growth, China and India remain the largest economies from the BRICS member nations that contribute to global Gross Domestic Product (GDP). During 2017, China’s economic growth prediction forecasted by the International Monetary Fund (IMF) is set for 6.6% while India is expected to grow by 7.4% (Roach, 2016). Considering all the data, China remains the largest engine for
growth and contributes 18% to world output with India’s share accounting for 7.6% (Roach, 2016). This indicates that China and India have a significant impact on the global economy as both consumers and producers of goods and services.

Manufacturing can be viewed as the core of the economy of many developing countries; it adds value in the form of jobs and through driving innovation at every level of the sector (Ehie & Muogboh, 2016, p. 238). This culminates in long term sustainable economic development (Ehie & Muogboh, 2016, p. 238) for the country. The predicted projections of developing countries’ economies have not been realised and has either flat-lined or declined which contradicts the growth forecasted (Ehie & Muogboh, 2016, p. 238). This has a direct impact on the economic growth and output of the South African economy preventing investments in new infrastructure, reluctance for investors to consider investments in the country in the form of (Foreign direct Investment) FDI. This then influences the associated demand for steel products as a direct result of stagnant growth.

The global markets have also seen a decline in the growth projections as a consequence of the overall depressed demand. The decline in growth projections for China with an economic growth of only 6.5% (2017) will directly impact the South African economy as an emerging market on the African continent (OECD, 2017). In addition to the absence of economic growth, South African structural challenges of energy supply, reliability and sustainability in which the manufacturing and mining sectors operate are inhibiting their ability to reach production targets and drive output to meet the demand for commodities (Engineering News, 2015). Considering all the apparent negative factors relating to economic and structural challenges, the BRICS nations are still predicted to become the most dominant economies by the year 2050
This includes South Africa as a member of the BRICS nations however; many political and structural factors must be addressed and resolved prior to the acceptance of the narrative that South Africa is truly open for business.

**Contextualising South African Economic Performance**

High growth is the aim of many countries and governments in that it expresses the levels of improvement in standards of living and provides an indicator that is the desirable outcome (Tahir & Azid, 2015). There is a view that with high trade and openness in economies the natural result is economic growth and improvement in the overall economy (Tahir & Azid, 2015). In order to place context to the South African economic position the following key indicator, namely unemployment is at 27.7% (adjusted from the previous rate of 26.5% in 2016) with further job losses forecasted based on weak economic growth forecasts and low confidence levels from investors (Trading Economics, 2017). This is a considerable portion of the population which could otherwise be productive in the economy and be creating value. Although there are various factors such as global economic shifts, political stability and business confidence that influence the overall economic landscape, the case for competiveness and productivity globally should not be discounted. South Africa is challenged and under immense pressure to turn its current state of political affairs and economic deterioration around. South Africa has seen a decline in GDP growth from 1.4% to 1.3% in 2014 and 2015 respectively (Statistics South Africa, 2017). The projection for the economy in 2017 is not positive as it is forecasted to weaken to 0.7%. This is compounded by the downgrade of the sovereign credit rating to sub-investment grade by two major ratings agencies that cite concerns
around political instability and lack of confidence (Statistics South Africa, 2017). A slowdown in demand or economic growth impacts directly on the steel value chain, upstream and downstream. In order to quantify the economic performance of South Africa, the following analysis was conducted to contextualise the situation facing the country with a particular view on the manufacturing sector.

South Africa is classified as a middle-income emerging market enriched with vast natural resources, well-established financial, legal, communications, energy and transport sectors (Central Intelligence Agency, 2017). South Africa has the largest stock-exchange (JSE-Johannesburg Stock Exchange) in Africa with a ranking among the Top 20 globally (Central Intelligence Agency, 2017). In comparison to the global context, South Africa is facing numerous structural challenges hampering its growth. Skills shortages, declining global competitiveness and high levels of worker strike actions are major causes of sluggish growth. Although South Africa’s focus has been on keeping inflation between 3% and 6%, efforts seem to have been ineffectual considering that the most recent inflation rate is above 6.13% (2017) (Statistics South Africa, 2017). South Africa’s key trading partners are China (9.2%), US (7.6%), Germany (6.6%), Namibia (5.1%), Botswana (5.1%), Japan (4.9%) and the UK (4.1%), based on 2015 figures published through the USA Central Intelligence Agency. This analysis shows that South Africa and China have a strategic partnership even though, in many situations, China’s dominance in the global markets has been negatively perceived by many countries, particularly the United States and the European Union. Further to the factors highlighted above and even though sluggish economic performance impacts the steel sector, carbon tax
and wages are key areas of consideration for long term sustainability of the steel sector.

The carbon debate has been a long standing issue for the heavy industries, mainly the cement and steel industries where there are perceived to be more negatives than there are positives. Government’s intention to curb high emissions through carbon taxes and policies is noble; however in the broader context of competitiveness this remains a challenge (Branger, Quirion, & Chevallier, 2016). The implementation of carbon taxes on industries such as steel can create a comparative disadvantage for countries which may not have the similar requirements of compliance (Branger, Quirion, & Chevallier, 2016). The likes of China and India are far from the implementation of such policies and are the largest polluters in terms of CO2 emissions (Branger, Quirion, & Chevallier, 2016). It is argued that the local steel industry would be negatively impacted should such taxes and policies be implemented in South Africa as it opens up the door for global competitors who may not need to comply with carbon laws, to increasing their chances of being more competitive. The cost of compliance for implementing carbon tax ultimately impacts the end users and the cost of doing business, which steel manufacturers in South African are already struggling to curb or counter the effects of low cost steel producing countries like China. In addition, the argument around carbon leakage has not been fully considered in the case of the South African markets, where a comparative disadvantage is most likely to evolve, in which countries such as China and India are more likely to benefit from the lack of stringent measures towards carbon emissions as it will lower their cost of production which is already subsidised by government ensuring they remain highly competitive. Hence, South Africa may
face additional costs versus its foreign competitors from the implementation of the carbon tax bill and create an environment that disadvantages the industry while other companies may seek to relocate their operations to countries with more relaxed requirements pertaining to carbon emission taxes reducing the foreign direct investment (FDI) much needed by industry. South Africa is set to implement a Carbon Emission Tax as directed by the Draft Carbon Tax Bill published in 2015 (Herbst, 2017) posing significant additional cost to the heavy industries. The impact on the steel producers in South Africa will be substantial as their competitiveness is already challenged. The requirement from government to introduce carbon taxes through the CO2-E will require the steel producers to reduce their CO2 footprint (Herbst, 2017) which on the positive side of the spectrum is beneficial towards the drive for climate change. Although the efforts by Government may seem noble in terms of climate change, the impact on the cost base of the already strained steel industry may have negative consequence in the broader economy. Thus, it will not just impact the steel industry, but will also have knock-on effect on the broader economy of South Africa.

Although South Africa is perceived to be one of the top performing economies on the African continent as a result of being the region’s role model in the areas of financial markets, competition, infrastructure and education, areas of focus for improvement must be considered including governance, policy uncertainty and the overall exchange rate volatility. There are a few limiting factors which affect the competitiveness and growth of the country, particularly in the areas of infrastructure development. Evidence of this is shown by delays in executing many mega projects both in the transport and electricity sectors by many of the State Owned Enterprises
(SOEs). In spite of the challenges South Africa is classified along with China, to be amongst the efficiency driven economies in the Global Competitiveness Index (GCI) (World Economic Forum, 2016). The steel value chain is illustrated below in Figure 1a, Steel value chain categorised per process in South Africa which demonstrates the integrated landscape or chain at each phase of production. The risks of imported products as final value-added products remain at each phase of the downstream markets. The assumption is that users’ preferences are for cheaper imports as it reduces their individual cost of doing business, hence the trend towards sourcing lower cost steel from China.

Figure 1a Steel value chain categorised per process in South Africa

Source: (Merchantec Research, September 2014)

The below explanation of the steel value chain provides insights to the inner workings and integrated nature of the steel manufacturing process in South Africa. The phases encompass raw material extraction to final product and distribution.
The purpose is to provide a view on the entire steel value chain which will set the framework for the discussion around the South African steel market.

**Exploration – Phase 1**

The steel value chain originates on the back of a strong iron ore mining industry. The key role players in this sector are Kumba (Pty) Ltd and Assmang (Pty) Ltd (Kumba Iron Ore, 2011). The raw iron ore is extracted from different mines in South Africa and then it is either processed further or it is exported.

**Manufacturing – Phase 2**

Scrap metals are processed through a process called EAF (Electric Arc Furnace) whereby steel is produced. In the case of iron ore, the iron ore is firstly run through mills and thereafter processed through blast furnaces to produce steel. Currently, AMSA is the only steel manufacturing plant in South Africa that use iron ore as their primary feedstock (Kumba Iron Ore, 2011).

**Fabrication – Phase 3**

Essentially, the fabricators buy steel products from manufactures, such as AMSA, and convert the steel into intermediate products i.e. wire, tube, cable, plate and sheet (Kumba Iron Ore, 2011).

**Manufacturers or End Users – Phase 4**

Primary users of the steel products are mainly the automotive industry, components manufacturers, packing industry, construction companies and locomotive assemblers (Kumba Iron Ore, 2011).
The study will mainly focus on **Phase 2 (Manufacturing)** of the value chain where ArcelorMittal (AMSA) and other manufacturers play a role. In terms of the overall value chain, it should be noted that only 15% of the total raw material is beneficiated in South Africa (Thulare, 2015). The largest portion is exported as a non-value added product (Thulare, 2015). This indicates a significant portion of the value being eroded from the South African markets.

### 2.3 South Africa’s ability to compete in the global steel industry

South Africa’s overall performance in terms of global competitiveness and its ability to compete with global steel producers, such as China, is diminishing. There are various and conflicting views on the relationship between commodity prices and the exchange rate and relative impacts both positive and negative on exporting countries that are enriched with natural resources (Hodge, 2015, p.357). Each country has their own structural issues and factors that affect the ability of a country to compete in the global markets (Hodge, 2015, p.357). There is no single factor such as exchange rate valuation for commodity prices that determine a country’s ability to export competitively (Hodge, 2015, p.357). These various structural factors have significance when compared with developed countries.

China operates with higher efficiency and productivity levels and has been uncompromising in their approach which led to China in becoming the largest steel producer in the world, surpassing that of Japan and South Korea. The China strategy towards an export-oriented market is reaping results and is seen in their strong GDP growth. China has focused on increasing its comparative advantage in medium technology (MT) and high technology products (MT) in which China has been and
remains the main source of assembly of goods rather than research and development (Zhao, Malouche, & Newfarmer, 2008, p111). Low technology products such as that in capital equipment has been the main source of its comparative advantage where the products are undifferentiated and mainly compete in the market on price (Zhao, Malouche, & Newfarmer, 2008, p.111).

Competitive advantage is the process of either providing additional value to the end-user by providing a lower cost option or comparable cost with unique additions or alternatively a differentiated strategy (Porter, 1986, p. 20). Theories around competitive advantage and globalisation have been around for decades however, the challenges that organisations face are still relevant in the business world today. Trade patterns have evolved with the shifts of operations through the relocation of processes, functions and other activities and advances in technology from innovation to low cost countries (LCCs) which are efficient and highly productive (Lall, 2004).

This affects the competitiveness of previously self-contained industries such as the South African Steel Sector which has largely been located in South African for local markets and has not changed its business model or operational strategy since the 1980s. The influences of globalisation and competition cannot be ignored as trade barriers are becoming less and firms need to found alternative methods to compete in order to retain market share. The South African steel industry is a strategic asset for the country and is of national concern and will impact negatively on the South African economy should the industry fail to exist in the long term.
Global Steel Industry

Steel is a heavily traded commodity in the global markets and it drives many manufacturing sectors (Commission, 2016). Steel is traded on the London Metal Exchange (LME) alongside that of precious metals and other minor metals while the prices are benchmarked globally in the categories of rebar and scrap. This indicates the significance of the commodity and its ability to drive markets and industry.

Global steel production has been on a growth trajectory for the last decade. Based on data gathered from the World Steel Association, which collates approximately 99% of total world crude steel production from 67 countries, it is evident that China is a super-producer of crude steel. China produces almost half of the total global steel production resulting in its experiences of excess capacity and oversupply of this commodity. Figure 1b Top Steel Producing countries, illustrates the top producing countries and relative size to market share based on 2015 data analysed.

![Top 10 Crude Steel Producing Countries in 2015](source)

**Figure 1 b Top Steel Producing countries for the year 2015**

Source: (World Steel Association, 2015)
The analysis conducted by the World Steel Association also shows that China is a major producer and consumer of steel and related steel products. It estimates that China processed approximately 803.8 million tonnes of crude steel production in 2015 with Japan second in line with 105.2 million tonnes (Basson, 2016). Lower down in the ranking are producers such as India (89.4 million tonnes), US (78.3 million tonnes) and Russia (70.9 million tonnes) (Basson, 2016). Other countries with high steel production include South Korea, Germany, Brazil and Turkey although production is minimal volumes when comparing them to the majors. Based on the World Steel Association figures published between 2009 and 2015, China consumed almost half of the global production of steel (Basson, 2016). During 2015, there was a global production of 1,620.9 million tonnes of steel. China produced 803.8 million tonnes and consumed 672.3 million tonnes in the same period (Basson, 2016). Asia consumes most of the steel production globally and the accusation by the United States (US), European Union (EU) that China dumps excess capacity on other countries needs to be analysed further in detail.

<table>
<thead>
<tr>
<th>Region</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union</td>
<td>121.20</td>
<td>146.40</td>
<td>140.30</td>
<td>142.00</td>
<td>142.00</td>
<td>149.10</td>
<td>153.30</td>
</tr>
<tr>
<td>Other Europe</td>
<td>23.20</td>
<td>28.80</td>
<td>32.70</td>
<td>34.10</td>
<td>36.90</td>
<td>37.10</td>
<td>40.10</td>
</tr>
<tr>
<td>CIS</td>
<td>35.90</td>
<td>49.50</td>
<td>55.30</td>
<td>57.70</td>
<td>58.70</td>
<td>56.00</td>
<td>50.00</td>
</tr>
<tr>
<td>NAFTA</td>
<td>83.90</td>
<td>111.70</td>
<td>123.20</td>
<td>132.70</td>
<td>129.90</td>
<td>146.70</td>
<td>134.50</td>
</tr>
<tr>
<td>Central and South America</td>
<td>33.30</td>
<td>45.20</td>
<td>47.10</td>
<td>48.70</td>
<td>51.30</td>
<td>48.90</td>
<td>45.40</td>
</tr>
<tr>
<td>Africa</td>
<td>31.90</td>
<td>28.40</td>
<td>29.40</td>
<td>32.90</td>
<td>36.40</td>
<td>37.40</td>
<td>39.00</td>
</tr>
<tr>
<td>Middle East</td>
<td>46.00</td>
<td>48.70</td>
<td>51.30</td>
<td>50.70</td>
<td>51.70</td>
<td>53.50</td>
<td>53.00</td>
</tr>
<tr>
<td>Asia</td>
<td>770.30</td>
<td>843.90</td>
<td>912.80</td>
<td>939.30</td>
<td>1020.60</td>
<td>1010.60</td>
<td>977.50</td>
</tr>
<tr>
<td>World Total Consumption</td>
<td>1145.70</td>
<td>1302.60</td>
<td>1392.10</td>
<td>1438.10</td>
<td>1527.50</td>
<td>1539.30</td>
<td>1492.80</td>
</tr>
</tbody>
</table>

Table 1 Steel Use - Million tonnes finished steel products

Adapted from: (World Steel Association, 2016)
Table 1 Steel Use-Million tonnes finished steel products; provides a trend view on the consumption side of the steel industry. The table indicates that Asia has been consuming the largest share of steel since 2009. Data on steel production indicates that no material changes have emerged from the major producers of crude steel since 2009. China remains the top producer in the 2016-17 periods with an output in the region of ±800 million tonnes (World Trade Organisation, 2017). Figure 2 below global steel production dispersal 2016, provides a view on the spread of the global producers and tonnage per country. Africa and particular South Africa is one of the lowest producers in metric tonne based on the dispersal in steel production, providing an interesting view based on the fact that there is vast natural resources as raw materials to establish a steel manufacturing industry.

**Figure 2 Global Steel Production Dispersal in 2016**

Source: (World Steel Association, 2016)
In the context of top steel producing companies globally, ArcelorMittal is ranked as the top producer globally, with a total of 97.14 million tonnes in 2015 (Basson, 2016) as per Table 2 Top Steel producing companies globally. ArcelorMittal is therefore well positioned as a major player in the steel industry as it controls a major portion of the steel production. The ability of the holding company to remain the top producer of steel and remain profitable is concerning for the South African operations which seem to have not taken learnings or considered opportunities to improve or streamline its local operations. This is a question that requires a detailed understanding of the ArcelorMittal SA manufacturing processes and operations strategy in order to identify opportunities.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ArcelorMittal</td>
<td>97.14</td>
</tr>
<tr>
<td>2</td>
<td>Hesteel Group</td>
<td>47.75</td>
</tr>
<tr>
<td>3</td>
<td>NSSMC</td>
<td>46.37</td>
</tr>
<tr>
<td>4</td>
<td>POSCO</td>
<td>41.97</td>
</tr>
<tr>
<td>5</td>
<td>Baosteel Group</td>
<td>34.94</td>
</tr>
<tr>
<td>6</td>
<td>Shagang Group</td>
<td>34.21</td>
</tr>
<tr>
<td>7</td>
<td>Ansteel Group</td>
<td>32.5</td>
</tr>
<tr>
<td>8</td>
<td>JFE Steel Corporation</td>
<td>29.83</td>
</tr>
<tr>
<td>9</td>
<td>Shougang Group</td>
<td>28.55</td>
</tr>
<tr>
<td>10</td>
<td>Tata Steel Group</td>
<td>26.31</td>
</tr>
</tbody>
</table>

Table 2 Top steel producing companies globally

Adapted from: (World Steel Association, 2016)
Overview of the South African Steel Supply Chain

Figure 3 below, depicts the steel value chain and the points of intersection with competitors globally. South Africa’s challenges to compete with the influx of cheaper steel products in the various downstream markets, indicates that a small volume of steel is beneficiated in South Africa while the bulk of iron ore is exported as raw material, thereby impacting negatively on the local market downstream (Thulare, 2015). In addition to the export of raw materials, the influence of imports on the downstream sector also plays a significant role in the decline of productivity and competitiveness. Although one could argue that competition and imports are beneficial to the economy in various ways, the effects are felt where an industry struggles to innovate their manufacturing strategies or find alternate markets to supply products.

Figure 3 Overview of the Steel Supply Chain in South Africa

Source: (Thulare, 2015)
Steel Market in South Africa

The large producers in the South African steel manufacturing industry are ArcelorMittal, Evraz Highveld Scaw, Cape Gate and Cisco with AMSA (ArcelorMittal South Africa) being the dominant player. ArcelorMittal was formed in 2006, through the merger of Luxembourg-based Arcelor and Indian-based Mittal, culminating in it becoming the largest steel producer globally and positioned in South Africa as the market leader claiming the largest portion of both flat steel and long steel products (Industry, 2014). According to ArcelorMittal, in South Africa, for every R1 million spent by the company, there are 3.5 jobs that are created (Industry, 2014). Therefore, this industry does not only have a significant and direct impact on the local South African economy when taking into account job creation and sustainability but also has a strategic bearing on the South African economy as a whole. The South African steel industry directly contributes 1.5% to the Gross Domestic Product (GDP) and indirectly supports 15% of the other industries in the South African economy that employ ±8 million people (Commission, 2016).

The overflow of cheaper Chinese products (surplus capacity), the shifts in market dynamics and the reduction in the global demand for steel products are significantly impacting on the South African steel industry. Considering that South Africa is not the only country affected by the Chinese over production and surplus capacity which is compounded by a global decline in demand, safeguards have been implemented in Europe and the United States to protect their local steel industries. South Africa is lagging behind the rest of the world in protecting its strategic steel sector because it only placed a 10% duty (from 0%) in 2016 on certain products i.e. large bore pipes, wire rods, rebar products, semi-finished steel products, plate, cold rolled and other
bars and rods. During 2016 Q2, steel imports decreased by 11.5% (234.8 million Kg to 207.8 million Kg) and a further reduction was seen in the quarterly average from 2015 of 28.8% (Commission, 2016). Safeguards by tariffs that have been implemented through government intervention in the local steel market have produced positive results for the South African steel sector. Short term intervention through tariff increases may not be sustainable due to the dynamic nature of these markets and business cycles.

The South African government has realised the detrimental impact of free trade policies with China on the country. The International Trade Administration Commission (ITAC,2016) has subsequently positioned a tariff for the next three years of 12% followed by 10% and then 8% to ensure the viability and sustainability of the local steel sector for certain hot rolled products (Engineering News, 2017).

In order to position the case for protectionism for the local steel industry, a summary of global safeguards implemented illustrates the trend towards shielding the local steel sector as a strategic enabler for the South African economy (Commission, 2016).

**Steel Value Chain**

The steel value chain in South Africa consists of various role players in the upstream and downstream sectors which are closely integrated to supply the South African market with final products used as inputs into sectors such as automobile manufacturing, construction and telecommunications. The entire steel value chain is impacted as a result of competitors and market shocks that need to be considered in providing solutions to the problems raised by the steel industry. Increased tariffs
addresses only one portion of the value chain and do not consider the alternatives of developing a competitive steel industry as a whole.

2.4 Government’s role in influencing the steel markets

International trade relations and trade regulation is a highly complex affair which involves multiple levels of institutions, organisations and governments (Cohn, 2017). Governments play a strategic role in ensuring there is balance in the market and intervenes when it is necessary. South Africa is driven by a free market economy with relatively low levels of government intervention. On the far end of the scale China is strongly influenced by its own government in that the Chinese government owns a large portion of the industries and invests significantly in its local economy. The role government plays in implementing safeguards to protect any of its local markets can be considered as make or break for any industry. South Africa has relaxed many of its trade barriers to allow the free flow of goods into the country. China on the other hand has retained barriers for trade and implemented various measures to ensure that its industry remains competitive.

The role of the World Trade Organisation (WTO)

Prior to the WTO the GATT previously aimed to coordinating global trade activities and multilateral trade negotiations (Cohn, 2017). Various rounds of negotiations took place over the years and were referred to as the Tokyo round, Genoa and Doha rounds which resulted in growing in the number of member countries to ensure trade negotiations and globalisation was coordinated and rules of trade were effective (Cohn, 2017).
The role of the World Trade Organisation (WTO) will be briefly explored below that will provide context to the global situation and policies that drive the steel industry and relates to the global view on steel trade and anti-dumping measures instituted to protect certain countries. World Trade Organisation is an international body that provides guidelines on international trade which in turn helps facilitating the process of globalisation of trade. The World Trade Organisation's primary role is to handle rules of trade between nations (World Trade Organisation, 2017). Previously, the GATT existed since 1947 and was replaced by the WTO in 1995. The key role of the WTO is to facilitate the flow of trade through negotiated agreements between nations which are then ratified by the various parliaments before implementing these agreements. South Africa became a signatory to the WTO in 1948 while China after an arduous and lengthy negotiation process became a member in 2001 (World Trade Organisation, 2017). China has seen significant growth in its exports and GDP since its signatory to the WTO in 2001 being an enabler of trade, facilitating secure trade and entry into foreign markets (World Trade Organisation, 2017). Anti-dumping has been high on the agenda of the WTO, where Japan raised the issues around the increase of investigations issued to the WTO particularly in the steel sector relating to overcapacity from emerging markets. Various players in the steel sector have placed anti-dumping duties as a measure to protect their local steel markets. The United States is leading the debate by imposing anti-dumping duties against Austria, Belgium, France, Germany and Italy for certain imports of certain carbon and alloy steel cut-to-length plate. The reality of international trade, globalisation and reduced barriers creates a unique situation in which countries need to consider the trade-offs of conducting trade in a sustainable manner benefiting both home country and trade partner.
2.5 Conclusion of literature review

There has been significant research conducted on various sectors, namely textiles and poultry in South Africa, relating to the impact on the importation of cheaper duty free goods from China and Brazil respectively, while considering the harmful effects this has had on the local economy. In addition, the role that government plays in South Africa through setting policy to enable the local market by providing the correct regulatory frameworks should be further studied. The alternatives include protectionism and other trade barriers to boost the economy for locally manufactured goods that have not been supported or justified in the available literature. Also, the above mentioned factors should be carefully considered when taking into account the problem pertaining to the high unemployment rate in South Africa which still remains both for economic policy makers and decision makers in government. This topic is to be investigated further to find plausible solutions for the South African steel industry as a whole in order to balance the relationships through the various trade agreements whilst protecting the South African local interests.

The research proposes to answer the following:

**Research Question 1:** Is South Africa steel industry competitive or comparable to the Chinese steel industry?

**Research Question 2:** Is the South African government correctly equipped or positioned to protect the local steel industry?
This section describes the methodology that will be followed to address the research questions in the Literature Review Section.

3.1 Research methodology

Due to the complexity of the research questions and the complexity of the case which has evolved over a period of approximately three years in the local steel sector, compounded by the issues in the political and economic landscape, the methodology to be used for this study will be Quantitative Research.

Quantitative Research provides an objective and reliable view on the situation (Welman, Kruger, & Mitchell, 2005) and removes subjectivity that the researcher may have or opinions and preconceived ideas about the situation. In quantitative research the researcher consider various variables and data points in developing a conclusion (Welman, Kruger, & Mitchell, 2005). Quantitative research removes subjectivity and biases from the researcher through developing findings based on real statistics or data, providing a scientific approach to the study (Welman, Kruger, & Mitchell, 2005). Statistical modelling is considered to be a suitable method to answer questions put forward for this type of research in that the data provides the real trends and concrete results for comparison. Quantitative research is based on actual data points which remove subjectivity, speculation and opinions while ensuring the research problem and proposed solutions are supported by quantifiable data.
The research methodology applied for the purposes of this study will be Descriptive Analysis which will include displaying data in tables, graphs, bar charts, pie charts and histograms while describing the data through these formats. Descriptive statistics includes the mean (average), measure of central tendency and variability measures. Inferential statistics which will also be part of the study will include regression analysis which incorporates identification, model building and conclusion or interpretation of the results through the testing of means for steel production between China and South Africa. Regression analysis includes modelling and analysing the relationships between a number of variables in order to draw conclusions about a problem or situation. Included in regression analysis is the relationship between a dependant variable and independent variable (s). Regression analysis is also a form of predictive analysis or modelling and is mainly used to indicate the significance of the relationship between the dependant and independent variables.

The research aims to investigate the following through Descriptive Statistics and Inferential Statistics:

- Relationship (cause/effect) between the introduction of reduced trade barriers between South Africa and China and impact thereof on the local steel industry
- Correlation between Chinese imports and decline in local demand or production volumes for South African Steel products
- Influence of trade remedies or tariffs on the steel industry as a whole
- Influence of economic positioning of the South African Steel Industry
Testing for the influence of global steel production on South African markets was done through the use of the SAS Statistical Software package.

The results of the statistical analysis are presented below in both tabular and graphical format. The results presented test the null hypothesis by either accepting or rejecting the null hypothesis statement.

Below is the null hypothesis statement.

- **H0**: South Africa Production = China Production
- **Alternative**
  - **H1**: South Africa < China

Data collated since 1990 up to 2017, was used to provide sufficient measurement in time (time series) to determine the effects. South African steel production was used as the dependant variable for comparison with the Top 10 Global Steel producing countries, with the main comparison between the South African and Chinese steel industry.

### 3.2 Research Design

Data analysis with the use of descriptive statistics and inferential statistics will be used to validate the information to support recommendations and conclusions for the two key research questions. Data collection through secondary sources is commonly used as a tool to search for information from reliable databases and sources. Secondary data is relatively easily accessible and the quality of the data is generally
high. Data analysis is a method of deciphering the data that is already collated and structured in a meaningful format.

The key advantage of this approach to research involves that of removing the researcher from the biases or opinions of the study i.e. Opinion: China is dominant; data proves the opinion or view without subjectivity. The focus being purely on the data ensures the accuracy and credibility of the source, as opposed to other forms of research i.e. Survey’s and interviews. Although there are benefits of conducting alternate methods of research to obtain underlying insights which may not be obvious in data, the approach followed should provide bearing to the study. Interviews or Surveys with various stakeholders may provide a bias towards their company / industry in order to distort the information while striving to achieve a desired outcome from the research. Data gathered from sources such as the DTI, WTO and IMF have gone through a form of scientific validation and ratification, as well as a form of statistical analysis prior to publishing the data for public use. Therefore, the integrity and trustworthiness of the data sources can be confirmed as highly credible or auditable.

3.3 **Population and sample**

For the purposes of this research, the local South African steel industry will be studied in comparison to the Chinese steel industry and evaluated against 10 additional steel producing economies from selected data sets i.e. including India, Japan, US, Germany and South Korea. Further analysis conducted on the impact of imports into South Africa considering the reduced tariffs applied for specific Iron and Steel (Articles of Iron and Steel) products from the top 10 producing countries.
3.3.1 Sample and sampling method

Economic steel pricing, indicators and trends over the past five years will be collected. The use of secondary data is the main method of sampling and data collection. This will be used for the comparisons between China’s and South Africa’s productivity and competitiveness in the steel sector. This will also form the basis of the sample. Steel production output per country, global steel safeguards across products in steel including the tariff rates per comparison between South Africa and China.

3.4 The research instrument

Secondary data sources and data points extracted from online databases shall be used for historical economic data and performance metrics; online internet research from reliable sources and credible databases will be used and assessed through the use of a statistical analysis tool. General political and financial views will be collated from reliable and credible sources (experts) to support data where applicable. Indicators such as Prices, Steel Index and Trade Balance (Imports analysis), reductions or increases in tariffs in accordance with the World Trade Organisation (WTO) will be the sourced.

3.5 Procedure for data collection

The researcher intends to obtain data from credible sources and trustworthy databases. Secondary data will be the main source for analysis. Data sourced from online databases published by reputable organisations will be used i.e. World Trade
Organisation (WTO), Department of Trade and Industry (DTI) and the International Monetary Fund (IMF). The procedure for data collection for both economic and production figures includes that of searching for valid databases, obtaining and extracting information from online databases, then transferring and manipulating the data into applicable graphs. The data will be tested within an approved statistical software tool such as SAS (Statistical Analysis Software).

Data selected and collected to support the type of methodology of quantitative research through descriptive analysis encompassed the sourcing of relevant data points pertaining to production volumes and trends, imports volumes and values for South African steel markets, Export Analysis for products of Iron and Steel. In addition and included in the data selected, in order to compare global prices for long and flat steel articles, while including economic factors such as input cost relating to price of Iron Ore the main feedstock for final steel products, Labour Rates in both base country and comparable country over a sufficient period to support the analysis. Further data selected included economic data pertaining to the fluctuations in the currency for both the base country (South Africa) and compared country (China). Specific data selected and analysed intends to focus the scope of the study to South Africa and China for the steel markets. Inclusions of additional countries were deliberately excluded from the detailed scope however provide context to the overall steel market globally. The focus of this study is developed to understand the relationship and competitiveness between China and South in relation to the steel sector. Data from secondary, credible, auditable and reliable databases and third party sources provided essential input for the statistical analysis. Secondary data source mainly obtained from government organisations, company annual reports and
global trade institutions ensure reliability and validity of the data sources or numerical figures applied in the form of descriptive statistics. The method chosen for sourcing and collection of data from credible approved databases ensured ease of access and data integrity.

Below is a table outlining the data sources per analysis conducted as part of the study:

<table>
<thead>
<tr>
<th>Data Analysis per Category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Steel Production Volumes and Value per country</td>
<td>World Steel Association, DTI</td>
</tr>
<tr>
<td>Imports Analysis for Iron and Articles of Steel for South Africa</td>
<td>DTI</td>
</tr>
<tr>
<td>Export Analysis for Iron and Articles of Steel for China</td>
<td>DTI, Trading Economics</td>
</tr>
<tr>
<td>Cumulative Bilateral Trade SA, China</td>
<td>SARS</td>
</tr>
<tr>
<td>Trade Policies for Steel and Articles of Steel</td>
<td>ITAC</td>
</tr>
<tr>
<td>Detailed Analysis on Tariffs SA, China</td>
<td>WTO</td>
</tr>
<tr>
<td>Economic Data Sources i.e. Pricing, Wages, Currency Trends</td>
<td>Trading Economics</td>
</tr>
<tr>
<td>AMSA Specific Data - Pricing, Production, Volumes, etc.</td>
<td>AMSA</td>
</tr>
</tbody>
</table>

3.6 Data analysis and interpretation

Secondary data focusing on economic, production, consumption and sales metrics will be analysed over a sufficient period of time. Trend analysis and comparative data over five or more years will be obtained in order to make reasonable assumptions and to support arguments and the recommendations made within this research. The use of descriptive and inferential statistics will be applied as the instrument to explain the data points, changes in the data, spread, variability and trends in the data collated.

Descriptive statistics involves the description obtained from a group of individual units for the purposes of analysis. In the case of one variable, the analysis is called univariate analysis, whilst in the case of two variables that are used involves
bivariate analysis and lastly the involvement of two or more variables are multivariate analysis (Welman, Kruger, & Mitchell, 2005). Inferential statistics is concerned with inferences, which one makes about the population indices. The t-test and analysis of variance enable us to determine if two groups have different or similar mean scores (Welman, Kruger, & Mitchell, 2005). A t-test also determines whether an observed difference in means is sufficiently large to be attributed to a change in some variable or alternately if it had occurred by chance (Welman, Kruger, & Mitchell, 2005). Linear Regression analysis will be used to determine relationships between South Africa and China. Regression Analysis is the simplest form of statistical analysis that is used in order to determine relationship between a dependant and independent variables. Regression is mainly used in forecasting and predictive analysis. In its simplest form regression is used to examine the relationship between two things. The main reason to conduct regression analysis is to determine (1) causal analysis, (2) forecasting effect and (3) trend forecasting. Regression analysis is useful in determining how the dependant variable changes with changes in one or more changes in the independent variable. The formula below illustrates the regression analysis applied in the model:

\[ y = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + \beta_n x_{in} \]

Where \( y \) = dependant variable;
\( \beta_0 \) =Constant  \( \beta_1 \) =Regression Coefficient  \( x_{i1} \) = Independent Variable

Both methods of statistical analysis, descriptive and inferential will be applied in this study. Comparisons included in the areas of analysis for both the South African Steel Sector and the China Steel Sector:
1. Steel Production per country through regression analysis
2. Imports Volume per country into SA through regression analysis
3. Economic trends i.e. SA Exchange Rate, Wage Rates
4. Comparative price of sale based on AMSA and Global Steel Price
5. Import Duties comparison between China and SA

3.7 Limitations of the study

Pure data analysis through the use of descriptive statistics does not provide real insight into external factors influencing the study such as the social and political climate. Potential gaps in conducting quantitative research may arise from missing the opportunity in identifying personal feelings, opinions, experiences that could substantiate or supplement the data analysed. Access to relevant information on steel commodity prices and demand data through online databases requires registration there is an associated cost payable.

3.8 Validity and reliability

3.8.1 External validity

From the research, it can be concluded that the external validity of this research is moderate to high. The same research principles can be applied to other industries such as textiles, clothing and Poultry. The research can be applied or extended to other countries without restrictions. It is noted that economies differ from country to country based on the positioning of their economies which may be developed versus emerging markets, hence the data may not be directly comparable i.e. skill levels,
education levels, infrastructure maturity, population size, GDP per capita are factors which may not be of a similar level.

3.8.2 Internal validity

Internal validity deals with the relationship between independent and dependant variables and whether the relationship is attributed to a causal nature (Welman et al., 2005). In those changes in one variable is responsible for the changes in the dependant variable (Welman et al., 2005). In terms of the research conducted, the relationship between Chinese imports and South African steel sector’s decline in production volumes (production or output) will be compared to determine a causal relationship. The internal validity of the research would rank high. Real steel prices and economic data for the past five years will be used which validates the internal validity. Comparison and validation of data against various sources guarantees data integrity and validity.

3.8.3 Reliability

The results should be repeatable or replicable under a similar methodology (Thulare, 2015). Methodology applied in the research should be consistent in that the data collected during the research be available for additional scrutiny (Thulare, 2015). In the case of this research, credible secondary data and analysis i.e. internet sources, databases and reliable data will be used to conduct the research. Secondary data will be the main source for analysis hence the reliability of the data and the study should be considered as high. The ability to repeat the study through a similar methodology and approach indicates that the process for reliability is transparent.
CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the results of the quantitative research conducted by means of inferential and descriptive statistics. The results produced are through the use of SAS (Statistical Analysis Software). Data sources used are reliable and credible, based on data source from Department of Trade and Industry (DTI), Trading Economics Online Databases, World Trade Organisation (WTO) and the International Monetary Fund (IMF). In addition, supplementary data was sourced from ArcelorMittal South Africa (AMSA), annual financial results for pricing information, volumes, raw materials basket costs and other relevant statistics (audited results).

4.2 Results pertaining to Research Question 1

4.2.1 Production Volumes comparison for Top 10 steel producing countries

Figure 4 Steel Production Trends for Top 10 Steel Producing Countries, provides a view on the state of the steel production capacity since 1990. This provides insights into the market trends and increase in production output per country. One can deduct from the graph that China surpassed Japan in 2017 in terms of its steel production while Japan has remained stable. Other countries which have a similar trend are the likes of India while the United States has significantly dropped its output since the global financial crisis. Turkey has also demonstrated increases in
production while South Africa has seen a slight decline with a downward trend in 2017.

Figure 4 Steel Production Trends for Top 10 Steel Producing Countries

Period 1990 until 2017

The figure 4 above illustrates the volume of steel produced per country on a monthly basis reported since 1990 until 2017. China experienced exponential growth since 1990, with rapid growth in production surpassing Japan as the major producer during 2009; there was a steep decline in output due the global financial crisis which is indicated by the graph downturn.
Figure 5 Steel Production Split

Adapted from: (World Steel Association, 2016)

The pie chart above, Figure 5 Steel Production Split per regions provides a view on the steel production split globally in percentages with China contributing ±50% of production in steel globally. This indicates the dominance of the China steel industry and sustained growth trend.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Error</th>
<th>t Value</th>
<th>Pr &gt;</th>
<th>t</th>
<th>Coeff of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>South African Steel Production</td>
<td>680.4951368</td>
<td>104.8267065</td>
<td>5.779283406</td>
<td>117.75</td>
<td>0.0000</td>
<td>15.40447548</td>
<td></td>
</tr>
<tr>
<td><strong>Japan Steel Production</strong></td>
<td><strong>8825.255702</strong></td>
<td>764.985683</td>
<td>42.17502593</td>
<td>209.25</td>
<td>0.0000</td>
<td>8.668141852</td>
<td></td>
</tr>
<tr>
<td>USA Steel Production</td>
<td>7412.401216</td>
<td>866.0551175</td>
<td>47.74716423</td>
<td>155.24</td>
<td>0.0000</td>
<td>11.68386724</td>
<td></td>
</tr>
<tr>
<td>Russia Steel Product</td>
<td>5143.452459</td>
<td>827.6812839</td>
<td>47.39289245</td>
<td>108.53</td>
<td>0.0000</td>
<td>16.09194001</td>
<td></td>
</tr>
<tr>
<td>South Korea Steel Production</td>
<td>4012.183799</td>
<td>1182.02192</td>
<td>65.16697794</td>
<td>61.57</td>
<td>0.0000</td>
<td>29.46081185</td>
<td></td>
</tr>
<tr>
<td>India Steel Production</td>
<td>3751.881459</td>
<td>2210.257497</td>
<td>121.8554403</td>
<td>30.79</td>
<td>0.0000</td>
<td>58.91064313</td>
<td></td>
</tr>
<tr>
<td><strong>China Steel Production</strong></td>
<td><strong>3730.009119</strong></td>
<td>2198.70266</td>
<td>121.2184015</td>
<td>30.77</td>
<td>0.0000</td>
<td>58.94630791</td>
<td></td>
</tr>
<tr>
<td>Germany Steel Production</td>
<td>3596.578541</td>
<td>365.0722495</td>
<td>20.12708464</td>
<td>178.69</td>
<td>0.0000</td>
<td>10.15054295</td>
<td></td>
</tr>
<tr>
<td>Ukraine Steel Production</td>
<td>2602.701639</td>
<td>582.7627029</td>
<td>33.3688953</td>
<td>78.00</td>
<td>0.0000</td>
<td>22.39068413</td>
<td></td>
</tr>
<tr>
<td>Brazil Steel Production</td>
<td>2426.100304</td>
<td>390.2683086</td>
<td>21.5168834</td>
<td>112.76</td>
<td>0.0000</td>
<td>16.08623963</td>
<td></td>
</tr>
<tr>
<td>Turkey Steel Production</td>
<td>1749.841252</td>
<td>756.8318095</td>
<td>41.72548833</td>
<td>41.94</td>
<td>0.0000</td>
<td>43.25145544</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Summary of Statistics, Comparison of the Top 10 Steel Producers

Countries which displayed significant growth in steel production include United States, Japan and Russia. Japan remained the top steel producer globally in terms
of production based on an average since 1990. The null hypothesis test was used to
determine that South African production equates China production, South African
production is not equal to China production and thirdly that South African is less than
China. This is clearly based on the size of the workforce, size of the country and
available resources in China. China may not have the vast natural resources that SA
has however; China does have the labour capacity to produce the volumes. China
has also invested in upskilling its workforce in the years which provides an added
competitive advantage over South Africa. Based on the data, it is clearly evident that
South Africa is not equal to China, hence the rejection of the null hypothesis and
therefore acceptance of the alternative as true; that South African steel production in
monthly volumes is significantly less than China since 1990. In this case the null
hypothesis is rejected if the p-value ≤ α where α is the significance level (5%).

Data analysed in Table 4, Correlation Analysis – SA Steel Production and China
Steel Production which measures the average steel production, minimum steel
production and maximum steel production per country since 1990. Based on the
data output, China experienced a minimum steel production of 1128 and a maximum
steel production of 9000 (thousand tonnes), whereas South Africa experienced a
minimum steel production of 182 and maximum steel production of 885 (thousand
tonnes) during the same period.
Correlation Analysis

2 Variables: South African Steel Production, China Steel Production

### Simple Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Sum</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>South African Steel</td>
<td>329</td>
<td>680.4951368</td>
<td>104.8267065</td>
<td>223882.9</td>
<td>182</td>
<td>885</td>
</tr>
<tr>
<td>China Steel Production</td>
<td>329</td>
<td>3730.009119</td>
<td>2198.70266</td>
<td>1227173</td>
<td>1128</td>
<td>9000</td>
</tr>
</tbody>
</table>

Pearson Correlation Coefficients, N = 329

<table>
<thead>
<tr>
<th></th>
<th>South African Steel Production</th>
<th>China Steel Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>South African Steel</td>
<td>1.0000</td>
<td>-0.52249</td>
</tr>
<tr>
<td>China Steel</td>
<td>-0.52249</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Table 4 Correlation Analysis - SA Steel Production and China Steel Production

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Err</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>329</td>
<td>-3049.51</td>
<td>2255.245</td>
<td>124.3357</td>
<td>-8507.1</td>
<td>-383</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean</th>
<th>95% CL Mean</th>
<th>Std Dev</th>
<th>95% CL Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3049.51</td>
<td>-3294.11</td>
<td>2255.245</td>
<td>2442.1275</td>
</tr>
</tbody>
</table>

| DF | t Value | Pr > |t| |
|----|---------|------|---|
| 328| -24.53  | 0.0000 |

Table 5 Paired t-Tests
Figure 6 Distribution between South African Steel Production and China Steel Production

Figure 7 Distribution between South African Steel Production and China Steel Production
<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Err</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>329</td>
<td>680.4951</td>
<td>104.8267</td>
<td>5.779283</td>
<td>182</td>
<td>885</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean</th>
<th>95% CL Mean</th>
<th>Std Dev</th>
<th>95% CL Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>680.4951</td>
<td>669.126</td>
<td>691.8643</td>
<td>104.8267</td>
</tr>
</tbody>
</table>

| DF  | t Value | Pr > |t| |
|-----|---------|------|-----|
| 328 | 117.75  | 0.0000 |

Table 6 South African Steel Production (t - Test)

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>10</td>
<td>2354474.923</td>
<td>235447.4923</td>
<td>65.77</td>
<td>0.0000</td>
</tr>
<tr>
<td>Error</td>
<td>294</td>
<td>1052542.928</td>
<td>3580.077986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>304</td>
<td>3407017.851</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>Type II SS</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>176.1783366</td>
<td>44.13223396</td>
<td>57053.9443</td>
<td>15.94</td>
<td>0.0001</td>
</tr>
<tr>
<td>* Japan Steel Production</td>
<td>0.026961138</td>
<td>0.0094832</td>
<td>28937.37405</td>
<td>8.08</td>
<td>0.0048</td>
</tr>
<tr>
<td>* USA Steel Production</td>
<td>-0.007889378</td>
<td>0.007199132</td>
<td>4299.498667</td>
<td>1.20</td>
<td>0.2740</td>
</tr>
<tr>
<td>* Russia Steel Product</td>
<td>0.036195547</td>
<td>0.010852974</td>
<td>39820.36288</td>
<td>11.12</td>
<td>0.0010</td>
</tr>
<tr>
<td>* South Korea Steel Production</td>
<td>-0.038726064</td>
<td>0.013105883</td>
<td>31258.39456</td>
<td>8.73</td>
<td>0.0034</td>
</tr>
<tr>
<td>* India Steel Production</td>
<td>0.015905864</td>
<td>0.017135606</td>
<td>3084.665609</td>
<td>0.86</td>
<td>0.3540</td>
</tr>
<tr>
<td>* China Steel Production</td>
<td>-0.019889525</td>
<td>0.015903873</td>
<td>5599.322622</td>
<td>1.56</td>
<td>0.2121</td>
</tr>
<tr>
<td>* Germany Steel Production</td>
<td>0.024861883</td>
<td>0.015750498</td>
<td>8920.145147</td>
<td>2.49</td>
<td>0.1155</td>
</tr>
<tr>
<td>* Ukraine Steel Production</td>
<td>0.028367766</td>
<td>0.01185864</td>
<td>20486.74582</td>
<td>5.72</td>
<td>0.0174</td>
</tr>
<tr>
<td>* Brazil Steel Production</td>
<td>0.129245249</td>
<td>0.023490744</td>
<td>10837.74781</td>
<td>30.27</td>
<td>0.0000</td>
</tr>
<tr>
<td>* Turkey Steel Production</td>
<td>-0.094352084</td>
<td>0.025622361</td>
<td>48546.41756</td>
<td>13.56</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

Table 7 Linear Regression Analysis the Top 10 Steel Producers
Figure 8 Scatter Plot, Steel Production Comparison - Top 10 Steel Producers

Correlations observed are based on visual assessment of the scatter plot diagram in Figure 8, Scatter Plot, Steel Production Comparison – Top 10 steel producing countries; correlations exist between countries such as Japan, United States, Germany, Ukraine and Brazil which are presented to similar. No correlation or a negative correlation exists between Russia, South Korea, India, China and Turkey.
4.2.2 Assessment of the influence of imports on South African Steel Markets

a) Imports Analysis for the period 2015 – 2017

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>10</td>
<td>6225521.943</td>
<td>622552.1943</td>
<td>0.88</td>
<td>0.5648</td>
</tr>
<tr>
<td>Error</td>
<td>18</td>
<td>12684974.61</td>
<td>704720.8116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>28</td>
<td>18910496.55</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Root MSE 839.47651  R-Square 0.3292  Dependent Mean 9910.34483  Adj R-Sq -0.0435  Coeff Var 8.47071

| Variable         | Parameter Estimate | Standard Error | t Value | Pr > |t| | Squared Partial Corr Type I | Squared Partial Corr Type II |
|------------------|--------------------|----------------|---------|-------|---------------|-----------------------------|-----------------------------|
| Intercept        | 9445.090438        | 830.4340629    | 11.37   | 0.0000|               |                             |                             |
| China_IaS_V      | 2.46296E-06        | 6.12006E-06    | 0.40    | 0.6921| 0.005109166   | 0.008917436                 |
| Japan_IaS_V      | -9.75883E-06       | 2.61351E-05    | -0.37   | 0.7132| 0.000217593   | 0.007686384                 |
| India_IaS_V      | 1.65802E-05        | 3.69028E-05    | 0.45    | 0.6586| 0.010977972   | 0.011090287                 |
| Russia_IaS_V     | -0.000333444       | 0.000561985    | -0.59   | 0.5603| 0.020497937   | 0.019182814                 |
| Germany_IaS_V    | -9.62811E-06       | 5.94441E-05    | -0.16   | 0.8731| 0.014811516   | 0.001455323                 |
| Brazil_IaS_V     | 4.00713E-05        | 0.000361446    | 0.11    | 0.9130| 0.000629236   | 0.000682358                 |
| Turkeyl_IaS_V    | -5.24613E-05       | 0.000147658    | -0.36   | 0.7265| 0.001784035   | 0.006964003                 |
| Ukraine_IaS_V    | 0.018746918        | 0.014661806    | 1.28    | 0.2173| 0.055074075   | 0.083263879                 |
| USA_IaS_V        | 0.000202773        | 0.000345532    | 0.59    | 0.5646| 0.094781956   | 0.018773306                 |
| SouthKorea_IaS_V | 0.000113077        | 5.84941E-05    | 1.93    | 0.0691| 0.171918686   | 0.171918686                 |

b) Exports Analysis Period from 2015 – 2017 for Iron and Steel

| Variable                    | Parameter Estimate | Standard Error | t Value | Pr > |t| | Squared Partial Corr Type I | Squared Partial Corr Type II |
|------------------------------|--------------------|----------------|---------|-------|---------------|-----------------------------|-----------------------------|
| Intercept                   | 4457723720         | 447358287.8    | 9.96    | 0.0000|               |                             |                             |
| Export_to_China_IaS_Volume  | 3.582899752        | 2.888086799    | 1.24    | 0.2258| 0.06583042    | 0.055885623                 |
| Export_to_China_IaS_Art_Volume_2 | -547.5607677 | 1256.044071    | -0.44   | 0.6665| 0.00725636    | 0.007256357                 |

Table 8 Summary of linear regression for steel imports and exports
The export analysis conducted and presented in Table 8 (b), Export Analysis Period 2015 – 2017 for Iron and Steel, via a regression analysis indicates a p-value greater than the significance level (0.05) for both Iron and Steel (0.2258) and Articles of Iron and Steel (0.666) in volumes. Trade with only China is 16.15% with respect to Iron & Steel for exports during 2017, indicated by Figure 9 Cumulative Bilateral Trade Profile for South Africa based on exports directly to China contribute to 16.15% of the total baskets of items exported into the Chinese markets. This indicates a large amount of minerals, and iron or steel (in raw material format) is being exported for further production in the Chinese value chain, thereby creating value-added products to support their export markets.
4.3 Results pertaining to Research Question 2

Review of the South African safeguards and actions pertaining to the protection of the local steel industry was investigated. Based on analysis of existing and implemented safeguards through the use of duties, the following results were attained.

The table below illustrates the trend in the global markets to ensure that specific controls are in place to protect the local steel industry through the implementation of safeguards and increased tariffs for specific goods in Steel and Steel Articles.

<table>
<thead>
<tr>
<th>Country</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>1) Steel wire rod</td>
</tr>
</tbody>
</table>
| India    | 1) Seamless pipes, tubes and hollow profiles of iron or non-alloy steel (other than cast iron and stainless steel)  
         | 2) Hot-rolled steel in coils |
| Indonesia| 1) Articles of finished casing and tubing  
         | 2) Articles of iron or steel wire  
         | 3) Flat rolled products of iron or non-alloy steel  
         | 4) I and H sections of other alloy steel |
| Malaysia | 1) Hot-rolled steel plate |
| Morocco  | 1) Cold-rolled sheets and plated or coated sheets  
         | 2) Reinforcing bars and wire rods |
| Philippines | 1) Steel angle bars |
| Thailand | 1) Hot-rolled steel flat products with certain amounts of alloying elements  
         | 2) Unalloyed hot-rolled steel flat products in coils and not in coils |
| Ukraine  | 1) Casing and pump compressor seamless steel pipes |
| Vietnam  | 1) Semi-finished and certain finished products of alloy and non-alloy steel |

Table 9 Summary of Global Steel Safeguards

Adapted from: (International Trade Administration Commission of SA, Sept 2016)
Most Favoured Nations means normal tariffs charged on an import which excludes preferential tariffs under the free trade agreements (World Trade Organisation, 2017). Iron and Steel including Articles of Iron and Steel (HS Code: 12, 17), extracted to support the view that China has higher import tariffs in comparison to South Africa. China is protecting their own steel market / industry whereas South African is free to trade through multiple trade agreements with reduced import tariffs.

<table>
<thead>
<tr>
<th>Average MNF Applied Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporter (Importer)</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>China Total</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>South Africa Total</td>
</tr>
<tr>
<td>Grand Total</td>
</tr>
</tbody>
</table>

Table 10 Summary of Averages for Most Favoured Nations (MFN) Applied

Adapted from: (World Trade Organisation, 2017)

<table>
<thead>
<tr>
<th>Tariffs Averages - MNF Applied Duty Rates for Iron &amp; Steel (HS72)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tariff Line Averaging Method</strong></td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>South Africa (2017)</td>
</tr>
<tr>
<td>China (2015 Rev.1)</td>
</tr>
</tbody>
</table>

**Simple Average = Sum of Duties/Number of Lines**

***Weighted Average = (Sum of (duty *import value))/Sum of import values**

Table 11 Tariff comparison

Adapted from: (World Trade Organisation, 2017)
Table 11, Tariff comparison provides the view that China has measures in place through tariffs which supports the view that South African tariffs on Iron and Steel imports are lower than China. This leads to access to the South African markets for raw materials without barriers of trade.

4.4 Summary of analysis relating to ArcelorMittal South Africa

In order to support the analysis and research questions the use of descriptive statistics was applied for additional data to gain an understanding of the steel trends and influences on AMSA.

Figure 10 Imports / Exports, Long Steel

Adapted from: (ArcelorMittal, 2016)
AMSA services the South African local market for both long and flat steel products based on the graphs. Less than half of their production is geared towards the export markets. Impact of the rise in imports into South Africa from China; do effect and reduce the level of output of AMSA and ability for the various plants to be productive and compete in the local market.

Table 12 Selling Price (Final Product) analysis per ton – ArcelorMittal SA Data

Adapted from: (ArcelorMittal, 2016)
Analysis based on AMSA pricing in comparison to global steel pricing, in Table 12. Selling price in above table indicates that AMSA has been selling its products at a higher rate than the China export FOB prices for both flat and long steel products since 2012. Purely based on the pricing, AMSA should be in a profitable space considering input costs are South African rand (ZAR) while the trend of the exchange rate since 2012 (R8 to 1 $) to 2017 (R13.02 to 1$) and their volumes during the same period have not significantly declined. However this does not take into account inflation, labour costs and raw material costs and the influence of those indicators on the cost base of AMSA. This detailed analysis should be taken further in a detailed study or modelled to gain a full understanding of the influence of these factors on the productivity and competitiveness of the local steel industry. In order to illustrate the impact and economic effects the below summary of key economic indicators provide a view for contextualising the landscape and externalities affecting the steel industry.

**Figure 12 Iron Ore USD per metric tonne**

In the Figure 13, Iron Ore per metric tonne, the indication is that the main input or raw materials into the steel manufacturing sector has been on the decline since 2014 hence there should be an explanation in terms of the high input costs for AMSA, which should be in the areas of electricity and labour. The labour rates in
manufacturing have increased since 2012 (from ± R12,000) to 2016 (± R16,000) indicating 33% on average over the five years period, indicated in Figure 14, SA wages in manufacturing (Rand per month) while inflation has averaged at 6% since 2012 for South Africa. In comparison the China average wages has remained flat until 2002, indicated in Figure 15, China average wage in manufacturing yearly (CNY/Year) which has benefitted the Chinese in exploiting cheaper labour to produce high volumes enabling them to undercut the market and gain market share through their strategy of cheaper steel products.

![South African Rand](image)

**Figure 15 South African Rand – Quarterly Average**


In terms of their pricing methodology previously AMSA used an import parity pricing approach and decided to transition to the present day model applied for prices. This effected changes to their pricing approach during 2006 towards a more transparent international basket of prices which has proven to be towards the benefit of AMSA which is priced higher than the global steel price index.
4.5 Summary of the results

Results from the statistical analysis for the steel production volumes and imports data into South African from China, indicate that there is a significant correlation between China overcapacity and the global steel industry. China’s overcapacity impact on the local steel industry is evident in the reduction of production (output) to service the local steel market, which is the primary market sector for AMSA. In addition, there are structural challenges and economic factors such as exchange volatility that influence and impact South Africa which is besides the need for increase of tariffs on imported goods to protect the industry. Factors to be further studied are in the areas of; labour cost, old or aging infrastructure and technology and high cost of electricity which requires further investigation into the effects and impact on AMSA. These factors however contribute significantly to the input cost for AMSA and overall competiveness based on literature review and AMSA’s financial results.
CHAPTER 5. DISCUSSION OF THE RESULTS

This chapter discusses and explains the results provided in Chapter 4 and provides arguments for the findings. The approach for this chapter shall be that of detailing the results, explaining the output data and providing logical reasons for the findings.

5.1 Introduction

This chapter broadly focuses on the discussion and summary of the results presented. It discusses the comparisons between the global top steel producers and South Africa as well as the results from an assessment conducted for the influence of imports on the South African market and subsequent effects on ArcelorMittal South Africa (AMSA). This chapter will also provide a brief discussion pertaining to government policies in supporting trade such as the interventions, trade remedies and the role that governments play in facilitating global trade, established by the various trade agreements and organisations.

5.2 Discussion pertaining to Research Question 1

Production volumes comparison for Top 10 Steel producing countries

Based on the data analysed using descriptive statistics presented in Chapter 4, it is evident that the global production has significantly increased since 1990 demonstrated in Figure 4, Steel Production Trends for Top 10 Steel Producing Countries particularly countries such as China, India, Turkey and South Korea. In terms of growth, China presents the highest growth since 2005 while other countries have remained with the range of monthly production.
Japan and the United States have been consistent in the production output but have experienced a decline during the 2009 financial crisis which affected many of the commodity markets at the time. China is at its peak in 2017 based on the production volumes output line plot in Figure 4. China is also considered to be a major producer contributing ±50% of global steel production as indicated in Chapter 4, Figure 6 Steel Production Split and has sustained its production levels in recent years. India and China follow a similar upward trend in the production output while Japan remains at constant levels in production output since 1990s. South Korea increased steel production from 2009 onwards based on the line plot data from levels not previously seen prior to the financial crisis. Based on the data, the overcapacity in the global steel industry is as a result of steel producing countries increasing production with China being the highest contributor the problem.

Statistics in Table 4, Correlation Analysis, comparison of between China and South Africa indicates that for the window period 1990 until 2017 and based on the correlation analysis of -0.52249 indicates a negative correlation between China and South Africa. There is a negative correlation between China and South Africa which implies that as China steel production increases the South African steel production declines. Therefore for every increase in production by China of 1000 tonnes, the South African production declines by the related value of -0.52249. This implies that when China steel production increases the South African steel production declines i.e. for every thousand tonnes increase in steel production by China there is negative impact or decline in South African steel production by 52%.
Summary of the production in Figure 4, over the period since 1990 until 2017 indicates that South African steel production has had a range of 182 minimum and a maximum of 885 (thousand tonnes) in comparison to China steel production over the same period which has a minimum of 1128 and a maximum of 9000 (thousand tonnes). It is evident that based on this statistic, China’s overcapacity has a large scale impact on the South African steel production which is compounded by overproduction and imports from other steel producers into the South African markets. Table 3, Summary of Statistics, Comparison of the top 10 steel producers is used to measure or to understand the spread or dispersal of data in the steel production per country. Based on the results there is a clear indication that China (58.9), India (58.9) and Turkey (43.2) have high variances in the data set. In terms of the trend (line plot) the rapid increase in steel production by China and India is clear where India follows the China upward trend line. In terms of the distribution of the South African markets, there is a negative skew (shape of the distribution) where there are continuous or stable volumes of production (monthly production); a graph skewed negative benefits the markets in that there is continuous production, with the highest between 690 and maximum of 750 thousand tonnes production. The view the South African steel producers have not increased their production has not changed relates to the stable demand.

The paired t-tests in Table, 5 confirms that the means of production in South African is the same or not the same for that of Chinese production (assumption) based on the null hypothesis test, this is confirmed through the use of quantitative statistics. The p-value in the results is zero (0.0000) for the paired t-test for the production volumes of each country. The decision rule is to reject the null hypothesis
if the p-value is less than or equals to the significance level of 5%. The setting of the significance level was set to 5% hence the level of confidence in the data is that of 95%. The results support the statement that the two markets are different based on the production output and size. In terms of the literature presented, the dominance of China in the steel markets presents the case that there is overcapacity in terms of steel production, which is probably being sold off in other countries at below cost.

Based on the statistics and relationship between South Africa and China, the data proves there is a negative correlation that hinders the production of local steel. Essentially, the overcapacity of China and the increase in their production output as well as the impact of additional imports into South Africa from the top producing countries provides a case for further detailed assessment of the extent of the problem in the local steel industry.

Linear regression provides an indication on how production influences the dependant variable (SA production) and how it compares to the top 10 markets (independent variable). Based on the analysis in Table 7, Linear Regression Analysis of the Top 10 Steel Producers indicates there is an influence on the South African markets for United States (0.27), India (0.35), China (0.21), Germany (0.11) which have a Pr > F (greater than) the significance value (0.05). The entire model including all data points (regression model) demonstrates a normal distribution, which can be used for forecasting. In summary, the data analysis conducted for the purposes of explaining the market dynamics, the role that the South African steel sector plays in the broader global steel market as well as the impact of globalisation, is proven by that fact that China overproduces and influences South Africa negatively. In Figure 9, Scatter Plot Steel Production Comparison – Top 10 Producers, the correlations between the
markets is indicated. Negative correlations relate to an inverse relationship where one variable increases while the other decreases. Negative correlations exist between Russia, South Korea, India, China and Turkey, this indicates that as these countries production increases the South African production decreases being the dependant variable.

This section of the study addresses the production side (output) of steel (supply side) for the global markets and demonstrates the dynamics, matching the demand side requires further modelling as data for demand per country was not available.

**Table 8 – Discussion on the assessment of the influence that imports (a) and exports (b) have on the South African Steel Industry**

- **Balance between inflow and outflow**

Statistical analysis were conducted to determine the volume of imports from the top 10 steel producing countries and their influence since 2015 based on data retrieved from the DTI for Iron and Steel (Articles of Iron and Steel). The analysis conducted pertaining to imports from top 10 countries in volume, which included the steel index as the base, refers to total steel production in South Africa.

A linear regression model was applied to determine the relationship between South African Local Steel Production and the relationship with imports of steel and articles of steel. The dependant variable is the (indices represents the total in 000’”) physical volumes of production in South Africa and independent variables are imports from the various countries.
Volumes of production in SA may have an influence based on the imports on the currently physical production with negative or positive trends, meaning that if there is an increase in imports the view is that the local market suffers and decreases its production and vice versa if a decrease in imports occur, the assumption is that the local market benefits and increases its production.

The linear regression model was run for the various importing countries i.e. China, Japan, India, Russia, Germany, Brazil, Turkey, Ukraine, United States and South Korea based on data extracted from the DTI database for imports in the category Iron and Steel including Articles of Iron and Steel (HS Code: 72). Analysis of variance; Table 8 analysis explains the p-value being (0.5648) which is greater than the significance value (0.05) and therefore the null hypothesis is not rejected. All the markets do indeed have an influence on the South African physical production and in this case that of imports. Individual assessments of the impact of imports by the different countries on South Africa indicate that the p-value for all the countries is greater than the significance value.

The conclusion is that South Africa does not have sufficient capacity to provide the entire market with steel, hence the need for imports from various countries. However, further analysis and investigation into the reason for the decline in the local market needs to be developed further. Recommendation is to investigate the problem further through a detailed study, including total demand and supply balancing for the SA markets, including imports, exports and comparison of the prices in relation to that of other countries in order to understand the full market dynamics.
Exports analysis in Table 8 (b), is based on total volumes of all commodities that South Africa exports into the global markets including Iron and Steel products. A regression model was used to determine the influences and effects that South African exports to China have on the markets. Only 7% (0.06583042) which is the Squared Partial Corr Type I; Table 8, Export Analysis, based on the data sourced from DTI contributes to the total basket of commodities of export products from SA to the world. Therefore the conclusion is that SA does not export significant volumes of Iron and Steel products in a value added format. The SA market is therefore a net importer of steel with AMSA focused on production for the local domestic market.

Figure 9, Cumulative Bilateral Trade Profile for South Africa, provides a view on the commodities in which South Africa and China exchange. China is a massive consumer of raw materials and is constantly seeking resource; hence the profile confirms that raw materials such as iron ore are being exported for consumption by the Chinese. Based on this assessment, the data presents a case that final steel products in the form of flat and long in SA is mainly for the local market and supplemented by imports. Opportunities then exist for government to invest in additional capacity to service the untapped imports market currently being offset by imports from China.

**Impact on ArcelorMittal South Africa (AMSA)**

AMSA has been experiencing a decline in profits and have reported losses since 2010. The latest financial results released indicate a loss of R458 million (ending 30 June 2016). Although AMSA has the capacity to produce between 6 million and 7 million tonnes of liquid steel, equating to 4.80 million tonnes of product throughout its
operating facilities in South Africa, the analysis indicates that AMSA and other steel producers cannot meet the full demand for steel in SA, hence the need for imports.

There is both an upside and downside to balancing steel production in SA through coordinated efforts while enhancing competition through imports of certain steel products. This relates to the topic of comparative advantage and efficiency, the Chinese may be perceived as cost-driven due to the labour environment in which skilled resources have accumulated at a very low cost while government subsidies are enablers for many of the firms which have further increased their ability to provide lower than market prices for steel products. Based on the graphs presented in Chapter 4, Figure 10 and Figure 11 it is clear that AMSA is geared towards a local market as opposed to the export markets for both its flat and long steel products. AMSA’s focus is South African markets (61%) while only the remaining (39%) is attributed to the export markets mainly in Sub-Saharan Africa. Although AMSA prices final steel products at a basket rate benchmarked with global producers, refer Table 12 – Selling Price; which is Dollar US$ based, there is a case to substantiate or argue that the pricing approach may be excessive in that the local market is South African Rand, ZAR (R) based. The profit margins that can be gained through this pricing methodology lack the respective offtake volumes (sales) which erode the value that can be derived through this methodology. Figures 12, 13, 14, 15 provide a summary in terms of the economic landscape in which AMSA operates. Input costs such as ore, wages and the influence of the exchange rate affects the overall profitability of AMSA.
In summary, globalisation of value chains is a reality, hence companies such as AMSA which have been in existence since 1928 needs to re-evaluate their operations and strategy, streamline businesses, upgrade infrastructure and technologies in order to compete and remain competitive in the steel industry.

5.3 Discussion pertaining to Research Question 2

Based on the analysis conducted in Table 10 Summary of Averages for MNF applied, it is clear that South Africa has relaxed tariffs on specific Iron and steel products (including Articles of Iron and Steel) in the tariff code category: HS12, 17 which is classified under the SARS codes for all sub-levels of steel products, in comparison to other countries and mainly China. South African average tariffs are set at 3.97 with a range of between 5-10, whereas certain products have a 0 duty charge while China’s tariffs for imports is set at 5.01 and a range of 1-10. This presents the case that China is protecting its steel market through a form of higher tariffs on imported goods where South Africa has much lower tariffs in this sector.

The trend globally is towards increased tariffs in order to protect the local markets as per Table 9, Summary of Global Safeguards. In terms of the South African market, tariff increases of 10% for SA as the importer, have been implemented with an escalation year on year (until a 22% over a three year period) and is in the process of being ratified by the World Trade Organisation (WTO). In terms of the International trends regarding protectionism, the United States imposed duties on hot-rolled flat products from various countries including Japan, Brazil and Australia. The use of protectionism indicates the extent of the problem as a result of overcapacity globally while certain countries are opportunistic in under-pricing to secure markets.
Government interventions such as that taken by the United States (US) and European Union (EU) by implementing tariffs as high as 36%, recognise the consequences should no action be taken and subsequent downstream impacts which would be filtered through the economy both in steel manufacturing sector and other integrated sectors or users of steel. Based on analysis conducted China has significant trade remedies in place against steel mill imports such as anti-dumping measure against EU (2), Japan (2), United States (1) totalling 5 remedies to safeguard the Chinese markets (Administration, 2016).

The subject around the relationship that South Africa has with China, particularly around trade and imports, supports the fact that the South African Government is not doing enough to support the local steel industry. The arguments that imports have a place in the economy are valid and therefore balancing the dynamics of local industry and competitiveness becomes a complex case. At an operational level, literature indicates the challenges around managing the imports of goods at the borders and various controls to manage the allocation of goods to the correct tariffs codes. Fraudulent activity at borders and the influx of goods that have not been correctly allocated to the rightful codes to ensure accurate and correct taxes are applied is still a challenge in South Africa. Custom officials play a key role in ensuring the black market trade (custom fraud) is controlled and properly managed at the borders. This is government’s role in ensuring revenue is generated from the trade of goods across domestic and international borders. Corruption in South Africa is high and the levels of corruption run deep, however various initiatives implemented by SARS and government have achieved success in the year, the act of corruption and fraud is still highly prevalent throughout the various levels in
government. In 2013, SARS implemented an automated system to ensure customs management is centralised and streamlined. Leakage through inaccurate tariff allocation or misuse of tariff codes, corruption and flaws in the customs process need to be curtailed in order to ensure accurate accounting and collection of tariffs which should be filtered back into the economy through initiatives. Border control and efficiency of borders enforce a single point of entry for the imports of goods which requires stringent measures that ensure correct allocation and classification in accordance with the applicable tariffs codes for Iron and steel products crossing the South African Borders. This forms the gateway into the South African markets for all imports of steel where the concern around incorrect classification eventually has a significant effect on the local markets. In terms of the role SARS plays to prevent incorrect classification and misuse of tariff headings for imports, the implementation of Harmonised Commodity and Coding System under the World Customs Organisation in 2012 which was amended to provide for changes in international trade patterns. The key goals of the WCO are aligned with that of the South African Revenue Services (SARS) in that it aims to ensure effective collection of revenue through the simplification of their systems and tools such as the Harmonised Commodity description and coding system (HS). The Industrial Policy Action Plan (IPAP) (2016/17) has a strategic and key role in influencing and boosting the economic transformation of the steel sector in South Africa. Although the IPAP highlighted programmes to address the competitiveness of local manufacturing in their Manufacturing Competitiveness Enhancement Programme (MCEP 2012), which aims to assist firms with upgrading facilities, product development, process improvement, value localisation and feasibility studies, it seems little development in this area has been achieved to ensure the steel sector is competitive with the
Chinese. In addition the New Growth Path (NGP) Framework of 2011, main intention was that of ensuring a policy that outlines government strategies around economic policy and job creation. This framework has proven fruitless where South Africa has had significant job losses in various sectors since the publishing of this framework and continues on the decline where the economy is set to grow below expected values based on the vast levels of corruption and political instability.

In terms of possible solutions which should be considered by both government and AMSA in the areas of automation, innovation or improvements of operations do not seem to be focus in order to resolve the competitiveness of the industry. Tariffs and pricing are also key drivers to be relooked at in order to protect the steel sector. Opportunities for manufacturing to consider are in the areas of energy efficiency and to curb the high cost of electricity which may ensure input cost are reduced taking into account that this is the one of the highest contributors to AMSA cost base. It is evident that the WTO also clearly supports anti-dumping from China, through WTO investigations which have been conducted into steel dumping and the decision or ruling to implement protectionism measures for anti-dumping from China. Further analysis into the downside effects of reduced tariffs over a period will support the view that China has been dominant and exploiting the trade benefits not only for South Africa but other WTO members. In support of the detailed assessment which would require a full scale model on prices, demand, production, input cost of the steel industry in addition the influence of increased tariffs and improvement initiatives by local steel producers, should provide a view of the real state of the steel industry in SA. Government should consider a joint task team dedicated to the resolution of
the steel industry which should be supported with appropriate policies that are enforced.

5.4 Conclusion

There is significant overcapacity in the global steel markets and this has had an influence on the local markets. South Africa is not a significant contributor to the export markets however is influenced by the China’s over production and dumping of excess capacity. Imports play a role in the overall market dynamics, in that there is an apparent need for imports based on the current limited capacity of the South African steel producers. The purpose of this research was to understand whether or not there is a relationship and in fact an influence on the local markets of cheaper imports from China compared with other countries. The results indicate the volumes imported has a relationship to the South African steel production, however this situation results in overcapacity and end-users seeking cheaper alternatives such as the Chinese imports. The challenge is essentially competing in the market on prices.

The balance between China and other countries imports is needed for SA; however pricing and input costs becomes the point of discussion. It is clear that the South African steel producers cannot meet the required demand for local steel and hence the need to import steel. South African steel producers need to become more competitive and cost effective to ensure they counter the effects of cheaper imports. Trade remedies such as the increase of tariffs on certain steel products supports the turnaround in the steel industry and particularly AMSA; however the solution resides in a collective collaboration between government, labour and business to ensure a sustainable and competitive sector both for the local and export market. Government
has the tools and strategies; but there is a gap in implementation, execution and monitoring of these strategies or plans. The plans and intentions to safeguard the steel industry are sound, however, Government has been slow to respond to situations when compared to other countries such as the United States and European Union which has taken strong positions in ensuring their markets are properly protected. The most plausible reason for the slow reaction by the South African Government is the extremely close relationship that exists between the South African Government and the Chinese Government and the fact that China is South Africa’s largest trading partner.
CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter covers the final evaluation and conclusion of the research study. The structure of this chapter will provide conclusions for the findings based on the research conducted; provide recommendations or options to consider for further research while considering a way forward for ArcelorMittal (AMSA).

6.2 Conclusions of the study

The world of steel is moving towards a protectionist environment following various investigations into the acts of dumping, this contradicts the very intent or mandate of the World Trade Organisation (WTO) and liberalisation of industry striving for fair and undistorted competition while reducing trade barriers among members. The view that tariff increases is the only solution to the industry problem experienced needs to be investigated at a detailed level. Tariff increases provide a one sided view to the problem and do not address inefficiencies within the steel manufacturing value chain. Tariff increases protect the industry at one level but at a secondary level it does not encourage competitiveness or innovation in the steel industry. Government’s role in the South African steel industry has been that of purely facilitating trade through agreements and tariffs and not supporting a holistic solution to encourage job creation and boost the steel industry. Tariff increases only protect the industry in the short term from imports and avert competition from global players; however the issues around electricity cost, labour cost and input or raw material costs still need to
be investigated to determine the real impact of these factors to the overall value chain and subsequent downstream steel business.

The steel overcapacity is a global challenge and needs to be addressed at governmental level and not at firm level, as the impact of a declining steel manufacturing sector has significant consequences for the country. Implementation of increased tariffs is the only action taken by government in order to protect the steel industry further action and plans such as subsidies for raw materials, electricity costs and other forms of stimulus for economic growth have seem to taken a secondary role in solving the problem.

The research questions were answered in that South Africa steel industry is not competitive when compared with China. There is a negative influence on the local steel markets through increased production and over supply by China. Competitiveness has many dimensions which the study did not address at detail and covers areas such as volumes, imports, economic indicators, improvements in transport and communication. Literature reviewed and data analysed indicates there is evidence that the South African steel market and in particular ArcelorMittal SA are not able to compete and are indeed influenced by cheaper imports from China. Although the output or production is not affected, the end product sales cannot compete, resulting in oversupply and preference for the markets to source cheaper low cost steel from China. South Africa requires imports in order to balance the demand and ensure fair competition, however the consequences of China’s overproduction and significant growth which has peaked in 2017 has downstream impacts on the South African steel markets. China has experienced the benefits of lower input cost such as labour and added benefits of government subsidies to
enhance their competitiveness over the years whereas South Africa is challenged on the basis of high electricity costs, increasing labour rates and a low demand scenario in which AMSA has its primary markets, being in the local market. The research question relating to: Is South Africa competitive with or comparable to the Chinese steel industry? has been answered by the research, in that SA is not comparable and is influenced at some level by imports, mainly based on pricing to the end customers, as the volumes imported from the top steel producers do not have a significant effect on the SA production (output) based on the regression model applied. South Africa’s steel industry, mainly AMSA, cannot compete on price with the Chinese, although the pricing methodology applied is that of a global pricing basket. It is then clear that China is selling their product below market value to sustain their steel industry coupled with the various government subsidies and reduced tariffs to enhance their competitiveness in the global markets. This is in itself is a form of dumping overcapacity and potential abuse of the trade agreements in place, hence the investigation into anti-dumping trade remedies to protect the United States, European Union and other emerging steel markets. The South African economic and political landscape has not helped the situation in the steel sector. Lack of growth and government stimulus in the form of investment in the economy has inhibited the ability of the local markets to compete at a global scale. AMSA is also not focused on the export markets where potential opportunity may present itself considering the fact that AMSA is a multination and top producer (manufacturer and distributor of iron and steel) globally ahead of the Chinese conglomerate Hestee Group with its headquarters in Shijiazhuang, China. South African trade agreements are geared to the benefit of other countries in particular China, where government intervention is required to balance the dynamics of the
relationship while securing jobs in SA. The argument that globalisation and international trade has its benefits cannot be disputed; however there is a fine line in supporting the exploitation of trade agreements, tariffs, government subsidies and relationships by the Chinese to the detriment of the South African steel sector, which is a vital source for job creation and economic growth. AMSA has been negatively impacted by the influx of cheaper steel products, where AMSA has seen a drop in profits and has in fact shown losses in recent years. In order to revive the local steel industry, substantial government intervention is needed to secure its sustainability and prevent job losses in the future. In terms of Question 2: Is government correctly equipped to protect the local steel industry? There are areas where government has demonstrated the ability to develop strategies and plans through the IPAPP and MCEPP however, these plans have been slow in implementation and the benefits have not been experienced in the steel sector. Hence, the situation of AMSA struggling to sustain its operations across the various plants in South Africa and the fact that other steel producing countries are implementing safeguards in the world presents the case for government intervention; the South African government has not proactively addressed the challenge of cheaper Chinese imports. Earlier intervention by the South African government may have prevented the decline in the local steel markets through tariff increases or anti-dumping measures and its associated policies. Government not only plays a role in ensuring trade remedies are in place but plays a significant role in ensuring the accurate collection of taxes for imports is correctly allocated and classified, thereby preventing fraudulent activities across borders. Government through SARS has implemented and enhanced various processes and systems to prevent fraud and should be recognised for the efforts
Thus far. There is still however significant corruption and fraud taking place at the various borders.

Corruption presents itself at all levels in South Africa and not only at the borders which then defeats the purpose of fair trade and competitiveness in the sector diminishing the efforts by customer officials on the ground that strive to prevent fraudulent activities. There are strategic policy issues which government needs to address while ensuring the operationalising of those policies are enforced. Based on the summary of actions taken to remediate the situation in the steel sector, government has implemented various forms of trade remedies over a period of 3 years through the use of tariffs. This is the short-term, quick fix solution whereas a detailed assessment of the entire steel industry should be undertaken in order to secure the strategic sector. Interventions should be undertaken by Government to secure jobs and stimulate economic growth in the steel manufacturing sector.

Based on the findings it is evident that China participates in the WTO purely to the benefit of its own agenda and opportunistically reaps the benefits of fair and free trade internationally. While China benefits from being a member they have instituted safeguards from imports into their own steel markets to protect the Chinese industry. The South African government is in a predicament to balance the trade of other products with China for the exports market considering China is South Africa’s top trading partner. Based on literature reviewed South Africa charges the lowest tariffs rates in comparison to the BRICS countries and has not gained the benefits of easier access to the BRICS markets (Thulare, 2015). The main exports of South Africa to China are in the categories of Iron Ore, steel, manganese, chrome ore tobacco, wool, granite, gold, copper, aluminium and motor vehicle spares (Statistics South
Africa, 2017). However, based on the analysis for exports, the data indicates that a small portion of total commodities exported are in the categories of Iron and Steel (Articles of Iron and Steel) for South Africa. South Africa is the main exporter of all the other products like coal, gold, diamonds, platinum (precious metals), with Iron ore featuring as one of the top 10 commodities exported in (2017). Government has sufficient data in order to conduct an in-depth analysis of the total value chain and impacts both in the upstream and downstream sectors of manufacturing in order to develop options and solutions to the benefit of South Africa. Balancing the economy is not a simple task as there are various actors which are integrated and influence the entire value chain. In summary and based on the data analysed there is no real significant impact on the total production output of South Africa combined when compared with that of China on the basis of imports. South Africa needs imports to balance the demand or meet the demand required for steel in the local markets. The conclusion or deduction made is that China is cheaper hence end-users source the low cost materials in order to increase their profit margin in the downstream markets. Thus, AMSA is not competitive when compared to China; although the steel products are sold at a basket of international pricing, China remains below the threshold and one must consider its cost base and the alternatives for AMSA to reduce its cost in the long term. There is still the aspect of Government intervention to ensure a level playing field while ensuring that the Chinese are not manipulating the markets to their benefit based on subsidies and lower labour costs. The theory suggests that other countries such as Germany, US, Japan are not dumping in South Africa and are pricing comparatively to global steel prices. Further investigation needs to be done in terms of the real impact of global steel imports into South Africa and influence on the local steel market.
The conclusion is that China is dominant and intentionally is dumping excess capacity. A next level of detailed analysis or an in-depth study should be investigated quantitatively in the areas of quality, price, volumes and customs tariffs impact to the overall steel industry in South Africa.

6.3 Recommendations

The South African government needs to leverage relationships and trade agreements to the benefit of South African such as the BRICS membership and as a signatory to the WTO, while ensuring that South African Steel industry is taking a higher priority in the export markets. South Africa, based on the analysis conducted, does not export sufficient value-added products in the form of Iron and Steel, only raw materials as an ore. This lack of beneficiation in South Africa prevents further development and encourages leakage from which the South African economy can greatly benefit through job creation by beneficiating the ore into value added products. South Africa and AMSA including other local steel manufacturers need to work together and collaborate while competing fairly to enhance innovation within this sector through a regulated forum that ensure balances in trade to the greater benefit of SA and not an individual company. Government needs to hold the steel manufacturers accountable to prevent manipulation of markets and prices without innovation or sustainable job creation strategies. Policies was must be enforced at all levels of government from customs officials on the ground to holding high ranking government officials accountable for corruption and fraudulent activities that ultimately impact the poorest of South Africa. Skills development is also high on the South African government agenda; this avenue of investment in manufacturing and securing downstream beneficiation can enhance the local skills market and create
significant jobs in manufacturing. AMSA must work closely with labour on the matter of wages and increases in wages; this is a highly topical and debatable issue in South Africa. AMSA must consider alternate sources of energy supply where there is excess capacity in the country, the option to source directly from Independent Power Producers (IPPs) in the form of gas and renewables needs to be discussed. Reviewing their operations through investment in new plants or upgrading of facilities must be considered as part of their strategy to ensure competitiveness and sustainability. South Africa is an importer of steel and should consider the fact that there are large deposits of natural resources which can be considered for the localisation of the value-added products rather than exporting iron ore as a raw material. AMSA should consider refocusing its strategy towards the SADC regions or other African regions in order to expand its footprint on the African continent. Options for AMSA to be considered is the buying into the upstream or exploration part of the value chain ensuring that AMSA takes ownership of the source of Iron Ore and thereby controls the input costs or raw materials. Securing the source enables AMSA to be vertically integrated and provides for added benefits such as diversified revenue streams from exports of raw materials i.e. iron ore. AMSA needs to start seeking opportunities globally and compete with the countries such as Brazil, Russia and India and not rely on imports from China. Strategies to counter the effects of competition should be developed with a longer term view on the steel markets and market trends. Leadership in AMSA needs to look passed the short term down turn in steel demand as these are normal business cycles, which eventually turn into market upswings. During this down cycle, AMSA should already be developing plans to counter the next steel down cycle in order to be more agile and sustainable going forward.
Government demonstrates the intention and willingness to resolve the issues, however does not put forward tangible, executable plans that would sustain the sector in the longer term. Programmes such as localisation strategies and preferential procurement by industries such as construction, automobile and other users of steel from South African Steel should be enforced as a minimum requirement. Government should consider the balancing of these strategic objectives with roadmaps for innovation and optimisation in the steel industry in order to improve the cost base and overall competitiveness of the steel sector. Government should consider investment or incentives for firms to upgrade the aging steel infrastructure and building additional capacity to meet the demand which is supplemented by Chinese imports, thereby reducing the reliance on cheaper Chinese imports. This will create jobs and stimulate economic growth in the local steel manufacturing sector. This should be supported by appropriate governmental policies to be implemented to safeguard the industry and enhance the collaborative relationships between the steel industries.

Forecasting and modelling of various scenarios taking into account the economic indicators and trends should be a key priority to AMSA strategic planning to mitigate reactionary situations by placing trade remedies or protectionism measures. Finally, government should establish a separate and independent body that tracks strategy (planning and execution), monitors, regulates and ensures the strategies set-out by the IPAPP 2016/2017 and New Growth Path (NGP) are progressing adequately and in line with the strategic objectives of South Africa and the manufacturing industry. Government should also establish a stronger position in the global markets as a contender or challenger (not just a follower of policies or receiver of imports) to the
top 10 producers by working closely with the WTO and various bodies established to focus on steel overcapacity.

6.4 Suggestions for further research

In conducting this study, it is evident that the issue or topic is a highly complex and broad area to focus on which requires significant research and understanding of the entire integrated steel value chain and its related issues. Further research into the steel manufacturing sector should provide a holistic view on the global markets and trends in steel to contextualise those factors towards the South African markets in order to provide solutions that would solve African problems. In terms of areas or opportunities to consider for further investigation and their impact and influence from globalisation as well as the effects of government policies on the South African Steel industry the suggestion would be for future researchers to consider modelling the market dynamics and economic impacts on the steel value chain and further downstream into areas of construction and other manufacturing value chains in South Africa. Areas to consider for further detailed study are in the areas of efficiency and productivity of the steel value chain end to end. Investigation into the real value derived from imports and the comparable quality of Chinese imports versus South Africa. Additional areas for further investigation are the benefits derived from a privation of AMSA; the question raised while conducting the study was if South Africa really benefitted from the sale of ISCOR to ArcelorMittal Limited.

Other areas which could not be addressed in detail as part of this study are that of input costs relating to labour, raw materials mainly iron ore, maintenance and electricity for AMSA versus other global producers and how comparable are those
costs to ensure a competitive and sustainable steel sector. Further research should be in the area of the impact of global value chains (GVCs) on the local steel sector and in particular the potential waves of the fourth industrial revolution on manufacturing and how prepared are the South African steel manufacturers for change.
REFERENCES


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