THE POLITICAL ECONOMY OF INDUSTRIAL POLICY IN POST-APARTHEID SOUTH AFRICA: A COMPARATIVE CASE STUDY ANALYSIS OF BRAZIL AND SOUTH KOREA

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ABSTRACT

South Africa is a country that has experienced premature deindustrialisation due to its inability to move out of middle-income status. The role of industrial policy in South Africa is pivotal to taking the country to greater economic heights and a higher-income status. South Africa's historical context indicates that the country experienced its highest GDP growth rates during the apartheid economy. Since the demise of apartheid, the post-apartheid economy has experienced poverty and economic inequality that the South African government cannot eradicate. This thesis addresses the failure of South Africa to overcome premature deindustrialisation, and it discusses the state of the political economy and economic growth in a pre-apartheid and post-apartheid context. The thesis also addressed the significance of industrial policy through the establishment of the Industrial Policy Action Plan (IPAP). The shortcomings and successes of IPAP form a critical part of the research and present an analysis of different economic sectors. This thesis also assesses the state of industrial policy using two countries as case studies: Brazil and South Korea.

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CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 RATIONALE FOR THE RESEARCH

This research project will use the political economy framework to analyse industrial policy in post-Apartheid South Africa. Hooks and Crookston (2013) define the political economy as a branch of social sciences that studies the relationship between a nation's population and its government when public policy is enacted. The assessment of the political economy framework is significant because it explains how society behaves when the government acts in their best interests. In the context of South Africa, this thesis will study how government actions and views toward industrial policy have emerged and evolved. The political economy comprises the following elements: utility, wealth, value, commodity, labour, land, and capital (Jevons, 1879). Grasping an understanding of the elements mentioned above is the first step to understanding the political economy. The political economy framework explains how power used by special interest groups enables the creation of rules that measure the balance of rent-seeking goals. The assessment of the South African political economy is essential because 30 years after the dismantling of apartheid, South Africa is still home to poor socioeconomic outcomes for its majority Black population.

Policies and interventions have resulted in notable gains in poverty reduction since 1994, but the country continues to face the challenges of high poverty, high inequality and high unemployment (World Bank Group, 2018). In essence, the persisting challenges that the country faces call for a comparative assessment of policies and interventions as a critical assessment of industrial performance in terms of output, exports and employment. The state of industrial policy in the post-apartheid era is a relevant discourse that needs to be explored to understand the challenges recognised in the research, such as the middle-income trap and premature deindustrialisation. South Africa has deindustrialised prematurely, and this has impacted the economy negatively.

Beyond falling into the middle-income trap, which is a crucial feature of premature deindustrialisation, a further impediment to South Africa's economic progress has been that the country is stuck in a middle-income technology trap (Andreoni and Tregenna, 2021). Throughout the post-democratic era, rapid premature deindustrialisation has seen a fall in manufacturing output as a percentage of real GDP, a fall in manufacturing employment as a percentage of total employment, and a fall in manufactured exports as a percentage of GDP and as a percentage of total exports. The fall in the aforementioned economic indicators is alarming because the literature on economic development and structural change widely considers manufacturing and industrialisation as the engine of growth (Kaldor, 1967; Haraguchi *et al.*, 2017; Fagerberg and Verspagen, 1999). According to World Bank (2022), as of 2021, SA's real GDP per capita (6,994.20 US dollars) is relatively close to its 2007 levels (6,780.90 US dollars). The

term "industrial policy" refers to "any form of selective policy that attempts to alter the structure of production in favour of sectors that offer better prospects for economic growth in a way that would not occur in the absence of such intervention in the market equilibrium" (Pack and Saggi, 2006:268).

1.2 OVERARCHING GOAL AND SUB-GOALS

The overarching goal is to understand why South Africa's industrial policy failed to prevent premature deindustrialisation. The achievement of this goal will be done through a comparative case study analysis of two countries: Brazil and South Korea. The following sub-goals of the research will be addressed:

Sub-goal 1: This research intends to help understand the post-apartheid era's industrial policy structure and the performance levels within the South African economy. This sub-goal is crucial because it will identify the gaps in sectoral performance and understand the causes and consequences of deindustrialisation.

Sub-goal 2: This research will assess the performance and results of industrial policy in South Africa; the purpose is to address the divergence between industrial policy goals and outcomes. This sub-goal aims to establish the realism and challenges behind the different industrial policy objectives.

Sub-goal 3: This research will analyse the racial and economic inequalities in the South African economy from the beginning of the twentieth century to the post-apartheid era. This sub-goal is based on analysing the historical context and linking it to the socioeconomic discourse that aligns with deindustrialisation.

1.3 THE SIGNIFICANCE OF THE STUDY

The contribution of this research to the study is significant because it highlights the shortcomings of why South Africa has yet to be able to achieve its industrial policy objectives via the creation of the Industrial Policy Action Plan. The importance of this study lies in the fact that the research addresses South Africa's industrial policy in line with the political and economic history of South Africa. The analysis of South African economic history offers guidance on the current thinking around the role of the state and the private sector in formulating policies that would ignite growth and help South Africa escape the economic stagnation of the last decade. This thesis will discuss industrial policies across key countries, such as Brazil and South Korea, to understand what drove their success and economic growth and compare it to South Africa in an industrial policy context. These countries have succeeded in achieving their industrial policy objectives because they successfully aligned their industrial policy initiatives with the public and private sector needs and interests. Furthermore, assessing these industrial

policies will help us understand what South Africa could have done differently to grow its economy significantly.

1.4 SCOPE OF THE RESEARCH

Understanding the historical context of the political economy of industrial policy in South Africa over the twentieth century is crucial. This research will analyse the economic and political factors behind the shortcomings of policies outlined in industrial policy documents, such as the Industrial Policy Action Plan (IPAP) and the National Industrial Policy Framework (NIPF). These policies need to improve concerning goals regarding structural transformation and socioeconomic mobility in South Africa. In doing this, it is vital to look at when and where these policies succeeded. Despite several revisions and versions, an analysis of these policy documents suggests that they need to self-reflect authentically in stating what they have failed to achieve, thereby making it difficult to ascertain where their failure stems from the ideas themselves or how they were implemented. The research aims to analyse premature deindustrialisation and why these policies must anticipate its onset and consequences.

Furthermore, it is critical to assess whether or not these policies contribute to premature deindustrialisation. In essence, evaluating the performance and results of industrial policy in South Africa is essential to the study because there needs to be more alignment in South African industrial policy on paper versus its actual implementation. The purpose is to address the divergence between industrial policy goals and outcomes. This research addresses industrial policy's position in post-apartheid South Africa. The racial and economic inequalities in the South African economy from the beginning of the twentieth century to the post-apartheid era indicate how far the country has developed with the different industrial policy changes. The political and economic interests of the South African people are critical to the study, and these interests are significant in influencing the economic policies that fall under the government's responsibility. The relationship between industrial policy and macroeconomics makes the scope of the research a lot clearer, and it is vital to analyse how industrial policy initiatives have materialised in the post-apartheid era. The assessment of the state of the political systems with different governments and the change in governance, from colonisation and apartheid to democracy, is a critical argument in the historical context. In context to the previous statement, the reader needs to be cognisant of how different governments and policies have influenced industrial policy and its effect on real economic variables such as manufacturing output and employment in the South African economy.

1.5 PROCEDURES, TECHNIQUES, AND ETHICAL CONSIDERATIONS

The thesis will follow the qualitative approach, which uses relevant literature and a comparative analysis where similarities and comparisons were drawn from Brazil and South Korea. Moreover, the qualitative

approach is accompanied by the interpretive research paradigm. The countries assessed are Brazil and South Korea. These countries have been chosen because of their middle-income status. Policy documents, journal articles, and books from economic literature (publicly available data) made up most of the data because the data is more qualitative than quantitative. The research will focus on policy documents, such as the Industrial Policy Action Plan (IPAP) and National Industrial Policy Framework (NIPF). The literature used for this study is publicly available data as the first source of information. Because the data and research are publicly available, there was low risk, so ethical clearance was not required.

1.6 OUTLINE OF THE THESIS

The next chapter of the thesis will discuss the significance of the interpretive research paradigm and the qualitative research approach. Moreover, it will expand on the uniqueness of document analysis and comparative case study analysis, and how these data analysis methods provide insight to the reader. The third chapter will discuss industrialisation, deindustrialisation and the engine of growth hypothesis. The fourth chapter will also address rapid and premature deindustrialisation, which is highly relevant in the current industrial policy debate.

Furthermore, it will address the current state of South African industrial policy and sectoral performance. Chapters 5 and 6 will discuss the identified industrial policy cases of Brazil and South Korea that intensified their industrial policies and faced challenges within the scope of the middle-income trap. The seventh chapter of the thesis will address the historical context of South African industrial policy. This chapter is about the emergence of the South African economy in the twentieth century.

Moreover, this chapter discusses the structure of the minerals-energy complex and the state of the South African political economy and industrial policy during the apartheid era. The eighth chapter discusses the state of the South African political economy in a post-apartheid context. The ninth chapter addresses the state of industrial policy in post-apartheid South Africa. It is worth noting that two key parts of the chapter are integral to understanding the post-apartheid context. The first part of this chapter highlights the successes and shortcomings of the Macroeconomic Research Group (MERG) report. The second part of this chapter discusses the weaknesses and successes of the IPAP and the NIPF. The last chapter of the thesis will conclude the comprehensive review of the literature and provide a pathway to what the government can implement in terms of methods and strategies in South African industrial policy.

CHAPTER 2: RESEARCH METHODOLOGY

2.1 INTRODUCTION

Chapter 2 will provide an overview of the research methodology followed in this study and discusses the interpretive research paradigm adopted for this study and its significance. This chapter will also explain the purpose of document analysis and its relationship with the interpretive research paradigm. Data collection forms a crucial part of the research study because the focal points of the research are policy documents and journal articles. This chapter will discuss document analysis as an element of comparative case study analysis. Moreover, it will emphasise the importance of data trustworthiness. The interpretive research paradigm and the qualitative research approach will provide the context of how the research has been conducted.

2.2 THE INTERPRETIVE RESEARCH PARADIGM

When assessing the research paradigm, it is critical to consider how the research fits the overarching goal. The research paradigm used in the study is the interpretive research paradigm. According to Rehman and Alharthi (2016), the goal of the interpretive research paradigm is not to discover the universal, context and value-free knowledge and truth but to try and understand individuals' interpretations of the social phenomena they interact with. The interpretive research paradigm broadens the reader's thought process when reading any academic work or publication.

The presence of qualitative data in the study fuels the thesis with much essential information from the current literature. Like other research paradigms, the interpretive research paradigm has received its fair share of criticism for its effectiveness in producing knowledge. The interpretive research paradigm has been criticised for being soft and incapable of yielding theories that could be generalised to larger populations and the researcher's involvement with participants, which leads to a lack of objectivity (Grix, 2004). In response to this criticism, research paradigms come with specific flaws that other researchers sometimes question. In this case, the interpretive research paradigm is said to have flaws in objectivity and an inability to produce factual knowledge authentically. Richards (2003) is of a different view and disagrees with this notion: qualitative inquiry is not soft because it demands rigour, precision, systematicity, and careful attention to detail. In essence, the interpretive research paradigm is beneficial in documentation analysis. At a philosophical level, the interpretive research paradigm emphasises the construction of theories and systems, such as logical points of departure, and conceptual framework, amongst others (Xinping, 2002).

2.3 QUALITATIVE RESEARCH APPROACH

The qualitative research approach prioritises text-based information and knowledge of academic literature, articles, and documentation. This particular approach is descriptive and focuses on the details of the facts and information provided in the research conducted. Qualitative research is the systematic inquiry into social phenomena in natural settings. These phenomena include but are not limited to how people experience aspects of their lives, how individuals and groups behave, how organisations function, and how interactions shape relationships (Teherani *et al.*, 2015). In the context of South Africa and the different case study countries, the government's decision-making in industrial policy and an informed understanding of the structure of the political economy is pivotal in successfully conducting the research through the interpretive paradigm and the qualitative research approach.

2.4 DATA COLLECTION

The data collection method is essential to the study because it informs the reader of the rigidity of the research approach. The research has been conducted qualitatively in alignment with the interpretive research paradigm. According to Rehman and Alharthi (2016), interpretive researchers employ methods that generate qualitative data - examples of qualitative data collection methods include open-ended interviews with varying structures, observations, filed notes, and documents. In this research, the focal points of the South African industrial policy arguments are the IPAP and the NIPF, which are necessary documents that outline the targets of South Africa's industrial policy objectives. The data collected is secondary and does not require ethical clearance, as outlined in Chapter 1.

2.5 DATA ANALYSIS

Data analysis is an essential part of narrowing important data and research down to achieve the overarching goal of the thesis. It allows the reader to understand the research approach and the relevance of the data that has been collected. This particular section of the thesis references document analysis and comparative case study analysis.

2.5.1 DOCUMENT ANALYSIS

This dissertation uses the research method of document analysis to discuss the different policy documents and qualitative data presented in the thesis. Document analysis aligns perfectly with the interpretive research paradigm because one of the interpretive methods of data collection is document collection. Document analysis is an iterative process that comprises skimming (superficial examination), reading (thorough examination), and interpretation (Bowen, 2009). As a research method, document analysis applies to qualitative case studies that produce detailed descriptions of a single phenomenon, event, organisation, or programme (Stake, 1995; Yin, 1994; Bowen, 2009). In the context of the previous statement, document analysis is a rigorous research approach because the data collected from various documents make up the research report or thesis. These findings must form a quality argument

in a particular research area. In the research context, document analysis proves to be an efficient method for qualitative research because there is a core focus on the structure of industrial policy documents in South Africa. Moreover, the research collected comprises articles and books that address the challenges and outcomes in the literature on the political economy and premature deindustrialisation.

This thesis discusses industrial policy challenges and political economy complexities, which indicates a detailed document analysis. Therefore, the relevant themes would be industrialisation, deindustrialisation, policymaking, premature deindustrialisation, and sectoral performance. As such, it is critical to understand that some advantages and limitations come with this research methodology. Bowen (2009:31) identified document analysis's advantages: "efficient method, cost-effectiveness, lack of obtrusiveness and reactivity, reflexivity, stability, exactness, and coverage". Bowen listed advantages that allow the researcher much room to construct a cohesive dissertation. If one looks at two advantages [availability and cost-effectiveness], resources and articles would be accessible for the researcher, and the researcher would not have to worry about using their income to access their research. The research limitations are a part of the challenges of selecting the correct data. In light of this statement, Bowen (2009:31-32) identified document analysis's limitations: "insufficient detail, low retrievability, and biased selectivity". It is worth noting that limitations are not disadvantageous to data collection and research. These limitations outline the difficulty in retrieving the appropriate and relevant research to achieve the ultimate research goal of the study. Based on the previous statement, Bowen (2009) asserts that document analysis offers advantages that outweigh the limitations based on its efficiency and cost-effectiveness. In this research context, it is worth noting that document analysis is a key element of comparative case study analysis.

2.5.2 COMPARATIVE CASE STUDY ANALYSIS

Comparative case study analysis is fundamentally important for this research context because there is an assessment of South African industrial policy in comparison to the industrial policies of two case study countries, Brazil and South Korea. According to Goodrick (2020), comparative case studies cover two or more cases in a way that produces more generalizable knowledge about causal questions - about how and why particular policies work or fail to work. Comparative case study analysis allows the reader to properly assess the information that has been provided to them and to make informed arguments about the topic at hand. Lune and Berg (2017) assert that case study research is a powerful tool because there are many issues and events that cannot be properly understood without this kind of deep, intense study from multiple angles. To understand what South Africa needs for its industrial policy to succeed significantly, a deep and extensive analysis of the two case study countries [Brazil and South Korea is required].

2.6 DATA TRUSTWORTHINESS

Data trustworthiness is a crucial piece of the research that has been conducted because it maintains the integrity of the thesis and the validity of achieving the overarching goal of the thesis. Research is deemed of substantial quality if it has credibility, transferability, dependability, and confirmability (Guba and Lincoln, 1994).

2.7 SUMMARY AND CONCLUSION

Chapter 2 presented a discussion of the research methodology followed in this study. A discussion was provided on the interpretive research paradigm that is utilised in modern-day research. The qualitative research approach was functional, in alignment with the interpretive research paradigm, in light of the detail that needs to be assessed from the conducted research.

This chapter also outlined the data analysis methods, where the significance of document analysis and comparative case study analysis were clarified. Moreover, secondary data collection was undertaken by a desktop study to collect the necessary literature that later allowed for document analysis. It was noted that document analysis would be utilised to analyse the literature information since the research will follow a qualitative research approach to ensure a deeper analysis of the collected data.

From the literature, it was noted that qualitative researchers are concerned with the trustworthiness of the data and research findings. The trustworthiness of qualitative research findings can be established by using the following four qualitative suppositions: credibility (internal validity), dependability (reliability), conformability (objectivity), and transferability (external validity). The following chapter will analyse industrialisation, deindustrialisation, and the engine of growth hypothesis. This chapter will also address the climate of industrial policy and sectoral performance in a South African context.

CHAPTER 3: INDUSTRIALISATION, DEINDUSTRIALISATION AND THE ENGINE OF GROWTH HYPOTHESIS

3.1 INTRODUCTION

Chapter 2 provided an analysis of how the research will be conducted and the effectiveness of the research methodology. Chapter 3 will discuss the theoretical framework that will be used for the study. This chapter will also discuss industrialisation, deindustrialisation, and the engine of growth hypothesis. These concepts are of great importance to this study because they address the capabilities of industrial policy, the state of industrial development, and the efficacy of sectoral performance within the economy.

3.2 INDUSTRIAL POLICY THEORY FRAMEWORK

The industrial policy theory framework is the theoretical framework that will be guiding the research context in the thesis. According to Oqubay *et al.* (2020), discourses on industrial policy and scholarly debates echo global economic shifts, changes in the international power structure, and the ideological fervour of the period. This framework is fundamental to the study because the research is located within the theory and practice of industrial policy. This framework will also discuss the economic history of South Africa that led to the development of industrial policy within South Africa. Moreover, the comparative case study analysis of Brazil and South Korea's industrial policies justifies the use of this framework because the two case study countries have key successes in industrial policy implementations that South Africa could learn from. The aforementioned industrial policy implementations of the two case study countries will be discussed in Chapters 5 and 6 of the thesis respectively.

The key issue here is that South Africa has failed to prevent premature deindustrialisation in the post-apartheid era. The assessment of the issue would have to start with the development and growth of South African industrial policy from the start of the twentieth century to the post-apartheid era. When looking at the start of the twentieth century, South Africa became a state that was about to establish its economy as well as its government. From 1910 to 1994, South Africa was divided into four provinces made up of the two former British colonies of the Cape and Natal, and the two former Boer republics of the Transvaal (previously the South African Republic) and Orange Free State (Feinstein, 2005). A key highlight of South African industrial policy is the establishment of ESCOM in 1922 through the Electricity Act (Freund, 2018). Freund (2018) asserts that the idea behind ESCOM was to make it as independent as possible both from private capital and from any political interest within South Africa. ESCOM distancing itself from private capital and political interest gave it autonomy to become a sole provider of electricity and to contribute to the economy in sectors that require electricity.

Another key highlight of South African industrial policy is the election of the apartheid government in 1948. Ashman and Newman (2013) point out that the election of the Nationalist Party government in 1948 marked the pinnacle of the disjuncture between economic and political power in South Africa.

The apartheid government in South Africa had the power to ensure that the economic and political interests of the country are aligned on the condition that they benefit from these interests. The power dynamics of the apartheid government played a pivotal role in governing the native majority of the South African population. Consequently, the onus was on the apartheid government to inspire economic growth in their political position. Apartheid did not enable South Africa to grow more rapidly than countries that did not have similar low-wage, labour-repressive economies, but neither did it prevent a successful performance (Feinstein, 2005). The establishment of ESCOM, the South African apartheid government, and the state of the South African economy under the apartheid regime will be discussed in great detail in Chapter 7 of the thesis.

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The economic history of South Africa plays a pivotal role in the research context because it maps out the story of South Africa's economic development and the state of South African industrial policy. Furthermore, industrial policy is integral to the development of any economy, especially if it is well-constructed and strategically implemented. The final highlight of South African industrial policy is the post-apartheid era. The state of the South African economy in the post-apartheid era is equally important as its economic history. Both the past and present of the South African economy will provide key information on the development of South African industrial policy. According to Ashman and Newman (2013), the new government of 1994 recognised the limitations of Industrial Policy driven by the desire to build up Afrikaner capital and to create employment for white workers. Essentially, the new government of 1994 was left with the task of reconfiguring South African industrial policy that accommodates all South Africans. In terms of key economic policies, the Mandela and Mbeki presidencies generated several policy documents such as the Macroeconomic Research Group (MERG) Report, the New Growth Path (NGP), the National Development Plan (NDP), among others (Francis *et al.*, 2022). The journey of generating key policy documents paved the way for the creation of the Industrial Policy Action Plan (IPAP) and the National Industrial Policy Framework (NIPF) in the late 2000s. It is worth noting that the current state of industrial policy, and its implementation, will determine whether deindustrialisation can be combatted or not. Moreover, the current state of industrial policy will determine the prospects of South Africa's industrialisation. According to Rodrik (2008), a lot of South African industrial policy takes place in different parts of the public sector - in several ministries (not just the Ministry of Trade and Industry) and development banks. In context to the previous statement, it is critical to consider how the different stakeholders (ministries and development banks) can optimise the growth of South African industrial policy. The state of industrial

policy in the post-apartheid era will be discussed in Chapter 9 of the thesis and will influence the recommendations given in Chapter 10 of the thesis.

3.3 INDUSTRIALISATION

Industrialisation is conceptualised as the expansion of the manufacturing sector (Szirmai, 2012). In essence, industrialisation is one of the critical causes of economic growth. It is not necessarily limited to Szirmai's definition. However, there is a prioritisation for the expansion of economic sectors. "The vision for industrialisation must be integrated with overall economic planning and be based on an understanding of sectoral dynamics and opportunities, taking land, water, and energy into account" (Bell *et al.*, 2018:vii). Industrialisation promotes the reduction of unemployment and poverty in the national economy. Manufacturing stimulated various related activities - from supplier input production and innovation to higher-value and more secure service sectors (Davies, 2021). The critical concern for middle-income economies is how economic growth provides a platform that cultivates and fosters industrialisation. The industrialisation path will remain necessary for low-income countries because they can take advantage of their backwardness relative to those countries which have already experienced rapid industrialisation with a disproportionately large share of manufacturing activities and could soon enter a mature stage of industrialisation (Haraguchi *et al.*, 2017). Consequently, it is essential to consider the different industrialisation experiences between low and middle-income countries.

Industrialisation is seen as a single global process of structural change in which individual countries follow different paths based on their initial conditions and the moment they enter the race (Szirmai, 2012). In economic literature, structural change forms part of industrialisation, influencing economic growth. In essence, the government of a country needs to grow all the sectors within the economy and provide financial assistance to facilitate growth. Furthermore, the policy that is put in place for the different sectors needs to be executed based on the available resources. Structural changes in any given sector influence the economic circumstances of suppliers and customers (Pasinetti and Lloyd, 1987). In essence, a sector needs to be fully equipped to meet the customers' needs, and the suppliers must ensure that their pursuits in selling the produced goods are profitable. Industrialisation is a key challenge in South Africa and Africa as a whole. Only a massive industrialisation effort will enable Africa to eradicate poverty and achieve sustainable development. Industrialisation will facilitate dynamic processes of technological innovation, skills development, knowledge intensification, and capital accumulation (Morris and Fessehaie, 2014). In the context of this statement, the importance of industrialisation cannot be taken because it is a critical mechanism of economic growth. The challenges and advantages of industrialisation will determine whether there is a relationship between industrialisation and economic growth. In industrialisation, it is paramount to assess the manufacturing sector and whether it correlates positively with economic growth.

Manufacturing carries several advantages that are centred towards industrialisation: increasing returns, dynamic imperfect competition, semi-skilled/skilled labour, reversible and more stable wages, higher revenue levels due to innovation, and the creation of a middle-class (Marti and Ssenkubuge, 2009; Reinert, 2007). As good as these advantages may seem, it is critical to analyse why some are reflected only partially in South Africa's industrial policy. South African industrial policy will be discussed in great detail in Chapter 9 of the thesis, but it is critical to address several industrialisation challenges in the thesis.

3.3.1 GLOBAL VALUE CHAIN (GVC) UPGRADING

A key aspect of promoting industrialisation is global value chain upgrading. Before the literature discusses the fine detail of GVC upgrading, it is salient to know what a global value chain means. A global value chain (GVC) refers to a system that focuses on expanding supply chains globally and the creation (and capturing) of value therein (Gereffi, 2014). A GVC is vital because it is a strong building block for industrialisation and global competitiveness. The process of globalisation has resulted in production being increasingly organised within GVCs (Morris *et al.*, 2022). GVCs are beneficial for industrial sectors because they improve and concentrate the productivity of different products. Morris *et al.* (2022) state that GVCs are recognised as being important because they drive the organisation of industrialisation activities (encompassing manufacturing and related services, minerals, and energy) on a global and national scale. The performance of GVCs is instrumental to any economy witnessing significant profitability and productivity not only at a domestic level but at a global level. As a result, there needs to be an enhancement of the GVCs, which means that GVC upgrading needs to be implemented.

Andreoni and Tregenna (2018) describe global value chain (GVC) upgrading as improving a firm's ability to move to more profitable or technologically sophisticated capital and skill-intensive economic niches. This description of GVC upgrading aligns firmly with the dynamic processes of technological innovation, skills development, knowledge intensification, and capital accumulation. GVC upgrading exists in different forms, namely: process upgrading, product upgrading, functional upgrading, and intersectoral upgrading (Andreoni and Tregenna, 2018). These different forms of GVC upgrading can make a significant difference in ensuring that firms in different industries promote industrialisation. Upgrading within GVCs is central to South Africa's further industrial and economic development because much of the country's engagement is located in high-value (and skill-intensive) activities that offer the potential for significant technological advancement (Morris *et al.*, 2022). Furthermore, Andreoni and Tregenna (2018:10) assert that "intersectoral upgrading is becoming an increasingly important process, given that modern, high-value manufacturing activities rely on cross-cutting

technology systems, such as biotechnologies, advanced materials, microelectronics, and automation, enable multiple production activities in different manufacturing industries".

The concept of GVC upgrading was defined by Andreoni and Tregenna (2018) as a process whereby the economy moves towards more profitable and/or technologically sophisticated capital-intensive and skills-intensive economic activities to create a space for higher value-creation potential. The different forms of GVC upgrading were listed in the same chapter: process upgrading, product upgrading, functional upgrading, and intersectoral upgrading. The drive for GVC upgrading is to ensure stability in the diverse production capabilities and the supply of goods. In light of this viewpoint, there is a bottom-up approach that describes upgrading as a mechanism used by countries, regions, and other economic stakeholders to maintain or improve their positions in the global economy (Gereffi, 2014; Gereffi and Fernandez-Stark, 2011). Engagement in GVCs has many potential advantages for developing countries, including developing countries having to specialise in tasks and provide intermediate inputs to GVCs for final assembly and market customisation (Morris *et al.*, 2022). Andreoni and Tregenna (2020) clarify the different forms of GVC upgrading and how they play a role in combating this particular structural challenge:

1. Process upgrading refers to the improved production methods that transform inputs into final products more efficiently through the reorganisation of production or the production of superior technology.
2. Product upgrading refers to moving into more sophisticated product lines in terms of higher unit-value products rather than moving to a different part of the value chain.
3. Functional upgrading refers to performing new superior functions in the chain, such as design or marketing, or abandoning existing low-value-added functions to focus on higher value-added activities.
4. Intersectoral upgrading entails applying the competence acquired in a particular function or industry to move into a new sector.

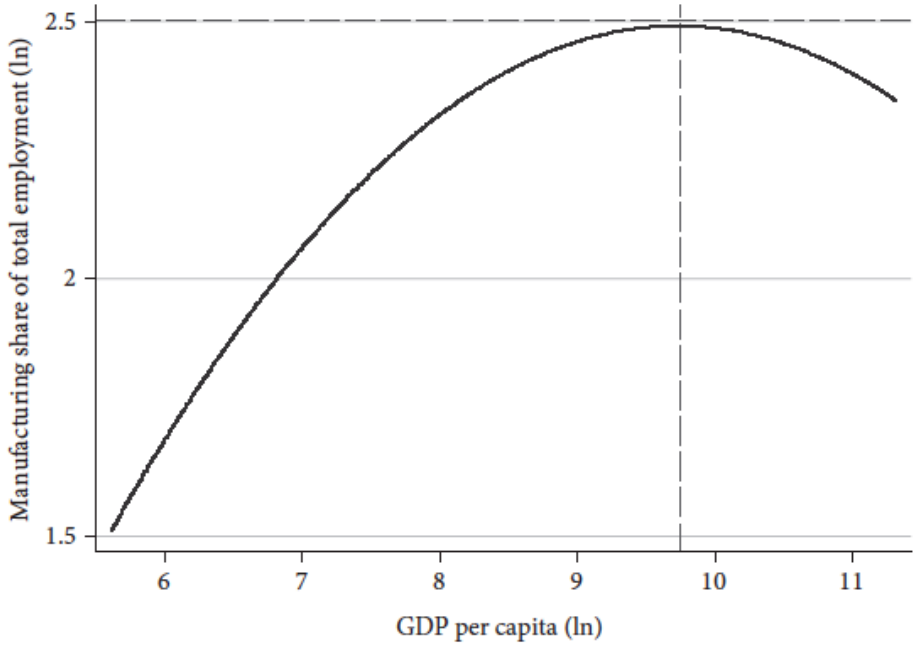
The above-mentioned forms of GVC upgrading aim to enhance economies to become active participants in the global economy, especially through international trade. Furthermore, the participation of the different industrial sectors in the global economy will promote globalisation and potentially increase the supplied amount of skills, capital, and labour in those sectors. In essence, the current South African government should focus more on intersectoral upgrading before worrying about the other forms of upgrading. Intersectoral upgrading requires cross-cutting capabilities and technology systems to strengthen intra-sectoral and intersectoral upgrading and enhance new development trajectories under innovation and technological upgrading (Andreoni and Tregenna, 2021).

3.4 DEINDUSTRIALISATION

For the study, it is essential to understand what deindustrialisation means. In current literature, deindustrialisation is conceptualised as a decline in manufacturing employment, manufacturing as a percentage of GDP, or manufactured exports as a percentage of total exports (Tregenna, 2009). The performance of key variables in the manufacturing sector is fundamental to defining the deindustrialisation phenomenon. Given the key principles outlined by Kaldor (1967) that have proven helpful in understanding the relationship between the manufacturing sector and economic growth, deindustrialisation may stifle economic growth in a developing country. According to Tregenna (2009), the first Kaldorian principle states that the faster the manufacturing growth rate is, the faster the economy's growth rate will be. In alignment with this principle, the sectors that fall under manufacturing and manufacturing will perform based on the state of the manufacturing growth rate.

During economic development, there is a difference in sectoral dominance. In the low stages of development, the primary sector tends to be larger than the secondary (industrial sector) (Andreoni and Tregenna, 2018). As economic development and structural change occur, and the economy produces an output of a more technologically sophisticated nature, the primary sector shrinks as a percentage of output - then it starts to have a nascent tertiary sector (services sector) (Szirmai and Verspagen, 2015). As the economy grows and becomes more technologically intensive, productivity in the manufacturing sector also rises (Palma, 2005). While this is happening, the services sector grows more than the manufacturing sector and surpasses it (deindustrialisation). So then, there is an inverted-U relationship between industrialisation and income (Palma, 2005). Hence, deindustrialisation is a normal economic development process (Andreoni and Tregenna, 2021). Notice here that while there is a dominant services industry, the manufacturing sector is still technologically sophisticated and externally competitive. However, premature deindustrialisation is not normal in long-run economic development. Tregenna (2009:440) defines deindustrialisation "as a fall in the share of manufacturing in employment". The definition of deindustrialisation needs to be considered because its presence could be clarified for the vision of industrial policymaking. Tregenna (2009) asserts that the narrow definition of deindustrialisation neglects trends in the level or share of manufacturing output, which could give rise to misleading policy interpretations.

Figure 3.1: Relationship between GDP per capita and manufacturing share of employment, 2015



Source: Andreoni and Tregenna (2021:249)

Manufacturing has traditionally played a key role in the economic development of developing countries. In recent years, it has been argued that the importance of manufacturing has diminished over the last 20–25 years, resulting in premature deindustrialisation or non-industrialisation in developing countries (Haraguchi *et al.*, 2017). The critical discourses to discuss in this research are the socioeconomic impacts of premature deindustrialisation and the engine of growth hypothesis in the South African context. "From the perspective that manufacturing has a special role to play in the growth process, deindustrialisation and premature deindustrialisation, in particular, would be regarded as problematic in terms of the implications for the rates and sustainability of growth" (Tregenna, 2009:436). The unique role of manufacturing has been confronted by deindustrialisation and economic inequality in recent literature. Manufacturing may no longer be the driver of economic growth because a high level of human capital (at least seven to eight years of education) is necessary for manufacturing to play a role as an engine of growth in developing countries (Szirmai and Verspagen, 2015; Haraguchi *et al.*, 2017). In the context of this statement, there is a positive relationship between human capital and manufacturing - when there is a lack of human capital, the manufacturing sector will suffer.

Moreover, assessing the relationship between manufacturing employment and manufacturing output and which is most relevant is vital. According to Tregenna (2009), the growth-pulling effects of manufacturing through backward and forward linkages with the rest of the domestic economy are related more to the GDP share of manufacturing in GDP and the growth of manufacturing output than to its share of employment or growth in manufacturing employment. In the context of this

statement, manufacturing output is often created through machinery and production processes. Even if manufacturing's share of employment is shrinking, if the sector as a whole is growing, this will give rise to higher demand for inputs from backward-linked sectors and provide stimulus and potentially lower input costs to forward-linked sectors (Tregenna, 2009).

As stated earlier, current literature defines deindustrialisation as a decline in manufacturing employment, manufacturing as a percentage of GDP, or manufactured exports. Tregenna (2009) gave a discerning view on deindustrialisation to redefine how policy surrounding different economic sectors should be positively influenced. On this point, it is pivotal to assess the difference in significance between manufacturing employment and manufacturing output.

3.5 THE ENGINE OF GROWTH HYPOTHESIS

The engine of growth hypothesis is concerned with the optimal performance of sectors in the overall economy wherein manufacturing takes a prominent role. The engine of growth hypothesis is heavily influenced by the uniqueness of the manufacturing sector and its growing influence on the economy. The manufacturing sector tends to be more important as an engine of growth in developing countries than in developed countries (Szirmai and Verspagen, 2015). In the context of this statement, the manufacturing sector is regarded as a high-performing sector. The manufacturing sector is a sector that is resilient to shocks, possesses a lot of intersectoral linkages, and tends to be low-skill labour-absorptive (Szirmai and Verspagen, 2015). Several arguments favour the engine of growth hypothesis. As such, these arguments are crucial in understanding the industrialisation and deindustrialisation of developing countries. Manufacturing is traditionally regarded as an engine of growth, implying that an absolute or relative decline in manufacturing would have deleterious consequences for sustainable growth (Tregenna, 2008).

The manufacturing sector is pivotal to economic growth and labour productivity. Therefore the engine of growth hypothesis outlines the challenges faced within the sector. The manufacturing sector's higher potential for productivity growth benefits from the sector's ability to achieve higher levels of capital accumulation, economies of scale, and technological progress relative to agriculture and some services (Cornwall, 1977; Szirmai, 2013; Haraguchi *et al.*, 2017). In a world where the Fourth Industrial Revolution is changing how goods are manufactured, machinery produces goods and acts as an unlimited labour supply. The benefit here is that the unlimited labour supply is tireless and robotic. However, the downside is that this machinery is a direct substitute for human capital in significant quantities. The Fourth Industrial Revolution risks jobs being destroyed by automation, mass customisation, and robotisation, potentially moving manufacturing closer to customers with increased use of recycled materials - its adoption requires a great understanding of and engagement with the

underlying technologies and of the strategies of the businesses seeking to use them to disrupt global markets (Sutherland, 2020). While there is an unlimited labour supply at subsistence wage levels, a capitalist sector can expand continuously by investing part of its profits until all the surplus labour has been absorbed (Lewis, 1954; Haraguchi *et al.*, 2017).

The argument favouring the hypothesis is that capital and labour must be optimised to succeed. In essence, industrialisation favours the manufacturing sector as a growth engine. According to Szirmai (2012:410), "the manufacturing sector offers special opportunities for capital accumulation - capital accumulation can be more easily realised in spatially concentrated manufacturing than in spatially dispersed agriculture". Capital accumulation is critical to the success of the manufacturing sector because of its adaptability to technological progress. If more capital is accumulated in this particular sector, the greater the capital intensity will be for a more capital-intensive sector than a labour-intensive sector. Capital accumulation is one of the aggregate sources of growth; thus, an increasing manufacturing share will contribute to aggregate growth (Szirmai, 2012). Lastly, the manufacturing sector's advantages can be exploited to benefit the economy. Industrialisation is defined as general economic development and is not only centred around manufacturing. Manufacturing exists within different sectors because of its sectoral linkages. In this case, a comparison between manufacturing and agriculture is used to expand on the different standpoints on industrialisation. A key argument in favour of industrialisation states that labour productivity in agriculture is much lower than labour productivity in the industry. A transfer of labour from low-productivity agriculture to high-productivity industry results in an immediate increase in overall productivity and income per capita.

3.6 SUMMARY AND CONCLUSION

Chapter 3 outlined the industrial policy theory framework that guides the research context. The industrial policy theory framework is fundamentally important because the thesis will discuss the state of South African industrial policy, and there will be a comparative case study analysis of Brazil and South Korea. This chapter thoroughly explains industrialisation, deindustrialisation, and the engine of growth hypothesis. Understanding these concepts gives the reader a clear picture of policy implementation challenges and sectoral performance. Should a sector not perform as well as it once did in the past, the reader will easily follow the research investigation and formulate arguments on why specific sectors could not reach optimal performance or why a particular economy performed a certain way.

This chapter also outlined the structure and purpose of global value chain (GVC) upgrading. It also clarified the importance of improving industrial policy and promoting industrialisation. Moreover, the fall in the manufacturing share played a pivotal role in how deindustrialisation negatively impacted

economic growth. This chapter also outlined the possibility of the manufacturing sector no longer being an active driver of economic growth. This chapter also clarified the purpose of the engine of growth hypothesis and how this hypothesis served as a crucial tool for the benefit of the manufacturing sector.

CHAPTER 4: PREMATURE DEINDUSTRIALISATION AND THE MIDDLE-INCOME TRAP

4.1 INTRODUCTION

This chapter reflects on the 2007 and 2018 IPAPs to understand the successes and shortcomings of South African industrial policy and the distinction between policy on paper and the implementation of the policy itself. This chapter will touch on the middle-income trap, the middle-income technology trap, and premature deindustrialisation. This discourse discusses how South Africa's industrial policy has played a role in deindustrialisation. The research will address the middle-income trap, the middle-income technology trap, premature deindustrialisation and the socioeconomic consequences of premature deindustrialisation in South Africa. This chapter will also address the fundamental challenges in industrial policy and the manufacturing sector. References will be made to the challenges the economy faces in terms of industrialisation and industrial development.

4.2 PREMATURE DEINDUSTRIALISATION

As highlighted earlier, the manufacturing sector contributes significantly to the GDP, and its success rests on the state of technology. The premature move to deindustrialisation will cause many problems for a country that rests on industrial policy principles, primarily through implementing the IPAP. South Africa is an unequal country and comprises mainly a middle-income class. Premature deindustrialisation is often thought to mean that the gains from manufacturing as an engine of growth and catching up are no longer available to developing economies (Cramer and Tregenna, 2020). Consequently, developing economies will become stagnant and underdeveloped while other economies advance. "Premature deindustrialisation, in turn, can contribute to countries being stuck in a middle-income trap" (Andreoni and Tregenna, 2021:238).

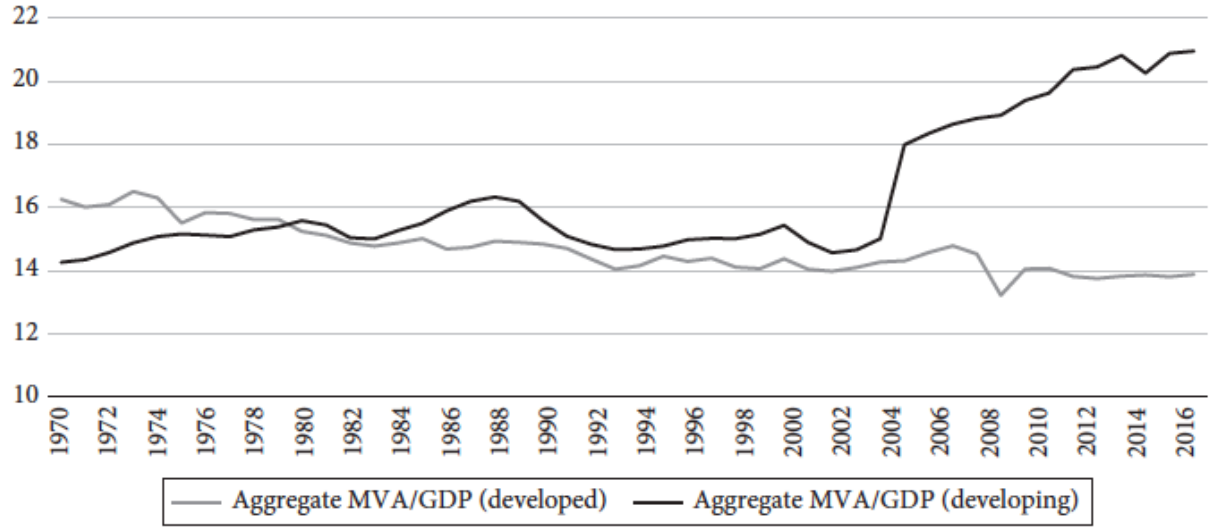
Linking the middle-income technology trap and premature deindustrialisation presents the possibility of a vicious cycle of weak technological and broader industrial upgrading, deindustrialisation, lack of structural transformation, and poor economic growth (Andreoni and Tregenna, 2021). In light of this statement, premature deindustrialisation is the key contributor to the middle-income trap. Premature deindustrialisation is shown through poor economic growth and low performance in sectors that contribute to the GDP significantly (under normal conditions). Suppose the idea is embraced that manufacturing industries play a critical role in boosting productivity, value addition, and technological change. Industrial hubs can attempt to restrict deindustrialisation because they are centred within the manufacturing sector. Industrial hubs can potentially contribute to the strengthening of intersectoral linkages, both amongst manufacturing firms within hubs and possibly with the rest of the domestic economy (Cramer and Tregenna, 2020). It is worth noting that premature deindustrialisation could be

another factor responsible for the middle-income trap phenomenon (Andreoni and Tregenna, 2021). Premature deindustrialisation brings many challenges to industrial policy, and it carries many implications for industrial-based sectors. The thesis focuses on South Africa, emphasising that Africa, as a continent, has much groundwork to advance and industrialise its economies. Cramer and Tregenna (2020) state that African economies will have to get what growth they can from expanding services without strong employment-generating effects. They will have to wait patiently for skill levels to rise.

A critical question that needs to be asked is how South Africa experienced signs of premature deindustrialisation. Premature deindustrialisation does not only harm industrial performance, but it hurts the labour market. Premature deindustrialisation is a threat to low and middle-income countries because it shrinks their opportunities for technological development and their capacity to add value in global value chains and tradable sectors, thereby ultimately reducing their scope for productivity increases (Tregenna, 2018). Premature deindustrialisation was highlighted clearly as a contributor to the middle-income trap. The economy must eliminate the middle-income trap by combating structural challenges with realistic timeframes and key action plans within the policy documents. Premature deindustrialisation represents a major threat to developing countries' prospects of sustained catching up (Andreoni and Tregenna, 2020). This is the phenomenon of premature deindustrialisation: the trend in which many developing economies have experienced a shrinkage in the share of manufacturing value added (MVA) in GDP and employment, at lower levels of income per capita and at lower shares of manufacturing than such declines had ever been experienced before (Cramer and Tregenna, 2020).

By shrinking the manufacturing base, premature deindustrialisation can reduce the opportunities for developing and accumulating technological capabilities and the scope for innovation and productivity growth (Andreoni and Tregenna, 2020). When assessing the significance of the manufacturing sector, it is beyond doubt that premature deindustrialisation is a cause of the middle-income trap and creates a space for underdevelopment in developing countries, such as South Africa. It is key to consider the graph below to understand the phenomenon of premature deindustrialisation. The graph clearly shows that there has been an increase in the manufacturing value added, as a share of GDP, for developing countries from 2004 onward. On the other hand, the manufacturing value added, as a share of GDP, for developed countries has experienced a steady and consistent decline throughout the time period 1970 to 2016.

Figure 4.1: Aggregate manufacturing value added as a share of GDP, developed and developing countries (1970–2016)



Source: Cramer and Tregenna (2020:49)

Countries experience premature deindustrialisation when the level of GDP per capita or the shares of manufacturing in total employment and GDP at which deindustrialisation sets in are lower than is the case internationally (Andreoni and Tregenna, 2021). The emphasis made in this argument is that countries' performance and shares in different sectors are vital to the economy's survival. Every sector in the economy has a crucial role in contributing different shares to the GDP. The manufacturing sector is a sector that interlinks with other sectors, particularly in producing final goods. In structuralist approaches, the manufacturing sector has historically been considered to have a unique role as the primary engine of growth (Alcorta *et al.*, 2013; Hirschman, 1958; Prebisch, 1950, 1963; Szirmai, 2012; Tregenna, 2009; Weiss and Jalilian, 2016).

4.3 THE MIDDLE-INCOME TRAP

The middle-income trap is a phenomenon that forms part of South Africa's unequal economy. South Africa has a middle-income economy that has been unable to break through to being a high-income economy. The middle-income trap is a phenomenon that has hindered South Africa from reducing inequality and advancing to higher-income status. Lin (2017) defines the middle-income trap as a result of a middle-income country's failure to have faster labour productivity growth through technological innovation and industrial upgrading than high-income countries. The middle-income trap is a critical challenge that can be addressed by investing capital goods into innovation and industry performance. A middle-income trap could occur not only if there is a delay in shifting the economy toward a productivity structure but also if there is a worsening in income distribution (Egawa, 2013). Between 1994 and 2019, South Africa was classified as middle-income and remained in middle-income status; it is worth noting that the middle-income trap is not confinement from which countries have no hope of

escape (Andreoni and Tregenna, 2021). In light of this matter, it is essential to refer to recent literature to understand the middle-income trap and how different countries have combated it in various ways, such as through technological enhancements and industrial growth.

The world's middle-income countries are a heterogeneous group of about 195 countries home to five billion people and generate half of the global GDP (Andreoni and Tregenna, 2020). The crux of this statement is that the middle-income group makes up the majority of the world, and the onus is on the heterogeneous group to bolster their different economic sectors to improve the livelihoods of their citizens. Numerous factors and explanations in the literature address the causes of the middle-income trap, and the aforementioned factors and reasons differ in various countries. Several factors include the following. There is a need to perform a comparative analysis with other developing countries that have suffered from the middle-income trap so that the reader understands what the middle-income trap entails and why countries fall into the middle-income trap. Wade (2016:472-473) has listed several mechanisms for the middle-income trap, all of which will be addressed in this section of the thesis: "diminishing returns to inter-sectoral reallocation and factor accumulation, export structure, foreign ownership, low investment to gross domestic product (GDP) and the foreign debt trap".

Diminishing returns to inter-sectoral reallocation and factor accumulation are contributors to the middle-income trap. Human capital is essential to averting the middle-income trap because it can become a catalyst for economic growth. Human capital is expressed through the education and skills individuals offer to the firms that employ them. There needs to be more than education levels and skills to ensure overall economic growth, and this needs to be complemented by rigid economic policy, industrial financing and strategic governance. Raising the population share with secondary and tertiary education may reduce the chances of experiencing growth slowdowns, but the causality is difficult to establish, and the causality of something as broad as governance reforms even more so (Kanchoochat and Intarakumnerd, 2014; Besley and Persson, 2011). Generally, factor accumulation explains most of the output growth for the Organisation for Economic Co-Operation and Development (OECD) countries - output growth decomposes into input, efficiency, and technological change components (Koop *et al.*, 2009; Limam and Miller, 2004). A focused inter-sectoral reallocation will allow for coherent coordination between different sectors and sectors that complement each other, such as the clothing and textile sector.

4.3.1 CHALLENGES OF THE MIDDLE-INCOME TRAP

A significant part of any economy is trading (imports and exports). This economic aspect is influential to the balance of payments in the economy. It gives the government ideas on how to strategise in terms of trade policy and other related policies, such as industrial policy. The following mechanism that the

research will focus on is export structure. The export structure refers to how well countries export goods to other countries, what categories of goods are being exported and how this form of trade benefits the sectors involved and, subsequently, the economy. Fagerberg *et al.* (2007) found, across a large set of countries, that countries that in 1980–1982 had a relatively high proportion of their exports from four categories of goods (ICT, pharmaceuticals, instruments, other machinery) enjoyed higher subsequent GDP growth to 2000–2002 than countries with less of their exports from these industries – for the reason that these four categories experienced the fastest growth of world trade of products. In essence, these findings prove the significance of a diversified export structure. It is a diversified export structure that needs to be promoted and advanced in economic policy, and these policies will advocate for labour market growth across numerous industries.

The foreign ownership of firms plays a crucial role in growing the domestic economy and adding value to the economy at a global scale. Multinational corporations are big businesses that boast foreign ownership and look to contribute positively to the sectors they represent and bolster the economy. In the research context, the focus is on the manufacturing sector and how deeply impacted it is when the MIT mechanisms are present. The difficulty faced by countries whose manufacturing sector is dominated by foreign-owned firms and dependent on technology imports in transitioning to one controlled by local managers - is known as the glass ceiling (Ohno, 2009; Wade, 2016). The problem identified here is a disconnect between local resources and foreign ownership. When assessing multinational corporations, they prefer using in-house production or imports from their suppliers, sourcing only simple content from local firms, and repatriating profits (Wade, 2016). To a large extent, the approach taken by multinational corporations works against them being able to produce at an optimal level and making profits for themselves other than just repatriating their profits. When local firms integrate into global manufacturing value chains, they may find themselves locked into low-value-added manufacturing activities that take on economic qualities similar to low-value-added commodities (Wade, 2016).

The following focus mechanism barely needs any new introduction in economic discourses: low investment to GDP. Potential investors from other countries and the private and public sectors are critical determinants of how well investment does within the scope of the GDP. Allen and Ndikumana (2000) assert that low investment will lead to macroeconomic uncertainty. In sum, there will be uncertainty in determining interest rates and national productivity. Furthermore, this uncertainty will lead to a drop in competitiveness in a trade (importing and exporting) context. High macroeconomic uncertainty disrupts economic decision-making and slows down productivity growth. This uncertainty level is associated with low investment because investors wait for its resolution as if it is perceived, whether correctly or incorrectly, as temporary (Allen and Ndikumana, 2000; Pindyck and Solimano,

1993). Addressing macroeconomic uncertainty is a significant opportunity for the middle-income trap to be combated and avoided in future. A fundamental cause of macroeconomic uncertainty is inflation. Inflation is highly influential on the state of the economy because it plays a role in price changes that could negatively impact consumers' living standards, and it applies more pressure on the economy to remain trapped in the middle-income bracket. The supporting argument favouring inflation emphasises a lot more autonomy from the consumers. A rise in inflation increases the cost of holding money - the premise of this argument is that inflation encourages saving, thus reducing the interest rate, which will result in higher investment and growth (Mundell, 1965; Tobin, 1965; Allen and Ndikumana, 2000). In light of this argument, the inflation approach is suitable for the economy's growth in the short term. Still, if it is continuously implemented long-term, it will negatively impact consumers' money income and livelihoods.

The last focus mechanism is the foreign debt trap. To a large extent, the foreign debt trap is topical because it is a deciding factor as to whether or not a country remains trapped in the middle-income bracket. Western countries have been known to assist African countries through investment in specific sectors and the creation and implementation of structural adjustment programs (SAPs). From the 1970s till today, western international organisations and development economists have urged developing country governments to adopt a strategy of economic growth with foreign borrowing (Bresser-Pereira and Gala, 2008; Bresser-Pereira *et al.*, 2014; Wade, 2016). The Washington Consensus is a great example to discuss when assessing African countries that suffer from debt traps and struggle to get out of the middle-income trap. This discourse will discuss the structure of the Washington Consensus and its tremendous impacts on the developing countries involved. The rationale is that more foreign borrowing permits a higher rate of domestic investment than less foreign borrowing (Wade, 2016:474). Domestic investment benefits the country regarding capital growth, infrastructure enhancement, sectoral development and a higher provision of public goods. However, the consequence of foreign borrowing is that the money invested into the economy's growth must be paid back. Advocates of foreign borrowing tend to downplay the dangers of the country's ability to repay (Wade, 2016:474).

4.3.2 THE MIDDLE-INCOME TRAP IN INDUSTRIAL POLICY

The middle-income trap is an issue that needs industrial policy approaches. It is critical to look at an example of an industrial policy approach countries can take to avert the middle-income trap. Firstly, market forces must take control of development, and the government should privatise specific industries. The public and private sectors must mutually cooperate so that a strong government presence will not distort market forces (Carnovale, 2012). In the South African economy, the

relationship between the private and public sectors is a stepping stone toward combating the middle-income trap. However, the state of this relationship needs to be unravelled.

It is vital to consider the different challenges and political economic dynamics that come with the respective sectors [public and private sector] and the challenges with the relationship between the individual sectors. The public sector, by design, is meant to focus on the needs of the public. The government mainly controls the public sector, and the onus is on them to ensure that their expenditure is valuable to the economy and the public. In essence, the government perspective would be that industrial policy must have a tangible and concrete political dividend, and the private sector must perceive their investment [in their view and that of the public sector] to be feasible and as a viable, alternative method of making a profit (Andreoni and Tregenna, 2018).

In terms of political involvement, the government would ensure that different institutions with governance structures are involved in formulating industrial policy. The government is articulated in different ministries, departments and agencies (MDAs) operating at national and sub-national levels, which are set up to perform critical industrial policy functions, allocating rents and tax exemptions (Andreoni and Tregenna, 2018). The vision that the government had, at face value, proved to be rigid and straightforward for ensuring precise and cohesive policy formulation. The issue, however, is that there needed to be more coordination of the different MDAs involved. According to Gill and Kharas (2015), the low rates of economic growth and the failure of "catch up" with advanced economies, are characteristics of countries stuck in a middle-income trap. A critical governance challenge is that the mandate of the involved institutions needs to be clarified, and duplication across the MDAs is common (Andreoni and Tregenna, 2018). The repetition across the MDAs causes a conflict of interest. The repetition will confuse the country when carrying out a function that has to do with any policy concerning those MDAs. An ideal solution would be to consider reformative measures allowing the MDAs to deal with the duplication and operate synergically. However, this is not the case in the view of the MDAs. The attempt, to reform institutional and governance structures, is challenging because MDAs are often focused on preserving their policy space and resources; they [instead] compete to protect and increase the resources they have been allocated to fulfil their functions (Andreoni and Tregenna, 2018).

From a private sector viewpoint, the goal is to gain profits from productivity and optimal performance following rigid industrial policy. Without hesitation, the private sector will seek to benefit from any economic engagement, especially where the public sector is involved. The private sector must be aware of the challenges posed by different economic industries, and it should also enhance productivity and provide resources in those particular industries. The ideal solution is to have formulated policies

designed to accommodate the needs of the private sector and the prospects of alternative means of making a valuable profit. Rodrik (2006) argues for the creation of high-productivity, high-wage jobs to absorb low-skilled workers, supported by a macroeconomic policy that keeps the exchange rate stable and competitive to encourage exports, and an industrial policy that encourages private investment and entrepreneurship. By mobilising resources towards productive forces in the private sector and incentivising the building up of the local production system, industrial policy can make productive investments feasible and profitable (Andreoni and Tregenna, 2018). The role of the government is pivotal to the success of both the public and private sectors.

The point here is that the government should not become greedy and realise economic growth that will benefit the country's citizens and not just for their sole benefit. The country's citizens will experience the provision of public goods, social security, brilliant infrastructure, and decent service delivery [amongst other things] because the government is playing its role by being transparent and fulfilling the mandate of the people it serves. To ensure that the government remains on the path of realising economic growth, there needs to be a presence of political settlements. Political settlements are defined as a "description of the distribution of power across organisations that are relevant for specific institutional or policy problem analysis" (Khan, 2017:640). In the context of this statement, the political settlement is pivotal to economic policymaking. Evans (1995) captures this viewpoint through the concept of embedded autonomy, where the government has to have its roots in society (embeddedness). Still, the government must have the willpower (autonomy) to intervene effectively. Embedded autonomy is significant to the government's economic operations because there needs to be both a realisation of economic profits for the private sector and the realisation of successful policy implementation for the public sector (government). Analysing a country's political settlement allows for a clear assessment of the feasibility of certain policy interventions and the extent to which a certain policy instrument can be implemented and enforced (Andreoni and Tregenna, 2018).

4.4 THE MIDDLE-INCOME TECHNOLOGY TRAP

The next focal point is the middle-income technology trap. The middle-income technology trap can contribute to premature deindustrialisation, as the failure to upgrade manufacturing and move to more technology-intensive industries can exacerbate the poor performance of manufacturing (Andreoni and Tregenna, 2021). It is important to note that South Africa is riddled with economic inequality, and the middle-income technology trap will have a domino effect on all the elements that form part of the manufacturing sector. The sector's failure will lead to a lack of revenue and stability for workers' income. Andreoni and Tregenna (2020:331-333) pointed out three structural challenges in the middle-income technology trap: "breaking into globally concentrated industrial production; linking up with global value chains while linking back with local production systems; and keeping pace with

technological change". Overcoming these structural challenges will be the first step toward controlling and decreasing premature deindustrialisation. These structural challenges are associated with the middle-income trap and feed into the middle-income technology trap.

4.4.1 CRITICAL ANALYSIS OF THE MIDDLE-INCOME TECHNOLOGY TRAP

One of the key challenges to face from the earlier challenges is keeping pace with technological changes. Andreoni and Tregenna (2021) state that lower and middle-income countries have increasingly recognised technological change at the innovation frontier (the fourth industrial revolution) as a critical competitive factor for global value chain upgrading and a leapfrogging opportunity. Technological changes are crucial to the success of economic sectors; to ensure strong competitiveness in the global economy and to strengthen the South African economy as a whole. Tassey (2010:6) best describes the role of the fourth industrial revolution as follows: "most modern technologies are systems, which means interdependencies exist among a set of industries that contribute advanced materials, various components, subsystems, manufacturing systems and eventually service systems based on sets of manufactured hardware and software. Therefore, the modern global economy is constructed around supply chains, whose tiers (industries) interact in complex ways". Possessing and using the right technologies will promote productivity and efficiency within particular industries, especially capital-intensive ones.

The response to technological changes is the implementation of key technology systems. Key technology systems are transversal in that they are used across multiple sectors and supply chains - these systems have the potential to be quality-enhancing, productivity-enhancing and strategic (Andreoni and Tregenna, 2021). The significance of having key technology systems put in place is vital because they will be able to take R&D and technology indicators on an upward trajectory and potentially avoid the middle-income technology trap. During an initial phase of development, lowincome countries can compete in international markets by producing labour-intensive, low-cost products using technologies imported from abroad - this allows them to achieve large productivity gains initially through a reallocation of labour from the low-productivity agricultural sectors to high-productivity manufacturing sectors - or to modern services (Agénor *et al.*, 2012). In 2009, the European Commission identified the following key technology systems as innovation enablers and structural change enablers in the global economy: micro-electronics, nano-electronics, nanotechnology, photonics, industrial biotechnology, advanced materials, and advanced manufacturing systems (Andreoni and Tregenna, 2021). Identifying key technology systems is a great contributor to industrial sectors because there is an opportunity for the country's economy to compete amongst other economies worldwide, knowing the position of their technological capabilities.

Moreover, it is crucial to outline the different technologies that contribute immensely to the economy. Proprietary technologies are technologies associated with specific products or industrial transformation processes; they are generally developed by private or state-owned enterprises operating in multiple markets with their own brands (Andreoni and Tregenna, 2020). The significance of proprietary technologies is immense in that enterprises can compete against each other and drive profits simultaneously. In context, large private companies are also involved in developing some proprietary technologies, often in collaboration with government-funded institutions or relying on public funding and grants (Andreoni, 2016).

The collaboration between the public and private sectors will be beneficial because the government (public sector) focuses on providing public goods for the citizens. In contrast, the private sector drives profits by selling goods to consumers. An integral public good that the government can provide is education because it is a tool that produces human capital, which is pivotal to the state of employment in South Africa. Education provision must coordinate with keeping abreast of technological changes, particularly proprietary technologies. Andreoni and Tregenna (2020) assert that proprietary technologies are based on generic technologies that emerge from the science base of one or more countries, their universities, industrial research centres, or military and health system institutions. In essence, the government's investment in education will increase social returns, enhance research production and produce a high level of human capital, ultimately generating revenue for firms.

4.4.2 STRUCTURAL CHALLENGES

The enhancement of technological capabilities will lead to firms producing more goods that the firms can sell in the economy. The first recognised structural challenge of keeping pace with technological changes is crucial to South Africa's case of premature deindustrialisation. Andreoni and Tregenna (2021) performed a comparative analysis between South Africa, Brazil, China and Malaysia. The comparisons indicated that South Africa ranked the worst in crucial research and development (R&D) and technology indicators (see table below). According to Andreoni and Tregenna (2021), these indicators include the following and stand as follows: scientific and technical journal articles (13,009), gross domestic expenditure on R&D as a percentage of GDP (0.8), gross domestic expenditure on R&D per capita (current purchasing power parity in US dollars [PPP$]) (108), total R&D personnel per million inhabitants (1,327), total R&D personnel per thousand total employment (4.6), high-technology exports as a percentage of manufactured exports (5.3), and patent applications (657).

Table 4.1: South Africa and comparator countries: R&D and technology indicators

	Brazil	China	Malaysia	South Africa
Total R&D personnel per million inhabitants	2,917	3,824	3,835	1,327
Total R&D personnel per thousand total employment	6.3	7.0	8.3	4.6
Gross domestic expenditure on R&D as a percentage of GDP	1.3	2.1	1.4	0.8
Gross domestic expenditure on R&D per capita (current PPP$)	194	320	405	108
Scientific and technical journal articles	60,148	528,263	23,661	13,009
Patent applications, residents	4,980	1,393,815	1,116	657
High-technology exports (% of manufactured exports)	13.0	31.4	52.8	5.3

Note: Each variable is shown for the most recent year for which data are available for all four countries; years and data sources as follows: both R&D personnel measures are for 2014 and from UNESCO; both R&D expenditure measures are for 2014 and from UNESCO; all other measures are for 2018 and from the World Bank World Development Indicators (WB WDI).

Source: Andreoni and Tregenna (2021:245)

The government needs to invest heavily in the indicators mentioned above so that there is a turnaround in the performance of organic economic growth. It is worth noting that industrialisation is crucial to the economy from a national and international perspective. In terms of the above-mentioned statistics, it is clear that South Africa needs to catch up with the rest of the countries in the comparative analysis. In essence, these indicators are areas for the government to work on if the country wants to avoid suffering further from both the middle-income and the middle-technology traps. The second recognised structural challenge is breaking into globally concentrated industrial production. In the context of this structural challenge, it is worth noting that international trade and industrialisation play a crucial role in combating such a challenge. Global manufacturing production remains concentrated and compressed, with most middle-income countries failing to break into and experiencing deindustrialisation (Andreoni and Tregenna, 2020). The failure of middle-income countries to break into globally concentrated industrial production has led to a lack of technological growth and improvement in industrial output across different economic sectors. The crux of this challenge is the participants in the industrial economy: the public sector, the private sector, multinational companies, franchises and other influential companies that produce goods and services prevalent in the industrial and global economies. According to Andreoni and Tregenna (2021), the domestic value added (DVA) indicates the extent to which a country adds value in manufacturing, excluding the value of imported intermediate inputs. Based on the previous statement, it is clear that the core focus is on export goods.

In South Africa, the net DVA declined among all major manufacturing subsectors between 1995 and 2008 - these subsectors are chemicals and non-metallic products, primary metals and metal products, machinery and equipment, computer/electronic and optical equipment, and transport equipment (Andreoni and Tregenna, 2021).

The manufacturing DVA is a specific indicator that the government can use to assess whether South Africa can compete with other manufacturing sectors continentally and globally. Some barriers prevent middle-income countries from breaking into globally concentrated industrial production, these barriers include: realising global-scale economies, intellectual property rights, institutions and capabilities for technological development and innovation (Andreoni and Tregenna, 2020). These barriers prevent the domestic economy from being globally competitive. As stated in the previous chapter, the IPAP's 10-year legacy reflected the growth of the total economy via an economic analysis and the state of manufacturing exports in South Africa. In essence, the barriers negatively influenced the performance of manufacturing exports in the economy. According to Andreoni and Tregenna (2020), investment in technological capabilities must be allocated along different stages of technological development - from research to technology scaling-up, commercialisation, and practical deployment in production operations - and have to be significant enough to compete on a global stage.

The third recognised structural challenge is linking up with global value chains (GVCs) while linking back with local production systems. Countries need to develop their industrial capabilities and maximise the potential benefits of forward integration into GVCs. Between 1990 and 2010, African countries experienced limited gains from GVC integration and declining forward integration (and DVA) in international trade (Andreoni and Tregenna, 2021). Addressing this challenge requires a hands-on approach to enhancing the quality of GVCs. The further industrialisation and development of South Africa and the countries in the Southern African region will depend heavily on the development of their GVC engagement and simultaneously upgrading their capacities into higher valued and more skill-intensive activities in the automotive sector and the clothing and textile sector, respectively (Morris *et al.*, 2022). The government cannot look down on the role of the participating firms in shaping GVCs because these firms are responsible for the decision-making at an industry level, and they want to increase both profit and industrial productivity. Gereffi (2014) describes this vantage point as a top-down view, where the governance of GVCs, focuses mainly on lead firms and the organisation of global industries.

4.5 SUMMARY AND CONCLUSION

Chapter 4 presented a discussion on premature deindustrialisation and the middle-income trap. Within the premature deindustrialisation discussion, the chapter highlighted the key challenges South Africa

faced as a middle-income country and how it cannot get out of the middle-income trap. This chapter also outlined the middle-income technology trap and the structural challenges South Africa needs to overcome to beat the middle-income trap and ascend through potentially achieving industrialisation. Moreover, examining the structural challenges provided a clear understanding of how South African industrial policy needs to improve to ensure structural transformation within the South African economy. The next two chapters (Chapters 5 and 6) will focus on the case study countries, namely Brazil and South Korea. These two case study countries will form part of the comparative case study analysis in order to understand how South African industrial policy can be improved in an international context.

CHAPTER 5: THE BRAZIL CASE STUDY

5.1 INTRODUCTION

Chapter 5 will focus on Brazil as a critical case study in the research. The significance of using Brazil as a case study is that it is a developing country with several challenges and successes across its industrial policy formulations and implementations. Furthermore, it is rich in numerous resources and a critical participant in the global economy like South Africa. According to Kharas and Kohli (2011), Brazil is the largest economy in Latin America, accounting for almost 40 per cent of the total GDP. Thanks to its rich resource base, Brazil grew at around 6 per cent for nearly a century (from 1900 onwards). Brazil's economy represents a large part of Latin America's total GDP, and the region's total GDP has continued to thrive based on Brazil's optimal performance. This chapter will address the state of import-substitution industrialisation and the protectionist regime of Brazil in the 1950s. This chapter will also discuss the establishment of Embrapa, and how Embrapa has shaped the agricultural sector in the Brazilian economy. This chapter will also outline the Brazilian political economy context, the state of Brazilian industrial policy in the 2000s and the middle-income trap.

5.2 SIGNIFICANCE OF BRAZIL AS A CASE STUDY

Brazil's economic performance showed promising and consistent growth, making it one of the best-developing economies. "In 1965, it was one of the wealthiest developing countries with a per capita income of $1,700 (in 2007 US dollars); Brazil continued to grow until 1978, when it reached $5,500 per capita, with an average growth of almost 9.5 per cent a year" (Kharas and Kohli, 2011:283). It is worth noting that the per capita income is an average of how much people earn, and the average is not equally distributed. The growth of per capita income indicates wealth and prosperity for the economy. However, this success was short-lived because the Brazilian economy saw a period of decline, represented by the economy falling into the middle-income trap. "Brazil entered a long period of decline and stagnation. It did not regain its 1978 per capita income until 1995 and then only briefly in the burst of activity that followed the end of hyperinflation and the beginning of stabilisation - it was only with the commodity boom in 2006 that Brazil again surpassed its 1978 income" (Kharas and Kohli, 2011:283-284).

To better understand the Brazilian case study, it is critical to discuss the start of Brazil's development of industrial policy strategies throughout the twentieth century, the 2000s and the early 2010s. Coutinho *et al.* (2012) point out essential tools that lead to effective Brazilian industrial policy, which will be discussed throughout this section of the thesis: the arsenal of any industrial policy comprises six policy instruments - financing, tax, trade-related measures, public procurement, technical and informational assistance, and regulation. This section of the thesis will address the transformation of industrial policy

and the key points where the research tackled the middle-income trap. This section will also focus on the protectionist regime, the failures and successes of Brazil's industrial policy, and the economy's position on premature deindustrialisation.

5.3 IMPORT-SUBSTITUTION INDUSTRIALISATION, PROTECTIONISM AND BRAZILIAN INDUSTRIAL POLICY IN THE PRE-2000s

The Brazil case study is prevalent because it addresses the three key structural challenges of the middle-income technology trap (breaking into, linking up and back, and keeping pace). The main industrial policy strategy adopted by the Brazilian government between the 1950s and 1970s was based on a protectionist regime structured around *ad valorem* tariffs (Andreoni and Tregenna, 2020). The purpose of this industrial policy strategy was to strengthen the domestic economy. The protectionist mechanism strictly ensures that businesses within the domestic economy are thriving. Protectionism refers to a practice that protects a country's domestic industries from foreign competition through the taxing of imports, thereby boosting the domestic production of goods and services and limiting the presence of foreign goods and services in the market (Corporate Finance Institute, 2022). The protectionist regime in the Brazilian economy aimed to advance domestic production, and it is key to note that domestic growth will require more participants (workers) to maintain the standards of the economy. Subsequently, the higher the workforce (the employment rate) is, the greater the GDP will be.

Because Brazil is rich in resources, the focus of the protectionist regime between the 1950s and 1970s considered their resources by implementing the Law of Similarities. The Law of Similarities states that a product can only be imported if it can be proven that a similar product was not produced in Brazil (Andreoni and Tregenna, 2020). In terms of the Law of Similarities, Brazil strengthened their protectionist measures and ensured that the Brazilian government effectively executed the industrial policy strategy. As promising as protectionism may be to the vision of the government that implements it, it has its disadvantages. Although protectionism focuses on growing the domestic economy, it excludes the country's domestic economy from competing in the global economy. Protectionism stagnates technological developments because domestic producers are not under pressure from foreign competitors, so there is no incentive to innovate or invest in new product research and development (R&D) (Corporate Finance Institute, 2022). Due to the lack of investment in research and development, the economy will fall behind and struggle to keep up with any innovations created in the global economy. Protectionism prioritises growth in the domestic economy, so it is critical to consider how this will negatively impact the public regarding product prices. There will be an increase in product prices due to the lack of competition. Consumers will consequently witness a price increase in a setting where there have been no significant upgrades or improvements in the products produced (Corporate Finance Institute, 2022). Accordingly, consumers are thrown further into the deep end because the

range of goods to buy is limited due to the limitation of foreign goods in the marketplace. The Brazilian government, however, continued to ensure that the people of the economy were a lot better off in different aspects. The technological policies of import-substitution industrialisation (ISI) were accompanied by various attempts to improve human capital by eradicating illiteracy, increasing the number of skilled workers and promoting secondary and higher education, with a special focus on engineering (Czarnecka-Gallas, 2013). These policies were beneficial because they improved the labour market and attempted to improve the living standards of households across the country.

In the late 1950s, the government launched two institutions in the country to promote higher education and provide scholarships to students, namely: CAPES, a ministerial agency for coordination and human capital improvement, and FINEP, an agency set up to finance university studies and various academic projects (Czarnecka-Gallas, 2013). In context to this statement, these institutions aimed to develop Brazil socially, politically and economically through the promotion and accessibility of education. In the medium-term to long term, the educational initiative invested in enhancing industrial policy in Brazil. From 1960 to 1980, the government intensified the Law of Similarities within an ISI strategy, which developed and diversified the domestic production system (Andreoni and Tregenna, 2020). The goal of the ISI strategy - as a mechanism of protectionism - was to grow the economy independently with little to no reliance on other countries. Behind most policy directions, two elements are always present: the promotion of the competitiveness of firms and the defence of jobs in national economies (Ferraz *et al.*, 2014). In this context, the purpose of the ISI strategy is to protect local enterprises and the domestic market as a whole against foreign competition and [simultaneously] enable domestic firms to learn, implement innovations and increase their international competitiveness (Czarnecka-Gallas, 2013).

During this particular protectionist regime, the Brazilian government was responsible for creating state-owned enterprises to further enhance the economy on top of educating (and improving the lives of) the public. According to Andreoni and Tregenna (2020), a number of state-owned enterprises were developed in strategic manufacturing sectors. These companies and organisations serve as Brazil's pillars of the industrial and financial system, namely: the Brazilian Development Bank [BNDES] (1952), Petrobras (1953), Usiminas (1956), Eletrobras (1962) and Embraer (1969). Although these companies are influential to the Brazilian economy, they did not receive enough exposure to the global economy due to the implementation of the ISI strategy. The lack of strategic export-promotion methods did not allow Brazil to link up to global value chains to the same extent as China (Andreoni and Tregenna, 2020). On the other hand, import substitution catered for diversification and the significant development of specific local production system linkages, but domestic companies fell behind in keeping pace with technological change (Andreoni and Tregenna, 2020).

5.4 EMBRAPA CASE STUDY

After the protectionist regime, Brazil looked to take its trade measures and industrial policy strategies to greater heights. However, the economy faced a critical challenge that negatively impacted the government's plans. Andreoni and Tregenna (2018:28) state that the debt crisis during the 1980s and 1990s forced the Brazilian government to reduce its industrial policy interventions in favour of structural adjustment programs (SAPs) and macroeconomic stabilisation. Brazil has ascended in the production and trade of goods after the protectionist regime. The onus was on the Brazilian government to recognise what sectors work best in the economy and which firms contribute beneficially to the overall state of the economy.

Today, Brazil is among the top-performing producers and exporters of orange juice, sugar, coffee, soya beans, beef, pork and chicken, as well as has caught up with the traditional big five grain exporters, namely: the United States of America, Canada, Australia, Argentina and the European Union (Andreoni and Tregenna, 2018; Andreoni and Tregenna, 2020). Consequently, Brazil began to solidify their status as a global participant over the years and improve the productivity of the aforementioned goods to ensure that its current account balance is in great form. According to Andreoni and Tregenna (2020), a network of intermediate institutes called Embrapa was at the centre of the Brazilian government's transformative policy package. This network fostered technological change and innovation, diversification and upgrading in agricultural farming (Andreoni and Tregenna, 2020). The origin of Embrapa is integral to the research because it is considered an influential institution under the scope of industrial policy and institutional innovation. According to Alves (2010), Embrapa is a classic case of successful innovation that has main characteristics in its current form: a public corporation model of organisation, the scale of operation at a national level, spatial decentralisation, specialisation of research units, enhanced training and human resource remuneration, and a vision centred on agriculture, science and technology. Embrapa's structures in enhancing education and the development of distinct industrial sectors are vital because they understand what challenges they face as an institution and as a roleplayer of the Brazilian economy.

One of the core priorities for Embrapa was the modernisation of the agricultural sector and how best to improve it as a significant contributor to the Brazilian economy. Embrapa, however, focused on environmental sectors that were not just limited to the agricultural sector. During its first decades, Embrapa created a network of national commodity centres and regional centres that focused on major cropping and animal production systems and eco-regional and national themes (Andreoni and Tregenna, 2020). When assessing the agricultural sector, it is critical to recognise it as a sector essential to human living because it provides food that serves as a basic need for the public. Food prices were kept artificially low to avoid pressure on urban salaries (Alves and Pastore, 1978; Baer, 2008; Gremaud

et al., 2004; Martha Jr & Alves, 2018). Given the fact that Brazil kept food prices low, it meant that the consumers would benefit greatly in satisfying their basic needs. Low food prices also allow consumers to spend money elsewhere other than on food. On the other hand, firms would have to rely on high volumes of consumers buying their food products to ensure they see real profits. The foundation of Embrapa was inspired by the vision of growing the Brazilian economy using a holistic approach.

5.4.1 EMBRAPA AND TOTAL FACTOR PRODUCTIVITY

In 1972, Embrapa was founded as a response to the main weaknesses of the National Agricultural Research and Experiment Department (DNPEA), where the focus was on the main agricultural commodities and regions, experiment stations and existing projects (Andreoni and Tregenna, 2018). In essence, addressing these weaknesses opened an opportunity for the government to be more knowledgeable about the agricultural sector, identify gaps in the different factors of production, and provide the necessary research to enhance the sector. This direct approach would lead to a higher total factor productivity for the agricultural sector. Total factor productivity (TFP) measures describe the relationship between output in real terms and the inputs involved in its production (Bureau of Labour Statistics, 2022). The TFP is designed to measure the joint influences of technological change, efficiency improvements, returns to scale, reallocation of resources, and other factors on economic growth, allowing for the effects of capital and labour (Bureau of Labour Statistics, 2022). To a large extent, the TFP is significant because it directs labour performance concerning capital or other factors of production. In the late 1960s, Brazilian policymakers realised that the strategy to increase food supply by expanding cultivated areas and adopting practices of limited technological content should be revised (Martha Jr *et al.*, 2012:207). In this case, labour, capital and land need to have a positive correlation to ensure the growth and efficiency of the sector, and the relevant technologies need to be used to promote productivity amongst the aforementioned factors of production.

The stock of agricultural technologies and empirical knowledge in the late 1960s indicated that the agricultural frontier *Cerrado* (also known as the Brazilian Savannah) could accommodate only subsistence farming (Martha Jr *et al.*, 2012). In light of this matter, the government needed to rethink how best they could grow the sector by investing in it but doing away with or improving the method of farming that has been put in place. The government rejected the subsistence farming alternative and started a massive effort to transform traditional tropical agriculture toward one based on science and anchored on productivity gains instead of area expansion (Martha Jr *et al.*, 2012). This massive effort was the first step to elevate technological change and grow human capital to ensure positive, consistent growth for the sector and scientific knowledge of agriculture. The technologies developed by Embrapa, state agricultural research organisations, universities and other public and private partners (in Brazil and abroad) were the ingredients for Brazilian agriculture to be transformed and to present high-impact

outcomes (Martha Jr *et al.*, 2012:207). Realistically promoting and implementing policies with significant roleplayers, such as research institutes and the government, will lead to the economy breaking into the global economy as competing participants.

According to Martha Jr, Contini & Alves (2012), the TFP of Brazilian agriculture increased steadily and continuously in the thirty-six years of 1970-2006 - compared to 1970, the TFP increased 124 per cent, the product rose 243 per cent, and inputs grew 53 per cent. These statistics are from the time that Embrapa was established and was able to counter the weaknesses that the DNPEA struggled with. Gasques, Bastos, Bacchi and Valdes (2010) estimated that a 1 per cent increase in Embrapa's research expenditure increases the agricultural TFP by 0.2 per cent. Understanding the purpose of agricultural research adds value to the TFP because the individuals and firms get to familiarise themselves with different production methods, enhancing productivity gains by using available resources and selling their products in the most efficient manner possible. Moreover, research is considered to be one of the positive influences. A prime example of this positive influence is the aforementioned statistics in this thesis section. When assessing the structure of Embrapa, it is seen as a government-based institution that serves the public. Although Embrapa serves the public, it is considered an institution that promotes collaboration between the public and private sectors.

By choosing private sector rules for its employees, Embrapa gained flexibility in personnel administration, construction of careers, and designing and implementing a personnel evaluation policy (Martha Jr and Alves, 2018). Based on this statement, it is clear that Embrapa aimed to create collaborations between private sector stakeholders a reality and make these collaborations viable to fulfil the policy objectives. The vision of Embrapa was to connect human resources, governmental power and thorough research surrounding the agricultural sector. By focusing on products, regions and areas of fundamental importance for the development of Brazil, researchers gained a better sense of their responsibilities, minimising ambiguities regarding goals and necessary actions (Martha Jr and Alves, 2018). Focusing on areas of importance allowed Embrapa to promote and nurture innovation successfully. The long-term goal would be for Embrapa to break new ground with science and technology. Consequently, established bodies of knowledge and information contribute to improving any sector the organisation invests in.

Embrapa's involvement in the agricultural sector provided a developmental approach to growing the economy, thus laying a foundation for the sector to expand its resources and use them to keep up with technological trends within and outside the country. Embrapa realised its growth as an institution with the government's support. According to Alves (2010), in the early years of Embrapa's establishment, the federal government understood the importance of technology for the development of agriculture.

The government investment in agriculture meant they would see higher-quality products enter the domestic economy. Consequently, consumers would see value in the money spent on purchasing these products. Embrapa comprised a network of intermediate technology institutes which presented numerous challenges: the institutes needed to develop generic technologies as well as product-specific technology and must invest in infra-facilities (testing facilities, metrology and data systems) without which products cannot be developed or brought to international markets (Andreoni and Tregenna, 2020).

The government's understanding of the role of technology within the sector meant that they could relate to the challenges of making and selling products manufactured within the sector. Moreover, the government can understand the country's position in the global economy and the profit-making prospects for the involved firms, the sector at large and the economy. Once the results proved Embrapa could be profitable as an option for the government, the battle for budget support remained. However, it took place in an environment where the corporation is one of the government's priorities - both in the executive and the National Congress (Alves, 2010). Moreover, the government ensured that all stakeholders benefited from being a part of Embrapa - they achieved this by dividing the control of Embrapa structurally. The significance of this approach was to increase efficiency for the stakeholders to ensure that the particular sector that Embrapa focuses on gets high total factor productivity and stable economic growth. According to Martha Jr and Alves (2018:316), Embrapa chose a decentralised territorial model which took the following approach: "(i) at a national level; the model requires strong interaction with decision-makers from the Presidency of the Republic, Congress and the different ministries; (ii) at a regional level, Embrapa research units were distributed throughout national territory and followed three major structures - products, resources and themes". In context to this statement, the success of Embrapa would become certain due to the division of duties amongst the different levels of government. Furthermore, the flexibility of collaboration between the private and public sectors gives Embrapa the autonomy to engage with challenges impacting the agricultural sector.

The government's relationship with the media was pivotal to Embrapa's success. The media had a crucial role in creating Embrapa's image. The media not only operates on top of achievements but also upon a consistent promise, provided that it is not for long (Alves, 2010). The media's involvement applied indirect pressure on the government to ensure that Embrapa became a success. Since Embrapa focused heavily on agriculture, the organisation prioritised the needs of the farmers. The support from farmers, their different associations, and the media helped Embrapa cultivate a favourable image in the eyes of both the public and the government (Martha Jr and Alves, 2018). It is worth noting that the government made a significant investment in Embrapa to realise its objectives and contribution to Brazilian industrial policy. Between 1974 and 1985, the government made considerable investments in

infrastructure, operational costs, and personnel training - the enormous investments were around 17.2 billion Brazilian real (Martha Jr and Alves, 2018). The government's support in the following decades would be consistent with maintaining the positive relationship between the farmers, the agricultural sector at large, Embrapa and the public. According to Martha Jr and Alves (2018), government support averaged 980 million Brazilian real in the 1970s, 1.9 billion Brazilian real in the 1980s, 2.21 billion Brazilian real in the 1990s, and 2.46 Brazilian real from the first decade of the 2000s. The significant expenditure since the establishment of Embrapa indicates the government's willingness to grow the industrial policy aspect of the economy and to advance technologies within Embrapa.

5.4.2 EMBRAPA AND RESEARCH GROWTH

At the helm of technological developments, the government must give credit to Embrapa's human resources. The involvement of researchers is an excellent response to the demand for human capital in the labour market and the demand of the Embrapa institution. Embrapa invested heavily in increasing the number of researchers, at an impressive rate of 5.8 per cent per year, from 872 in 1974 to 2146 researchers in 1990 (Martha Jr and Alves, 2018). The growth of researchers showed significant promise for the development of the institution. Consequently, this meant that the researchers created more diverse information and knowledge-sharing systems to strengthen mechanisms that would allow Embrapa to grapple with any challenge that it would come across. The field of researchers within the organisation also became mature because it comprised highly qualified individuals that conducted research for the institution. Martha Jr and Alves (2018:317) highlighted the changes in the field of researchers that led to the strengthening of Embrapa's human resources: "(i) in 1974, researchers whose highest qualification was a Bachelor of Science (BSc), Master of Science (MSc), and Doctor of Philosophy (PhD) represented 83 per cent, 15.3 per cent and 1.7 per cent respectively; (ii) in 1990, researchers whose highest qualification was a BSc, MSc, and PhD represented 20.3 per cent, 53.6 per cent and 26.1 per cent respectively, and; (iii) in 2015, researchers whose highest qualification was a BSc, MSc, and PhD represented 0.7 per cent, 13.5 per cent and 85.8 per cent, respectively". In essence, the presence of more PhD researchers represents a sophisticated specialisation in research and the growth of knowledge-generating systems. Martha Jr and Alves (2018) assert that the significant change in the composition expresses the science-based approach that Embrapa has pursued since its establishment.

When looking back at the decentralisation characteristic, it provided Embrapa with the autonomy to take ownership of which internal and external organisations they would collaborate with and develop research with. Embrapa increased its internal capabilities by signing partnerships with US universities, which allowed Embrapa's staff to receive postgraduate training (Andreoni and Tregenna, 2020). Embrapa's staff receiving training is a representation of strengthening human resources for the betterment of the organisation and the upswing in research and development. Throughout the 1990s,

Embrapa was involved in various agricultural research and technology activities, including plant breeding, pest management, food safety, satellite monitoring, sustainable agricultural development, and hunger relief (Matthey *et al.*, 2004; Andreoni and Tregenna, 2020). These activities aim to ensure that the food produced is healthy and of higher quality and can be sold to the public for consumption.

5.4.3 THE POLITICAL ECONOMY CONTEXT AND THE STATE OF EMBRAPA

In light of the political economy context, it is vital to consider the role of politicians in the functioning of Embrapa. Embrapa's independence from politics allowed them to use their autonomy to involve politicians in deciding what is best for them, the public and for the sector. Embrapa distanced itself from taking a paternalistic approach and chose a collaborative approach in establishing Embrapa's approach. Martha Jr and Alves (2018) assert that it is fundamentally vital that politicians play an active role in Embrapa's operation concerning directions, research priorities and institutional development because they represent Brazilian society. Embrapa has won over the media, the farmers, the agricultural sector and the public. Essentially, it is vital to consider the stance of the politicians due to their influence towards the public by making them support - or go against - the government. Embrapa has had a close working relationship with politicians, and this relationship has been guided by a selfless commitment to the country's interests rather than to particular political forces (Martha Jr and Alves, 2018). Politicians naturally engage a lot more with society than the government does. Hence, the relationship with the government through the Embrapa institution ensures that the public is catered for. The involvement of politicians also provided clear-cut links between policy and science within Embrapa's vision. A degree of independence from politics has contributed to Embrapa's success, resulting in a widely recognised impression of transparency (Martha Jr and Alves, 2018). Allowing politicians to form part of the decision-making process puts the public at ease because the government is fulfilling its mandate by serving its people through realising industrial policy projects.

The significant change in researchers' representation of the science-based approach also meant flexibility in the research prospects, creating a pathway for international cooperation. Empirical evidence has shown that the interaction between people with different heritages in terms of geographical, cultural, social, and political factors is essential in fostering the development of knowledge and technology that supports sustained innovation flows (Sowell, 2015). International cooperation intends to attract other countries to engage with the Brazilian economy and to attract foreign direct investment. According to Martha Jr and Alves (2018), the Brazilian economy's openness to international cooperation enabled Embrapa:

1. To create a positive image abroad, facilitating relationships with donors, universities and research organisations in other countries.
2. To help Brazil as an instrument of foreign policy.

3. To understand that in a globalised world, science is also globalised, and its existence must improve interaction mechanisms with other countries, universities, scientists and other external organisations.

Having solidified collaborations with both internal and external organisations will lead to the growth of the respective institutions collaborating, and it will also lead to positive development for these institutions' profits through the projects they pursue. International cooperation allows countries to exchange ideas on science development, promoting collaboration through economic decision-making and multilateralism, the efficient manufacturing of particular goods and learning more about different technological innovations. Martha Jr and Alves (2018) pointed out the benefits of international scientific cooperation among partner countries:

1. It opens up new possibilities for developing and applying knowledge and innovation about agricultural and related value chains.
2. Research costs can be reduced when synergies are built, identified and consolidated.
3. International scientific cooperation reduces the time required for knowledge appropriation and/or cutting-edge technologies by the productive sector, contributing to its competitiveness and sustainability.

In line with the strengthening of human resources, Embrapa sent several hundred professionals to receive training in the United States of America, the United Kingdom, Canada, Spain, the Netherlands, Germany, and Australia (Martha Jr and Alves, 2018). The training of professionals equips them with additional skills and further promotes Embrapa's role in the mandate of globalisation and enhancing productivity and innovation beyond national borders. Moreover, Embrapa's performance helped them form important bridges with the academic world abroad (Martha Jr and Alves, 2018). In essence, the developments of Embrapa and its institutional structure have created a platform for discourses in the academic world and the research fields of industrial policy, macroeconomics and political economy, respectively. When considering human resources, research performance, productivity, and government support, it is critical to map out the significant accomplishments of Embrapa. Throughout the case study, it is safe to conclude that several accomplishments have been mapped out. A standout accomplishment in this case study is that of the *Cerrado*. The claiming of the *Cerrado* for modern agriculture is a significant accomplishment for Embrapa - it introduced new varieties, cultural practices, zoning, tillage, biological fixation of nitrogen, livestock development of both meat and milk, fruits and vegetables, and knowledge of the Cerrado natural resource basis (Alves, 2010; Andreoni and Tregenna, 2020). Alves (2010) asserts that the success of Brazilian tropical agriculture motivates developing countries to seek information and support for technology transfer from Embrapa. The modernisation of agriculture in a tropical country, such as Brazil, created a pathway for other tropical countries to

develop tropical agriculture and research in any other sector that can use such a tropical environment to their advantage.

The successes of Embrapa have presented an outlook on the future of Brazil's agricultural performance. Brazil is now recognised as the sole agricultural power in the tropics - its share in world agricultural markets (8 per cent) is only second to that of the United States (17 per cent). Some analysts suggest that Brazil's share will be similar to the US in the next ten to fifteen years (Martha Jr *et al.*, 2012). Embrapa has also dedicated itself to becoming an organisation that is a holistic participant in the Brazilian economy in an industrial policy context. Embrapa became a critical intermediary between agricultural and manufacturing R&D, education, markets, and on-farm agricultural production (Andreoni and Tregenna, 2020). Embrapa's involvement as an intermediary allowed them to execute their vision as a pillar in today's modern economy. This intermediary role catered for the bridging and transferring of knowledge, technical solutions and innovations across different sectors, thus facilitating various forms of intersectoral learning (Andreoni and Chang, 2014; Andreoni and Tregenna, 2020).

In closing, Embrapa's independence from politics and consistent government support have contributed to the health of the agricultural sector. Since its inception, Embrapa has generated and recommended more than nine thousand technologies for Brazilian farmers (Andreoni and Tregenna, 2020). Moreover, these elements have also been beneficial for advancing knowledge, innovation, science and technology, and other sectors.

5.5 BRAZILIAN INDUSTRIAL POLICY IN THE 2000s

Brazil's industrial policy focused on developing strategies to strengthen the economy, reduce economic inequality and improve the country's socioeconomic status. In context to the research conducted, Ferraz *et al.* (2014) pointed out the standout themes of Brazilian industrial policy: the promotion of the competitiveness of firms and the defence of jobs within the national economy. When considering the Embrapa case study, there have been many achievements under the umbrella of collaboration between the government, Embrapa itself, universities, research institutes and politicians. In Brazil, private business interests were co-opted by the state through the appointment of business leaders to cabinet positions, but sustained direct channels of lobbying, bargaining and interest representation between private business associations and the state remained very fragmented and tied to sectoral rather than national levels (Schneider, 2004; Khan and Blankenburg, 2009). As much as the government collaborated with Embrapa, it was key for them to create an industrial policy initiative to advance Brazilian industrial policy. In the same way, the South African government established the Industrial Policy Action Plan (IPAP) to improve the state of South African industrial policy. The graph illustrates the differences between Brazil and South Africa's gross national income (GNI) per capita and

manufacturing value added (MVA) per capita between 1990 and 2018. It is worth noting that the inclusion of China in this graph is to indicate its consistent increase in both GNI and MVA per capita.

Figure 5.1: Gross national income and Manufacturing Value Added per capita in Brazil, China, and South Africa, 1990-2018 (constant 2010 US dollars)

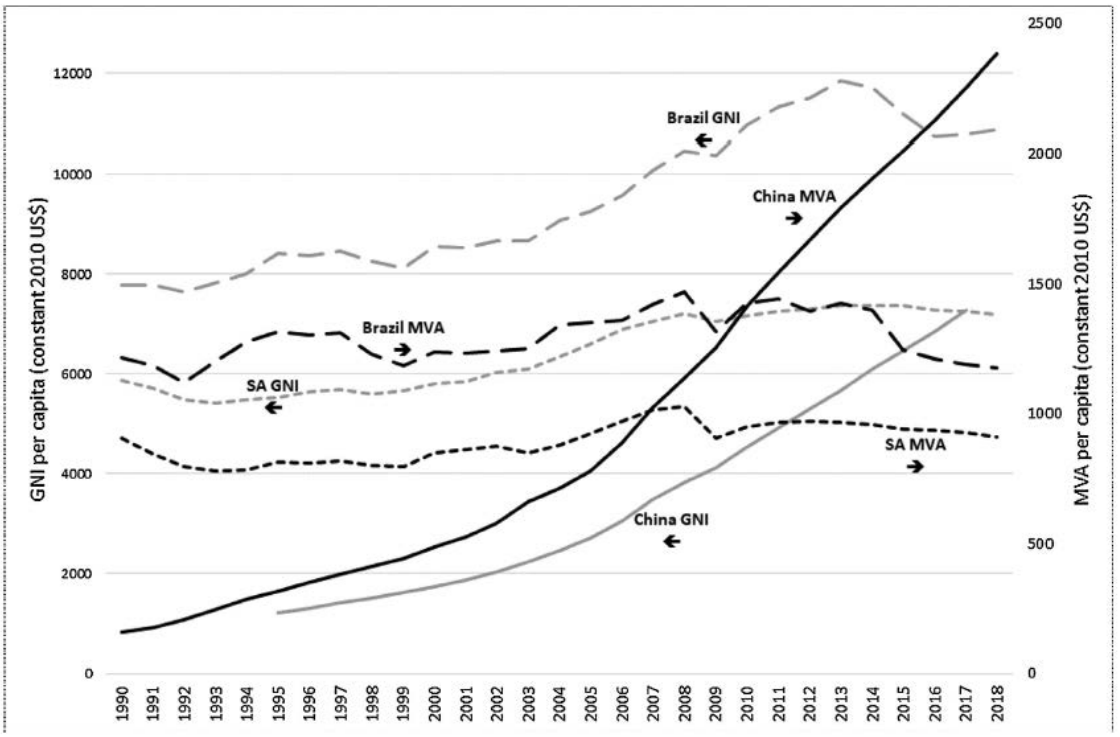


Figure 4. GNI and MVA per capita in China, Brazil and South Africa, 1990 to 2018.
Notes: GNI per capita (in constant 2010 US$) is depicted in grey, with values on the left-hand axis. MVA per capita (in constant 2010 US$) is depicted in black, with values on the right-hand axis. China is shown in solid lines (GNI data only available for 1995 to 2017); Brazil is shown in long-dashed lines and South Africa in dotted lines.

Andreoni and Tregenna (2020:330)

The 2000s signalled the return of selective (sector-specific) industrial policies to Brazil. The Lula Administration was influential in enhancing the resources already present in sustaining the different sectors within the Brazilian economy. In November 2003, the first Lula government announced the Guidelines for an Industrial, Technology and Foreign Trade Policy (henceforth PITCE), which were aimed at increasing industrial competitiveness by boosting technological development in critical sectors (semiconductors, software, pharmaceuticals and medicines, and capital goods) thus enabling the promotion of exporting higher-value goods (Andreoni and Tregenna, 2020:333). The establishment of PITCE aimed to represent the government's and the public's interests by enhancing sectoral resources. Moreover, improving sectoral resources would require increased human capital - this aligns with the standout themes pointed out earlier by Ferraz *et al.* (2014). With the return to industrial policy in the 2000s and the publication of PITCE, the government emphasised technology policies and regulations aimed at advancing Brazil's science and technology bases in biotechnology, nanotechnology and biomass/renewable energies (Andreoni and Tregenna, 2020).

5.5.1 GUIDELINES FOR AN INDUSTRIAL, TECHNOLOGY AND FOREIGN TRADE POLICY (PITCE)

PITCE was not limited to advancing science and technology - this initiative was also based on facilitating regulations within Brazilian industrial policy. PITCE represented an opportunity to address a number of misalignments across different funding schemes for industrial research - thus eliminating duplication and scattershot initiatives (ABDI, 2006), as well as re-aligning financial incentives and other complementary legislation concerning intellectual property rights and public-private partnerships (Andreoni and Tregenna, 2020). As outlined in the Embrapa case study, there is a strong presence of partnerships between the public and private sectors where the government will meet both sectors' interests for the greater good of the Brazilian economy. PITCE's main contribution was to set up a high-level tripartite forum to promote consensus on industrial strategies and priorities and create facilitating agencies to promote industrial development and exports (Ferraz *et al.*, 2014). PITCE was established to use industrial policy as a definite development mechanism, which is why the consensus on industrial priorities is crucial.

The goal of the PITCE was to induce a change in the technological level of the Brazilian industry, aiming at more innovation and differentiation of products (Kupfer *et al.*, 2013). The importance of having to achieve this goal was vital because of Brazil's return to sector-specific industrial policy. The expectation was that developing the country's technology sectors would favour an export upgrade, fostering gains in more sophisticated segments in the international market (Kupfer *et al.*, 2013). Achieving improvements in segments of the international market would lay a foundation for cementing Brazil's competitiveness and increasing exports in the global economy. The high profitability of exporting commodities attracted foreign investments, which, coupled with the strong inflow of short-term capital owing to the gains in arbitration stemming from the glaring difference between domestic and foreign interest rates, put the exchange rate on a strong evaluation track (Kupfer *et al.*, 2013). In essence, exporting commodities is beneficial for countries worldwide because countries are good at producing certain products or making innovations that comprise different ingredients/components from numerous parts of the world. The exporting of commodities gave rise to a rupture in the economic scenario in which the PITCE was based four years earlier - PITCE lasted until mid-2008 when it gave way to the Productive Development Policy (PDP) (Kupfer *et al.*, 2013).

5.5.2 PRODUCTIVE DEVELOPMENT POLICY (PDP)

The Productive Development Policy (henceforth PDP) was meant to achieve what the PITCE could not gain from an industrial policy and political economy perspective. Furthermore, its overall aim was

to inspire economic growth in the same way that the PITCE did. According to Andreoni and Tregenna (2020), the PDP's structure was based on four challenges:

1. Maintaining the rate of growth in investment above GDP growth
2. Upgrading and diversifying the export basket
3. Fostering technological investment and innovation
4. Restructuring the industrial system and supporting small and medium enterprises (SMEs) and national industrial drivers

Just like Embrapa, the government's support would go an incredibly long way if the challenges faced are properly assessed and action plans are put in place to deal with the challenges as mentioned above. In light of the challenges, Kupfer *et al.* (2013) pointed out four macro-targets were set for the PDP: (i) an increase in the participation of the gross formation of fixed-capital (GFFC) in the GDP from 17.4 per cent in 2007 to 21 per cent in 2010; (ii) an increase in the participation of corporate spending in R&D in the GDP from 0.49 per cent in 2005 to 0.65 per cent in 2010; (iii); an increase in the participation of Brazilian exports in worldwide exports from 1.16 per cent in 2007 to 1.25 per cent in 2010; and (iv) a 10 per cent increase in the number of exporting Micro and Small Enterprises (MSEs) by 2010 (11,792 in 2006). Although the PDP has mapped out the targets, there has been great difficulty in reaching the different targets. The PDP is a complex industrial policy package aligned with specific macro-targets and comprising 425 policy measures organised into 34 programs, including both 'sectoral' and 'systemic' actions (Andreoni and Tregenna, 2020). In light of the 2008 international financial crisis, the complex structure of the PDP made it somewhat difficult for the programs to fulfil their strategic objectives. The strategic objectives of the PDP did not have any key action plans. However, these objectives had a bearing on Brazil's global position. The strategic objectives of the PDP are world leadership, market access, focus, differentiation, and increased access. According to Kupfer *et al.* (2013), these strategic objectives were defined by principles:

1. World leadership, where Brazil would maintain and/or position its productive system or Brazilian companies among the top five world players.
2. Market access, where Brazil would maintain and/or position its local productive system among the five biggest world exporters.
3. Focus, where Brazil would build and consolidate certain activities in strategic high-tech areas
4. Differentiation, where Brazil would position its companies and brands among the top five in their markets.
5. Increased access, where Brazil would promote the population's access to basic services and goods for improved quality of life.

It is worth noting that hardships arose from implementing the aforementioned strategic objectives, especially since the PDP was established during the 2008 international financial crisis, which added mounting pressure to the Brazilian economy. Throughout this adverse time, the policy was focused on resisting and overcoming the international crisis, strengthening the structure of the Brazilian industry within a more competitive environment (Kupfer *et al.*, 2013). However, these actions occurred concurrently with emerging and undesirable microeconomic transformations (Kupfer *et al.*, 2013). The microeconomic transformations meant that the four PDP macro targets were not reached, and this failure negatively impacted the overall initiative. The table below shows the average annual labour productivity growth rates from 1950 to 2011, which represents an overview of the Brazilian economy's growth over different regimes.

Table 5.1: Average annual growth rates of Brazilian labour productivity, 1950-2011

	Agriculture and Mining	Manufacturing	Construction and Energy infrastructure	Services of low skilled labor	Services of high skilled labor	Overall labor productivity growth
1950–1979	3,2	4,1	2,2	1,1	3,6	**4.4 (a)**
1980–1994	1,6	−1,7	0,4	−2,2	−1,4	**−0.9**
1995–2011	4,9	1,2	−0,8	0,0	−1,1	**0.8**
1980–2011	4,0	−0,5	0,1	−1,6	−1,8	**−0.2**
1950–2011	3,7	2,0	1,2	−0,1	0,8	**2.1**

Source: Nassif et al. (2020:8)

In light of the sectoral actions that the research pointed out, it is critical to discuss the structure of the sectoral actions and their significance towards enhancing the Brazilian economy during an intense international financial climate. The sectoral actions expand PITCE's targets along three main lines: 'Mobilisation Programmes in Strategic Areas', 'Programmes to Strengthen Competitiveness', and 'Programmes to Consolidate and Expand Leadership' (Andreoni and Tregenna, 2020). Each main line was specific to detailing how best the PDP can be implemented and comprised different sectors that would be best suited to achieve the different sectoral actions. The first main line of the PDP ('Mobilisation Programs in Strategic Areas') addressed the following sectors: health industrial complex, defence industrial complex, nuclear energy, information and communications technology, nanotechnology and biotechnology (Kupfer *et al.*, 2013). The second main line (Programs to Strengthen competitiveness) covered the following areas: agribusiness, biodiesel, plastics, clothing and textile, civil construction, services complex, wood and furniture, amongst others (Kupfer *et al.*, 2013). The third main line (Programs to Consolidate and Expand Leadership) touched on the following sectors: bioethanol, steel, mining, cellulose, and the aeronautical complex, amongst others (Kupfer *et al.*, 2013).

When analysing the different main lines, the theme picked up from the prioritisation of the sectors is high productivity. The key was for the government to invest in the main lines of the PDP and execute

its objectives successfully. However, their objectives were not achieved as planned. According to Kupfer *et al.* (2013), the result of the PDP was a slow evolution of productivity, a sharp increase in imports of manufactured goods, and, consequently, the hollowing out of numerous industrial value chains installed in Brazil. As a result, the shortcomings of the PDP were set to be addressed by the Grander Brazil Plan (PBM).

5.5.3 THE GRANDER BRAZIL PLAN (PBM)

The Grander Brazil Plan (hereinafter referred to as the PBM) was a signifier of transformation in Brazilian industrial policy. It was created to ensure that the government addressed Brazil's economic inequality and low sectoral performance. Furthermore, PBM was a mechanism that aimed to combat and subsequently escape the middle-income trap, as well as address what the PDP was unable to. In 2011, the Brazilian government launched the PBM. This launch signalled a systematic attempt at implementing industrial policy and achieving sustained growth (Andreoni and Tregenna, 2020). The launch of this initiative aimed to include the Brazilian economy participating in the global economy, and in involving the global economy, the different sectors would promote industrial productivity further. The Brazilian economy would realise the increase in human capital and employment. According to Andreoni and Tregenna (2020), the government built the PBM based on four interdependent guiding principles:

1. Strengthening critical competencies and productive capacity, corporate research and development (R&D) and industrial skills.
2. Enhancing value chains through structural upgrading and the re-organisation of production systems.
3. Expanding both domestic and foreign markets beyond the specialisation in primary goods
4. Achieving greater sustainability both socially and environmentally.

The foundation on which the PBM has been built is integral to achieving sustained economic growth. The aforementioned guiding principles are defined by ten strategic objectives shaping the PBM's effectiveness (Ferraz *et al.*, 2014). The objectives are as follows:

1. Innovate and invest in increasing competitiveness, supporting growth and improving the quality of life (the ultimate goal of PBM).
2. Diversify exports and promote the internationalisation of Brazilian companies.
3. Increase the local competitive supply of goods and services for energy industries.
4. Expand access to goods and services by the population.
5. Increase the share of knowledge-intensive sectors in the GDP.
6. Strengthen micro, small and medium-sized companies.
7. Induce clean and efficient production.

8. Increase fixed investment.
9. Expand corporate R&D.
10. Increase competence of the labour force.

These objectives were centred on ensuring that people living in Brazil realise significant growth in their socioeconomic livelihoods. The subsequent improvement in their livelihoods would give them an incentive to work for an income, thus enabling people to provide for themselves and their families. In the long run, the successful execution of these objectives would lead to the fall of the middle-income trap. The core focus of the objectives was the success of the companies within the different sectors and how they would promote productivity and trade. The improvement of the Brazilian companies' capabilities in linking up internationally and back to the local production system led to the enhancement of various resources (Andreoni and Tregenna, 2020). This improvement gave the government hope to improve its economic policy. The PBM strengthened production chains, diversified/upgraded exports through tax relief, and offered trade remedies (e.g. anti-dumping measures), financing, and loan guarantees for exporters (especially for SMEs) (Andreoni and Tregenna, 2020). The government launched the PBM right after the 2008 international financial crisis, which means that the successful implementation of the objectives, as mentioned earlier, must have a long-lasting impact on the economy.

Consequently, this long-lasting impact would have to be sufficient to withstand any potential international financial crisis. According to Kupfer *et al.* (2013), the PBM was conceived to foster a sweeping restructuring of Brazilian industry - it had to face a challenging national and international economic context because the slacking Brazilian economy revealed an important deterioration in the competitiveness of the national industry. In essence, the onus was on the PBM to prioritise the needs, resources and profits of companies within the different sectors to ensure that all involved parties (companies, public sector and private sector) thrive in growing the economy in shaping up Brazilian industry.

5.5.4 THE IMPACT OF BNDES ON THE BRAZILIAN ECONOMY

As outlined earlier, the Brazilian Development Bank (henceforth BNDES) serves as one of the Brazilian economy's influential pillars in the present day. It has been pivotal to Brazil's industrial policy. According to Ferraz *et al.* (2014), long-term financing has strategic importance: it can foster more and better work opportunities, infrastructure, and competitive capabilities - if markets are shallow, incomplete or "fail", a development bank is an essential instrument to foster sustainability, investment and accumulation of competences. In context to this statement, the BNDES fits the description because it is a development bank, and it is meant to improve the state of the Brazilian economy in every

facet possible. BNDES also served as a critical contributor to PBM and is perceived as a strategic asset to the Brazilian economy. It is vital to assert BNDES' capabilities in terms of the support it provides.

According to Ferraz *et al.* (2014), the BNDES is the main provider of long-term financing in the country, holding two-thirds of credit with a maturity of over five years - it is a wholly state-owned company under private law with institutional funding. It is among the world's largest development banks in terms of assets and loan portfolio. In context to the PBM, BNDES was a crucial player in recovering from the damage caused by the 2008 international financial crisis. The impact of the international crisis on BNDES' disbursements to productive sectors was a slight reduction related to scale-intensive and agribusiness industries that are highly exposed to foreign demand (Ferraz *et al.*, 2014). In essence, the BNDES was able to handle any financial losses that were caused by the international financial crisis. It is imperative to understand how the BNDES' disbursements have grown in the various sectors and how much was allocated to the multiple disbursements. Ferraz *et al.* (2014) point out that disbursements in 2006 stood at close to 50 billion Brazilian real and these disbursements grew until they peaked between 2010 and 2012, nearing 125 billion Brazilian real.

Overcoming any forthcoming obstacle was possible due to the resources BNDES have, and the amount of disbursements they provided in the previous example proves how effective their resources are. Ferraz *et al.* (2014) provide evidence that BNDES has an extensive range of financial instruments, offering:

1. Direct financing support for large-scale industrial and infrastructure projects (credit and project finance)
2. The commercialisation of machinery and equipment through commercial banks
3. Support for the export of engineering-intensive goods and services
4. Credit for micro and small companies
5. Equity and venture capital funds and direct investment in firms, always maintaining a minority stake

These financial instruments allow BNDES to prioritise certain sectors that it aims to assist with a PBM by providing knowledgeable assistance. Furthermore, the PBM stood firm in improving employment within the Brazilian economy. Besides allocating financing to priority sectors, BNDES fosters investments and job creation in Brazil. (Ferraz *et al.*, 2014). BNDES' positive influence on job creation and their valuable contribution to the economy has also been significant. BNDES-financed firms raised investments ten percentage points higher than unsupported firms with similar corporate profiles (Coutinho, 2013). In contrast, small firms found a similar pattern in job creation: compared with

unsupported firms - BNDES-financed firms expanded formal jobs by ten more percentage points (Machado and Parreiras, 2013).

5.6 BRAZIL'S QUASI-STAGNATION AND THE MIDDLE-INCOME TRAP

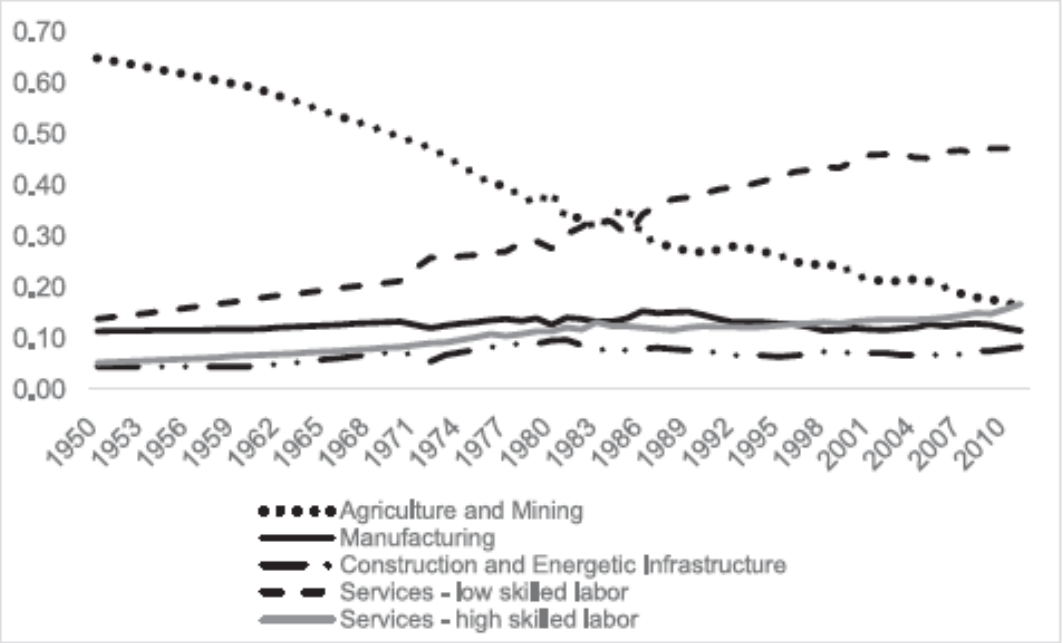
To a certain extent, the PBM addressed the middle-income trap through BNDES' investments towards job creation. The state of the middle-income trap is critical to the study because it outlines the difficulties the Brazilian economy faced. Between 1950 and 2010, Brazil spent the first seven years as a low-income country and the next 53 years as a lower-middle-income country - over the 2000s, it grew fast, inspiring The Economist in 2009 to devote 14 pages to Latin America's big success story (Wade, 2016). Considering all the findings provided thus far, the middle-income trap and its role in shaping the Brazilian economy is essential. The Brazilian economy faced quasi-stagnation, and it was due to Brazil's quasi-stagnation that suggests Brazil experienced little to no substantial economic growth.

Brazil's quasi-stagnation in the 2010s has created many problems in terms of economic growth prospects. Bresser-Pereira (2021:506) provided the following evidence where there was a comparison of Brazil's growth in the 1970s and the 2010s: "GDP growth: 8.7 per cent (1971-1980) and 0.71 per cent (2011-2019), GDP per capita: 6.1 per cent (1971-1980) and -0.13 per cent (2011-2019), total investment (private and public) concerning GDP: 21.1 per cent (1971-1980) and 18.9 per cent (2011-2019), and capital productivity ratio: 0.41 (1971-1980) and 0.04 (2011-2019)". Brazil has stagnated in growth and dropped significantly from its growth rates in the 1970s. Therefore, Brazil's industrial policy in the present day is not as effective as it was in the past.

Bresser-Pereira (2021) points out four historical facts that explain why the leading direct causes of growth – the investment rate and the productivity of capital – have interrupted growth in Brazil in the 1980s: (i) the fiscal crisis of the state, associated with public savings turning negative and curtailing public investments; (ii) financial liberalisation, which freed up capital flows and facilitated two mistaken policies: incurring current account deficits and raising the interest rate to attract capitals; (iii) trade liberalisation, which dismantled the mechanism that neutralised the Dutch disease, thus restoring major competitive disadvantages for the country; and (iv) deindustrialisation which, combined with the inevitable increase of the capital intensity of capital accumulation, reduced the productivity of capital. Investigating the root cause of the present stagnation is essential, and the answer points to the first historical fact. "The first historical fact that caused the present stagnation was the state's fiscal crisis that happened 40 years ago in Brazil and the whole of Latin America in the context of the great foreign debt crisis of the 1980s" (Bresser-Pereira, 2021:506). The foreign debt crisis had a long-lasting impact on Brazil's growth decline right after GDP growth increased by 8.7 per cent from 1971 to 1980. The present stagnation is a pure reflection of Brazil's middle-income status, and, as a result, Brazil is

struggling to wriggle itself out of the middle-income trap. However, Brazil's economy has managed to pick up the pace, which was reflected in the increase in the real GDP. Brazil's real GDP grew as follows: 80 billion US dollars in 1998, 160 billion US dollars in 2008, and 220 billion US dollars in 2012 (Lubis and Saputra, 2015). A positive characteristic that has sparked hope in improving Brazil's economic state is the decrease in the unemployment rate. According to Lubis and Saputra (2015), the unemployment rate (in terms of the labour force) has been low for a long period: 10 per cent in 1970, 9.3 per cent in 1990 and 6.7 per cent in 2010. The low unemployment rate can only do so much to improve the incomes of employed citizens in Brazil. Agénor *et al.* (2012) assert that developing countries would face rising wages in the long term. Essentially, Brazil would have to improve different facets of its economy to go beyond middle-income status. The graph below represents an overview of the different sectoral labour shares of the second half of the Brazilian economy from 1950-2011.

Figure 5.2: Share of sectoral labour in total employment, 1950-2010 (in percentage)



Source: Nassif et al. (2020:9)

Brazil is a country that has experienced an intense growth decline and has been challenging the middle-income trap in conjunction with quasi-stagnation. According to Aiyar *et al.* (2018), Brazil was stuck in the lower-middle income country trap between 1975 and 1985. This finding aligns with Brazil's economic status during that particular time frame. It is worth noting that this time frame saw Brazil's economic upswing, followed by the commencement of the great foreign debt crisis, which ultimately led to Brazil experiencing a normal middle-income trap in the 21st century. A critical point that the research outlined earlier is that Brazil experienced deindustrialisation. As Andreoni and Tregenna (2021) outlined, premature deindustrialisation is among the key factors that lock several middle-income

countries in a trap of stagnant growth and thwart their catching up with advanced economies. The comparison of Brazil's growth rates in the 1970s and the 2010s signifies that Brazil's economic decline has had a negative outlook, and the quasi-stagnation has contributed to premature deindustrialisation. According to Bresser-Pereira (2021:508), "huge and premature deindustrialisation experienced by the Brazilian economy because the share of the manufacturing industry fell from around 26 per cent of GDP in the 1980s to 11 per cent in 2018". The state of the manufacturing industry plays a pivotal role in thwarting both the middle-income trap and the middle-income technology trap. The relationship between premature deindustrialisation and quasi-stagnation is positive because one factor causes the other to surface.

5.7 RATIONALE FOR BRAZIL AS A COMPARATIVE CASE STUDY IN CONTEXT TO SOUTH AFRICA

Like South Africa, Brazil is a developing country with a middle-class status and a promising economy. South Africa has reached periods of high economic growth during the apartheid era, but has not seen the same success in the post-apartheid era. Just like South Africa, Brazil has turned to agriculture as a sector that promises economic growth. Agriculture is directly associated to food supply, so it is an important sector in terms of sustaining people's livelihoods. In the case of South Africa, agriculture was heavily supported by the government but did not produce significant export income (Freund and Padayachee, 2022). Furthermore, the agricultural sector has not produced significant growth in the post-apartheid era. At the start of the post-apartheid era (1994), agriculture as a share of GDP stood at 4.2 per cent and it dropped to 1.7 per cent in 2019 (Tregenna *et al.*, 2022). When looking at South Africa's agricultural history in the apartheid era, there is much to celebrate in terms of economic prosperity. Although the setting was unequal in terms of economic opportunities being kept for white people, the agricultural sector had a total of 1,184,676 people working on a total of 62,084 commercial farming units in 1990 (Sihlobo and Kirsten, 2022). Essentially, the agricultural sector had a productive and massive workforce that could have taken the sector to economic prosperity in the post-apartheid era.

In the case of Brazil, agriculture had government support which did not just stop at finances. The establishment of Embrapa was pivotal to the growth of Brazilian agriculture, which would, subsequently, contribute significantly to the Brazilian economy. For most of the twentieth century, Brazilian agriculture was considered an inefficient, backward sector (Martha Jr and Alves, 2018). Prior to the establishment of Embrapa, the Brazilian government had put policies in place that would expand agriculture in the 1950s. According to Martha Jr and Alves (2018), it was until the 1950s where most Brazilian agricultural policies were aimed at expanding the agricultural frontier, they were subordinated to the overriding goal of industrialisation. Looking back to South Africa, agriculture easily fell under the

shadow of industrialisation - this was clearly shown in the discoveries of precious metals and minerals [gold, diamonds, coal], the prioritization of the mining sector and the establishment of ESCOM, ISCOR and SASOL. In the context of Brazil, the establishment of Embrapa has allowed Brazil to modernise agriculture for the benefit of Brazilian people and for the benefit of the Brazilian economy. In terms of Embrapa's total spending, government support was 90 to 95 per cent from 1974 to 1982, and it was after this period that Embrapa succeeded on its own as a successful science-based research institution - with the government only acting as an investor (Alves, 2010).

Another key point to highlight is Brazil's establishment of programs, PITCE, PDP, and PBM, that aimed to redefine industrial policy and, subsequently, bolster economic growth. It is worth noting that all these programs took a holistic approach in improving different areas of the economy. In the case of South Africa, the introduction of the Industrial Policy Action Plan (IPAP) would also aim to redefine industrial policy and bolster economic growth. The characteristics, successes and challenges of the IPAP will be discussed later in the thesis.

5.8 SUMMARY AND CONCLUSION

Chapter 5 provided a clear-cut understanding of how premature deindustrialisation was defined in the context of the Brazilian economy. Premature deindustrialisation means transferring workers and technicians with a certain level of education and industrial training from well-paid industrial jobs to poorly paid service jobs. This perverse reallocation of people reduces the productivity of labour, which entails a direct reduction in the per capita growth rate (Bresser-Pereira, 2021). Brazil's quasi-stagnation has harmed industrial, economic and socioeconomic indicators. However, there is an argument that challenges the middle-income trap viewpoint. According to Bresser-Pereira (2021), double liberalisation, the fall in investment capacity of the state, and the fall in capital productivity associated with deindustrialisation are the natural explanations for Brazil's quasi-stagnation since the 1990s - which means that Brazil fell into a liberalisation trap and not a middle-income trap.

Bresser-Pereira *et al.* (2020) point to an argument alternative to the middle-income trap, which is associated with middle-income countries. According to Bresser-Pereira *et al.* (2020), growth did not happen because countries turned middle-income. However, it occurred in a given period, around the 1980s, when certain countries in Asia and Latin America faced a severe foreign debt crisis and were constrained to open their economies (Bresser-Pereira *et al.*, 2020). To a large extent, it would be remiss to state that there is no middle-income trap when the earlier evidence (Brazil's growth rates) indicated how Brazil has remained in middle-income status for decades. In the same respect, one cannot disregard the liberalisation trap.

CHAPTER 6: THE SOUTH KOREA CASE STUDY

6.1 INTRODUCTION

This chapter will examine the case studies of South Korea to understand the East Asian experience of industrial policy and how it was crafted, as well as the state of the political economy. The political economy of countries that developed through critical industrial policy decisions needs to be considered. Chapter 6 will discuss South Korea (henceforth Korea) and its history in industrial policy and economic development. In essence, this chapter will discuss Korea's sources of economic growth, industrial policy approaches and human development. This section will assess the historical context of Korea's political economy and the development of its economy from the twentieth century to the present day. This chapter will outline the development and growth of large-family conglomerates (the *chaebol*) and their role in the Korean economy. Furthermore, this chapter will address the heavy and chemical industries' drive, the growth of the automotive and steel sectors, and the middle-income trap.

6.2 SIGNIFICANCE OF KOREA AS A CASE STUDY AND THE HISTORICAL CONTEXT OF KOREA

Korea's history is significant to the research conducted because Korea is a developed country with an advanced economy. The Korean government had a focused analysis of what constitutes industrial policy. In light of this context, Itoh *et al.* (1988) define industrial policy as a set of policies designed to develop selected industries to increase the welfare of the country and achieve dynamic comparative advantages for these industries by using state apparatus in resource allocation. Essentially, the focus is on how sectors compete across countries - for example, the Korean services sector competing with the Chinese services sector. The competition between sectors also encourages positive growth and promotes industrial development, enhancing the economy domestically and internationally.

In one specific case, the Korean government incorporated a financial element within the Korean industrial policy, an industrial-financial policy. Akkemik (2008) defines Korean industrial-financial policy as a core model that evaluates the supply-side, demand-side, international sector, and price normalisation. The industrial-financial policy aims to ensure that the optimal performance of sectors is complemented by rigid financial decision-making. The next point of focus is human development. An economy cannot exist without human capital, and its highly educated human capital represents the success of the Korean economy. "Thanks to the strong growth of school enrollments, the educational attainments of the labour force increased remarkably from 1945 to 1960; by the early 1960s, Korea already had a substantial stock of human resources" (Lee, 2007:6). A vital driving force behind the consistent economic success of Korea is human capital with highly educated backgrounds. Korea's human capital blends in emphatically with its rigid industrial policy and government intervention.

According to Harvie and Lee (2003), the GDP per capita stood at 78 US dollars in 1960; in 1965, the GDP per capita was 105 US dollars; in 1970, it was 248 US dollars; in 1975, 598 US dollars; and in 1979, it was 1,649 US dollars. Based on the GDP per capita growth, it is clear to see the positive impact of industrial policy decisions in Korea. There was also a negative impact on unemployment because it decreased as GDP per capita increased. According to Harvie and Lee (2003), the unemployment rate stood at 11.7 per cent in 1960; in 1965, it was 7.4 per cent; in 1970, it was 4.5 per cent; in 1975, it was 4.1 per cent; and in 1979, it was 3.8 per cent. The GDP per capita and the unemployment rate of the Korean economy are significant reflections of Korean citizens benefiting from the decisions of their government. The significant drop in the unemployment rate meant that human capital became the heart of the economy and that Korean households would be able to live in better conditions due to employment and remuneration.

6.3 THE KOREAN WAR & KOREAN INDUSTRIAL POLICY IN THE 1950S AND THE 1960S

The Korean government had to experience a hardship that pushed them to grow the economy to greater heights. The historical example that stands out in terms of Korea's development is the Korean War. The Korean War, which took place between 1950 and 1953, severely damaged the economy - the war destroyed most production facilities and killed about one million soldiers and civilians (Lee, 2007). The discussion of Korea is relevant because they had experienced war and could grow after the war from 1954 going forward. Korea could prioritise rebuilding the damaged production facilities and growing the sectors that stood after the war. Lee (2007) stated that the economy gradually improved from 1954 to 1961 - the gross domestic product (GDP) growth rate was about 4.1 per cent. However, per capita income grew only by 0.8 per cent each year due to the rapid population growth. The 1960s was a period that inspired economic success for Korea, fueled by a consistent labour force and strategic decision-making [by the government] within industrial policy. When assessing the performance of the Korean manufacturing sector, it is worth noting that there has been gradual improvement which led to an uprising in industrial development - this will be discussed further later in the thesis.

The manufacturing sector has become a reliable sector for the growth of Korean industrial policy and the development of the Korean economy. The Korean manufacturing sector is one that has had humble growth and contribution until President Park Chung Hee prioritised the mobility and growth of the manufacturing sector. His prioritisation of the sector will be discussed in this chapter, but it is worth noting that the manufacturing sector was not looked at in isolation. The manufacturing sector is also integral to the productivity and growth of other sectors that require manufacturing, as outlined in Chapter 3. As seen in the table below, Korea's manufacturing sector has experienced consistent growth

from 1960 to 2000, with a slight decline in 2005. Even in comparison to its East Asian counterparts, Japan, Korea's manufacturing sector has become a powerhouse and stands better in terms of overall manufacturing performance.

Table 6.1: Sectoral Shares in GDP at Current Market Prices in Japan and Korea, 1960-2005

	1960	1970	1975	1980	1985	1990	1995	2000	2005
Japan									
Primary sectors	9.0	5.0	4.5	3.2	2.6	2.1	1.7	2.0	1.6
Industry	43.0	32.9	31.2	31.1	30.4	30.7	29.4	34.6	29.7
Manufacturing	16.5	25.8	22.5	22.0	22.1	21.1	19.1	23.8	21.0
Services	48.0	36.3	41.8	43.7	44.9	46.1	49.8	63.4	68.7
Korea									
Primary sectors	36.9	26.9	24.5	14.2	12.6	8.5	6.2	4.6	3.0
Manufacturing	14.0	20.5	25.3	26.1	29.2	28.8	29.4	31.5	25.3
Industry	15.9	22.4	27.5	37.8	40.9	43.1	43.2	42.7	35.8
Services	47.4	50.7	48.0	48.1	46.5	48.4	50.6	52.7	61.1

Source: Akkemik (2008:2)

6.4 THE CHAEBOL AND THE SIGNIFICANCE OF THE PARK CHUNG HEE REGIME

The successful industrial policy story of the Korean political economy experienced organisations that looked to benefit from Korea's economic success; these organisations are *chaebols*. A *chaebol* is a group of prominent business enterprises comprising several corporations (Chang, 1988). In Korea, from 1960 onwards, the government promoted large conglomerates named *chaebol* (Akkemik, 2008). *Chaebols* are organisations that contribute to the economy significantly by attracting foreign capital and generating revenue through exports. In Korea, production activities in the new high-technology industries were concentrated in the *chaebol*, which had a large production capacity. They were, therefore, the main competitors of American high-technology producers (Akkemik, 2008). In context to this statement, chaebols are businesses that generate profits and compete healthily against other businesses around the globe. A prime example of a *chaebol* is Samsung, which produces smartphones and tablets. In sum, *chaebols* pursue their profits and are incentivised to bring foreign capital in and be responsible for a portion of the country's economic growth. The goal of discussing Korean industrial policy was to highlight the approaches to establishing successful industrialisation and a cohesive relationship between large conglomerates and the government.

6.4.1 HISTORICAL CONTEXT OF THE CHAEBOL

The origin of the *chaebol* is one that was unique to the Korean economy. The *chaebol* is portrayed as an organisation created and managed by the state for national interests, with Korean President Park Chung Hee sitting on top as the Chief Executive Officer (CEO) (Baik *et al*., 2011). The purpose of the *chaebol* was for them to act as businesses and pursue the government's interests as well - this was done through a rigid partnership. Although the *chaebol's* purpose was to generate revenue, the partnership between them and the state was beneficial through the implementation of economic policy. Bearing this in mind, the vision of Korean President Park Chung Hee (henceforth Park) is vital to the study because of his close involvement with the *chaebol* in the political and economic matters of the country. The military coup of 1961 aimed to make the country independent from imports and, consequently, from foreign powers (Schneidewind, 2016). In order to achieve these goals, a strong export industry needed to be built up, President Park and his regime depended on the financially strong and powerfully managed *chaebol* (Schneidewind, 2016). As long as the *chaebol* accepted the general direction of the economic policy and refrained from getting entangled in partisan politics, President Park let the *chaebol* be the CEOs of Korean economic development (Kim and Park, 2011).

Consequently, President Park let the *chaebol* be in terms of their operations, but he was vocal and paternalistic in his interventions. Consequently, the *chaebol* would have to operate on his terms and in line with the economic policies that the government outlined. In the early 1960s, President Park's objective was to get the *chaebol* to collaborate on state-formulated industrial projects through an asymmetric exchange of political support and risk-taking between the state and the *chaebol* (Kim and Park, 2011). In terms of the chaebol's risk-taking to generate revenue, the onus was on the Korean government to reassure the *chaebol* that they would be supported if the risks failed. In essence, the risks that would fail or not materialise as expected would require some form of monetary support for the *chaebol* to fall back on. According to Baik *et al.* (2011), President Park centralised power in the Economic Planning Board (EPB) and used it to encourage the *chaebol* to take risks in return for his political support.

6.4.2 THE DEVELOPMENT AND GROWTH OF THE CHAEBOL

According to Choi (1987), the Economic Planning Board was created in July 1961, right after the military coup of General Park, who then became the President of Korea. The Economic Planning Board (henceforth EPB) was instrumental to the success of Korean industrial policy. It is vital to understand how the EPB came to exist and the significance of its role in economic policy. The establishment of the EPB symbolised the military government's resolve to prioritise economic development and its commitment to a systematic and sustained pursuit of long-term economic development plans (Choi, 1987). Under the oversight of President Park, the EPB provided strategies

for the government to ensure that the *chaebol* realised their productivity growth and growth as significant economic contributors. According to Kim (1992), the dominance of the EPB arose because the Ministry of Finance managed critical state resources; was internally centralised; occupied a privileged position in personnel recruitment; and had capable state agencies as allies. Moreover, President Park also nationalised all commercial banks intending to control the sources of capital (Kim and Park, 2011).

The nationalisation of commercial banks led to the government taking advantage of achieving industrial policy objectives. Commercial banks would lose the autonomy they would have because the government's decision-making processes largely influence their interests. Consequently, banks became an instrument through which the state could secure business compliance with the goals of industrial policy and macroeconomic planning (Baik *et al.*, 2011). The bank nationalisation was significant because President Park could synergise industrial policy objectives with political power. At the heart of economic policymaking in Korea is the central coordination by the Deputy Prime Minister (DPM), who also serves as the Minister of the EPB and the President's top economic advisor (Choi, 1987). The EPB gave financial direction in building an economic bureaucracy at the forefront of Korean economic development and policymaking.

Moreover, the EPB holds institutional autonomy, which allows it to maintain a broader economic policy perspective, provide objective analysis (as opposed to ostensibly partisan analysis) and, therefore, render a unique service to the President and the nation (Choi, 1987). According to Akkemik (2008), rent distribution was another effective tool in industrial policies during the 1960s, for example, export incentives including a multiple exchange rate system, direct cash payments, and easier access to foreign exchange. Furthermore, the state-*chaebol* partnership was fed by the rents generated through subsidised bank loans and state-guaranteed foreign loans (Kim and Park, 2011).

A key point in the development of the *chaebol* was its partnership with the state and its unwavering support from an institutionally autonomous EPB. However, the success of the *chaebol* extended beyond the state-*chaebol* partnership and the EPB. *Chaebol* groups have been operating on the values of the Korean management system where relationships of family, alumni, region and the state are critically important (Chang, 1988). These core values proved vital when the *chaebol* participated in the global economy. Many Korean *chaebols* adopt specific tactics, such as gaining advantageous new family ties through marriage, to secure their existence and to maintain the family's dominance in management (Lee *et al.*, 1991).

The family aspect of the management and operation within the *chaebol* is critically important when one assesses its significance. Schneidewind (2016) asserts that the owners of a *chaebol* tried to employ as many relatives as possible in their companies, starting with their children. The family management strategy mainly has to do with the tendency of Koreans in leading positions to found and continue dynasties - the children have to obey the father as a person of absolute respect, something which cannot be necessarily expected to the same degree from distant relatives or people from the outside (Schneidewind, 2016). The purpose of this family management aspect is that promotes trust and collegiality within the working and functional spaces of the *chaebol*. Hyundai and Samsung, among others, are prime examples of *chaebol* managed by families. The founder of Hyundai, Ju Yung Chung, has seven sons, five of whom managed ten of the different Hyundai corporations as top executives - whereas the founder of Samsung, Byun Chung Lee, had his family members control the most critical positions of the enterprise (Chang, 1988).

The rigid operation of *chaebols* allowed President Park to use them efficiently for improving sectoral performance and manufacturing products that would be sold to the public and exported to the participants of the global economy. The successful generation of rents led to the *chaebol* being able to generate more revenue and expand their businesses further. In the mid-1960s, the *chaebol* lived as exporters in a competitive world of global markets. They remained accountable to President Park as the state-designed vehicles for building a "rich nation, strong army" (Kim and Park, 2011). In their role assigned to them as trading companies, the *chaebol* were the government's decentralising its administration of export incentives and undertaking the activities needed to strengthen Korea's export marketing capabilities (Westphal, 1990). The presence of *chaebols* in the Korean economy motivated exports to increase due to their productive and innovative abilities. Baik *et al.* (2011) assert that the *chaebol* came to be the source of major innovative policy and the construction of special export zones and industrial complexes to launch Japanese-style general trading companies. When assessing major indicators of the Korean economy, a period of consistent growth inspired Korea's rapid industrialisation. According to Harvie and Lee (2003), exports in 1960 were at 33 million US dollars; in 1965, exports were at 175 million US dollars, and exports grew all the way to 4.5 billion US dollars consistently in 1974. The growth of exports reflected positively in the current account and led to enhanced growth of the Korean GDP. The GDP in 1960 stood at 2 billion US dollars; in 1965, GDP stood at 3 billion US dollars, and from there, the GDP grew consistently to 18.8 billion US dollars in 1974 (Harvie and Lee, 2003). It is worth noting that Korean exports exceeded the government-set targets, as seen in the table below.

Table 6.2: Korean exports, 1963-1971

Year	*Export target ($m)*	*Exports ($m)*	*Growth rate (%)*
1963		86.8	58.4
1964	100	119.1	37.2
1965		175.1	47.0
1966		250.3	42.9
1967	300	320.2	27.9
1968		455.4	42.2
1969		622.5	36.7
1970	1,000	835.2	34.2
1971		1,067.6	27.8

Source: Kim (2004:116)

6.4.3 THE GROWTH OF THE CHAEBOL AND THE STATE OF INFANT INDUSTRIES

In 1964, the Five-Year Economic Development Plan (FYEDP) called for concentrating resources on a few strategic industries and promoting exports in order to understand the world market (Kim and Park, 2011). Consequently, the concentration of resources and export promotion led to the successful export growth outlined by Harvie and Lee (2003). President Park was emulating Meiji Japan in his modernisation of strategy, in which the state worked with the economic powerhouses of the *zaibatsu* (a Japanese organisation comprising industrial firms and financial institutions) to grow through export markets (Baik *et al.*, 2011). Korea's export activity also inspired collaboration with other countries in economic and political projects. The theme identified here is President Park acting as a militant specialist to enhance economic growth indirectly.

According to Kim and Park (2011), the Korean government's 1964 decision to dispatch combat troops to South Vietnam in support of US war efforts also provided the *chaebol* with the opportunity to earn foreign exchange. This decision taken by President Park proved to be instrumental in enhancing the economy. Subsequently, gold and foreign exchange reserves stood at 138 million US dollars in 1965 and increased to 584 million US dollars in 1970 (Harvie and Lee, 2003). Moreover, the percentage shares in manufacturing value added at world prices give a clear-cut picture of the state of different sector types in the Korean economy. The year 1968 will be used for this particular explanation as it is a year that sums up how the economy fared throughout the 1960s. Non-import competing industries' direct exports stood at 1.2 per cent, and domestic sales were at 57.5 per cent (Westphal and Kim, 1977). Export industries' direct exports stood at 8.7 per cent. Domestic sales were at 18.3 per cent, import-competing industries' direct exports stood at 0.1 per cent, and domestic sales were at 10.5 per cent. Then, finally, export-and-import competing industries' direct exports stood at 1.3, and domestic sales were at 2.5 per cent (Westphal and Kim, 1977). These manufacturing value-added (MVA)

percentage shares indicate the level of contribution manufacturing production has brought to Korea. Westphal (1990) points out that these MVA percentage shares illustrate selective intervention in the promotion of infant industries being very selective in the sense of being narrowly focused.

Exports continued to do wonders for the Korean economy because they positively impacted the employment rate and, subsequently, the gross national product (GNP). Economic growth, which had been between 4 and 5 per cent prior to 1962, doubled to an average annual growth rate of 8.8 per cent during 1962–1971 - whereas per capita income increased from 82 US dollars in 1961 to 286 US dollars in 1971 (Harvie and Lee, 2003). According to Amsden (1992), labour-intensive manufacturing exports began to reduce underemployment, thus transforming Korea's domestic political environment. From 1965 to 1969, employment in the manufacturing sector expanded by 50 per cent (Amsden, 1992). The increase in employment positively influenced the growth of exports as a share of the GNP. According to Dornbusch and Park (1987), exports as a share of GNP were at an average of 14.5 per cent between 1963-1973 and later grew to an average of 36.8 per cent between 1981-1986.

The government enabled infant industries to practise discriminatory pricing on non-export sales, which made exports profitable because marginal revenue exceeded the marginal cost (Westphal, 1990). Consequently, these infant industries could not perform at an optimal level to enhance economic growth. The government's continuous interventions may have made them active participants in the Korean economy, but this was because sectors were export-oriented. President Park placed the *chaebol* at the top of his priority sector regarding the growth of the Korean economy. He allowed the *chaebol* to organise their corporate governance structures, inter-firm relations, and internal hierarchy in a direction that would enable them to raise capital with a minimum threat to their corporate control (Kim and Park, 2011). President Park also promoted productivity by letting *chaebols* compete with one another in order to grow their respective enterprises. Conspicuous products of selective intervention are the *chaebol*, Daewoo, Hyundai and Samsung and other large conglomerates whose activities cover all sectors but were initially concentrated in manufacturing and construction (Westphal, 1990). These products later (Daewoo, Hyundai, and Samsung, amongst others) became economic powerhouses that are known around the world in the present day. They initially evolved through market opportunities, but government interventions during the 1970s significantly contributed to their present form and stature (Amsden, 1992).

Promoting competition amongst the *chaebol* groups was beneficial for the growth of the Korean economy. Baik *et al.* (2011) assert that the 1960s' competition for loans and licences caused a significant restructuring in big business. The different *chaebol* within the economy had to use these loans to emerge as major firms that could collaborate with other firms in other countries. One of the risk-taking *chaebol*

was Hyundai, which saw significant growth towards the end of the 1960s. According to Kim and Park (2011), the 1960s saw Hyundai transformed into an industrial conglomerate with six affiliate companies by entering these new growth frontiers: Hyundai Construction (1947), Hyundai Marine and Fire Insurance (1955), Hyundai Securities (1962), Inchon Iron and Steel (1964), and Hyundai Motors (1967). These growth frontiers provided the Hyundai *chaebol* with different stakes in different sectors. The oligopolistic rivalry within the *chaebol* groups provided pressure to remain consistent in providing for the different sectors that they were participating. The *chaebol* that replaced the second and third-largest *chaebol* - Samho and Kaep'ung - was a new group of bold risk-takers: Hanjin, Sinjin Motors, Ssangyong, Hyundai, Hanhwa and Taenong (Baik *et al.*, 2011). The onus was on these *chaebol* to remain in the top ten list because of the resources provided by the EPB (industrial financing) and the government (state support). Moreover, the *chaebol* are considered to be economic powerhouses that are expected to be global participants.

According to Chang (1993), many *chaebols* which state favour (for political and/or efficiency reasons) went into oblivion or were disbanded and their carcasses were distributed to other *chaebols*. In the context of this statement, the competition established by President Park was critical for the chaebol's success in the future and, subsequently, promoted industrial growth that would extend beyond Park's tenure as the President of Korea. The new *chaebol* [Hanjin, Sinjin Motors, Ssangyong, Hyundai, Hanhwa and Taenong] invested more in the heavy and chemical industries, whereas the old *chaebol* were largely involved in light manufacturing and commerce (Kim and Park, 2011). The involvement of the *chaebol* was to drive President Park's strategic sector into becoming a significant contributor to the Korean economy. The heavy and chemical industries (HCI) drive will be discussed in great detail later in this chapter.

6.4.4 THE CHAEBOLS' FINANCIAL CHALLENGES

The flexibility of loan provision to the *chaebol* later proved detrimental to the health and operation of the *chaebol* because they accrued high amounts of indebtedness and could not pay back the loans that were provided to them. The *chaebol* had become heavily indebted after five years of hypergrowth, with a large portion of capital financed by short-term private loans on the curb market and foreign commercial loans (Kim and Park, 2011). The growth of the *chaebol* has come under immense pressure due to the bold decisions taken by President Park and the EPB, respectively. Of the total corporate funds that were available in 1968, debt totalled a hefty 72.5 per cent - and the interest rates for private curb market loans ranged from 40 to 70 per cent, which further aggravated both the SME's and the *chaebol's* financial positions (Kim and Park, 2011). The solution required here needed a relief plan to take the economy from downswing to upswing. Furthermore, this relief plan would have to prioritise the *chaebol* negatively impacted by debt, and the relief plan would have to alleviate the debt. To rescue the

financially weak business community, the Emergency Decree for Economic Stability and Growth allowed corporate debtors to repay their private curb market liabilities over five years with a three-year grace period at a monthly interest rate of 1.35 per cent (16.2 per cent annually) when the monthly interest rate in the curb market stood at 3.84 per cent on average (Baik *et al.,* 2011).

The approach taken by the Emergency Decree for Economic Stability and Growth (henceforth EDESG) to rescue the business community allowed businesses to recuperate and generate revenue that would help them alleviate their financial constraints. The indebtedness of businesses indicates the exploitation of loan provisions because they would borrow large amounts of money to fuel their manufacturing and capital. However, the investments would not materialise as expected. This indebtedness of businesses (especially *chaebols*) is due to the institutional autonomy of EPB and the flexibility it has provided in terms of loan provisions. Baik *et al.* (2011) assert that the EDESG successfully relieved the pressures of the liquidity squeeze but at the cost of paralysing the private curb market that had served as a capital source for hard-pressed firms when regular bank financing was unavailable. Essentially, the negatively impacted firms were handed a lifeline to return to normal profits without hindrances and grow beyond just making normal profits. Consequently, the EDESG consolidated the *chaebol's* place in the Korean economy by not only putting the *chaebol* on a financially sound base but by enabling them to exploit new opportunities in HCI-led corporate growth from a position of financial soundness (Kim and Park, 2011).

6.5 THE HEAVY CHEMICAL AND INDUSTRIES (HCI) DRIVE

The heavy and chemical industries (HCI) drive is an initiative that President Park has implemented to grow the economy strategically. Because he is a militant leader, it is a drive that he seemed to exploit from a military perspective in terms of Korean warfare and offering extensive support to other countries when they are at war. President Park's decision-making was a pillar in Korean industrial development. In 1969, US President Richard Nixon announced the end of US military support for its Asia-Pacific allies (Lane, 2022). The withdrawal of US support meant that Korea would have to rely on its resources for military equipment. According to Lane (2022), the HCI drive was triggered by a political crisis, which was fundamentally driven by security and militarisation. The export-oriented industrialisation programme widened the gap between those engaged in export and domestic business (Harvie and Lee, 2003). The mandate of the drive was to close the gap and establish an alignment of export business and domestic business growth. By the early 1970s, light industry exports began to weaken, highlighting the need to develop new exportable products - this led to Korea shifting from general export promotion and incentives to targeting heavy and chemical industries in May 1973 (Harvie and Lee, 2003).

6.5.1 HISTORICAL CONTEXT OF THE HCI DRIVE

Following the intervention of the EDESG in the late 1960s, the HCI *chaebol* went on to thrive in growth and production. In the 1970s, the government reverted to lower interest rates while intensifying its controls further over credit allocation (Cho and Kim, 1995). The HCI drive was a project set to ascend, but it needed to be received better in the global economy. Multiple Western lenders chose not to lend to HCI, arguing that heavy industry was unlikely to become competitive and that Korea's comparative advantage lay in labour-intensive manufacturing (Lane, 2022). Consequently, the HCI drive did not commence because it was met with reservations by Western lenders. Under both US and internal pressure from planners), President Park had no choice but to abandon early heavy industry projects before the official commencement of the HCI drive (Lane, 2022).

Consequently, President Park had to think of starting the HCI drive effectively because of the initial challenges that could only kickstart after the 1970s. Korea lacked domestic capital with the US and had little chance of getting the seed money to finance HCI projects (Baik *et al.*, 2011). Consequently, the Korean government had to tap into their resources to see how it could kickstart the HCI drive successfully.

According to Woo (1991), the main goal of Korea's finance was to haemorrhage as much capital as possible into the heavy and chemical industrialisation program. This goal inspired the creation of the National Investment Fund (NIF), which will be discussed later in great detail. Existing *chaebol* involved in the HCI drive saw themselves grow as organisations and organisations that would grow the Korean economy. Daewoo, established only in 1967, became a shining example to other *chaebol* in the 1970s and grew over 54 per cent annually (Baik *et al.*, 2011). The growth of the HCI chaebol gave the Korean economy much hope for sustainable growth and cohesive industrial development. Hyundai grew by 38 per cent to become the largest *chaebol*, surpassing Samsung (Baik *et al.*, 2011). The HCI's growth was expected to be organic, unbiased and developmental industrially. According to Cho (1997), the plan of the HCI drive was aimed at four main development goals: (a) economic construction, (b) cultivation of human resources, (c) national land development and (d) self-reliant national defence. Given the examples of Hyundai and Samsung's successes, among other *chaebol*, it is important to consider the efforts taken by different stakeholders to ensure the success of the HCI drive.

Harvie and Lee (2003) assert that the 1970s was an important period of great focus, which was placed upon the development of strategic HCIs, which further contributed to the rapid growth of the country's industrial conglomerates. The HCI drive was instrumental to Korea's road to rapid industrialisation. The establishment of the *chaebol* was a significant mark in Korea's economic growth. It took many risks regarding loan provisions and producing its goods without relying on companies from

other countries. From that point of growth, there were financial hurdles that would negatively impact the *chaebol* in terms of making a profit and/or being able to manufacture goods, especially within the HCI drive. The EDESG alleviated many financial issues the *chaebol* faced, and overcoming these hurdles became the foundation for the chaebol to build.

The HCI drive aimed to advance industrialisation, which would be expected to thrive beyond the twentieth century. The HCI drive had three key objectives that would guarantee economic growth. Harvie and Lee (2003) stated the three key objectives: (i) to overcome obstacles to further economic growth and the implementation of import substitution policies focusing upon the development of heavy and chemical industries was thought desirable; (ii) the development of such industries would also provide a source of new export growth industries; and (iii) it sought to correct the imbalance in the manufacturing sector caused by a growth policy that favoured light industry. The approach to achieving the objectives required more concentrated decision-making because a lot of financial risks were taken during the development and growth of the *chaebol*, which led to the intervention of the EDESG. A lot fewer financial risks would have to be taken for the HCI drive to ensure the soundness of the objectives being achieved. The lapse back to more repressive financial policies was motivated by the policy shift toward the promotion of the HCI drive, which required enormous amounts of cheap financing and constituted a significant departure from the export-oriented, non-sectoral biased strategy during the 1960s (Cho, 1997). Another critical point of the HCI drive was the financing that initiated its existence and subsequent movement.

6.5.2 THE HCI DRIVE: AN INITIATIVE IN ACTION

The critical aspect of the HCI drive's potential success was the source of finance. In 1973, a promotional team named the Promotional Mission, led by Deputy Prime Minister T'ae Wanson, left for the United States of America to promote the HCI plan (Kim, 2004). Essentially, the purpose of the Deputy Prime Minister leaving Korea for the US was to promote collaboration, request economic assistance and enhance industrialisation in the Korean economy. The primary aim of the Promotional Mission was to raise 5.8 billion US dollars in foreign capital, mainly through foreign borrowing and investment (Kim, 2004). The foreign capital served as a critical investment to complete the objectives of the HCI drive. An important point is the extensive government intervention in pursuing the HCI drive. In 1973, a special committee named the Heavy and Chemical Industry Promotion Committee (HCIPC) was established to examine the HCI plans and make final decisions that had the same impact as the state council's (Kim, 2004). This government extension intended to ensure President Park could hold all involved firms and organisations accountable for any misfortunes or economic downswings.

According to Cho (1997), the Korean government established the National Investment Fund (NIF) in 1974, and it expanded Bank of Korea (BOK) discounts - the NIF was mobilised from a combination of funds from private financial intermediaries and the government. These measures adopted by the government were critical to the sustainability of the drive. Ultimately, the drive itself was expected to leave a significant mark on the development of the Korean economy. It is critical to analyse the structure and operation of the NIF and how it contributed to the HCI drive. The NIF was operated with an annual fund-raising and loan programme (Cho and Kim, 1995). The creation of the NIF solidified credit control within Korean industrial policy. The Bank of Korea (BOK) expanded its rediscount facility to support HCI, including a list of the following bills: qualified bills for rediscounting, bills by HCI-qualified firms, and bills associated with raw material imports for HCI (Cho and Kim, 1995). Rediscounting meant that firms within HCI had access to funds and could expand on the resources they had to manufacture goods that would develop the Korean economy, enhance economic concentration and solidify Korean military self-defence. The credit policies for the different HCI firms were quite flexible and accommodative for them to realise their potential growth and subsequent modernisation. During the HCI period, policy loans had more extended repayment periods, and average interest rates were five percentage points lower than other loans (Lane, 2022).

One notable policy measure was the creation of the NIF in 1974 through contributions from banks, insurance companies and public funds to finance HCI projects at favourable rates (Lee *et al.*, 2012; Lim, 2003). The funding sources of the NIF included funds contributed by banks and insurance companies and such public funds as the Civil Servants' Pension Fund (Cho and Kim, 1995). In light of this provision, it is important to consider the specificities of the financing allocated to HCI compared to other sectors. The manufacturing sector received 46.1 per cent of total domestic bank loans in 1970 but contributed only 21.3 per cent to GDP (Cho, 1997).

Within the manufacturing sector, the HCI received 22.6 per cent of the total domestic bank loans but only contributed 8.6 per cent to GDP in 1970 (Cho, 1997). Essentially, the HCI drive was established to grow the shares of the GDP from what was produced in 1970. In 1980, after a decade of the HCI drive, the bank credit share allocated to HCI increased to 32.1 per cent, while its contribution to GDP rose to 16.5 per cent (Cho, 1997). The GDP contribution increase is a pivotal part of the growth in the HCI drive. During 1974-1991, total NIF loans amounted to 7.5 trillion won - HCI loans captured the largest share, accounting for 66.6 per cent, followed by post-shipment export financing (13.6 per cent), the electric power industry (13.4 per cent), and the expansion of food production which stood at 6.4 per cent (Cho and Kim, 1995). The extensive loans indicate the autonomy that the NIF had in ensuring that the developmental and financial needs of the HCI were taken care of. Additionally, consistent government intervention ensured that industrial policy initiatives saw their fruition.

The HCI drive was particularly influenced by President Park's vision of a "rich nation, strong army" - the same vision he used to establish the *chaebol*. According to Hyung-A Kim (2004), President Park appointed O Wonch'ol as his Senior Economic Secretary in the Second Economic Secretariat (SES). The purpose of President Park establishing this governance structure was to enhance Korean economic operations, but most importantly, prioritise the HCI drive. As chief of the SES, O Wonch'ol was given several duties once the Big Push - the HCI programme - commenced at the start of 1973 - these duties included: the HCI program, development of skilled man-power, nuclear weapons and missile capability development, replanning of national land development and military modernisation (Kim, 2004). Under the HCI drive (1973–1979), industry-neutral export incentives were replaced by industry-specific and, in some cases, firm-specific measures where they received generous government assistance and the main tool of promotion was preferential access to bank credit (Harvie and Lee, 2003). The HCI drive was an initiative that aimed not only to grow capital-intensive heavy goods and chemicals but also to grow the *chaebol's* manufacturing capabilities. The guidance of President Park in implementing the drive proved useful because he continued to promote competition among the *chaebol* in the economy. Competitive markets are the best way to efficiently organise the production and distribution of goods and services - domestic and external competition provides incentives to unleash entrepreneurship and technological progress (World Bank, 1991).

Aware of the need to concentrate resources in order to realise economies of scale in the capital-intensive heavy and chemical industries, President Park chose the strategy of getting the *chaebol* to construct an oligopolistic structure of competition in five industries: (i) non-ferrous metal, (ii) petrochemical, (iii) machinery, (iv) shipbuilding, and (v) electronics (Baik *et al.*, 2011). Structuring an oligopoly in the Korean economy proved to be helpful because this would provide a sharper focus on domestic growth and export growth. Furthermore, Korea intended to choose sectors that were not in conflict with comparative advantage (Lane, 2022). Once President Park decided to pursue HCI, export promotion strengthened business concentration - in the absence of sufficient domestic demand, he designated the heavy and chemical industries as export sectors when they were only infant industries (Baik *et al.*, 2011).

The growth of infant industries was highlighted as an important ingredient for Korean success because the infant industries would thrive under export promotion and export-oriented industrialisation. The alignment of export and domestic growth aimed to advance the HCI drive autonomously, without relying on other countries, mainly First World countries. Throughout the HCI drive, almost 60 per cent of total bank loans, and more than 75 per cent of total manufacturing investment, went to (i) non-ferrous metal, (ii) petrochemical, (iii) machinery, (iv) shipbuilding, and (v) electronics, thus stifling

the flow of funds available to light manufacturing industries and small and medium enterprises (SMEs) (Harvie and Lee, 2003). Without a doubt, the organisations at the forefront of manufacturing investment were the *chaebol*. Hyundai turned out to be one of the most versatile *chaebol* in the industry by having their major firms participate in different sectors from the early 1970s, which set the tone for their success and Hyundai's illustrious Pony Project, which will be addressed further later in the thesis.

By 1972, Ju Yung Chung, founder of Hyundai, laid the foundation to become the HCI magnate of Korea, with six of his eight major firms each building an empire in construction, iron and steel, oil refinery, and automobile industries (Kim and Park, 2011). The HCI drive also inspired significant growth within the different *chaebols*. Between 1974 and 1978, Hyundai's affiliates grew from 9 to 31, Samsung's affiliates grew from 24 to 33, Daewoo's affiliates grew from 10 to 35, and Lucky-Gold Star's affiliates from 17 to 43 (Cho and Kim, 1995). The affiliates that grew within the aforementioned *chaebol* became helpful in the operation of the HCI drive because they specialised in sectors that were focused on both the HCI drive and Korea's path to industrialisation. According to Cho and Kim (1995), the aforementioned *chaebol* had the following acquisitions in HCI:

1. Hyundai: automobile, machinery, iron and steel, shipbuilding, aluminium, oil refining, heavy electrical goods and heavy machinery.
2. Samsung: shipbuilding, general machinery, electric switching systems and petrochemicals.
3. Daewoo: machinery, automobile and shipbuilding.
4. Lucky Gold-Star: petrochemicals, oil refining and electronics.

While the *chaebol* had already played a significant role in Korea's economic development during the 1960s, their rapid growth was during the HCI drive (Harvie and Lee, 2003). The powerhouse status of the *chaebol* served as motivation for them to carry their impressive productivity into the HCI drive. The investments in the HCI drive began to reflect after the different *chaebol* produced their goods. By 1977, 93 per cent of all commodities were produced under monopoly, duopoly or oligopoly conditions in which the top three producers accounted for more than 60 per cent of the market share (Harvie and Lee, 2003). The production of commodities in the market allowed the different firms to generate revenue and continuously achieve objectives within the HCI drive.

Upon the completion of the HCI drive, there were key victories for the Korean economy. The financial contributions toward the HCI drive were quite significant to its success, and these contributions were in the form of loans. According to Cho and Kim (1995), the share of loans in HCI was as follows: in 1970, 22.6 per cent; in 1980, 32.1 per cent; and in 1990, 30.2 per cent. Significant loans toward HCI were required to reflect Korea's GDP growth. Consequently, the HCI share in the GDP is reflected as follows: in 1970, 8.6 per cent; in 1980, 16.5 per cent; and in 1990, 18.1 per cent (Cho and Kim, 1995).

Given the loan shares and GDP shares of HCI, it is clear that there is a positive relationship between the loans and the output of HCI. In the mid-1980s, HCIs became the leading export industry in Korea (Cho & Kim, 1995).

Unfortunately, a key political event marked the HCI drive's end. President Park's assassination in 1979 prompted the withdrawal of HCI and a period of economic liberalisation (Kim, 1988). The withdrawal of the HCI drive did not necessarily mean that HCI suffered, but it meant that the initiative President Park implemented ended when he died. As outlined earlier, HCI produced an excellent performance in the 1980s. The end of the HCI drive meant that Korea dismantled HCI incentives pursuing investment adjustment for HCI and further accelerating trade liberalisation (Lane, 2022). The Korean economy became concentrated and grew organically, with the *chaebols* at the forefront. When the HCI drive was completed, *chaebols* had captured a large share of economic power (Cho and Kim, 1995). By 1981, the top five *chaebols* were responsible for 23 per cent of manufacturing sales, whereas the top thirty *chaebols* were responsible for 41 per cent of total manufacturing sales (Cho and Kim, 1995). Import liberalisation began to grow after the end of the HCI drive, while HCI was on its way to becoming an export-leading industry. Lane (2022) asserts that the import liberalisation ratio climbed from 68.6 in 1979 to 76.6 by 1982. The growth of the HCI drive was beneficial for HCI's industrial structure and export composition. According to Cho and Kim (1995), the HCI's industrial structure was recorded as follows: 11.9 per cent in 1970; 20.9 per cent in 1975; 26.3 per cent in 1980, and; 28.3 per cent in 1985. HCI's export composition stood as follows: 12.8 per cent in 1970; 29 per cent in 1975; 38.3 per cent in 1980, and; 47.5 per cent in 1985 (Cho and Kim, 1995). The growth of the HCI drive also ensured the manufacturing sector remained a prominent sector in the Korean economy. As seen in the table below, Korean industrial performance between 1979 and 1988 is the highest overall in comparison to Brazil, Chile, Greece, Mexico, South Africa and Spain.

Table 6.3: Korea's comparative industrial performance, 1979-1988 (annual real growth rates of production)

	Brazil	Chile	Greece	Korea	Mexico	South Africa	Spain
Heavy industries[a]	0·6	1·6	−0·8	17·2	2·7	0·4	2·1
Chemical industries[b]	2·6	0·6	2·2	7·5	3·4	1·3	0·8
Light industries[c]	1·5	2·6	0·3	7·8	1·8	2·7	1·6
Manufacturing	1·5	2·7	0·4	11·7	2·1	1·6	1·5
1986 per capita GNP (dollars)	1810	1320	3680	2370	1860	1830	4860

Source: Chang (1993:135)

6.6 THE KOREAN AUTOMOTIVE SECTOR

According to Nieuwenhuis and Wells (2015), South Korea's automotive sector has its roots in the colonial period, specifically in 1944, with the establishment of Keisei Precision & Industrial, the forerunner of Kia. The Korean automotive sector is a crucial example of economic growth in South Korea. It is a prominent sector that performed brilliantly, especially in comparison to South Africa's automotive sector. However, the automotive sector had its full-fledged beginning with the five-year economic development plan of 1962 following the period of remodelling and assembly of vehicles financed by the American military after the Korean War, which means that the automotive sector developed as a direct result of governmental industrial policy (Ku, 2015).

Chang (1998) asserts that the Korean government took direct measures to push its firms to design their own cars, localise their parts and components, upgrade their technologies and compete in the world market. These direct measures gave the firms a great deal of autonomy in growing the automobile sector. As a result, Korea - whose per capita manufacturing value added in 1961 was one-seventh that of South Africa and whose car production was one-sixth that of South Africa as late as 1980 - is now a major independent player in the world auto industry, with almost complete localisation of parts [95 per cent by 1988, when it was 55 per cent in South Africa] (Chang, 1998).

In 1963, the government announced the Automobile Industry Promotion Law. The government also announced plans to allow only one firm to manufacture automobiles for economies of scale in the small domestic market (Rhee, 2002). The Korean automotive sector became a prominent economic contributor when the government allowed firms to design their cars. According to Chang (1998), the government punished firms that did not design their own cars in the mid-1970s - the government de-licensed one of the automobile producers for failing to design their own cars. When assessing the swift growth of the Korean automotive sector, it is critical to consider the South African standpoint. Chang (1998) states that South Africa remained a typical Third World producer assembling too many models at high costs under foreign licensing, while Korea's automotive sector was growing locally in the 1980s. A vital example of a lucrative *chaebol* that transformed the Korean automotive sector is the Hyundai Motor Company. The Hyundai Motor Company became a significant role player in the automotive sector and worked hard to become a globally recognised organisation in the present day.

6.6.1 THE DEVELOPMENT OF HYUNDAI MOTOR COMPANY (HMC)

The story of the Hyundai Motor Company (henceforth HMC) changed the Korean automotive industry. HMC was established in 1967 to assemble American-designed cars for local consumption (Wright *et al.*, 2009). The presence of HMC was set to change the Korean automobile sector's state positively. It is critical to assess the Korean government's plans to develop the automotive sector. In

1969, new Ministry of Commerce and Industry (MCI) minister Yi Nak-son made public a Basic Promotion Plan for the automotive sector - to develop the parts and components industry, schedules to increase local content were set up by the MCI for each passenger car model (Lee, 2011). The approach taken by the MCI was crucial because the schedules put in place applied critical pressure for passenger car models to be produced in time. According to Lee (2011), only one car assembler was to be chosen based on three criteria in order to prevent the problem of surplus capacity from increasing to a threatening level:

1. The assembler must establish a joint venture with a multinational in the production of engines.
2. The assembler must export surplus engines in excess of domestic consumption.
3. The assembler must involve as many domestic vendor firms as possible in developing locally produced engines.

The strategies that Yi Nak-son implemented were set to grow the automotive sector domestically before it could compete globally. Consequently, the Automobile Industry Promotion Law would work hand-in-hand with the Basic Promotion Plan to ensure that firms within the automobile sector would enhance their resources and, subsequently, these firms would grow the sector as a whole. The long-term goal for the Korean economy in the 1960s was to industrialise and compete with other countries, so the onus was on HMC and other companies to build on the resources and financial support they had to modernise the automobile sector and perform brilliantly in both the domestic and global economies.

6.6.2 HYUNDAI MOTOR COMPANY (HMC) AND THE PONY PROJECT

The success of HMC has been considered instrumental to the chaebol's development. The state created a business environment for risk-taking, but the local automakers took the risk of entering the manufacturing stage (Baik *et al.*, 2011). Hyundai's entry into the manufacturing sector was considered a risk because it was a consistent participant in the HCI drive. Hyundai took on a project that would help uplift its growth in the manufacturing sector - this project was called the "Pony Project". In 1973, Hyundai succeeded in developing Korea's first independently designed and manufactured model, the Pony, following the government's long-term Automobile Promotion Plan (Chung, 2014). The Korean government had strongly urged the country's automakers to build an original Korean model and not simply produce European cars under licence (Bencuya, 2014). The Pony project was critical because HMC had to rely on their resources to design and assemble the Pony. Furthermore, assembling the Pony was critical for HMC because it looked to provide quality transport in large quantities for local consumption. The development of the Pony as a domestic model kickstarted the path to mass production for HMC (Ku, 2015).

The Pony was Korea's first original automobile and was successfully launched in the domestic market in 1976 (Bencuya, 2014). Although the Pony was Korea's first original automobile, HMC needed help to work on assembling this automobile. HMC engaged in technical cooperation with Mitsubishi Motors of Japan, obtaining chassis components and other parts that were difficult to manufacture (such as gearboxes and engines) directly from Mitsubishi while fabricating the cylinder head and blocks, housings and transmissions cases in-house (Chung, 2014). It is worth noting that the design of the Pony also required assistance. According to Bencuya (2014), HMC used ItalDesign of Italy to design the Pony because the firm had no in-house design capacity back in 1973. The two firms have established a fairly long-term relationship since then. The Pony Project matched the expectations of HMC and the Korean government because it became a huge success. According to Lee (2011), the Pony became an instant hit, enabling HMC to increase its market share from 19 per cent to 39 per cent in a year.

The immense success of the Pony made Hyundai the leading Korean automobile firm - the domestic market share of Hyundai in passenger cars rose from 28.3 per cent in 1975 to 57.5 per cent in 1976 (Hyun and Lee, 1989). The achievements of the Pony Project became advantageous not only for HMC and the Korean economy but for the people of Korea as well. According to Bencuya (2014), HMC's development of the Pony helped the company get timely government support but also helped its image with the Korean people, who saw it as a pioneer in the industry. The development of the Pony also strengthened HMC as a firm because of its ability to cohesively collaborate with other businesses, in this case, ItalDesign and Mitsubishi. The image of the Pony, and the popularity it brought, helped to boost Hyundai's share of the domestic market, allowing it, in concert with its exports, to transform itself from an assembler of foreign models to a comprehensive automaker (Bencuya, 2014).

6.6.3 HMC AND ITS INTERNATIONAL EXPANSION

HMC's next growth phase was establishing a global footprint by producing car models in different countries. The significance of this initiative was to grow HMC and to industrialise Korea rapidly. HMC's growth as a firm was based on organisational learning. Organisational learning refers to the ability of a firm to adapt and innovate its internal resources and capabilities (Nonaka, 1994). The purpose of HMC's organisational learning is to equip the firm with resources that will enable it to work in any automotive sector globally and thrive in it. The firm's absorptive capacity involves more than simple exposure to new knowledge sources - it also hinges upon its ability to absorb new knowledge internally through its communication and transfer to sub-units and its integration with internal processes (Wright *et al.*, 2009). In order to increase international competitiveness, Hyundai adopted a two-step approach - the first step was the adoption of best practices, and the second step was adopting a high-technology approach to rationalise production and increase efficiency (Chung, 2014).

6.6.3.1 HMC'S SHORTCOMINGS IN CANADA

According to Wright *et al.* (2009), HMC's first attempt at overseas production was in Canada, which had been a focus of exports since the early 1980s. In cooperation with Mitsubishi, HMC opened its first overseas plant in Quebec, Canada, in 1985 to assemble the medium-sized front-wheel drive Sonata model (Lansbury *et al.*, 2006). The purpose of HMC collaborating with Canada and Japan was to grow HMC and build production plants worldwide. Mounting pressure in North America to restrict automotive imports was a major factor in HMC's decision to establish a Canadian production plant (Wright *et al.*, 2009). Consequently, HMC faced a challenge by pursuing a project in Canada. To mitigate this mountain pressure, HMC sought to boost its sales and avoid the imposition of import quotas (Lansbury *et al.*, 2006). The key objective of this project was to profit from HMC's initial success in Canada in 1984, with the Pony, when HMC became the largest auto importer in the country (Lansbury *et al.*, 2006).

HMC invested 382 million Canadian dollars in constructing the Canadian plant at Bromont in Quebec. (Wright *et al.*, 2009). In addition, the Quebec Department of Labour gave a 7.3 million Canadian dollar grant to HMC to assist with training the workforce over three years (Lansbury *et al.*, 2006). When the Bromont production plant became operational, the plant had a capacity of 100,000 units, and Hyundai officially became the first non-American automaker to manufacture cars in Quebec (Jacobs, 2022). HMC selected Bromont because the Quebec provincial government had promised to provide substantial grants, including a 400-acre greenfield site, 9 million Canadian dollars in employee training, and an interest subsidy for investment amounting to approximately 100 million Canadian dollars over five years (Wright *et al*, 2009).

Following the establishment of the Bromont plant and financial support, HMC's progress in Canada failed to make a profitable impact in the North American automotive sector. HMC's investment intended to show that it is not coming to Canada for one-sided gains but was mindful of the need for a mutual benefit from trade (Hyun and Lee, 1989). Furthermore, the decision to assemble the mid-sized front wheel drive Sonata was part of Hyundai's strategy to diversify its export models and enhance its competitiveness (Teal, 1995). According to Wright *et al.* (2009), the Bromont plant was HMC's first attempt at highly automated manufacturing: the automation of the body shop at Bromont was 85 per cent compared with only 65 per cent at the Ulsan plant in Korea. HMC's first attempt at automated manufacturing was part of its organisational learning because this form of manufacturing did not proceed as expected. Hyundai's almost annual labour problems, such as strikes and occupations that led to shutdowns at its Ulsan plant since 1987 meant delays in the delivery of essential parts to Bromont, but the Bromont plant had also experienced some quality problems due to defects in body parts as a result of handling and shipping from Korea (Teal, 1995). HMC's production problems in Canada were

compounded by its inadequate knowledge of the North American medium-passenger car market (Wright *et al.*, 2009).

HMC made efforts to mitigate the strikes and subsequent shutdowns in Ulsan by enhancing their resources to successfully manufacture cars within the proximity of the Bromont production plant. Lansbury *et al.* (2006) state that HMC built both a paint and a press shop to increase North American content (an important criterion for exporting to the USA) and because of problems in gaining components from Korea due to labour problems and strikes at HMC's Ulsan plant. In 1989, with sales of only 14,000 units but a capacity of 100,000 units, the Sonata failed to achieve its North American target (Wright *et al.*, 2009). Consequently, HMC failed to make a breakthrough in the North American automotive sector by only selling 14 per cent of the Sonata. In 1990 and 1991, the production of the Sonata failed to exceed 30,000 and dropped below 20,000 (Wright *et al.*, 2009). HMC negotiated with Chrysler to support Bromont-produced Sonata badged as Eagles to sustain the Sonata, but the Bromont plant was shut down in 1993, and HMC's first attempt at overseas production ended in failure (Wright *et al.*, 2009).

6.6.3.2 HMC'S SUCCESSES IN INDIA

With its need for a new growth engine, HMC chose India as the next region to achieve market penetration in a short time while carrying forward with globalisation (Park and Rhee, 2015). Essentially, HMC sought greener pastures in international expansion after their venture in Canada failed. In 1995, HMC undertook a large-scale overseas investment to establish a greenfield plant in India (Wright *et al.*, 2009). The significance of this establishment meant that HMC was set to expand across Asia. Furthermore, HMC was able to learn from its failure in Canada and improve when it invested in India. For HMC, a plant in India, halfway between Asia and Europe, would offer a strategic export base for its low-priced vehicles (Wright *et al.*, 2009). In 1996, five years after the closure of the Quebec plant, HMC established a 100 per cent owned subsidiary, the Hyundai Motor Company of India (HMI), to manufacture cars in India (Lansbury *et al.*, 2006). The establishment of the subsidiary in India was critical because of its geographical location.

Although HMC had planned a small-scale joint venture plant (20,000 to 30,000 units per annum), the difficulties other foreign carmakers had experienced with Indian partners led it to opt for a 100 per cent owned subsidiary (Yoon, 2002). The establishment of HMI was an excellent achievement for HMC because Korea was closer to India, and HMC would be more hands-on with HMI's affairs. During the first year of operation, almost all senior decision-making positions at HMI were held by HMC-based Korean managers. (Lansbury *et al.*, 2006) Not only were heads of the division responsible for HMI's key activities, but also, some were placed at the operational level to provide support and advice to

middle-level Indian managers and to coordinate management activities (Lansbury *et al.*, 2006). HMI settled well after making a significant impact on the production of the Santro. HMC's success in the Indian market was reflected when it started to sell the Santro in October 1998, and six months later, it became the second-largest manufacturer in India (Wright *et al.*, 2009). In 1999, the Santro was named "Car of the Year" by the Business Standard, an influential Indian newspaper, and it scored highly in quality surveys (Wright *et al.*, 2009). The Santro becoming a quality car stemmed from the fact that it was manufactured differently from other cars. To differentiate the Santro from local competitors, product designers emphasised up-to-date technology and created a sporty look (Yoon, 2002).

According to Lansbury *et al.* (2006), HMI invested more than 450 million US dollars in constructing a plant with the capacity to produce 120,000 passenger cars per year that were completed in Chennai, Southern India, in 1999. The decision to choose Chennai as the production plant location had fair reasoning. Wright *et al.* (2009) state that detailed investigations were done to ensure the location [Chennai] was chosen correctly. The investigations entailed the following: the distance to consumer markets, local parts suppliers' location, the labour force's nature and utility conditions such as electric power and industrial water. HMI produced several passenger cars consistently, and the high productivity in Chennai led to further growth of the Korean automotive sector. By May 2000, the Chennai plant was producing 100,000 vehicles a year and had captured 14 per cent of the Indian market - HMI produced two models in Chennai: Santro (999 cc) and Accent (1,499 cc), both of which achieved approximately one-quarter of their respective market segments during the first four months of 2000 (Lansbury *et al.*, 2006). Between 1999 and 2001, HMC's sales increased from 61,135 units to 82,837, and its market share rose from 12.7 per cent to 16.2 per cent (Wright *et al.*, 2009). The overall success of HMC between 1999 and 2001 filtered down to HMI. With the sales increase, HMI increased production and enlarged its product line with the Accent in 1999 and the Sonata in 2001 (Wright *et al.*, 2009). The production of cars in high volume brought desired success to both HMC and HMI. Consequently, in 2001, the workforce had increased to 3,000 workers and a three-shift operation. HMI had become one of the fastest-growing auto manufacturers in India and shared the lead with Ford of India in its respective market segments (Lansbury *et al.*, 2006). In sum, HMI's success brought good fortune to HMC, which meant that HMC began to expand and grow as a significant automotive firm. The success of the Chennai plant strengthened HMI's role as a supply base for core components and low value-added products within its global business structure (Wright *et al.*, 2009).

6.6.3.3 HMC'S SUCCESS IN THE UNITED STATES OF AMERICA

The HMC's collaboration with the United States of America was expected to be one that would produce great results after a successful venture in India, where Hyundai Motors India (HMI) was established. In 2002, HMC announced its decision to build a production plant in Montgomery,

Alabama, with an investment of 1.06 billion US dollars to manufacture the Santa Fe and Sonata models (Hamilton, 2004). In addition to the production plant, HMC created a new subsidiary, Hyundai Motor Manufacturing America (HMMA) (Wright *et al.*, 2009). The creation of a subsidiary in America indicated that HMC would expand in the North American car market after a failed attempt in Canada in the 1980s. HMC chose Montgomery, Alabama, because of the availability of relatively low-cost, non-union labour, easy accessibility, sound infrastructure, and proximity to a South port (Wright *et al.*, 2009). Furthermore, Alabama state provided incentives worth 254.8 million US dollars (Hamilton, 2004).

The Montgomery plant was sophisticated in characteristics and could produce cars optimally. Wright *et al.* (2009) assert that the Montgomery plant was fully integrated, with engine, press, body, paint, assembly shops and numerous testing facilities. Echoing HMC's earlier pattern of setting aggressive goals, such as the introduction in 1998 of an unprecedented 10-year/100,000-mile power-train warranty for cars sold in the USA, HMC pushed hard to raise its position in industry quality rankings (Krebs, 1998). The Montgomery plant manufactured 251,000 and 238,000 units of the two models - Sonata and Santa Fe - in 2007 and 2008, respectively (Jo and You, 2011). The production techniques that HMC has been familiar with are those of Korea and India, so the question of how HMC would develop their production techniques has been addressed by its past Canadian venture. However, the American sector is smaller than the Canadian automotive sector. Therefore, HMMA had to understand how best it would produce cars for profit. The HMMA plant's productivity for the Sonata was ranked fourth among the midsize sedan plants in North America in 2007, whereas the productivity of the HMMA plant for the Santa Fe received good evaluation among midsize SUV plants in North America in the same year (Jo and You, 2011). Given the inherent difficulty of transferring a production system to another country with different institutional environments, HMMA's outstanding performance is surprising because it achieved high productivity from the first year of its operation (Jo and You, 2011).

Essentially, HMC drew on its expertise in automated production from within its Korean operations and used experienced managers to transfer knowledge to its American operations (Wright *et al.*, 2009). Furthermore, HMC established simulation assembly lines in its Korean research and development to training American production workers (Chappell, 2005). With its investment in R&D and achievement of number one ranking for quality in volume car brands, the American case meant that HMC has indeed moved beyond imitative learning to innovative learning (Kim, 1998). The establishment of the highly-automated American plant highlighted HMC's broader strategic intention to improve its brand value as a producer of high-quality cars (Wright *et al.*, 2009). HMMA's success in the US market is astounding because it has risen to one of the highest-ranking automakers in the United States in terms

of productivity and quality (Jo and You, 2011). HMC's success was reflected in its impact on the profits that HMMA generated and the high productivity and sales of modern cars.

6.6.3.4 AN OVERVIEW OF HMC

HMC has experienced significant organisational and innovative learning that eventually led to its current status as one of the world's best automotive firms. HMC's experiences in Canada, India and the United States contributed to a body of knowledge built for HMC to improve and grow as an organisation. HMC's experience in Canada was a significant learning curve for HMC as it experienced critical issues in terms of inadequate knowledge of the Canadian market and a need for production strategies. As outlined by Wright *et al.* (2009), the Chennai plant in India solidified HMI's position as the regional headquarters for exports to developing countries, leading to the beginning of HMC's global production network. The pivotal point for HMC was the success of HMI in order for HMC to make an economic impact in the global production network. The experience in the United States continued this momentum by establishing the Montgomery plant and HMMA to grow the global production network and HMC.

6.7 POHANG IRON AND STEEL COMPANY (POSCO)

The establishment of the Pohang Iron and Steel Company became critical to the growth of the HCI drive and the Korean economy, mainly due to past reservations from other countries that Korea would not be able to succeed in heavy industry. One of the astonishing facts about POSCO is that the founder and the first employees had no experience or expertise in steelmaking -they learned it all from others while making many visits to Japanese steel plants, which at that time were considered among the world's best (Kim and Jaffe, 2010). The firm establishment of the HCI drive created a pathway for POSCO to become a reality. According to Cho and Kim (1995), building the steel industry in Korea was an ambitious undertaking that sought to tackle critical obstacles:

1. The steel industry is highly capital-intensive, but Korea needed more capital.
2. The steel industry is a typical natural monopoly industry where costs are sensitive to scale
3. Korea's domestic market was very small.
4. The steel industry had uncertain returns on investments.
5. Both iron-ore resources and the technical skills necessary to efficiently produce steel were absent in Korea.

According to Mah (2007), in 1968, the government established Pohang Iron and Steel Company Ltd (POSCO), the first integrated iron and steel mill in Korea, which became one of the world's best-performing steel companies a few decades after its formation. The formation of POSCO was an active push for industrialisation and growing the economy. The Republic of Korea has grown by more

than 8 per cent each year since the early 1960s, making it the fastest-growing economy in the world (Lee, 2007:1). The developmental growth of the Korean economy was significant because the industrial policy was not the only focal point. Korean industrial policy also showed how industrialisation should be implemented to improve economic productivity in all facets. The different Korean governments were open to experimenting with their policies to promote economic development and push industrialisation forward. Korea boasted significant growth in industrial development from the 1960s going onwards. POSCO was formally founded in 1968, and the construction of its integrated steel mill began in April 1970 and was completed in July 1973 (Baik *et al.*, 2011).

6.7.1 THE DEVELOPMENT OF POSCO

The establishment of POSCO was an accurate fit for the HCI drive because the drive prioritised steel as a metal required to produce goods sold in the economy. Steel was a measure of military prowess, economic modernisation, and technological progress (Baik *et al.*, 2011). The creation of steel and steel products provided a platform for the Korean government to help improve the manufacturing sector and further the HCI drive. In the context of the research conducted, Korea's industrial policy relied on investment incentives and the availability of imported intermediates rather than the overt production of output markets (Lane, 2022). The reliable and consistent steel production required a solid industrial policy that spoke directly to the needs of POSCO and the steel industry. In 1970, the Economic Planning Board collaborated with the Ministry of Commerce and Industry to draft the Steel Industry Promotion Act (Rhyu and Lew, 2011). This Act aimed to ensure that the steel industry would thrive in becoming a high-performing industry. Furthermore, the Act ensured that POSCO would continuously achieve objectives that would make it a globally recognised and competitive firm.

The Steel Industry Promotion Act provided POSCO with access to long-term, low-interest foreign capital for the equipment and the erection of a port building, water supply facilities, an electricity-generation station, roads and a railroad line (Amsden, 1992). From a legislative viewpoint, the Act enabled POSCO to gain access to resources that would help it grow as a major steel firm. However, the Steel Industry Promotion Act was not isolated to POSCO. The Economic Planning Board feared that a particular law (instead of an industry law) tailored only to the needs would run the risk of making POSCO a perpetual infant company, constantly looking to the state for subsidies and frequently captured by rent-seekers such as bureaucrats, politicians and business forces (Rhyu and Lew, 2011). Implementing an industry law over a special law ensured an open platform for any other business specialising in steel to become a high-performing steel firm like POSCO potentially. The Korean government adopting an industry law would pressure POSCO into raising productivity because, under an industry law, entry was closed to outsiders (Rhyu and Lew, 2011).

6.7.2 POSCO'S COLLABORATION WITH JAPAN

In addition to implementing the Steel Industry Promotion Act, POSCO ensured their success by collaborating with Japan. Japan joined the Korean government to help strengthen POSCO and establish a solid institutional foundation (Baik *et al.*, 2011). The solid institutional foundation of POSCO was crucial to Korea's economic modernisation and military security because steel was seen as an industry that would authentically develop the nation of Korea. Steel and non-ferrous metals supplied crucial upstream materials for basic defence components, electric components for electric weaponry and machinery for precision military production (Lane, 2022). In the context of the previous statement, it is clear that steel was essential for military security. In 1969, President Park decided to use a portion of the Japanese reparations fund agreed upon at the settlement of the normalisation of the treaty with Japan for the POSCO project (Rhyu and Lew, 2011). President Park made it a point to ensure that POSCO's establishment and operation aligned with the goal of Korean industrialisation. In the same year (1969), President Park met with the chairpersons of Japan's three largest integrated steel companies [Yawata, Fuji and NKK] in various meetings and argued for the case of the POSCO project stating that industrialisation with steel at its base was the key to building a vigorous Korean economy (Hogan, 2001). Consequently, President Park's decision was instrumental to the establishment of POSCO - the existence of POSCO later inspired collaboration between Korea and Japan.

According to Rhyu and Lew (2011), POSCO received 77.2 million US dollars in reparations funds which entailed 30.8 million US dollars without interest and 46.4 million US dollars with an interest rate of 3.5 per cent over twenty years with a seven-year grace period. In order to move closer to modernisation, POSCO was able to obtain the most modern production facilities and technologies from Japan (Chau *et al.*, 2001). The funds invested towards the foundation of POSCO were useful, and the contribution of foreign loans increased these funds. Out of the total foreign loans, 77.2 million US dollars were from the Japanese reparations fund, 66.5 million US dollars from Japanese commercial loans and about 40 million US dollars from Austrian commercial loans (Cho and Kim, 1995). The collaboration of Japan did not only have a financial element to it, and there were strategic elements in the sense that the Japanese steel industry offered strategic advice. According to Baik *et al.* (2011), the head of the Japanese Economic Planning Agency's coordination bureau Akazawa Shouichi gave Korean Deputy Prime Minister Kim Hak-ryol three prerequisites for Japanese coordination in the steel industry:

1. The Korean state should continue actively mobilising domestic capital to minimise the financial risks and costs entailed in the construction and operation of POSCO.
2. Korea should enact a special industry law in support of POSCO in order to ensure POSCO a stable supply of electricity and industrial water at discount prices.
3. The Korean state should assume responsibility for constructing POSCO's infrastructure.

In essence, this was the advice that led to the creation and implementation of the Steel Industry Promotion Act and to POSCO's prioritisation in the HCI drive. For a firm that was expected to compete in the global economy, POSCO had to hold the comparative advantage as a key objective for the economy's benefit. POSCO's collaboration with Japan proved to be beneficial because it decided to compete with Japan's top firms. According to Amsden (1992), creating comparative advantage through learning rather than innovation is much less risky because POSCO had both a model and a teacher [Nippon Steel Company, a Japanese state-owned enterprise] to guide it. The learner-teacher relationship is vital because POSCO can learn from its own and Nippon Steel's mistakes and short-lived economic triumphs. Hogan (2001) asserts that POSCO sought to learn everything possible from the technological cooperation extended by the Japanese steel industry, without which the Pohang plant's construction would not have been possible. Furthermore, POSCO had the opportunity to learn about Nippon Steel's economic growth and experience as a prominent steel producer and state-owned enterprise.

Regarding the learner-teacher relationship between POSCO and Nippon Steel Company, the learner faces more competition than the innovator and the competitive position with a new product or low-cost process (Amsden, 1992). The learner-teacher relationship also became beneficial because the prospects of the thriving steel industry were frowned upon prior to the commencement of the HCI drive. In 1968, the World Bank turned down POSCO's loan request because Korea had no comparative advantage in steel production (Amsden, 1992). Consequently, the onus was on POSCO to prove that the steel industry could become a prominent force within the Korean and global economies. In the 1960s, only five out of ten developing countries had steel mills which had an annual production capacity of over half a million tons, whereas Korea trailed far behind in possession of small steel mills - this is why the World Bank was reluctant to assist POSCO with a loan (Rhyu and Lew, 2011). POSCO had to ensure that it studies the performance of steel industries in other countries and learns through its actions. Amsden (1992) asserts that POSCO's model and teacher [Nippon Steel Company] was also its major competitor. To match the level of Nippon Steel Company, POSCO had to improve as a firm. The company had to strengthen international competitiveness, which was only possible when POSCO increased its capacity for technological innovation and expanded production to meet world standards (Rhyu and Lew, 2011). Moreover, POSCO had to compete based on higher productivity and match Japan's incremental productivity improvements (Amsden, 1992).

6.7.3 POSCO AND THE KOREAN ECONOMY

The successful establishment of POSCO meant that Korea had a firm that would represent them in championing the HCI drive and succeeding in the domestic and global steel industries. When POSCO completed the construction of its integrated steel mill in 1973, it was set to produce steel at a high

capacity. Upon completion of its integrated steel mill in 1973, POSCO achieved an annual production capacity of 1.03 million tons - this phase alone cost 123.7 million US dollars (Rhyu and Lew, 2011). POSCO continued to impress by enhancing its production capacity. POSCO has been profitable every year since 1973, consequently. The expansion of production capacity continued rapidly and endowed POSCO with an annual production capacity of 9.1 million tons (Ma, 1986; Amsden, 1992; Baik *et al.*, 2011). POSCO's increasing production capacity meant it could create more competitiveness and generate higher profits. A key factor that explains POSCO's profitability is its labour costs. In 1973, labour costs per ton shipped of the hot-rolled product were 7.06 US dollars at POSCO, 23.83 US dollars in Japan, 27.06 US dollars in the United Kingdom, 32.86 US dollars in Germany and 37.83 US dollars in the United States (Amsden, 1992). Based on the aforementioned labour costs, it is clear that POSCO's labour costs are the lowest.

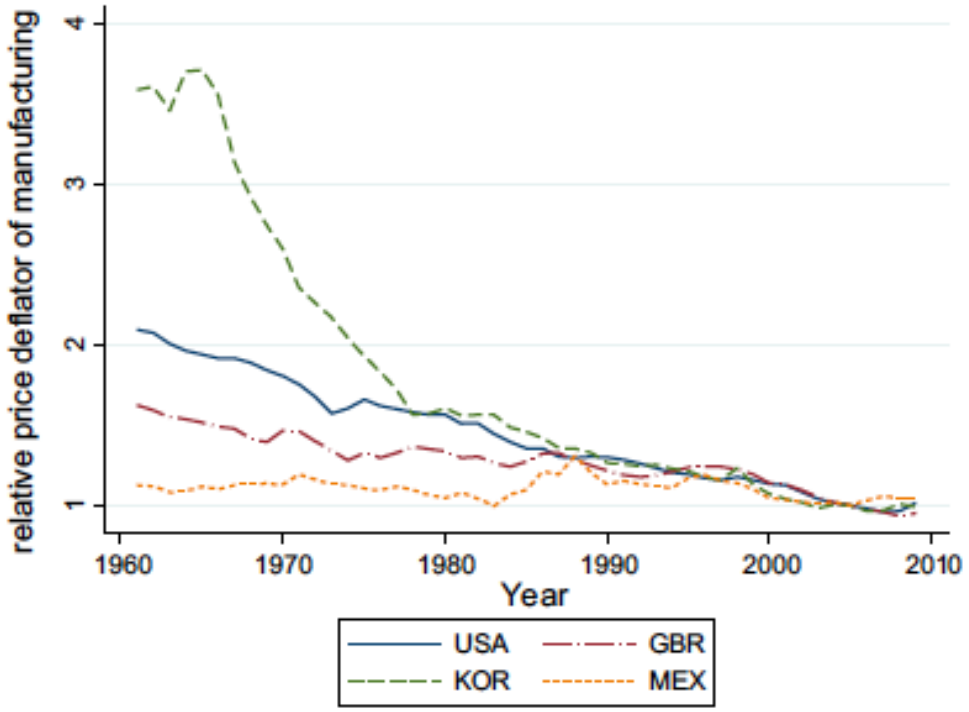
Another important factor that describes POSCO's profitability is the low construction costs. Amsden (1992) states that construction costs per metric ton of integrated mills after the oil crisis were the following: 1750 US dollars for Brazil, 820 US dollars for the United States, 700 US dollars for the European Economic Community, 590 US dollars for Japan, and 400 US dollars for POSCO. POSCO's low construction costs meant that infrastructure would be built in a short space of time and would further promote economic enrichment. The final factor that explains POSCO's profitability is active government support. Amsden (1992) asserts that POSCO's profitability was shored up by government subsidisation of capital costs and investments in infrastructure. The support of the Korean government has never been in question due to President Park's vision of enhancing the Korean nation through industrialisation. The Korea Advanced Institute of Science (KAIS) has estimated that the government spent a minimum of 13.3 billion Korean won just for the massive supporting facilities of POSCO (Amsden, 1992).

From 1973 onwards, the steady operation of POSCO was a significant stepping stone for the steel industry because POSCO continuously brought in profit. In the same year, POSCO grew politically strong in the Korean political economy, especially under the backing of a general industry law (the Steel Industry Promotion Act). When POSCO completed the construction of its integrated steel mill in 1973, it boasted powerful patrons and effective intermediaries working on its behalf within the country's innermost policy circles (Rhyu and Lew, 2011). Additionally, it also became one of the top-performing companies in the Korean economy. From 1974 onwards, POSCO became the number one company in the list of the top 200 most profitable Korean companies (Ma, 1986). POSCO's success did not come as a complete surprise because of the planning that was made prior to its establishment. POSCO's operating rates (production divided by rated capacity) were crucial for the firm's overall performance. According to Amsden (1992), the operating rate for the last half of 1973

was 44.5 per cent, but in 1974, it reached 114 per cent, indicating that the rated capacity had been exceeded. As outlined earlier, POSCO's financial support was based on loans. The foreign financial support that POSCO won over eventually began to decline. After 1979, foreign borrowing fell significantly while loans from commercial banks and foreign bank branches (Cho and Kim, 1995).

The Korean government promoted the steel industry as the top priority in the country's plan for its economic development, and this prioritisation became one of the reasons behind Korea's eventual rapid growth and industrial transformation (Cho and Kim, 1995). High production sales complemented POSCO's low labour costs in the coming years. Ma (1986) states that production sales were recorded as follows: 100 million US dollars in 1973, 520 million US dollars in 1977, and 2.4 billion US dollars in 1982 and 1985. These production sales reflected POSCO's profit consistency and maintained its growth as a high steel-producing firm. According to Ma (1986), POSCO recorded high net profits, which stood as follows: 12 million US dollars in 1973; 28 million US dollars in 1977; 21 million US dollars in 1982, and; 79 million US dollars in 1985. The graph below is an indication of how price decreases have contributed to manufacturing, in comparison to other countries, such as the United States, Great Britain and Mexico.

Figure 6.1: Relative price trends (United States of America, Great Britain, Korea, and Mexico), 1960-2010



Source: Rodrik (2016:9)

POSCO continued to shine in the 1980s and the 1990s. However, POSCO's continued dominance in the steel industry was dependent on the foundation it laid within the first decade of its establishment.

From 1968-1979, POSCO's priority was to increase volume, given the excess demand for steel in the domestic market - this was done through the increase of productivity and yields complemented by capacity expansion (Amsden, 1992). POSCO's capital and labour serve as critical ingredients for the firm to produce steel consistently, and it is of utmost importance that both capital and labour be of high quality. To improve the performance of each piece of equipment, POSCO provided training to its 61,400 workers in all grades between 1968 and 1979 (Amsden, 1992). The training the workers received proved beneficial as it enhanced labour productivity for POSCO. Employee hours per ton shipped dropped from 32.65 in 1975 to 9.62 in 1984 (Amsden, 1992). An essential part of POSCO's growth came from its competition with other firms in other countries. Hogan (2001) emphasises that POSCO's technology strategy makes major financial and human capital commitments to drive improvements in the company's operating performance and competitive position. In the context of this statement, POSCO's commitments materialised because it has enhanced overall productivity and efficiency, which has led to sharp profit growth. Between 1983 and 1984, POSCO's annual average net rate of return relative to sales volume was maintained at a level of 5 per cent, which was very high, especially when compared with those of the top five steel-producing firms in industrialised countries: (i) Japan: 0.6 per cent, (ii) United States: -3.8 per cent, and (iii) West Germany: -0.8 per cent (Cho and Kim, 1995).

Since its establishment, POSCO has performed well on its own and in comparison to other countries. However, it has experienced some stiff competition. According to Barnett and Crandall (1986), the cost of producing cold-rolled coil in an efficient integrated steel firm reflected as follows in 1985: (i) United States: 446 US dollars per ton, (ii) West Germany: 364 US dollars per ton, (iii) Japan: 387 US dollars per ton, (iv) Korea: 362 US dollars per ton, and (v) Brazil: 384 US dollars per ton. POSCO's collaboration with Japan later paid off but at the expense of Japan itself. In 1981, Korean steel exports to Japan surpassed Korean steel imports from Japan, causing an outcry among Japanese steel producers, who believed that they had undermined their market position by assisting POSCO (Baik *et al.*, 2011).

POSCO relied heavily on its Pohang plant to ensure that steel would be produced in large quantities. However, POSCO ensured that it found an avenue to grow its production capacity. Pak T'ae Jun, CEO of POSCO, assembled a coalition of foreign technology licensors, plant suppliers, and bank lenders to help POSCO complete the building of its second mill [Kwangyang Integrated Steel Mill] in 1992 and, subsequently, boost its total annual production capacity to 21.1 million tons (Rhyu and Lew, 2011). POSCO was a key role player in positively influencing the exports of the Korean economy. As outlined earlier, the HCI drive made up a significant part of the Korean export composition, mainly because the Korean economy was based on export-led industrialisation. Essentially, POSCO picked up where the HCI drive left off in positively impacting exports but in a Korean economy that focused on both industrialisation and exports. According to Hogan (2001), POSCO's export sales by product were as

follows (the unit used here is thousands of tons): 6,008 in 1996; 6,514 in 1997; 7,501 in 1998; 6,448 in 1999, and; 6,425 in 2000.

6.7.4 AN OVERVIEW OF POSCO

POSCO's success proved crucial for the Korean steel industry and industrialisation. Cho and Kim (1995) assert that POSCO's success is due to a comprehensive industrial policy harmonised by cooperation between the government (acting as an active risk partner) and the various banking institutions. Korea's steel industry has been a catalyst for the growth of other domestic industries, including automotive, appliances, construction, distribution through service centres, shipbuilding, and containers, and has moved to the upper echelon of the industrialised world (Hogan, 2001).

Having built a foundation to become Korea's most profitable company, POSCO set its sights on leaving a mark in the global economy. Since the mid-1960s, just before POSCO's establishment, the Korean steel market has undergone a more than 100-fold growth, from just 328,000 tons in 1965 to 38.5 million tons in the year 2000 (Hogan, 2001). POSCO rapidly became an international competitor and, by the end of 1992, had grown into the third-largest steel company in the world, boasting a production capacity of 21 million tons (Cho and Kim, 1995). By the year 2000, POSCO was the second-largest steel producer in the world, surpassed only by Nippon Steel Company, with an annual production capacity of 2.8 million tons (Rhyu and Lew, 2011). The impact that POSCO had on the Korean steel industry is also remarkable, especially in the context of industrialisation. In a political context, POSCO was not swayed by any political issues that could negatively impact its performance or profits. President Park protected POSCO from rent-seekers and bureaucratic intruders during its formative years and gave it the time required to build up its corporate identity, institutional autonomy and technological capabilities to grow out of the infant stage (Rhyu and Lew, 2011). This has helped POSCO solidify its place as a high-produced steel firm without any hindrances from the political economy. In 2013, POSCO ranked sixth in Korea's top twenty *chaebol* with 65 billion US dollars in sales and 46 affiliated companies (Schneidewind, 2016).

6.8 KOREA AND THE MIDDLE-INCOME TRAP

The case of Korea and the middle-income trap is critical to the study because it will provide substantial insight as to how Korea experienced socioeconomic hurdles prior to Korea's industrialisation. Based on the research, it is clear that Korea has had active government intervention that has shaped both the economy and the political economy. In the context of the middle-income trap, it is also critical to see how the Korean government has made a socioeconomic impact on the people of Korea and whether this impact has sufficed to combat the middle-income trap.

The Korean government has played a central role in the country's economic development through its cunning use of state-created rents as an industrial development (Chang, 1993). The use of state-created rents was visible when President Park decided to administer the *chaebol's* movements in the political sphere and when he had an oversight role of different *chaebols* in the HCI drive and offered rigid guidance in the development and growth of POSCO. Moreover, he ensured that the CEOs of the *chaebols* led and ran the business they wished on the condition that they became significant economic role players and aligned to the vision of a "rich nation, strong army". In terms of the middle-income trap,

Korea has experienced consistent economic growth to a point where it has avoided being stuck in the middle-income trap. In a steadily growing economy, Korea's per capita Gross Domestic Product (GDP) has risen continuously over time (positive growth) toward higher income levels between 1975 and 2005 (Kharas and Kohli, 2011). This is no surprise because Korea managed to industrialise towards the end of the twentieth century and continued to ascend in innovation in the early 2000s. Egawa (2013) states that Korea's per capita Gross National Income (GNI) increased significantly from 9,910 US dollars in 2000 to 20,870 US dollars in 2011. In the research context, Korea has experienced a series of government interventions focused on policy. According to Kanchoochat and Intarakumnerd (2014), these interventions are (i) strong infant industry protection, (ii) strong export promotion, (iii) the use of state-owned enterprises in critical industries, (iv) the strong promotion of large private sector firms, and (v) private sector-led research and development. These interventions were fundamental to the longevity of a healthy Korean economy which did not experience too many hurdles like other economies.

Korea's uniqueness stems from its drive to innovate and industrialise beyond limitation. This drive is a part of why they have managed to avoid the middle-income trap. Korea, a country that has escaped a middle-income trap, spends about 4.4% of its GDP on R&D, ranking first among OECD countries in R&D intensity (Gill and Kharas, 2015). Kharas and Kohli (2011) assert that Korea used specialisation to promote rapid innovation and introduce new products and processes based on firms' capabilities. In context to the statement, a good example that speaks to specialisation is the decision of HMC to produce cars in India and the USA through establishing subsidiaries, which became hubs of a global production network. Korea's real GDP has grown consistently in a positive trajectory: 30 billion US dollars in 1998, 90 billion US dollars in 2008 and 110 billion US dollars in 2012 (Lubis and Saputra, 2015). A distinct characteristic that also led to Korea avoiding the middle-income trap is the direct intent in the planning of their policies and how committed the Korean government was to ensuring that the policies in place were implemented. Kanchoochat and Intarakumnerd (2014) state that Korea had the following mechanisms that guaranteed policy implementation: strong centralisation in policymaking, the government-private sector relationship had a top-down direction, and the role of

private sector associations was prioritised. Essentially, Korea's consistent growth was enough to ensure that the nation did not face the middle-income trap and eventually avoided it.

6.9 RATIONALE FOR KOREA AS A COMPARATIVE CASE STUDY IN CONTEXT TO SOUTH AFRICA

Korea was a developing country with a middle-income status, then later became a developed country, but it is quite different from South Africa. As stated earlier, South Africa prioritised the ambition of taking its economy to the next level through industrialisation with mining, ESKOM, ISCOR, and SASOL as the leaders of this venture. Korea had a unique way of taking its level, and actually getting there, through the introduction of business conglomerates called *chaebol* and the implementation of the HCI drive. The inspiration behind two initiatives is the militant Korean president Park Chung Hee. The establishment of *chaebol* simply made Korea stand out because the Korean Economic Planning Board was created to facilitate loans, and the creation and growth of the *chaebol*, which would later became big businesses that would bolster economic growth and give policy contributions. Kim and Cho (1995) point out that directed credit was a basic instrument of economic policy. The use of credit started off well, backfired, then paid off once the *chaebol* were established and fully operational. It is worth noting that the *chaebol* came to be the source of major innovative policy ideas, from the construction of special economic zones and industrial complexes to the launching of Japanese-style general trading companies (Baik *et al*., 2011). Today, *chaebol* such as Samsung and Hyundai are globally renowned and play integral roles in different economies around the world.

The HCI drive was a critical part of President Park's vision to grow the Korean economy. The government intervention in Korea was as direct as possible, and it ensured that Korea thrived in key sectors that would help economic growth. Government intervention was effective in Korea because it was predicated on close consultation with industry, it was implemented within the context of a business environment with a strong export orientation, and was closely monitored and evaluated (Cho and Kim, 1995). A key influence in the promotion of the HCI drive was President Park because he wanted to ensure that Korea was strong from a military point of view. The point of the HCI drive was to drive the growth of heavy and chemical industries within the Korean economy. The HCI drive also inspired the formation of POSCO, which went on to become a global steel firm. In the case of South Africa, state-owned enterprises (SOEs) like ESKOM, SASOL, and ISCOR, were prioritising the country's domestic growth but they did work with other countries within their respective specialties. When considering the *chaebol* method, it is unclear to say that it would have worked in South Africa's favour but the SOEs could have taken more bold decisions in terms of investment and strategic direct use to expand in their respective industries.

6.10 SUMMARY AND CONCLUSION

Chapter 6 indicates that the industrial policy approach that Korea has taken was evolutionary. This approach was seen based on the movement from the sole reliance on import substitution to import substitution working hand in hand with export promotion. According to Dornbusch and Park (1987), Korean industrial policy and protection combined yield an incentive structure favouring export-oriented industrialisation. Export-oriented industrialisation for Korea represented the diversification of economic market opportunities and revenue generation for the Korean economy. The Korean political economy prioritised government intervention for stable economic growth. Akkemik (2008) states that the interventions took the forms of import protection, tax concessions to collaborating firms, provision of public funds as loans, and a wide range of direct subsidies mainly for investments and export production.

This chapter also outlined the importance of government interventions. Government interventions act as a form of economic foundation. They seem to favour the different economic elements (exports, investments, import protection). The Korean experience indicated that a development strategy comprises a set of interrelated policies rather than a simple trade regime (Chang, 1993). In light of Chang's statement, it is clear that Korea's economic success is centred around putting interrelated policies into practice and using government intervention to facilitate consistent economic growth. Additionally, Korea's discipline and intent to drive the economy forward led to rapid industrialisation and the successes of the *chaebols*, the HCI drive and POSCO.

CHAPTER 7: HISTORICAL CONTEXT OF SOUTH AFRICAN INDUSTRIAL POLICY

7.1 INTRODUCTION

Chapter 7 analyses the different South African governments that created and facilitated industrial policy during the twentieth century. It is important to note that the economic inequalities engendered through the mode of accumulation by political and economic elite groups, namely, the English and the Afrikaans after the end of the Anglo-Boer War, are not the only signifiers of economic interests in South Africa. The discourse continues because of the brimful story of industrial policy within South Africa to understand social, economic and political order. As discussed later in the thesis, the white working class was not visible as it was shrunk through white-collar jobs.

Additionally, there is a need to discuss the structure of the South African labour force and social capital. In the context of the statement, the analysis of the significance of the political economy during apartheid cannot be taken lightly. According to Mariotti and Fourie (2014:114), "economists and policymakers are rightly interested in addressing these consequences of apartheid that impact South Africa today. The task seems to have fallen to economic historians to discover precisely how policy decisions during the apartheid era determine the country's economic growth in the twenty-first century".

Although the main themes that define apartheid are race, power and segregation, it is crucial to understand that this thesis will assess the industrialisation and industrial policy of South Africa during the apartheid era. Still, nearly thirty years after it was abolished, apartheid, when least measured on socioeconomic indicators, has morphed into a different form and preserves a persisting legacy. Here, there is a reconciliation of white minority interests (mining groups, agricultural groups, among others) in the economy. White people were defined as citizens of a self-governing state with basic citizenship rights, whereas black people were excluded from these basic citizenship rights (Davies, 2021). According to Mariotti and Fourie (2014), a confounding feature of apartheid is the fluidity of the economic ideology in response to need and opportunity. In light of this, the current research adopts a conceptual framework that abandons the conventional narrative of white oppression and black victimhood. Essentially, the research analyses how South Africa's elite groups have instilled economic policies that have largely left out most of the country's population in response to needs and opportunities. In doing so, this thesis narrowly looks at industrial policy formulation.

Since the late 1980s, at least, debates on economic policy in South Africa have revolved around the relationship between growth, inequality and economic structure (Makgetla, 2004). It has been close to thirty years since the easing and elimination of apartheid laws. Therefore, the review's focus cannot only

look at white oppression and black victimhood. As mentioned earlier, examining the industrial policy's performance during the period is critical. In the context of the post-apartheid era, the programs such as the Growth, Employment and Redistribution (GEAR) programme and the National Development Plan (NDP), and the Industrial Policy Action Plan (IPAP) have to be assessed for further understanding. This section of the thesis will engage with the performance of industrial sectors and loopholes in manufacturing during the apartheid era in context to the statement. This thesis aims to help the reader formulate a substantial understanding of industrial policy structure and performance within the South African political economy in the apartheid and post-apartheid periods. Furthermore, the analysis of the bargaining process between special interest groups, in South Africa, during the apartheid and post-apartheid periods is integral to the discourse of the political economy.

7.2 THE EMERGENCE OF THE SOUTH AFRICAN ECONOMY IN THE TWENTIETH CENTURY

The emergence of the South African economy represented the growth of a developmental state. In 1902, the English and the Afrikaners ended the second Anglo-Boer War by signing the Treaty of Vereeniging. "The treaty of Vereeniging brought the war to an end on the 31st May 1902, when the guns of war became silent; the treaty promised the vanquished Boers civil institutions and ultimately self-government, and it held out the prospect of constitutional reform for the White inhabitants within the two Crown colonies" (Devenish, 2011:109). The Treaty of Vereeniging opened economic and political opportunities for the English and the Afrikaners. The creation of economic and political control was at the expense of the native African people. According to Devenish (2011), Africans and other people of colour were left out of constitutional reform based on conciliation between British and Dutch South Africans. In context to the statement made by Devenish, the Treaty of Vereeniging strengthened the English and the Afrikaners' interests. This treaty consolidated the white political and economic elite pursuing their interests. The white people established their supremacy over the native Africans, Indians and Coloureds - however, this only occurred after resistance from the different tribes within the country (Lipton, 1986). According to Swirzer (1993), the history of the Ciskei is a microcosm of South African history because the Xhosa resistance against white rule in the Ciskei was a representation of other tribes' resistance to white rule in other regions. The political power of the English and the Afrikaners meant that the rest of the South African population had no effective political representation in Parliament.

The South African economy was set to grow based on the English and the Afrikaners working as a collective based on constitutional reform. They worked on establishing different sectors in the new South African state and exercised their political and economic power. The foundation of apartheid originates in legislative and customary measures of all the colonies/republics [the Cape, Natal,

Transvaal and the Orange Free State], which formed the Union of South Africa in 1910 (Lipton, 1986). According to Jones and Muller (2016:11), "the new state was highly favoured; agriculture was the major occupation in 1910 with quality varying from one region to another". Academic literature surrounding the impact of apartheid is often discussed more politically than in an economic light, as emphasised by Freund (2018). Freund (2018) states that While many would choose to focus only on the issues of race, segregation and apartheid, the apartheid economy had a drive towards modernisation and industrialisation. This thesis departs from this convention by arguing that political power in South Africa has been predicated on economic grounds. The research analyses the economy's structure and the government's policy decisions between 1902 and 1993. Understanding the theoretical framework that defines the political economy in twentieth-century South Africa is essential. The South African political economy, particularly, is centred around the social sciences that build it.

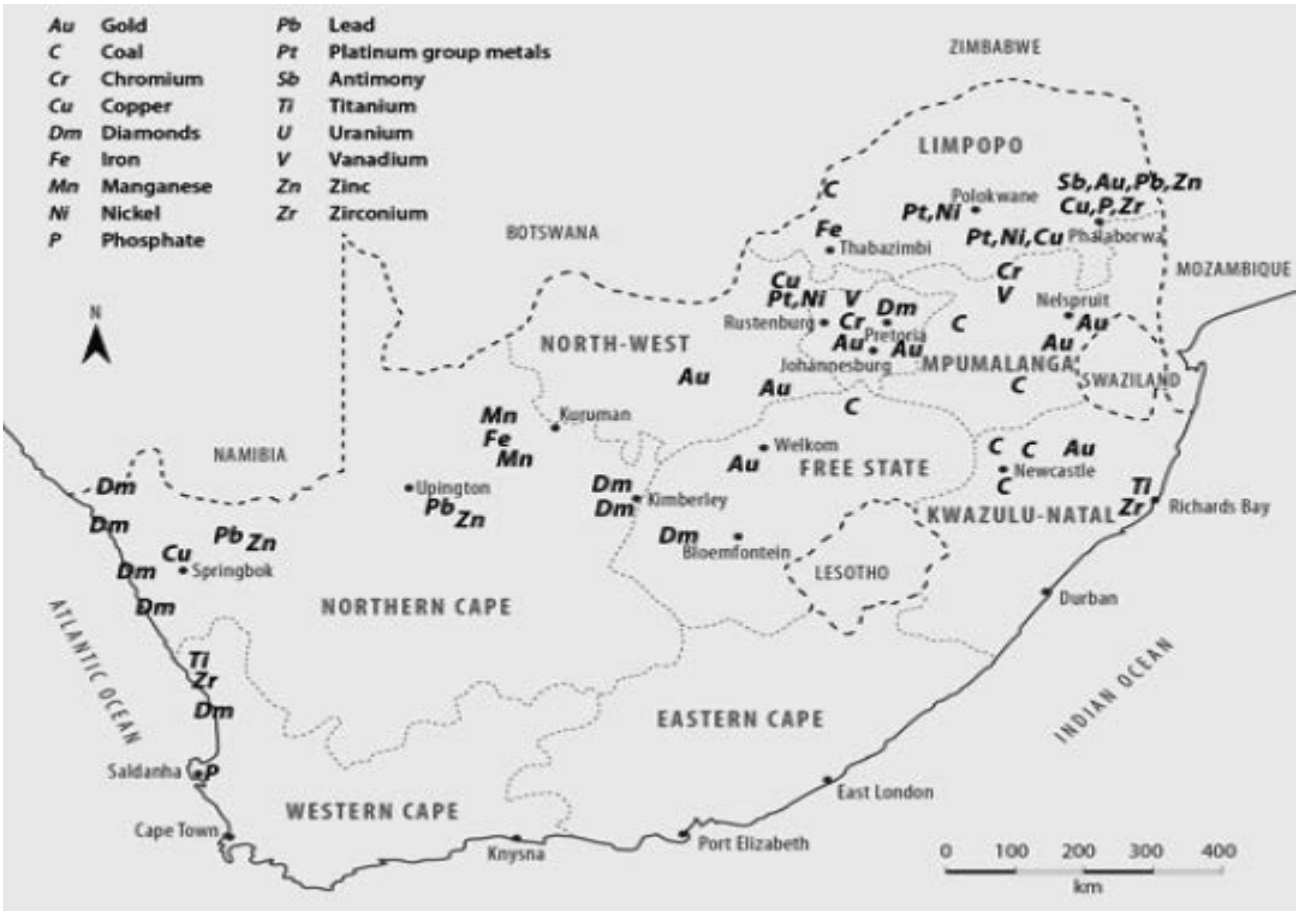
7.2.1 THE SOUTH AFRICAN MINING INDUSTRY

Before the advent of its great mineral revolution in the latter half of the nineteenth century, South Africa was a mere colonial backwater whose unpromising landscape was seemingly devoid of any economic potential (Davenport, 2013). Innes (1984) points out that the first significant capitalist mining venture undertaken in Southern Africa was in 1852 when Messrs Phillip & King, a Cape firm, began mining copper in Namaqualand (in the remote western part of the Cape Colony). The mining industry is an industry that has contributed immensely to the South African economy since its establishment. Without question, the mining industry required a lot of investment in order to become a high-performing industry within the South African economy.

It is undeniable that the diamond and gold industries were new engines of export-led growth; the diamond fields were already producing 1 million carats by 1872 and gold exports stood at 4.5 million British pounds per year during the 1890s (Schirmer, 2022). Although the mining industry has proven itself to become a great success that the South African economy needed, its success was not isolated to the discoveries of diamonds, gold and coal. There is no doubt that mining activity in southern Africa flourished during the pre-colonial era, but later, because many ‘ancient’ mines were seen simply as indications of rich mineral deposits, much of the archaeological evidence they contained was destroyed by colonial and post-colonial prospecting and mining activities (Hammel *et al.*, 2000). The Barberton Greenstone Belt is a decent example of numerous mineral occurrences that prove South Africa’s wealth in diverse precious metals. The Barberton Greenstone Belt had occurrences of the following minerals: chrysolite asbestos, tin, iron, magnesite, barite, antimony, talc, mercury, nickel-copper, stibnite, verdite-buddstone, zinc, cassiterite and cinnabar (Anhaeusser, 2012). In context to this statement, the strong mineral occurrence in Barberton became a key benefit for the South African mining industry because these different minerals would be exported to other countries. Furthermore, these minerals

were used as intermediate goods for the manufacturing sector, which would lead to the production of final goods that would be exported. As stated earlier, the Barberton Greenstone Belt was only a puzzle piece of the big South African mining puzzle. Davenport (2013) asserts that the mineral revolution enabled the introduction of an aggressively organised and racially dominated form of industrial capitalism, an economic system that dominated South Africa's socio-political and fiscal arena for more than a century. From a national point of view, South Africa has various mineral occurrences, which have become key elements of the mining industry, as seen in the picture below.

Figure 7.1: South Africa's major mineral deposits



Source: Davenport (2013:13)

The legislation that the Parliament of South Africa enacted in the twentieth century proved crucial to growing wealth inequality in present-day South Africa. A prime example is the Natives Land Act of 1913, which allowed for large amounts of land available to white people and a fraction of land public to black people. According to Feinberg (1993), the Natives Land Act delineated the boundaries of African land reserves - the schedule brought under the coverage of the Act about 22 million acres of land. In context to Feinberg's statement, the government used the land appropriated by the white population for individual benefit and the benefit of the South African economy. The 1913 Land Act reserved

almost 14 per cent of the land for Africans, who constituted 70 per cent of the population (Lipton, 1986). The livelihoods of native Africans in rural areas largely revolve around agriculture and livestock farming, so it is safe to say that the economies of African societies were set to decline due to land usurpation and the law of diminishing marginal productivity.

In light of the economic decline in African societies, the white-established government authority continued to exercise the Natives Land Act of 1913. It ensured that the indigenous African people did not profit from the land that was once theirs. The most important provision of the Act stated that Africans could no longer buy, lease, or in any other manner acquire land outside a scheduled area, and Europeans were prohibited from buying or leasing land from an African (Feinberg, 1993). When analysing this viewpoint, land acquisition was not only used for economic improvement but also to widen the social and economic inequality gap between the Africans and Europeans; the government in power profited from the fertile land they seized.

It is vital to understand the type of state that South Africa was in the twentieth century. Today, South Africa is a state that has an economy that prospers from the mining industry. The origin of the mining industry lays a foundation for what is meant by the twentieth-century state. According to Freund (2018), a developmental state arises when an economy is weak and major capitalists are scarce and deficient. The beginning of the twentieth century was a decisive period for South Africa. Arguably, this decisive period saw a pursuit of economic and political interests between the English and the Afrikaners at the expense of the native African people of South Africa.

7.2.1.1 THE HISTORY OF DIAMOND MINING IN SOUTH AFRICA

The 1868 discovery of diamonds near Kimberley, followed by an 1886 gold boom in the Witwatersrand hills near Johannesburg and the exploitation of the coalfields of Witbank and Vryheid, sparked the birth of South Africa's industrial revolution (Majozi and Veldhuizen, 2015). The 1868 discovery of diamonds marked the beginning of economic prosperity for South Africa. In 1869, two adjacent farms, on which the Bultfontein and Dutoitspan mines were later to be developed, were acquired by Hopetown Diamond Mining Company (Turrell, 1987). Hopetown Diamond Mining Company's acquisition of the Bultfontein and Dutoitspan became instrumental to their eventual success as a company participating in the diamond mining industry. In 1870, the Koffiefontein and Jagersfontein mines, situated firmly within the borders of the Boer Republic of the Orange Free State, had been the first two diamondiferous kimberlite pipes to be discovered in South Africa (Davenport, 2013). In 1871, two diamond mines, De Beers and Kimberley, were found on a farm called Vooruitzicht owned by Johannes De Beer (Turrell, 1987). By the end of 1871, the largest diamond-producing mines had been established in Kimberley - the five largest of these mines were: the De Beers Mine, the Kimberley Mine, the

Dutoitspan Mine, the Bultfontein Mine, and the Jagersfontein Mine (Innes, 1984). Essentially, these five mines played an integral part in solidifying South Africa's high diamond production.

The mining industry is an industry that requires a significant use of labour and capital, just like any other industry in the tertiary sector. In order to mine deep pipes in which diamonds were found, capital, technology and control of water were all-important (Beinart, 2001). The productivity of diamonds in the various mines underwent different production phases in order to grow the amount of diamonds that were produced. According to Turrell (1987), there were five production phases between 1871 and 1891 that helped the growth of diamond production:

1. In the first phase (1871-1873), the yellow and blue ground was loaded into buckets, hauled out of the mines by windlasses and dry-sorted on diggers' encampments.
2. In the second phase (1874-1877), a novel system of haulage based on aerial tramways was developed. This phase allowed the centre of the mine to be worked, while the richly regarded reef claims suffered under an accumulation of water and debris.
3. In the third phase (1877-1881), output soared as De Beers, Dutoitspan and Bultfontein began serious production for the first time. The use of steam machinery became the dominant motive-power in the industry, with the poorer mines investing for the first time and Kimberley buying larger engines.
4. In the fourth phase (1882-1885) the mining industry suffered an extended depression, the product of both problems in mining and a collapse in the European diamond market. During the depression the industry worked to between 60 and 70 per cent of capacity and a quarter of the capital was liquidated.
5. In the fifth and final phase (1886-1891) underground mining replaced open-cast production in Kimberley and De Beers and marked a new era in the diamond industry. The large companies experimented with different systems until a uniform method was adopted when the mines were brought under the control of the De Beers Consolidated Mines Limited.

It is worth noting that the fifth phase of diamond production sparked competition between the Kimberley and De Beers diamond companies. Frankel (1938) points out that the issued share capital of the two giants stood at the following values in 1888: De Beers: 2 509 620 British pounds and Kimberley: 1 748 190 British pounds. The competition between De Beers and Kimberley remained fierce as neither would agree to terms to limit production and neither was strong enough to impose terms on the other (Innes, 1984). The competition between De Beers and Kimberley also sparked the idea of both companies being partners in the South African diamond mining industry. Davenport (2013) points out that Cecil John Rhodes formed the De Beers Consolidated Mines Limited in 1888. The assets of De Beers Consolidated were considerable: it owned the whole of the De Beers Mine,

three-fifths of the shares in the Kimberley Mine and a controlling interest in both Bultfontein and Dutoitspan (Bryant, 1987). The formation of De Beers Consolidated had a huge impact on the diamond mining industry because decisions made by this monopoly company influenced the industry greatly. From 1889 to 1903, the value of diamonds produced by De Beers Consolidated stood at a total of over 40 million British pounds as seen in the table below (Turrell, 1987). Davenport (2013) asserts that De Beers Consolidated Mines may have marked the practical advent of a monopoly in the South African diamond mining industry but a considerable amount of work still had to be done to cement and build on the progress that had already been made.

Table 7.1: Production Statistics of the De Beers Consolidated Mines Limited, 1889-1903 for Kimberley and De Beers Mines

Year ending	Number of loads of blue hoisted	Number of loads of blue washed	Number of carats of diamonds found	Value of diamonds produced	Average number of carats per load	Average value per carat	Average value per load	Cost of production per load	Number of loads of blue on floors at close of year, exclusive of lumps	Dividends paid. Amount
				£		s. d.	s. d.	s. d.		£ s. d.
March 31, 1889 prior to Consolidation	944,706	712,263	914,121	901,818	1.28	19 8.75	25 3.75	9 10.5	***243,960	188 329 10 0
March 31, 1890	2,192,226	1,251,245	1,450,605	2,330,179	1.15	32 6.75	37 2.75	8 10.5	476,403 ***159,437 1,576,821	789,682 0 0
March 31, 1891	1,978,153	2,029,588	2,020,515	2,974,670	.99	29 6	29 3.75	8 8	1,525,386	789,791 0 0
*June 30, 1892	3,338,553	3,239,134	3,035,481	3,931,542	.92	25 6	23 5	7 4.3	1,624,805	1,382,134 5 0
June 30, 1893	3,090,183	2,108,626	2,229,805	3,239,389	1.05	29 0.6	30 6.75	6 11.6	2,606,362	987,238 15 0
June 30, 1894	2,999,431	2,577,460	2,308,463½	2,820,172	.89	24 5.2	21 10.6	6 6.8	3,028,333	987,238 15 0
June 30, 1895	2,525,717	2,854,817	2,435,541½	3,105,957	.85	25 6	21 8	6 10.8	2,699,233	987,238 15 0
June 30, 1896	2,698,109	2,597,026	2,363,437½	3,165,382	.91	26 9.4	24 4.5	7 0.1	2,800,316	1,579,582 0 0
June 30, 1897	2,515,889	3,011,288	2,769,422½	3,722,099	.92	26 10.6	24 8.6	7 4.3	2,304,917	1,579,582 0 0
June 30, 1898	3,332,688	3,259,692	2,603,250	3,451,214	.80	26 6.2	21 2.1	6 7.4	2,377,913	1,579,582 0 0
June 30, 1899	3,504,899	3,311,733	2,345,466	3,471,060	.71	29 7.2	20 11.5	6 7.7	2,937,784	1,579,582 0 0
June 30, 1900	1,673,664	1,522,108	1,000,964	1,794,222	.67	35 10.2	23 6.9	7 6.2	2,722,595	
June 30, 1901	2,120,397	2,616,873	2,000,495½	3,959,383	.76	39 7	30 3.1	8 5	2,226,119	1,579,582 0 0
June 30, 1902	2,062,459	1,961,858	1,499,299½	3,484,247	.76	46 5.7	35 6.2	8 5.6	2,326,720	†2,445,000 0 0
June 30, 1903	2,370,503	2,561,940	1,574,189½	3,819,653	.61	48 6.3	29 9.8	7 3.1	2,135,283	†2,175,000 0 0
Total	37,347,577	35,615,691	30,551,057	46,170,993	.8578	30 2.7	25 11.1			18,629,563 0 0

Source: Turrell (1987:239)

In 1902, the diamond world was rocked by the discovery of a diamondiferous kimberlite pipe in Gauteng (Davenport, 2013). The Cullinan Mine, located some 37 km east-northeast of Pretoria, is one of the world's most celebrated diamond mines and is a source of large, high-quality Type II gem diamonds and a regular supplier of rare blue diamonds (de Wit *et al.*, 2016). The discovery of this kimberlite pipe in Pretoria also meant that diamond mining companies would turn their heads away from Kimberley to see what they could gain in Pretoria. Davenport (2013) points out that this newly-discovered mine became the largest kimberlite ever discovered in South Africa and it proved to be a host to some extraordinary gems, such as the Cullinan diamond. The diamond mining industry was considered to be a very volatile industry because the profits obtained in the 1900s were not as consistent as the profits obtained from 1910 going forward. A key event that was frowned upon within

the industry was the 1907-1908 economic recession. According to Davenport (2013), De Beers was forced to close two of its mines and retrench hundreds of miners during the 1907-1908 economic recession. The demand for diamonds was negatively impacted by poor economic growth periods and this is also proven in the 1921-1922 economic recession. In 1921-1922, the diamond industry's fortunes were seriously undermined by the Soviet government, which had nationalised property and confiscated jewellery from the wealthy nobles and was selling diamonds for cash on the American market at less than half the ruling prices for South African stones (Jones and Muller, 2016). The table below indicates that there has been a great deal of inconsistency and volatility when it comes to the value of exports and production in the diamond mining industry.

Table 7.2: The production and exports of diamonds, 1910-1936 (annual averages)

	1910–12	*1922–24*	*1928–30*	*1934–36*
Production (carats)	5 040 000	1 721 000	3 733 000	580 000
Value of exports (£ million)	8.67	6.24	n.a.	3.03
Percentage of total exports	14.90	8.11	n.a.	3.04

Source: Jones and Muller (2016:48)

The Great Depression (1929-1941) played a critical role in negatively impacting the world economy's productivity and its general imports and exports. Crafts and Fearon (2013) state that the economic crisis that began in 1929 soon engulfed virtually in every manufacturing country and all food and raw materials producers. In the context of an already-volatile diamond mining industry, the Great Depression had a negative impact on the industry. In the early 1930s, the demand for most agricultural exports and diamonds fell sharply but the demand for gold remained unchanged (Nattrass and Seekings, 2010). During the 1930s, there was a slow revival in the demand for diamonds which permitted a gradual reopening of the South African mines, which had been closed during the Great Depression (Jones and Muller, 2016).

The reopening of the mines in the 1930s meant that South Africa was set to make an economic recovery after suffering from the Great Depression. In 1938, De Beers obtained the entire share capital of the Diamond Corporation, which ultimately led to an association of companies that became known as the Central Selling Organisation (Davenport, 2013). The road to recovery seemed promising for the diamond mining industry but this road was cut short. In 1940, De Beers was again forced to suspend all of its Southern African mining operations, and in 1941, South African diamond production plunged to 200,000 carats, the lowest level since 1871 (Davenport, 2013). The 1950s proved to be a critical

turnaround period for diamond mining. Jones and Muller (2016) point out that the windfall profits [of the diamond industry] in the 1950s were invested in gold mining and other ventures outside the diamond industry. In context to the revival of the diamond industry, any form of investment outside of the diamond industry is risky because it is not helping the industry's revival. External investments proved to be a far-sighted decision, as income from these investments provided a steady source of income during times when diamond sales declined, and increased the ability of the company to borrow funds whenever the stabilisation of the industry necessitated the stockpiling of diamonds (Jones and Muller, 2016). It is worth noting that the South African diamond industry [especially from the 1950s onwards] became a mere facet of what was an intricately complex and secretive global network of mining interests and supply contracts (Davenport, 2013). In the 1960s, the diamond industry began to establish its profit growth once more. Jones and Muller (2016) assert that sales of rough diamonds yielded 16.9 million British pounds in 1960, and grew slowly thereafter.

The story of the South African diamond mining industry is one with critical events that witnessed the health of the South African economy change constantly. The 1868 discovery of diamonds in Kimberley marked the beginning of South Africa's economic status prior to South Africa becoming an union in 1910. The 1868 diamond discovery represented the commencement of South Africa's industrial revolution and the founding of a city named Kimberley. Just before the start of the twentieth century, diamond production grew in different phases that led to the quality of diamonds being better than how they were when they were first discovered. The profitability of the diamond mining industry led to the establishment of a diamond monopoly in the form of De Beers Consolidated Mining Company in the late 1880s. The company's ruthlessness in making profits paid off because they managed to produce 46 million diamonds from 1889 to 1903. The discovery of the Cullinan mine in Gauteng in 1902 posed a serious threat to Kimberley, which was known for its diamonds, because the Cullinan mine had a massive kimberlite pipe. Nonetheless, diamonds were produced across the country to produce high profits but these profits were decreasing slowly. Between 1910 and 1936, diamond production became volatile due to economic recessions in the country and the eventual Great Depression which negatively impacted the world economy. In the 1930s, diamond mines were set to reopen in order to recover from its volatile production. From 1934-1936, diamond production stood at 500,000 carats which was a far cry from diamond production in 1928-1930, which stood at 3,733,000 carats. Additionally, the 1940s and 1950s did not show much promise for the diamond mining industry. In the 1940s, De Beers had to suspend mining operations and this led to diamond production plunging to 200,000 carats. The 1950s had also been a quiet period for the diamond mining industry because the windfall profits were invested in gold mining and other industries thus leading to inactivity within the industry. However, the year 1960 saw the diamond mining industry specialise in the trade of rough diamonds which led to the industry making a slow recovery and yielding a total of 16.9 million British pounds in the same year.

7.2.1.2 THE HISTORY OF GOLD MINING IN SOUTH AFRICA

The 1886 gold boom led to South Africa being recognised as a prominent gold producer in the world. As early as the first decade of the twentieth century, the Transvaal colony - within which lay the Witwatersrand and several other minor gold fields - was the largest single producer of gold in the world (Richardson and van Helten, 1984). This achievement was remarkable for a country that was about to establish itself completely. The discovery of gold motivated the inhibition of citizens from outside of South Africa to come and live in South Africa. Between 1895 and 1898, there was a net outward migration of 75,500 United Kingdom citizens to South African ports as a result of the economic expansion generated by the Witwatersrand gold fields (Richardson and van Helten, 1984). The theme of gold discoveries motivating the migration of people was not only limited to South Africa - an example of this is the 1848 gold rush in California, United States of America. The 1848 California gold rush attracted some 300,000 fortune-seekers to America's west coast (Brands, 2010). By 1898, South Africa overtook the United States of America and Australia to occupy the number one position in gold production (Innes, 1984). By 1899, the Transvaal produced 27 per cent of the world's annual output of gold whereby gold mining was one of the first contributors to the South African economy (van Helten, 1982; Beinart, 2001). The gold boom provided opportunities for people to participate in the mining industry and improve their living standards. Feinstein (2005) asserts that gold mining contributed substantially to output, income and employment. Consequently, gold production and diamond production contributed significantly towards South African exports as seen in the table below.

Table 7.3: Annual average exports from the Cape and Natal, 1850-1909

	Wool (£ million)	Hides, skins, ostrich feathers (£ million)	Other products (mohair, wine, fresh fruit, maize, sugar, and meat) (£ million)	Diamonds (£ million)	Gold (£ million)	Total of Cape and Natal (£ million)	Gold as a percentage of total (%)
1860-1864	1.51	0.18	0.63	-	-	2.32	-
1865-1869	1.80	0.51	0.31	0.01	-	2.63	-
1870-1874	2.79	0.49	0.94	1.03	-	5.24	-
1875-1879	2.68	0.72	0.96	1.90	0.04	6.30	0.6
1880-1884	2.58	1.34	1.21	3.42	0.02	8.57	0.2
1885-1889	2.45	0.86	1.38	3.72	0.30	8.71	3.5
1890-1894	2.55	0.97	1.46	3.82	4.15	12.94	32.1
1895-1899	2.36	1.12	2.72	4.52	11.29	22.01	51.3
1900-1904	1.80	1.37	3.85	5.14	7.00	19.16	36.5
1905-1909	2.93	2.33	5.03	7.23	27.30	44.82	60.9

Source: Feinstein (2005:101)

The gold mining industry had great impetus in comparison to the diamond mining industry. Gold became a force in the South African economy due to its involvement in the growth of South African employment and its significant contributions in the world economy. In 1906, gold accounted for two-thirds of the exports from the country that emerged as the Union of South Africa - after a painful civil war over the control of the mines (Wilson, 2001). By the end of 1906, the yield of the 70 mines operating on the Witwatersrand was 180,187 kilograms, an amount that represented 30 per cent of the world's entire gold production for that year (Davenport, 2013). Jones and Muller (2016) point out that the value of gold production (about 32 million British pounds in 1910) was far in excess of that of production in agriculture or industry. In fact, the mines were a major source of government revenue in 1910 because they paid high amounts of taxation: 1.4 million British pounds in 1910, which was more than 20 per cent of government revenue in that year (Jones and Muller, 2016). In the beginning of the twentieth century, the gold mining industry contributed to employment in the overall mining industry. According to Feinstein (2005), some 260,000 Africans were employed on gold and other mines by 1911. The significant number of workers in the mining industry displayed their impact in the South African gross domestic product. In 1911, the gold share of the gross domestic product (GDP) was almost 20 per cent, and from 1920 to 1939, it was between 12 per cent and 18 per cent (Feinstein, 2005).

Between 1916 and 1921, the production of gold decreased from 9.3 million ounces to 8.1 million ounces - the decrease in gold production led to the mine owners attempting to economise on White labour in order to prune costs (Jones and Muller, 2016). Nonetheless, the South African mining industry was a profitable industry that was attractive to the international global economy and, consequently, inspired the involvement of the Anglo American Corporation. The formation of the Anglo American Corporation (AAC) in 1917 and its subsequent South African orientation is a testament to the profitability of investing in South Africa, AAC registered as a South African firm because of the tax advantages (Innes, 1984). AAC used its position as a South African firm to work closely with the state and moved into manufacturing behind protective barriers, thus extending its control over the South African economy in order to increase its profits (Schneider, 2000). However, the consistent mining of gold led to an increase in costs that would negatively impact the mining industry and, subsequently, the South African economy.

The supply of gold was influential in growing the South African economy but the profitability of the gold mines came with problems of its own. The strike of 1922, known as the Rand Revolt, started after negotiations with the miners' union failed and the Chamber of Mines repudiated the status quo agreement in December 1921 (Jones and Muller, 2016). In fact, the Rand Revolt began on 1 January

1922 with a strike initiated by coal miners who were attempting to force their employers to go to arbitration over their five-shilling wage cut (Davenport, 2013). The hostility of the strike and the strike itself put the mining industry in jeopardy because the workers were unwilling to work and uplift the industry. The critical point of the strike came when the coal miners' negotiations failed, men from the gold mines, engineering firms and all but one of the power stations joined the strike (Davenport, 2013). Discontent among the strikers was further fanned by the Chamber's announcement in January 1922 that some 2,000 White workers would be retrenched, while the wages of White workers would be reduced (Jones and Muller, 2016). It is noteworthy that there were 180,000 Black mineworkers on the Witwatersrand when the strike began, yet the evidence suggests that organised white labour did not cast them as enemies (Krikler, 2005). However, the cause of the strike perceived Black mineworkers as a threat to the jobs of White mineworkers.

The repudiated status quo agreement permitted the remaining Whites to earn relatively high wages in semi-skilled jobs for which Blacks were available at much lower rates (Jones and Muller, 2016). Essentially, the employers' offensive against white labour in 1922 was linked to a need to provide opportunities for black mineworkers who had recently engaged in an historic strike of their own (Krikler, 2011). The strike, however, turned out to be a failure due to the police forces that intervened. Krikler (2005) points out that Captain J.M.L Fulford had ordered that his commandos kill the strikers - Captain Fulford was convinced of the crowd's malign intent, and equally that the strikers' temper demanded the use of firearms against them. The Rand Revolt, which was a culmination of major strikes, was a pivotal event in South African history where more than 200 lives were lost and where workers' unions were crushed (Alexander, 1999). The deaths of the strikers restored some form of order within the mining industry because the government showed the mineworkers that they should not disrupt the path that has been set for them, although they were discontent with how they felt about the failed negotiations.

The violent nature of the failed strike led to several workers losing their faith in trade unionism, this was seen in the total membership of trade unions decreasing by 25 per cent during the course of 1922 (Jones and Muller, 2016). In order to map a way forward, mining companies sought answers as to how best the industry should function. According to Feinstein (2005), a Mining Regulations Commission was appointed to examine the issues, which were reported in 1925, and it found that the process of displacement of white workers was already far advanced in semi-skilled work, and endorsed the fears of the Mine Workers' Union that this would in due course apply also to skilled work. It is key to analyse how mining gave vital assistance to South African industrial policy. In 1925, the government brought a system of protective tariffs to promote manufacturing expansion (Feinstein, 2005). The mining sector paved the way for the growth of the manufacturing sector - the research will discuss this discourse in

the next part of the thesis. Mining was not only limited to gold; it included platinum, diamonds and coal (Feinstein, 2005). As much as the mining industry was in upswing [even after the 1922 strike], it even experienced low performances. An example of this is the contribution of mining to GDP declining from 27 per cent in 1912 to 17 per cent in 1930 (Jones and Muller, 2016).

Mines stimulated coal mining and electricity generation to provide their enormous power supplies; they were a significant force behind the development of internal transport as lines raced from the coast, first to Kimberley and then to Johannesburg (Feinstein, 2005). Essentially, mining generated revenue to grow different sectors and develop the economy. The period from 1930 to 1960 was a remarkable period in the history of the mining industry, which in turn had linkages into both manufacturing and finance (Freund and Padayachee, 2022). The aforementioned time period brought significant changes to the mining industry, which included substantial improvements in gold output achieved through both technological advancements and the development of three new gold fields (Innes, 1984). Furthermore, the table below demonstrates the sales of gold and other mining output and the impact of gold sales in comparison to other minerals.

Table 7.4: Sales of gold and other mining output, 1930-1960 (millions of British pounds)

Year	*Gold*	*Other*	*Total*	*Gold as % of total*
1930	45	14	59	76
1935	77	7	84	91
1940	118	12	130	91
1945	105	22	127	83
1950	145	52	197	74
1955	183	108	291	63
1960	268	160	428	63

Source: Jones and Muller (2016:161)

The mining industry's linkages into manufacturing and finance proved to be beneficial for the South African economy. In terms of the total value of minerals produced in South Africa from 1910 to the end of 1936, gold accounted for 75.6 per cent, diamonds for 16.3 per cent and coal for 5.4 per cent, with the remaining 2.7 per cent coming from copper, tin, silver, asbestos and other minerals (Jones and Muller, 2016). The aforementioned percentages show the significant impact of gold mining in comparison to other minerals but it is noteworthy that the diverse mineral production showcased the strength of the mining industry. Innes (1984) asserts that the gold mining boom which occurred during the 1930s owed its life to the rising gold price. The devaluation of sterling in terms of gold in 1931, and the subsequent appreciation of the dollar, provided an enormous stimulus to gold-mining throughout the world (Jones and Muller, 2016). This stimulus worked in favour of the gold mining industry from

the 1930s onwards because the industry was able to keep the economy afloat while other sectors were not promising in terms of their output, as seen in the table below.

Table 7.5: Annual average exports of South African products and precious metals, 1910-1954

	(1) Agricultural and pastoral products	(2) Diamonds	(3) Other products[a]	(4) Gold and specie[b]	(5) Total	(6) Gold and specie as % of total
	(£ million)					
1910–14	10.3	8.7	4.0	32.9	55.9	58.9
1915–19	18.0	6.3	5.8	38.1	68.2	55.9
1920–4	21.9	6.3	7.0	41.6	76.8	54.2
1925–9	28.2	10.5	6.2	44.1	89.1	49.5
1930–4	16.5	3.2	4.1	53.7	77.5	69.3
1935–9	22.1	2.8	5.7	80.4	111.0	72.4
1940–4	19.9	4.6	22.7	86.5	133.7	64.7
1945–9	52.1	11.2	32.7	135.4	231.4	58.5
1950–4	127.8	18.5	82.2	146.1	374.6	39.0

[a] Includes other mining products, manufactured goods, and coal bunkers and other ships' stores.
[b] The value of gold exports includes the premium received as a result of currency fluctuations, for example in 1933–38; exports of semi-processed gold and of gold and silver plate and plated ware in 1949–53 are included with gold.

Source: Feinstein (2005:102).

The table above shows that there has been a great increase in all exports, especially diamonds and gold, and this proves that the mining industry and the South African economy were moving in an upward trajectory. When the Second World War broke out in 1939, the Witwatersrand mining industry was expanding on a massive scale - this expansion saw the development of eleven new mines in the space of seven years (Davenport, 2013). Gold was thus the export staple that enabled South Africa to break free from the constraints which had held back its economic development, and gold was the source of the riches on which sectors were able to draw (Feinstein, 2005). Gold mining became a consistent and outstanding contributor to the GDP and this performance was shown in 1941. Jones and Muller (2016) point out that an unprecedented amount of 448,128 kilograms of gold was produced in 1941, thus yielding a record revenue of 121 million British pounds.

The ability to record high revenues indicates the significance of gold mining to the South African economy and the South African mining industry. The success of 1941, however, was short-lived because the output of gold began to experience a decline. Production declined from 439,394 kilograms

in 1942 to 380,229 kilograms in 1945, resulting in the loss of some 15 million British pounds in value from the sale of gold during that period (Davenport, 2013). From 1942 onwards, wartime conditions disrupted gold mining and there were decreases in tonnage of ore treated as well as decreases in actual gold production (Jones and Muller, 2016). Wars serve as critical determinants to economic growth because they can negatively impact industrial production and ruin infrastructure. Davenport (2013) states that the decline of gold output from the South African mines continued in the aftermath of the Second World War, bottoming out in 1951 at a production figure of 358,202 kilograms. In the mid-1950s, the relative contribution of mining to GDP was 12 per cent, only half of what it had been in 1940 (Jones and Muller, 2016). The performance of gold mining, whether positive or negative, had a significant influence on the South African mining industry and the GDP.

The 1886 gold boom, and the development of the gold mining industry, paved the way for gold to be a pillar of the South African economy and made a significant breakthrough to becoming a key export staple of the twentieth century. At the start of the twentieth century, gold became an immediate force to be reckoned with when South Africa's gold production became the highest in the world, overtaking the United States of America and Australia. The South African gold mining industry experienced booming growth and became instantly attractive to the international market until it experienced a decline in production between 1916 and 1921. The industry took a turn for the worst when the coal miners' negotiations, for better pay and improved working conditions, failed in 1922 and they decided to strike. Because coal was an integral part of gold mining, the gold miners joined the coal miners in the 1922 strike. The 1922 Rand Revolt was a culmination of strikes that aimed to improve working conditions of the miners. The 1922 Rand Revolt showcased the militancy and solidarity of workers within the mining industry. Mining workers also relied on workers' unions to represent the needs of the workers, and to influence employers to pay their workers a better remuneration. As militant as the Revolt was, it ended tragically. About 200 workers lost their lives and the fight for improved working conditions stopped there. The end of the Rand Revolt also brought a loss of faith in workers' unions. The Great Depression (1929-1941) was an economic downswing that brought the world economy to its knees, but the South African gold mining industry stood firm and grew consistently. The devaluation of sterling in terms of gold in 1931, and the subsequent appreciation of the dollar, provided an enormous stimulus that helped the gold mining to perform substantially. Between 1935 and 1939, gold formed 72.4 per cent of South African exports, while its production value stood at 5.7 million British pounds. This brilliant performance of gold exports indicated that gold was a reliable contributor to the South African GDP and a critical export staple. Between the 1940s and the 1950s, gold production experienced a decline due to wartime conditions and the Second World War. Gold production only began to pick up after the end of the Second World War.

7.2.1.3 THE HISTORY OF COAL MINING IN SOUTH AFRICA

While diamonds and gold have taken centre stage, coal mining came to be of crucial importance because there was cheap labour that produced cheap coal (Iliffe, 1999). The discovery of coal is a key example of how mineral-rich South Africa is, given the fact that South Africa is home to numerous precious metals and minerals. The mineral revolution and subsequent rapid industrialisation of South Africa's economy, driven first by the discovery of diamonds and then gold, could not have been achieved extraordinarily without the supply of cheap fuel - such as coal (Davenport, 2013). In about 1840, coal was discovered by Europeans in Natal but it was not until the late eighties that any attempt was made to open up deposits on a commercial basis (van Rhijn, 1959). Coal discoveries were essential for the country's economic development and subsequent industrialisation but it was critical to exploit these discoveries strategically. In 1878, a British geologist named George W. Stow discovered coal near Vereeniging on the banks of Vaal River, which borders the Gauteng, Mpumalanga, Free State and North West provinces (Majozi and Veldhuizen, 2015). In 1881, Frederick W. North, the British geological expert who had been appointed by Lieutenant-Governor Sir Henry Bulwer to investigate Natal's resources, attracted much attention to the region by reporting that Klip River County was endowed with a workable coalfield which was 3,496.5 square kilometres in extent and contained 2,073 million tons of coal (Guest, 1988). These discoveries were integral to the development of the coal-mining industry at a national level and at an international level. Although coal was discovered in different parts of the country, coal mines were opened in Gauteng. The first coal mines were opened on the East Rand in the late 1880s, and cheap fuel from this area was a crucial element in the rapid exploitation of goldfields (Feinstein, 2005).

The large-scale commercial exploitation of northern Natal's coal deposits was initiated by the formation in January 1889 of the Dundee (Natal) Coal Company under the chairmanship of the highly successful Durban businessman and civic leader, Benjamin Greenacre (Guest, 1988). The commercial potential of coal only began to pick up speed when it became the fuel for the development of other industries. It was only the development of the Witwatersrand gold mining industry and the coming of the Cape's railway line in the 1890s that enabled the commercial exploitation of the Transvaal's coal. Coal became a reliable resource that would help South Africa industrialise its economy. Coal was a catalyst in growing the performance of the manufacturing sector and establishing other industries that are interlinked with the manufacturing sector. South Africa's abundant coal reserves led to the chemical industry spending much of the twentieth century isolated from world trade (Majozi and Veldhuizen, 2015).

In terms of the coal mining industry, there was a buzzing growth that sparked an industrial revolution. Guest (1988) points out that the 1886 Witwatersrand gold reef ensured a reasonable share of the trade bonanza for Natal that was expected to ensue from the anticipated development of a major gold

mining industry. In Natal, where the Durban-Johannesburg railway line reached Klip River in 1889, profitable mining of the coalfields became possible (Jones and Muller, 2016). The storage of coal also became important to the growth and development of the industry in order to avoid wastage of resources. As early as 1891, it was recognised that improved facilities for the storage and handling of coal on the quayside were essential in order to avoid deterioration through exposure to the elements and the danger of spontaneous combustion (Guest, 1988). Just like gold, coal did not waste time in making a significant impact after its introduction to the South African economy. According to Alexander (1999), coal output in South Africa stood at 0.8 million tons in 1893. Furthermore, in the mid-1890s, the already-robust Transvaal coal mining industry was given a further boost with the opening up of the Witbank-Middelburg Coalfield, which is South Africa's richest deposit of carboniferous material (Davenport, 2013). Coal mining became quite beneficial in terms of helping different sectors thrive as a collective to expand the economy.

In 1896, the completion of the railway line connecting Delagoa Bay and Pretoria was most advantageous for the Witbank-Middelburg Coalfield as the railway track ran over the extensive coal seams (Davenport, 2013). The completion of the railway line also meant that railway transport was set to thrive in South Africa. In 1907, representatives of most of the Transvaal coal mines established the Transvaal Coal Owners' Association (TCOA), which agreed on production quotas and a fixed price for coal (Alexander, 2007). The establishment of a fixed coal price simply meant that buyers, sellers and investors are able to meet each other's needs in terms of business regarding coal. After 1910, there was a great increase in the demand for coal by power stations, as industries, mines and households were quick to appreciate the advantages of electricity (Jones and Muller, 2016). Coal had become a reliant ingredient for industries that required electricity to function and, subsequently, produce final goods. One of the key reasons behind South Africa's high coal production is its efficient production method. By 1920, 52 per cent of Natal's coal and 82 per cent of the Transvaal's coal was cut by machine [either by compressed air or electric cutters] (Alexander, 2007). The table presented below indicates the amount of coal produced between 1910 and 1933.

Table 7.6: Coal production, 1910-1933 (thousand Imperial tons)

	1910	*1930*	*1933*
Transvaal	3974	7545	6977
Natal	2570	4455	3117
Free State	470	1102	1429

Source: Jones and Muller (2016:61)

As seen in the table above, coal production from 1910 to 1933 remained the highest in the Transvaal. It is worth noting that there was unrest in the 1920s regarding the coal mining industry - the coal miners initiated the 1922 Rand Revolt, and the gold miners joined them. Feinstein (2005) points out that the strike, which involved both gold and coal mines, was backed on a limited scale. With the strike eventually coming to an end, the gold and coal miners continued to work and maintain high production for the mining industry. The end of the Revolt in 1924 led to the passage of an Industrial Conciliation Act that further bureaucratised the mainly white unions and institutionalised a deep divide between white unions and African workers (Alexander, 1999).

The establishments of the Electricity Supply Commission (ESCOM) in 1923 and Iron and Steel Corporation in 1928 were part of South Africa's road to industrialisation. Feinstein (2005) asserts that ESCOM and ISCOR were designed to exploit South Africa's resources of coal and iron ore. During the Great Depression, coal production in the Transvaal remained remarkably constant, due to the stabilising influence of the gold mines on the local economy (Jones and Muller, 2016). The constant coal production, during the Great Depression (1929-1941), provided the coal mining industry with an opportunity to rebuild and increase production to greater amounts. The strong grip that the gold mines had on the coal mines was partly because, directly and indirectly, they provided the gold mines with their principal market (Alexander, 2007). The role of coal in the development of the gold mines cannot be taken lightly because the growth of the gold remained unshaken by economic threats such as the Second World War. Without coal, the costs of gold mining would have been much higher, with the result that less gold would have been won, fewer opportunities would have been created and less foreign exchange would have been earned (Jones and Muller, 2016).

The abundant reserves of coal laid a proper foundation for South Africa to solidify its chemical industry. Before the Second World War, coal provided more than two-thirds of the world's energy (Majozi and Veldhuizen, 2015). The substantial performance of the coal mining industry in the early twentieth century exhausted its capabilities in the middle of the twentieth century. By 1949, South Africa was producing 28 million tons of coal, nearly double the output of 25 years before, but still less than middle-ranking countries like France, Japan and India (Alexander, 2017). A pivotal time for the coal mining industry was the 1951 crisis. In the winter of 1951, the railway system was unable to transport all the coal needed by power stations and other local consumers as well as foreign buyers (Jones and Muller, 2016). In 1951, there was a national coal shortage which endangered the South African economy, and the government instituted a total ban on the export of coal (Nel *et al.*, 2001). The coal shortage upset the balance of the coal mining industry and disrupted economic performance. According to Guest (1988), the national coal shortage led to the railway authorities resorting to the expropriating of export coal. Furthermore, the total ban dealt a heavy blow to coal exports - which had

shown promising growth during and after the Second World War - as South Africa's reliability as a supplier became suspect (Jones and Muller, 2016). The total ban on coal exports aimed to protect the coal mining industry from a domestic viewpoint, but the total ban meant that South African exports would decrease, and South African coal lost its presence and participation in the world economy. The total ban, coupled with the implementation of import control after 1950 which reduced the volume of shipping calling in at Durban, led to a 35 per cent decline in export and bunker sales (Guest, 1988). From this point, the onus was on the government, stakeholders and coal businesses to turn the state of affairs around in the coal mining industry.

A crucial corporation that aimed to uplift the coal mining industry is the South African Coal, Oil and Gas Corporation (SASOL). According to Davenport (2013), the financing of SASOL was provided by the Industrial Development Corporation (IDC). One of the government's most important projects was its support for SASOL, a major new public corporation formed in 1950 to convert coal into gas, and then gas into petrol, diesel and other liquid products (Feinstein, 2005). SASOL had to make its mark as a new public corporation because it relied on innovation to grow its economy. According to Barnard and Bromfield (2009), SASOL was the only firm using Fischer-Tropsch technology [converting fuel from gas and coal] in South Africa during the 1950s, and there was no need to develop mechanisms to share knowledge within the country. Based on the fact that SASOL was making its own products, it had to develop quite slowly before becoming a great corporation. Unlike other state corporations in apartheid South Africa, SASOL had to sell its products to ordinary South African individual consumers to make a profit (Sparks, 2012). The establishment of SASOL marked the start of an industrial journey for the South African economy but SASOL had to adjust to the industry before making genuine progress. SASOL's first coal-to-liquid plant began production in 1955 in Sasolburg, Free State, where Sasol's chemists and engineers kept the plant operating and improved its efficiency to include feedstocks for the manufacture of synthetic rubber, fertilisers, and secondary chemicals (Majozi and Veldhuizen, 2015). After five years of teething troubles from 1955 to 1960, SASOL showed its modest profit of 1960 (Jones and Muller, 2016).

With the successful establishment of SASOL, coal became a critical resource for South Africa's industrial production. While SASOL may have been established as part of the effort to shift industrial development in the country away from its emphasis on the mining industry, its coal mining practices remained firmly rooted (Sparks, 2012). In 1957, coal contributed 1.44 million British pounds to South African exports, which is low in comparison to gold [217 million British pounds], diamonds [30.68 million British pounds] and asbestos [10.95 million British pounds] (van Rhijn, 1959). The fortunes of coal, however, took a positive turn in 1960 when there was an increase in coal production. In 1960, coal

production stood at 38 million metric tons, which represented money sales of 27.5 million British pounds (Jones and Muller, 2016).

The increase in coal production created an opportunity for the coal mining industry to grow from the setbacks that it experienced. Additionally, the coal that was produced proved to be critical for other industries. During the 1960s, Anglo American engineers developed new washing techniques which removed sufficient of the high ash content to create good coking coal suitable for the iron and steel industries (Feinstein, 2005). Moreover, Davenport (2013) asserts that the new coal-washing process would dramatically change the fortunes of South Africa's coal mining industry and enable it to finally realise its long-held ambition of joining the ranks of the world's major exporters. The coal mining industry, however, had a big workforce that was reflective of its high production but the workforce was not well-treated. According to Jones and Muller (2016), the coal mining industry was home to 66,000 - which represented 10.7 per cent of the 620,000 workers in the mining industry in 1960 - but the industry's ability to improve worker remuneration and to attract productive workers was impaired by the price control of coal which produced relatively low margins of profit.

The interest in coal demand from outside South Africa, however, helped the coal mining industry to get back on its feet internationally. Foreign demand for South African coal increased significantly from approximately one million tons in the early 1970s to 29 million tons in the 1980s (Guest, 1988). Jones and Muller (2016) state that coal exports had been stimulated by the 1973 oil crisis, which had increased the demand for coal, particularly by power stations. Furthermore, the 1973 oil crisis was a debilitating period in which the Organisation of the Petroleum Exporting Countries (OPEC) withheld oil supplies and caused the crude oil price to soar, thus causing many major industrial countries to use coal as the main energy fuel (Davenport, 2013). The use of coal as the main energy fuel, due to the 1973 oil crisis, led to South Africa establishing a strong foothold in the international coal market. Substantial new markets were found in Europe and Japan [both for coking coal and for steam coal for electricity generation] and production more than trebled from 55 million tons in 1970 to 175 million tons in 1985, while exports soared over the same period from just over 1 million to 47 million tons (Feinstein, 2005).

The origin of the coal mining industry started with critical coal discoveries by geological experts, George W. Stow and Frederick W. North, in 1878 and 1881 respectively. It was only in 1889 that coal experienced a large-scale commercial exploitation in Natal but this exploitation was triggered by the 1886 gold in the Transvaal. At the start of the twentieth century, coal production began to grow strongly because it was a critical energy fuel for diamond mining and gold mining. The 1922 Rand Revolt, however, showed the cracks in the coal mining industry because workers demanded better pay and improved working conditions. The coal miners were joined by the gold miners but the Rand Revolt

ended in defeat, as stated earlier. The establishments of ESCOM and ISCOR marked the start of South Africa's path to industrialisation. With ESCOM specialising in the production of electricity and ISCOR specialising in the production of iron and steel, both corporations relied on the exploitation of coal in order to produce their respective products. The Great Depression (1929-1941) posed a threat to economies around the world but the coal mining industry did not succumb to the Great Depression because its production remained constant. The creation of SASOL in 1950 was beneficial for the development of South Africa's petrochemical industry but it aimed to help the coal mining industry because it relied on the use of coal to create fuel and other liquid products. It is worth noting that the South African coal mining industry was able to make a strong recovery from the total ban in the 1950s and it managed to regain its strength from taking advantage of the 1973 oil crisis. Coal was able to restore its place as a main energy fuel in the international market and the coal mining industry became a reliable contributor to the South African economy.

7.2.2 ELECTRICITY SUPPLY COMMISSION (ESCOM) AND IRON AND STEEL CORPORATION (ISCOR)

Industrialisation during twentieth-century South Africa is centred around this political economy theoretical framework. In the context of industrial policy, the economy's performance is influenced by the efficacy of the manufacturing sector. Industrialisation largely remained confined to consumer goods manufacture and economic activity that relied on agricultural/pastoral activities (Freund, 2018). In the context of industrial policy, manufacturing remained a top priority in twentieth-century South Africa. According to Fine (2008), state corporations in electricity, steel, transport, and so on, represented an accommodation across the economic power of the mining conglomerates and the political power of the Afrikaners.

During the creation of ESCOM and ISCOR, there was an Afrikaner nationalist movement justified by the Boers' humiliation in the war that led to the formation of the Union of South Africa in 1910 (Dubow, 2006). In light of the loss of the Boers' republican independence and the physical collateral damage done, many Boers state that the British were not lenient during the peace negotiations (Wessels, 2011). Dubow (2006) points out that ESCOM and ISCOR are capital-intensive industrial ventures designed to provide the whole country with tremendous electricity and steel supplies. At the centre of this movement was General J.B.M. Hertzog. General Hertzog, the leader of the National Party - and from 1924 Prime Minister - was an ardent Afrikaner nationalist, and a sovereign and independent South Africa was among his top priorities (Feinstein, 2005). Hertzog wanted to promote the living standards of Afrikaner people by employing white workers (Feinstein, 2005). According to Feinstein (2005:118), "Hertzog's government recognised that mines were a wasting asset, so in the long run, needed to replace them as a major primary source of production, employment and government revenue". During

his tenure, the government was set to see its economy thrive from manufacturing as it could employ a large number of workers in comparison to mining. Given agriculture's unsatisfactory state, only manufacturing had the potential to be a primary source of production, employment and government revenue (Feinstein, 2005).

7.2.2.1 THE CREATION AND STATE OF ESCOM

As discussed in the mining industry section of the thesis, electricity quickly became a reliable resource that contributed to economic growth in South Africa. Electricity was first publicly supplied in South Africa in 1882 when the diamond city of Kimberley switched on electric lights (Gentle, 2009). In fact, Kimberley was the first city in the Southern Hemisphere, and seventh in the world, to install electric street lighting (Davenport, 2013). The public use of electricity marked the beginning of South Africa's industrial activity [alongside mining] and the use of electricity later spread to different parts of the country. Gentle (2009) points out that the 1886 Witwatersrand gold discovery led to Johannesburg installing an electricity reticulation system in 1891. In context to the previous statement, electricity system installations followed suit in the following cities: Pretoria in 1892, Cape Town and Durban in 1893, Pietermaritzburg in 1895, East London in 1899, Bloemfontein in 1900 and Port Elizabeth in 1906 (Christie, 1984).

It is worth noting that cheap electricity was generated by coal reserves that were in abundance in Limpopo, Mpumalanga, Free State, and Gauteng (Inglesi-Lotz, 2022). This goes to show how important the influence of coal is when it comes to the generation of electricity. Since 1905, South Africa has had the cheapest steam-generated electricity supplies in the world because the coal seams are thick and shallow, and the electricity supply industry is structured by the state to provide cheap power for mining, transport and manufacturing (Christie, 1984). In the late 1900s, electricity generation started at the urban municipal level as part of their mandate to provide electricity in public spaces (Essex and de Groot, 2019). In 1910, the South African government intensified the effort to create an integrated system for generation and transmission, which focused on the supply of low-tariff electricity to South Africa's industrial sector (Inglesi-Lotz, 2022).

During the 1922 miners' strike, a consortium consisting of Prime Minister Jan Smuts, South African Railways General Manager William Hoy and the mining engineers and scientific advisors Robert Kotze, Warrington Smyth, and Hendrik van der Bijl drafted an Electricity Bill, which later became the Electricity Act of 1922 (Gentle, 2009). Conradie and Messerschmidt (2000) assert that the Electricity Supply Commission (ESCOM) was founded based on the Electricity Act of 1922. Furthermore, the Electricity Act of 1922 formalised the nationalisation of electricity generation (Inglesi-Lotz, 2022). Prior to ESCOM's establishment, electricity provision was fragmented and decentralised (Hodge and

Paremoer, 2022). The South African government regulated the private and municipal supply of electricity; after 1923, the South African government supplied electricity at ESCOM's cost (Christie, 1984). According to Freund (2018), the idea behind ESCOM was to make it as independent as possible both from private capital and from political interest within the state. The 1922 Electricity Act also created the Electricity Control Board (ECB), which was responsible for the control, and licensing, of electricity supply and enforced the sharing of surplus profits with customers in the case of private power companies (Gentle, 2009). The creation of state-owned enterprises drove a key motive to industrialise the economy and to enhance the production of goods and services. The Electricity Supply Commission (ESCOM) and the Iron and Steel Corporation (ISCOR) were created for the government to maintain a controlling interest (Dubow, 2006). What the South African government, under Jan Smuts, did here was to ensure that ESCOM and ISCOR were the sole providers of electricity and steel in the country, respectively. The Electricity Act of 1922 gave ESCOM a set of powers that could be used to Escom's benefit. Gentle (2009) asserts that ESCOM exercised the set of powers in three ways:

1. ESCOM can establish its own generation capacity either through building such undertakings or through acquiring existing private undertakings;
2. By entering into cooperation agreements with existing private companies so as to encourage investments in areas likely to facilitate industries' needs;
3. Together with the ECB, through regulating private power companies and municipalities by issuing licences with certain conditions and ensuring that surplus conditions are conscribed.

In addition to ESCOM being able to exercise the aforementioned set of powers, electricity generation became quite consistent and it was matched by high consumption. While only 852 million kilowatt hours were consumed in 1916-1917, the country's consumption increased to 1,694 million kilowatt hours by 1926-1927, and consumption rose to 4,361 million kilowatt hours a decade later (Davenport, 2013). The centralisation of electricity supply, and ESCOM being the chief supplier, played a critical role in the increase of production capacity. As much as ESCOM was a state-owned enterprise, it stopped at nothing to become a profit-driven enterprise. Since its establishment, ESCOM has been at the centre of, and epitomised the trajectory of, South African capitalism (Gentle, 2009). South Africa's economy was set to grow under crucial conditions due to the Great Depression bringing the world economy to its knees in the 1930s. South Africa's abandonment of the gold standard in 1932 led to South Africa returning to parity with the sterling, and thus a substantial devaluation of the South African currency with the dollar, with a corresponding increase of almost 50 per cent in the sterling price of gold between 1932 and 1933 (Feinstein, 2005). The abandonment of the gold standard in 1932 created a platform for Escom to grow electricity generation. Between 1933 and 1948, electricity consumption grew fivefold (Gentle, 2009). In 1937, ESCOM House was opened and it was on the occasion of the building's opening where van der Bijl stated that ESCOM's purpose was to contribute

to making South Africa a better country to live in (Dubow, 2006). The period 1933-1948 was monumental for ESCOM because it had finished construction of its own building [ESCOM House] in 1937 and was set to make a mark in growing the South African economy. The table below presents how much electricity was produced in the country just before and after the Great Depression.

Table 7.7: Capacity of South African Power Stations (in Megawatts), 1928-1948

	1928–9		1935–6		1939–40		1943–4		1948–9	
Power Stations	*Number*	*Total Capacity MW*	*Number*	*Total Capacity MW*	*Number*	*Total Capacity MW*	*Number*	*Total Capacity MW*	*Number*	*Total Capacity MW*
OVER 50 MW	4	233	8	730	11	1268	13	1486	15	1939
20–49 MW	9	260	8	300	6	213	4	156	5	161
10–19 MW	3	40	3	35	6	75	5	75	5	78
5–9 MW	4	27	7	56	5	40	6	46	5	39
1–4 MW	27	48	28	62	35	70	42	85	47	105
BELOW 1 MW	157	34	213	46	243	57	248	55	243	56
TOTAL	204	642	267	1229	306	1723	318	1903	320	2378

Source: Christie (1984:125)

The year 1948 marked the commencement of the apartheid regime due to the National Party's election. Apartheid policies with their exclusionary nature resulted in less than one-third of households in townships having electricity connections (Louw *et al.*, 2008). In the same year, ESCOM went on to buy purchased the largest private producer, the British-owned Victoria Falls Transvaal Power Company (Eberhard, 2003). Thereafter, ESCOM acquired most of the generation capacity in South Africa by 1950 (Wright, 2003). Apartheid policies aligning with electricity usage meant that people of colour did not have access to electricity. Electricity, essential to the economic self-sufficiency of apartheid, was also an instrument of discrimination, employed in the complex task of managing the relations between the government and human groups ordered into races and assigned unequal statuses and rights (Jaglin and Dubresson, 2016).

Electricity was provided only to white areas, thus creating a racially determined part of the population that had to rely on dirty and dangerous fuels to cover their daily needs (Inglesi-Lotz, 2022). In addition to providing electricity only to white areas, ESCOM focused heavily on broadening its horizon in multiple industries. The new ESCOM director, Albertus Jacobs, the chief engineer who succeeded Hendrik van der Bijl in December 1948, decided to order the simultaneous construction of ten new power stations located near the Transvaal coal deposits, which also led to the creation of new urban mining settlements (Jaglin and Dubresson, 2016). South African Railways (SAR) extended electrification; in 1950, there were 215 electric locomotives in service; in 1960, there were 472, and in 1974, there were 1,422 (Christie, 1984). In context to this statement, it is clear that the transport

industry aimed to grow significantly (and industrialise) through electrification. As ESCOM grew, so did its electricity generation, its electricity consumption and its sales. Between 1949 and 1959, Rand and Orange Free State electricity sales increased, from 2,654 Gigawatt hours (GWh) to 11,034 Gwh, whereas Eastern Transvaal increased from 358 to 633 GWh (Christie, 1984). ESCOM's rise in electricity production attracted investment. Investment in ESCOM was stimulated by the vigorous economic growth of 5.5 per cent a year in the 1960s, and by the rise in electricity demand from both companies and white households in which domestic appliances were proliferating (Jaglin and Dubresson, 2016). ESCOM aimed to generate electricity efficiently and differently from its usual reliance on coal in order to generate electricity. However, it still wanted to take advantage of the abundant coal reserves in South Africa. Between 1960 and 1975, ESCOM interlocked its networks into a single national grid, and moved to a policy of building new steam-stations on the major coal fields, transmitting energy from the coal fields by wire rather than moving coal by rail (Christie, 1984). ESCOM sought to reap economies of scale and larger coal-fired power stations as South Africa has only modest hydro-electricity and gas resources (Eberhard and Mtepa, 2003). By the 1960s, technology had advanced to the extent that bulk transfer of power over long distances had become economic, and hydro-electric generation became feasible in Southern Africa (Christie, 1984). Technological advancements became beneficial for ESCOM because it was able to optimise its resources and maintain economies of scale.

In the 1970s, three factors led to an acceleration in power station construction programs: the establishment of the national grid, connecting local transmission networks into a single network, and the obsessive fear among ESCOM engineers and management of failing to meet national needs (Jaglin and Dubresson, 2016). All three of the aforementioned factors drove ESCOM to maintain its standard of providing consistent and reliable electricity to its customers. It is worth noting that constant rising demand for electricity came from municipalities whose power stations had become less and less competitive following the 1973 oil crisis (Eberhard, 2003). The prospects of hydro-electric generation seemed promising due to ESCOM's national grid operation structure. Reinhardt Straszacker, a professor at Stellenbosch University's engineering department and ESCOM chairman in 1962, negotiated a partnership agreement with the Portuguese government in 1966 to make ESCOM a stakeholder in the large Cabora Bassa hydro-electric dam [located on the Zambezi River in Mozambique] where lake-filling operations were completed at the end of 1974 (Jaglin and Dubresson, 2016). It is worth noting that Cabora Bassa, from a political perspective, was a scheme that bolstered the faltering rule of the Portuguese rule in Mozambique and the defence of settler power in the subcontinent (Dubow, 2006). Apartheid was a segregation system that the South African government took pride but it was a system that the rest of the world stood against firmly. Consequently, South

Africa's battle to grow ESCOM was a battle that it had to fight on its own. According to Christie (1984), hydro-electricity generation played the following key roles in the ESCOM system:

1. One dam's water supplies were so dependable that it could act as a base-load power station, providing large power blocks on a firm basis irrespective of season.
2. Two more dams had such insecure water supplies that they could only be used briefly in periods of maximum demand, to relieve the strain on the system. Running dry, without water, their generators were able to control voltage levels in the grid system by acting as stabilising synchronous condensers.
3. By 1975, a third type of hydro-electric system was being built in which water would be pumped upwards into storage using cheap off-peak power, and the same water would then be allowed to run downwards through the same turbines to generate electricity when the national grid needed it at times of peak demand.

The first deliveries to South Africa from Mozambique began in 1975, the year Mozambique became independent, but they were quickly suspended because of the civil war fuelled by the Pretorian government and the sabotage of high-voltage lines, including the line linking the hydro-electric plant to South Africa (Jaglin and Dubresson, 2016). After the suspension of the deliveries, Cabora Bassa resumed its deliveries. The immense physical size of Cabora Bassa and the other dams do not detract from the importance of the coal-fired power stations, which provided over 97 per cent of ESCOM's power in 1977 (Christie, 1984). In context to this statement, coal played an integral role in ensuring that electricity supply remained at its highest. However, it is vital to consider the substantial productivity of Cabora Bassa. Christie (1984) points out that Cabora Bassa supplied 4,231.9 million units to South Africa, at a re-negotiated price, in 1977. The 1980s were a time period for ESCOM to continuously grow its capacity but this decision backfired and it, consequently, had a negative impact for the national grid. Between 1981 and 1990, ESCOM added a massive 17,300 Megawatts (MW) of new capacity but this turned out to have been poor planning resulting in excess capacity and over 10,000 MW being mothballed over the following decade (Crompton and Matsika, 2022).

The state-owned enterprise initially established as the Electric Supply Commission, and known as ESCOM, was restructured and named ESKOM in 1987 (Marquard *et al.*, 2007). The year 1987 was a crucial point for ESKOM with apartheid coming to an end and welcomed the beginning of neo-liberalism and electricity production catering for all individuals living within South Africa. It is fundamental to note that Gentle (2009) outlined the significance of the two new Acts, the Electricity Act (No. 41 of 1987) and the ESKOM Act (No. 40 of 1987) that were finalised:

1. The provision of the 1922 Electricity Act had compelled ESCOM to supply electricity in the public interest and specifically forbade profit-making. The repeal of this requirement in 1987

marked an intervention on the state's part to expand the terrain of commodification of public services - albeit in its South African variant, which had seen ESCOM as a public utility set up to benefit white people.

2. The scrapping of the Electricity Control Board and its replacement by an Electricity Council marked the direct involvement of private capital in the decision-making processes of the state.
3. The transfer of ministerial accountability from the Ministry of Minerals and Energy Affairs to the Ministry of Public Enterprises (whose brief was to oversee the privatisation process of ESCOM/ESKOM) ended the long run of the twentieth century brand of racial capitalism, whereby energy policy and mining capital were regarded as virtually synonymous.

Eberhard (2003) argues that ESKOM's reform process was slow and modest because ESKOM remained in state ownership. The two new Acts paved the way for ESKOM to provide electricity to the whole population and address key challenges that came with electricity provision. Under apartheid, black local authorities (i.e., municipal authorities responsible for the townships to which African, coloured and Indian South Africans were residentially restricted) were not given the required resources to meet the basic needs of the marginalised populations under their jurisdiction (Gentle, 2009). Jaglin and Dubresson (2016) state that the early 1990s were a time of intense negotiations between all stakeholders in democratic change, characterised by the establishment of multiple forums seeking viable compromises between white employers, unions, political parties and civil society structures. The late apartheid government attempted to depoliticise service provision by making selective concessions to demands for arrears write-offs, while generating support for a primary role for private enterprise in development (Gentle, 2009).

ESKOM only extended its reach in distribution later under the electrification drive, in the early 1990s, as the country started its transition to democracy and extended basic services to black communities in rural and urban areas (Hodge and Paremoer, 2022). In the early 1990s, ESKOM embarked on a massive electrification drive connecting 1.75 million, mostly black, households by 1999 - this number later increased to 7.8 million by 2004 (Hodge and Paremoer, 2022). In the same time period, ESKOM promoted ferroalloys and aluminium plants to increase electricity demand - these refineries are extremely energy intensive, and the plants were effectively designed to beneficiate coal as much as metal ores (Makgetla, 2022). The year 1994 became extremely pivotal for South African governance and the state of ESKOM. Soon after the 1994 democratic elections, the government concentrated efforts on rebuilding the South African economy with a focus on taking care of the inequalities created by the previous regime, putting into action the Reconstruction and Development Program [RDP] (Mohlakoana, 2014). In the RDP, electricity was identified as a key and convenient fuel to ensure universal access and minimise health incidents due to indoor air pollution, while at the same time

creating employment and income-generation opportunities and living standards (Inglesi-Lotz, 2022). Consequently, ESKOM was corporatised in 2002 following the market-orientated reforms in the 1998 White Paper, which included: customer choice of supplies, competition in the generation market, open access to the transmission network, the unbundling of ESKOM, and encouraging private participation (Crompton and Matsika, 2022).

7.2.2.2 THE CREATION AND STATE OF ISCOR

The year 1919 saw the start of construction of a blast furnace at Newcastle and production started in 1926 as rhe Newcastle Iron and Steel Works (later renamed Armcor Iron Works) and was later acquired by Iscor (Venter, 2014). According to Feinstein (2005), there had been a number of early attempts, both before 1910 and in the early 1920s, to develop a South African iron and steel industry using local materials, but they were effectively defeated by the scale of the investment required. In the same manner that ESCOM required the Electricity Act of 1922 to exist, ISCOR required legislation to be formed. Davenport (2013) points out that the passage of the Iron and Steel Industry Act of 1928 led to ISCOR's establishment. The creation of ISCOR in 1928 as a state-owned enterprise served as the Pact government's major contribution to the industrialisation of South Africa (Christie, 1984). The purpose of ISCOR was to ensure optimal performance in manufacturing, and in doing so, ISCOR would give out a consistent supply of iron and steel.

When ISCOR was formed, the government's intention was that only 51 per cent of the shares should be held by the state and that the public should subscribe for the remaining 49 per cent (Davenport, 2013). The majority shareholders of ISCOR, the state, were able to make decisions that benefitted ISCOR in the context of its involvement in the South African steel industry. The public's involvement in the ISCOR venture was critical because the public were able to easily hold the state accountable if any of its plans for ISCOR's growth and development did not materialise. Unfortunately, the public did not have any passion and enthusiasm for ISCOR. According to Davenport (2013), the public's response to ISCOR was unenthusiastic and only a limited number of the available shares were taken up by private investors. Consequently, the government was compelled to amend the Iron and Steel Industry Act in 1931 and take up the remaining unissued shares - which then led to ISCOR becoming a state-owned enterprise (Houghton, 1967).

In the period between 1926 and 1937, owing to the establishment of ISCOR, the basic metals subsector grew at the high average annual compound rate of 24.7 per cent (Bell and Farrell, 1997). The Iron and Steel Corporation of South Africa (ISCOR) was formed in 1928 but only instituted in Pretoria as a manufacturing concern in 1934 - government-manufactured steel was vehemently opposed by the mining industry and was lucky to find a somewhat renegade British manufacturer, Charles Merz,

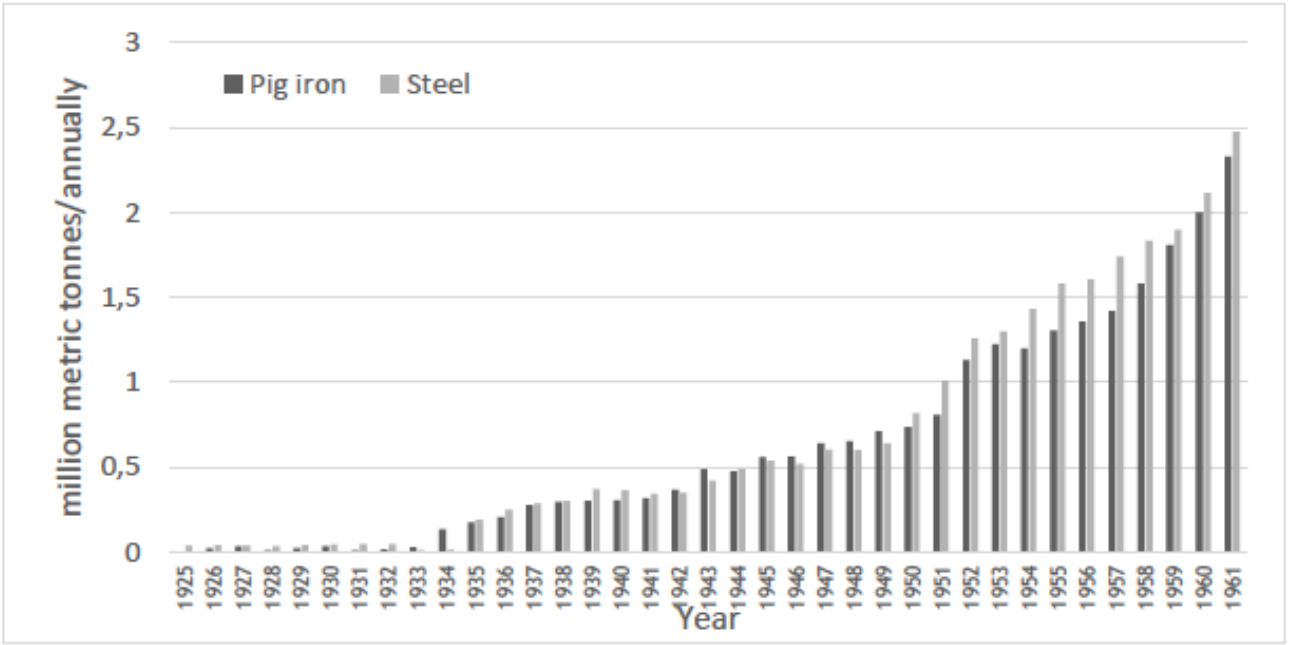
prepared to sell know-how and machinery (Freund, 2018). South Africa's abandonment of the gold standard in 1932 had stimulated gold mining activity which in turn led to a greatly increased demand for steel (Scott, 1951). The production of steel in 1934, which was during the Great Depression, was frowned upon but ISCOR managed to maintain its ground and develop itself from the amounts of steel it was set to make. The Pretoria plant, which cost the state some 3.5 million British pounds and it was in close proximity to iron ore and coking coal, was estimated at 48 million tons and it was crucial to the principal market on the Witwatersrand (Davenport, 2013).

In the 1930s, South Africa had become the biggest foreign market for British steel production; now this dependence began to diminish as markets for South African steel would eventually become problematic just before the start of the 21st century, in the early 1990s (Cross, 1994). The growing demand for steel in 1932 positively impacted steel consumption in the space of five years where steel consumption had multiplied threefold in 1937 (Scott, 1951). The Pretoria plant managed to produce steel at a capacity of 160,000 ingot tonnes per annum from 1934 onwards (Dondofema *et al.*, 2017). To improve efficiency, ISCOR became a major electricity consumer and built its own power station, where Hendrik van der Bijl [chairman of ESCOM and ISCOR] co-ordinated the work of his two state-owned enterprises in South Africa's industrialisation (Christie, 1984). 1937 was a phenomenal year for the South African steel industry with ISCOR at the helm of the industry's success. In 1937, when South Africa produced one-third of the 869,000 tons of iron and steel absorbed by the domestic market, ISCOR alone contributed 92 per cent (Scott, 1951). In the same year, the price of steel started to increase and the future of the South African steel industry began to look secure, while worldwide recovery was still underway (Jones and Muller, 2016).

The 1940s were intense for the South African steel industry due to the increase in steel demand. In 1940, ISCOR produced 320,000 tons of steel and the profits exceeded one million British pounds (Jones and Muller, 2016). Owing to sheer demand, the Pretoria works reached the limit of its growth capacity in 1941, just seven years after it was commissioned (Davenport, 2013). The limitation of the Pretoria works was a crisis that applied pressure on ISCOR to think of a long-standing solution. The Pretoria works' contribution to the annual production could not justify the selection of Pretoria as a site - the total raw materials required annually to produce 132,000 tonnes of rolled products was 1.03 million tonnes, Pretoria could supply only a seventh of that (Dondofema *et al.*, 2017). As a result, in 1941, van der Bijl and six fellow government-appointed government directors decided to commission a second steelworks near Vereeniging (Davenport, 2013). Throughout the 1940s, expansion of the South African steel industry was accelerated by wartime and post-war conditions (Scott, 1951). Consequently, steel production had increased from 320,000 tons in 1940 to 600,000 tons in 1950 - almost half of the steel produced in South Africa at the time (Feinstein, 2005).

The growth of ISCOR and its high steel production inspired the birth of a city that existed within in an industrial environment. Vanderbijlpark was a model town built from scratch, it was laid out in 1941 on 25,000 acres and purchased by ISCOR (Freund, 2018). Vanderbijlpark was bare veld in 1944, but in 1950, it became a complete industrial town containing blast furnaces, a steel plant, engineering works, and it had a population of 20,000 inhabitants (Scott, 1951). According to Jones and Muller (2016), ISCOR's productive capacity grew significantly from 1945, so it rose from 457,000 metric tons in 1945 to 1,287,000 tons in 1955. On the back of the significant growth spurt experienced during the Second World War, by 1950 ISCOR was producing over 600,000 tons, almost half of the steel used in South Africa (Houghton, 1967). The local production of steel helped South Africa stand on its own without having to rely heavily on other countries for assistance. In 1951, steel-users in South Africa were saving 18 million British pounds annually by using locally-produced steel (Jones and Muller, 2016). In 1953, ISCOR commissioned the open-pit Sishen Mine [situated on the very edge of the Kalahari desert] only because the mine's output was being used as feedstock for the Vanderbijlpark works (Davenport). The graph below shows the growth of steel production in South Africa from 1925 to 1961.

Figure 7.2: Pig iron and steel production, 1925-1961



Source: Dondofema et al. (2017:7)

As seen in the graph above, steel production at the start of the 1960s was at its highest. The sheer growth of South Africa's industrial sector led to demand outstripping supply and by the early 1960s, ISCOR was compelled to start another expansion program (Davenport, 2013). According to Davenport (2013), ISCOR commenced a second development phase at its Vanderbijlpark works at a

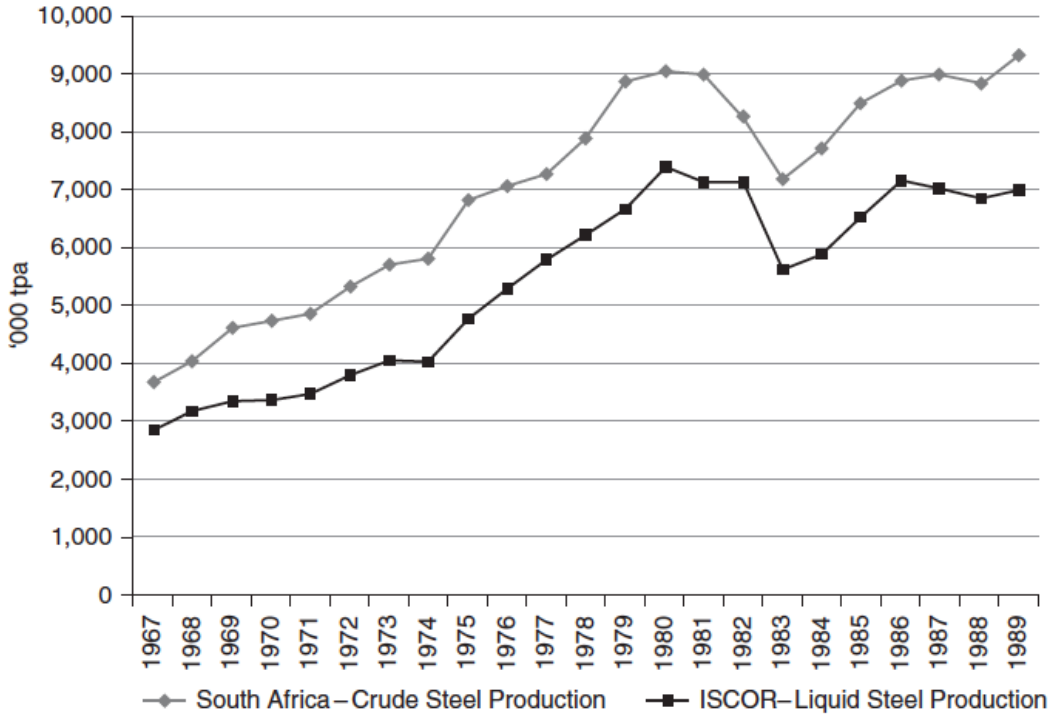
cost of 574 million Rand in 1962; the development project involved large extensions of the facilities, and the modernisation of the older plants to supply higher quality and value-added products such as electrolytic tinplate for the canning and beverage industries. In addition to ISCOR attempting to solidify its growth as a leader in the South African steel industry, it witnessed a potential threat to its contributions. In 1964, Anglo American acquired Scaw Metals, began their production at Highveld, and rebranded the company name as the Highveld Steel and Vanadium Corporation [HSVC] (Dondofema *et al.*, 2017). Upon its establishment, HSVC continued to make a critical impact in the steel and metals industries. The Highveld plant was erected in 1965 and by 1970 was the fourth-largest industrial firm listed on the Johannesburg Securities Exchange (Innes, 1984). Following the acquisition of the remaining shareholding of Transvaal Vanadium Company (Ltd), this company became a division of HSVC, which was the largest vanadium producer in the world in 1966 (Venter, 2014). HSVC made use of a mine crucial to its success named Mapochs open-cast mine. Since this mine was commissioned in 1967, its sole purpose has been to supply both iron ore and vanadium to HSVC (Davenport, 2013). The production of the Mapochs Mine has become indispensable in the production of the vanadium-rich steel and iron products and has enabled South Africa to become a major player in the vanadium market (Cowey, 1995; Davenport, 2013).

HSVC's establishment and vanadium production, however, inspired ISCOR to push itself further and continuously grow its steel production. In 1967, ISCOR, which dominated Vanderbijlpark's economy, opened up a training facility for black workers, which comprised: an induction course, instruction in the Fanakalo language, pre-school education, safety instructions, training of instructors, and training of operators (Freund, 2018). On completion of that second development phase in 1969, ISCOR had considerably increased its productive capacity, producing in excess of 3,384 million tons of steel products and meeting three-quarters of the country's requirements (Davenport, 2013). In 1971, ISCOR started erecting an integrated steel works and long products mill at Newcastle (Venter, 2014). ISCOR expanded further after completing their 1971 project. According to Dondofema *et al.* (2017), ISCOR acquired ownership of Cape Town Iron and Steel (CISCO) in 1973 - it is worth noting that CISCO only came into existence in 1965.

Despite all the developments that ISCOR had made in the early 1970s, the corporation experienced some serious challenges. With unpredictable ups and downs, ISCOR incurred major debts in the 1970s and depended on government bailouts, noticeably the sale of the Sishen-Saldanha railway in 1976 (Freund, 2018). The untapped potential of the Sishen mine was unlocked in 1976, while it was only used as feedstock for steel production in the Vanderbijlpark works before 1976. According to Davenport (2013), it was only in 1976, with the commissioning of the Newcastle steelworks and, simultaneously, the Sishen-Saldanha railway line, which enabled ISCOR to transport ore to the coast for

the purposes of export, that production at the Sishen Mine began to grow exponentially. ISCOR's annual capital expenditure was devoted solely to maintenance and was reduced to about one-third of what it had been during the expansion phase in the mid-1970s when it had exceeded one billion rand per year (Jones and Muller, 2016). ISCOR's unpredictable ups and downs are seen clearly in the graph below, as there was a peak in steel production reached in 1981, before a sudden decline rocked the South African steel industry in 1982. The graph also displays the positive relationship between ISCOR's production and the production of the rest of the steel companies within the South African steel industry.

Figure 7.3: South African and ISCOR Crude Liquid Steel Production, 1967-1989 (millions of tons per annum)



Source: Freund (2018:211)

In 1989 South Africa had developed a steel industry of global scale where Iscor was the 15th largest steel group internationally in production terms, excluding the socialist economies, accounting for 1.3 per cent of global steel exports (Zalk, 2017). Following its privatisation in 1989, ISCOR continued to receive substantial government support in the 1990s and was the subject of a major government-sponsored restructuring strategy resulting in its acquisition to become ArcelorMittal South Africa in 2007 (Roberts and Rustomjee, 2009; Rustomjee *et al.*, 2018). The restructuring of ISCOR was an uncomfortable process because ISCOR embarked on a program of massive job cuts immediately after privatisation (Roberts and Rustomjee, 2009). It is noteworthy that ISCOR cut its workforce, including both mining and steel-working operations, from 58,000 in 1989 to 48,506 in 1994 (Zalk,

2017). Additionally, ISCOR was listed on the Johannesburg Securities Exchange (JSE) in 1989 (Venter, 2014). The substantial amount of government support in the 1990s improved ISCOR's production efficiencies (Roberts and Rustomjee, 2009; Rustomjee *et al.*, 2018). Essentially, ISCOR's listing on the JSE meant that investors and private companies that wished to invest in ISCOR would make an informed decision on the basis of ISCOR's value and industry performance.

7.2.2.3 THE AFTERMATH OF ESCOM AND ISCOR

The origin story of these two state-owned enterprises (SOEs), ESCOM and ISCOR, are associated with the pioneer Hendrik van der Bijl. Both SOEs required legislation in order to be shaped into existence and both corporations looked to be sole providers of electricity and steel respectively. When it came to restructuring of ESKOM in 1987, ESKOM had to forgo certain legislative powers, it also had to forgo prioritisation of providing electricity to a white minority and, subsequently, readjust in order to provide electricity for the entire nation. The 1994 democratic elections marked the end of the apartheid, which meant that ESKOM had a compulsory duty, as a SOE, to ensure that there was electricity for all people of South Africa. The generation of electricity in South Africa could not have been possible without the abundant supply of coal. With regards to electricity supply, the government signalled from the late 1990s that ESKOM should not invest in new generation capacity as private-sector investment would be facilitated, and then not opening the policy space for such investment, has been the fundamental reason for post-apartheid South Africa's electricity shortage (Creamer, 2022). In the 21st century, ESKOM continued to rely on large coal plants, even as new technologies became both cheaper and more flexible; it allowed the new investors in the coal mines to retain a higher share of the rents (Makgetla, 2022). The post-apartheid era came with the hopes that decisions that were made on ESKOM's behest were firm and informed. After its 2004 electoral victory, the ANC reversed its decision on partial privatisation of ESKOM and changed its focus from market reform to security of supply limiting private ownership of generation capacity to 30 per cent (Crompton and Matsika, 2022). The limitation of private generation capacity had dire consequences on ESKOM's overall generation capacity because ESKOM did not invest in new generation capacity and that is what led to South Africa's overall electricity supply. Today, South Africa faces consistent load-shedding and it is up to ESKOM to dig deep and find a sustainable and firm way of bringing back consistent electricity supply.

The story of ISCOR is one that started off well, but it had its own ups and downs. ISCOR inspired the creation of Vanderbijlpark, which later housed one of ISCOR's most productive steelworks in the country. The discovery of the Sishen Mine and the competition with HSVC pushed ISCOR to produce steel significantly and make South Africa rely on international steel companies a lot less. Furthermore, different steel projects were established in different parts of the country and because ISCOR was mainly providing steel for the domestic market, it had to produce voluminous amounts of steel to not

only provide for the market but to advance the mandate of South African industrialisation as a SOE. The South African mining industry also demanded a significant amount of steel to be produced. From 1932 to 1937, steel consumption had increased threefold (Scott, 1951). Steel production continued to rise throughout the twentieth century but production did run into some hindrances from time to time. Steel production took a long time to return to the peak reached in 1981, then ISCOR found itself saddled with substantial excess capacity, which forced it to curtail employment and expenditure (Jones and Muller, 2016). The privatisation of ISCOR reflected the culmination of efforts by its directors and management to secure increasing autonomy from the government (Zalk, 2017). In 1991, ISCOR gained full control of the USCO Steel Works and renamed it to ISCOR Vereeniging Works (Venter, 2014).

Formerly state-owned ISCOR's 2001 unbundling saw its steel operations transferred to transnational ArcelorMittal with the contractual right to iron ore supply on concessional terms from Anglo subsidiary Kumba that had acquired ISCOR's iron ore assets (Zalk, 2017). As from September 2004, LNM acquired more than 51 per cent of ISCOR Limited and the LNM subsidiary's name was changed to Ispat ISCOR Limited (Venter, 2014). Venter (2014) points out that Ispat ISCOR Limited was officially renamed Mittal Steel South Africa Limited in March 2005. In June 2006, Mittal Steel merged with Arcelor, creating ArcelorMittal, the largest steel company in the world, thus placing all Iscor operations under ArcelorMittal South Africa (AMSA) (Dondofema *et al.*, 2017). Despite its ups and downs, AMSA was the forefront of South Africa's steel industry but the overall statistics of basic iron and steel at the start of the 21st century are underwhelming. When global steel export prices dropped to a 10-year low in 2016, the South African government was pressurised to provide AMSA with significant support (Andreoni *et al.*, 2021). According to Mondliwa and Roberts (2022), the basic iron and steel for the period 1994 to 2019:

- Total employment growth (1994-2019): −3.3%.
- Share of total employment, by broad sector: (1994) 5.4%.
- Share of total employment, by broad sector (2019): 2.6%
- Value added growth (1994-2019): 2.3%.
- Share of total value added, by broad sector (1994): 3.8%.
- Share of total value added, by broad sector (2019): 4.3%

AMSA has been, and still is, the leader of steel production in the South African steel industry. It is the key engine of the steel industry and it is pivotal for AMSA to ensure that steel is produced at an optimal level because South African steel production is prominent in Africa. According to Venter (2014), South Africa is the major producer of crude steel in Africa, accounting for more than half of the continent's production and for about 1 per cent of the world's total steel production.

Manufacturing served as an industrial power and became a significant revenue source that aimed to make mining ("a wasting asset") a secondary revenue source. Fundamentally, the expertise of production having the know-how of manufacturing goods was essential to expanding industrial policy in twentieth-century South Africa. Apartheid had foundations, such as the Afrikaner nationalist movement, before it was instituted. The establishment of ESCOM and ISCOR added to economic inequality because the elite groups witnessed the country being given electricity and steel, respectively (Clark, 1993). On the point of economic inequality, the economic elite generated revenues that they profited from. The government's decision to intervene in the industry through ISCOR was designed to exploit South Africa's rich resources of coal and iron ore (Feinstein, 2005). Furthermore, ESCOM and ISCOR served as monopoly forms of market control.

7.2.3 A BRIEF HISTORY OF THE MANUFACTURING SECTOR IN SOUTH AFRICA

As outlined in Chapter 3, it is worth emphasising that the manufacturing sector is a strong driver of the South African economy and a prime example of the engine of growth hypothesis. The development of the South African manufacturing sector is integral to the study, because it maps out the effectiveness of industrial policy implementation in the twentieth century. The development of a viable manufacturing sector is often seen as the key to self-sustaining development, because there are constraints on the extent to which a society can develop through the export of primary products done (Schneider, 2000). The South African government was an active participant in economic decision-making, especially when it came to the manufacturing sector. Direct government intervention in the economy to promote local industries began with the installation of protectionist policies in 1881 by Paul Kruger, President of the Transvaal *Zuid Afrikaansche Republiek* (Schneider, 2000). The origin of the South African manufacturing sector relied heavily on the prioritisation of different industries. According to Iliffe (1999), manufacturing at the regional level originated from two directions: the gradual development of food-processing and consumer-goods industries, and the heavy industries supplying the gold mines with cement, chemicals, mechanical repair, and especially electricity through the world's largest coal-fired power station. According to Heydenrych (1985), a key highlight of the manufacturing sector at a national level was the construction of state-owned railways in the following places: Cape agricultural districts during the 1870s, Kimberley in 1885, and the Witwatersrand during the 1890s. Although built largely with imported materials, the railways provided a market for coal, created demand for electricity and steel, and gradually integrated the widely separated regional economies, concentrating heavy industry on the Witwatersrand (Iliffe, 1999).

According to Schirmer (2022), Johannesburg and Cape Town contained the largest and most diverse manufacturing activities, but industry had taken root in other parts of the country such as Makhanda

(formerly Grahamstown), Qonce (formerly King William's Town), Pietermaritzburg, Gqeberha (formerly Port Elizabeth), Vereeniging among others. The picture of the manufacturing sector is diverse in characteristics and it is not only limited to the construction of state-owned railways and the mining of precious metals. Schirmer (2022) asserts that the picture presented of manufacturing in the early 1900s is a collection of small, sickly firms, subject to the whims of the market and the state. In context to this statement, the onus was on the South African government to ensure that firms within the manufacturing sector became active roleplayers in promoting industrial policy, contributing to the sector, and enhancing economic performance. There were impediments preventing the sector from growing and becoming internationally competitive, but there were also many solid, dynamic firms driven by a determination to expand (Schirmer, 2008). On the eve of the First World War (1914-1918) manufacturing was still largely confined to the production of fairly basic consumer goods, produced by small-scale, labour-intensive processes, and of certain products - such as explosives and mining boots - required by the gold mines (Feinstein, 2005). Consequently, the manufacturing sector contributed only 15,000,000 British pounds to the country's GDP in 1913, less than 5 per cent of the total, compared with 60,000,000 British pounds from agriculture and 87,000,000 British pounds from mining (Feinstein, 2005).

The manufacturing sector began to show signs of expansion with the different industrial cities becoming active participants in the South African economy. In 1917, Port Elizabeth was labelled the "Liverpool of South Africa" due to its significant contributions to the relatively large boot and shoe industry (Schirmer, 2022). A company called British Shoe United Machinery (BU), which was based in Port Elizabeth, supplied local firms with shoemaking equipment (Schirmer, 2022). BU was an integral roleplayer in the shoe industry and went on to diversify its industry interests in order to properly contribute to the manufacturing sector. BU had set up an engineering plant in the 1930s to repair the machinery it leased to the shoe companies, and in the 1960s, BU expanded into general engineering jobbing to produce machine tools for motor companies (Adler, 1993). Port Elizabeth, which was an industrial city, was not only known for its involvement in the boot and shoe industry. Schirmer (2022) points out that the city's industrial development was further enhanced when Ford and General Motors established assembly plants. In fact, Ford choosing to open a plant in Port Elizabeth in 1926 followed General Motors' pattern of opening rival operations in markets where Ford's earlier penetration gave it a substantial competitive advantage (Adler, 1993). Another prime example of an industrial centre is Vereeniging. By the early 20th century, cities in the coal-rich valley such as Vereeniging, Vanderbijlpark and Sasolburg, became industrial centres with the establishment of electric power and water purification stations, engineering firms, plants for making steel, synthetic fuels and chemicals (Majozi and Veldhuizen, 2015). It is noteworthy that Vereeniging had two major industrial companies operating in the town during the 1920s, namely: the Vereeniging Brick and Tile Company and the Union Steel

Corporation (Schirmer, 2022). In a national context - private industry advanced during the 1920s, notably the garment industry, which employed many women, and motor-car assembly, one of many fields in which subsidiaries of overseas manufacturers provided a new source of entrepreneurship (Iliffe, 1999).

From 1912 to 1939, South Africa saw value-added private manufacturing rise from 8 million to 53.8 million British pounds (Ndzendze and Marwala, 2022). The manufacturing sector's rigidity and growth rested on its resources, its productivity and the legislation that protects it. The cornerstone of the state's efforts to develop a viable manufacturing sector was the Tariff Act of 1925 (Schneider, 2000). The Tariff Act of 1925 was fundamental to the development of the South African manufacturing sector. According to Innes (1984), the Tariff Act was successful in generating a resurgence of foreign investment in South Africa and a significant rise in the level of both foreign and mining investment in manufacturing production. Prior to the establishment of the Tariff Act, most profits from gold flowed overseas, and no capital was reinvested in local development (Clark, 1993). It is important to understand tariff protection did not come as a new phenomenon when the Tariff Act was established. According to Christie (1978), the first consolidated union tariff was introduced in 1914 and increased in 1915, to be altered at intervals thereafter. The Tariff Act solidified the protection of various industries within the South African economy - this protection was displayed through the rates of the Act. Tariff rates under the Tariff Act ranged from 20 per cent to 25 per cent, which was not high for a developing country at the time, but was substantial enough to make it quite profitable to produce for the domestic market (Schneider, 2000).

In the context of the Tariff Act, industries already protected from foreign competition by earlier tariffs were granted additional protection, and new industries were added to the list (Feinstein, 2005). The addition of new industries under the Tariff Act promoted authentic growth within the manufacturing sector. There was a 7.7 per cent increase in the number of manufacturing firms from the time tariffs were introduced in 1925 until the Great Depression in 1929 (Schneider, 2000). With the formation of ESCOM and ISCOR in the 1920s, the state-owned enterprises and sole providers of electricity and steel respectively, the increase in the number of manufacturing firms [which were protected by the Tariff Act] only meant that industrialisation in South Africa was set to become a reality. Since South Africa was still dependent for the most part on imported technology, the participation of foreign firms in the industrialisation process was vital (Schneider, 2000). The Tariff Act also gave a reconstituted Board of Trade and Industries a set of wide powers and advisory duties for the protection of the secondary industry, and the Board played a major part in the implementation of the civilised labour policy (Feinstein, 2005). The rise of value-added private manufacturing to 53.8 million British pounds in 1939 was due to industrialisation policies put in place during the interwar period (1919-1939) during which

South Africa's governments had enacted the establishment of ESKOM in 1923, the privately-owned African Explosives and Chemical Industries (AE&CI) in 1924, and ISCOR in 1928 (Ndzendze and Marwala, 2022). The table below is a representation of the development of the South African manufacturing sector in the context of employment and net output from 1944 to 1963. These statistics are inclusive of, but are not limited to, the productivity of ESKOM, SASOL, ISCOR and the mining industry.

Table 7.8: Development of Manufacturing, 1944-1963

	1944-5	1954-5	1962-3
Number of workers in '000s	361	653	830
Value of net output in Rand millions	276	852	1,442

Source: Houghton (1967:120)

The number of workers, in the table above, stood highest in 1962-1963 at 830,000 producing a value of net output standing at 1,442 million Rand. In this time period, there is positive growth in light of manufacturing development. The table below shows the annual growth rates of manufacturing growth and GDP growth in South Africa.

Table 7.9: Annual Rates of Growth in Manufacturing and GDP in South Africa, 1946-1990 (Constant 1990 Prices, by per cent)

	Manufacturing Output	GDP
1946-50	9.0	2.8
1950-55	7.5	4.9
1955-60	4.6	4.1
1960-65	9.8	6.3
1965-70	7.4	5.1
1970-75	5.9	3.6
1975-80	4.7	3.1
1980-85	-0.5	1.4
1985-90	1.4	1.7

Source: Schneider (2000:418)

In context to the table above, South Africa's manufacturing output and GDP have gone through inconsistent patterns of growth from 1946 to 1990. The lowest levels of growth for both manufacturing output and GDP were achieved between 1980 and 1990, just before the start of South Africa's post-apartheid era. Consequently, the start of the post-apartheid era meant that the 1994

government had to make key decisions to enhance economic and industrial policies to grow various sectors for long periods of time. The key points in the table above are the respective peaks of manufacturing growth and GDP growth between 1960 and 1965, before taking a negative turn from 1965 onwards. The 1970s represented a turning point when the developmental-state thrust lost rtaction as economic growth noticeably slowed (Freund and Padayachee, 2022). According to Schneider (2000), South Africa's economic crisis since the 1970's can be blamed on the following factors:

1. Insufficient attention given to the achievement of technological autonomy.
2. Insufficient efforts taken to make South African businesses internationally competitive.
3. Restrictions on black labour that limited mobility, training, education, and the size of the domestic market.
4. The high cost of skilled labour due to the civilised labour policy.
5. Domestic unrest generated by apartheid.
6. International sanctions and disinvestment generated by apartheid.
7. Costly state programs designed to make South Africa self-sufficient

It was also in the 1970s where assistance from the International Monetary Fund (IMF) to South Africa was greater than the combined assistance to all other African countries during that time (Freund and Padayachee, 2022). The borrowing of funds made it difficult for South Africa to realise authentic economic growth because the country now had to pay the IMF with interest and, simultaneously, rescue a drowning economy. Industrialisation in South Africa was generated by a symbiotic relationship among the state, state corporations, and the mining sector with the creation of huge state-owned enterprises, protection of domestic industries, passion of a guaranteed local market for new industries, and state repression of labour (Schneider, 2000). Essentially, this symbiotic relationship ensured that the different industries worked productively and in the same direction to attempt to recover the economy.

7.3 THE CREATION OF APARTHEID, THE STATE OF THE POLITICAL ECONOMY AND INDUSTRIAL POLICY DURING APARTHEID

It is important to look at how the nationalist apartheid movement was instituted and its ideologies forged into the political economy. Clark (1993:66) maintains that "the South African economy was isolated from the industrial networks which lowered European capital costs, its local supply of 'cheap' labour could compensate for higher costs". The cheap labour supply filled the cavity of capital costs, contributed to state corporations' growth, and solidified the industrial economy's state. In the context of the nationalist apartheid movement, the industrialisation limits were defined by using cheap labour and disregarding the rights and liberties of the cheap labourers. For ESCOM and ISCOR, the transition from cheap to mechanised labour proved beneficial in production processes; the corporations were set to thrive.

The nationalist movement of apartheid in 1948 was influential in solidifying the inequalities between white people, indigenous African people and people of colour. "The pattern of South Africa's 'development' hardened radically when the white supremacist National Party (NP) achieved a surprise victory in the 1948 election under the banner of Afrikaner nationalism" (Marais, 2011:15). The result of this election process solidified an already existing tower of white political and economic supremacy. The election of the NP to government in 1948 represented an electoral triumph of an alliance of class forces that were threatened by the weakening of segregation (Davies, 2021). The promotion of the apartheid movement was centred around, but not limited to, race, power and segregation. According to Davies (2021), the groups that were threatened by the weakening of segregation include the following: small-scale white commercial farmers (who depended on influx-control regulations to secure cheap labour) and the white working class (who saw weakened job colour bars as undermining their access to employment). Essentially, Afrikaner nationalism had the ambitions of aspirant bourgeois Afrikaners, who assiduously promoted an 'ideology through which Afrikaner capital developed' via an 'extensive network of cross-cutting organisations' (Marais, 2011).

The apartheid movement ensured that capitalism thrived hand in hand with substantial political control and promoted Afrikaner culture. The government controlled the South African labour market structure to maintain the economic and political inequality between whites, indigenous Africans, and other people of colour. The South African labour market had a great preference for white people. Lipton (1986:24) states: "in the private sector, the National Party (NP) supported white labour and tightened labour policy on the mines". The private sector guaranteed that white people would get high wages at the expense of black people; the civilised labour policy further strengthened this guarantee. Black people were disadvantaged further by implementing the Bantu Education System to secure white labour preferences. Racial segregation in South African labour markets was entrenched by the end of the nineteenth century and increased throughout the twentieth century, almost until the end of apartheid in 1994 (Mariotti, 2012). If they had finished their education at a secondary level or university, the civilised labour policy made it nearly impossible for black people to find stable employment. However, this did not prove easy because of the power dynamics that have existed over the twentieth century. According to Bhattacharya and Linn (1988), industrial policy objectives include employment creation, national economic independence, export development, and technological development. Fundamentally, the South African government prioritised the extension of the labour force by creating cheap labour through indigenous African people and other people of colour.

The South African government invested heavily in export and technological developments by using the labour force to attain resources through agriculture, mining, and infrastructure, amongst other sectors,

to grow the economy. In light of this, the apartheid economy maintained a high growth rate even before apartheid was founded. According to Moll (1991), the real GDP growth rates were recorded as follows: 4.2 per cent in 1920-1929; 4.6 per cent in 1929-1936; 3.8 per cent in 1936-1948; 4.4 per cent in 1948-1954; 3.9 per cent in 1954-1963; and 4.6 per cent in 1963-1974. According to Freund (2018), these economic growth rates are the highest the country has ever recorded in recent times. The country's strong economic growth was a representation of high productivity in the different sectors that kickstarted the existence of the South African economy. South Africa's GDP growth rates are reflected positively on other major indicators. Imports increased from 65.21 million British pounds in 1924 to 555.46 million British pounds in 1958, exports [minus gold] increased from 35.15 million British pounds in 1924 to 353.66 million British pounds in 1958, and the value of gold exports increased from 40.20 million British pounds in 1924 to 221.87 million British pounds in 1958 (Freund, 2018).

The apartheid-era industrialisation discourse aims to discuss how industrial policy operated throughout the apartheid era. According to Zalk (2014), the discovery of precious minerals kicked off a process of mining and mining-linked industrialisation. In context to this statement, mining proved to be a significant mark for building the South African economy and represented the growth of a developmental state. Additionally, mining was a key contributor to other economic sectors. In the twentieth century, the commonwealth of knowledge used by the English and the Afrikaners was crucial to establishing state-owned enterprises. The two state-owned enterprises that provided the most critical sets of inputs into downstream manufacturing, mining, and agriculture were privatised in the late apartheid era: Sasol (petrochemicals) in 1979 and Iscor (steel) in 1989 (Zalk, 2014). In essence, the privatisation of these enterprises allowed them to continue pursuing profits and attracting foreign capital. Fine and Rustomjee (1996:91) assert that "South Africa's industrialisation has been characterised as dominated by a 'minerals-energy complex' in two senses, both as a set of core sectors and as the predominant system through which capital accumulation has taken place. The accumulation of capital and resources has shaped the identity of a labour-intensive industrial policy in a historical context; industrialisation improved over time by inventing technologies that can efficiently produce commodities". In the context of this statement, ESCOM and ISCOR produced electricity and iron, respectively, and these goods play a crucial role in producing several goods that can be traded. In closing, this is a relevant matter that stands out when analysing the influence of the minerals-energy complex.

7.4 MINERALS-ENERGY COMPLEX (MEC)

According to Fine and Rustomjee (1996), the state of industrial policy in post-apartheid South Africa is constructed through the accumulation of capital and the minerals-energy complex in the twentieth century. South Africa's industrialisation is centred around the structure of the minerals-energy complex

(MEC) and is based on the growth of industries within the country. "The South African economy is a mixed economy (comprising both state and private ownership) - state ownership of the productive sector is not large in comparison with private ownership because it is concentrated in sectors associated with MEC" (Fine and Rustomjee, 1996:97). Consequently, the MEC shaped the economy in terms of the different ownership levels - private and public. Still, the MEC also developed the economy in a way that benefitted different elite groups - in this case, the English and the Afrikaners. Fine and Rustomjee (1996) assert that a disjuncture between economic and political power within the capitalist class came to a head in the 1930s - the Afrikaner fraction was holding state power, and the variously named English, mining or foreign fraction exerting economic control.

The MEC extends beyond its name - it focuses on minerals and energy and the challenges and benefits of using minerals and energy. Minerals and energy are associated with the performance of different economic sectors - such as engineering, mining, agriculture, chemicals, manufacturing and many other industries. The MEC must reflect the different power dynamics and roles of the state between the English and the Afrikaners and how they used their power over the native South Africans to develop the economy. Low-priced electricity was used as a policy instrument to create and expand a range of capital- and electricity-intensive industries that processed minerals and other primary resources into semi-processed commodities (Zalk, 2014). In essence, the apartheid state catered for the establishment of state-owned enterprises. The capital-intensive aspect of the MEC has proved to be beneficial as it grew the South African manufacturing sector significantly. Black (2022) asserts that the capital-intensive manufactures in total manufactured exports increased from 27.9 per cent in 1970 to 49.4 per cent in 1990. Although total manufactured exports have grown significantly, there has been a major hurdle that has created externalities. The MEC took a sizeable environmental toll on South Africa's natural state (Freund and Padayachee, 2022). The environment's health is still a pressing issue in the current context. The environment's health plays a pivotal role in both the economy and the livelihoods of people because a negatively impacted environment will not be feasible for both the economy and the people of South Africa. According to Greenpeace (2020), the economic impacts of air pollution from fossil fuels are important to consider in the context of Eskom's massive debt crisis, which amounts to over 400 billion Rand because the estimated total cost of air pollution from fossil fuels in South Africa is a staggering 94.7 billion Rand every year. In the context of this statement, it is clear that generating electricity is for the consumer's benefit. However, air pollution comes at a social and deadly cost to the livelihood of an ordinary individual.

7.5 SUMMARY AND CONCLUSION

This chapter discussed the historical context of South African industrial policy. The Treaty of Vereeniging set the pace for the political and economic elite of South Africa (the English and the

Afrikaners) to accumulate capital and invest their resources into growing their interests and, most importantly, the South African economy. A major economic occupation was agriculture, which became a dominant contributor to the economy. Other sectors, such as mining and manufacturing, became part and parcel of the economy after the significant discoveries of gold, diamonds and other precious metals. Mining became fundamentally important in enhancing sectoral performance because it activated mining-linked industrialisation. It is fundamental to understand the importance of coal and how it was integral to mining, electricity generation, and overall industrial activity. The chapter's main topic was apartheid, where Freund (2018) outlined that apartheid was not limited to power, race and segregation. Prior to the commencement of apartheid, the Natives Land Act of 1913 was created to disadvantage people of colour. The general purpose of this Act was for the white minority to occupy almost all the land in the country and use it for business, agricultural growth, the building of universities and corporations, and knowledge intensification. A critical part of this chapter is the establishment of ESCOM and ISCOR. Both corporations were created to supply electricity and iron, promote capitalism within the political and economic elite, and actively participate in capital-intensive industries.

This chapter also outlined the state of the apartheid political economy, where the significance of cheap labour was clarified. Cheap human labour in South Africa led to a disconnect across the industrial networks within the global economy. Using cheap human labour limited the prospects of industrialisation and promoted economic inequality between the native people of South Africa and the white minority. This chapter also outlined a brief history of the South African manufacturing sector and how it influenced GDP growth both positively and negatively. The economic crisis of the 1970s became a hurdle in South Africa's GDP growth, and South Africa's overreliance on the IMF made matters worse.

CHAPTER 8: THE SOUTH AFRICAN POLITICAL ECONOMY IN THE POST-APARTHEID ERA

8.1 INTRODUCTION

Chapter 8 focuses on the growth of industrial policy and the state of the South African political economy in the post-apartheid era. The demise of the apartheid regime meant that the onus was on the newly elected South African government to address past political and socioeconomic injustices simultaneously. The South African government had to uplift previously marginalised individuals, create and implement industrial policy initiatives centred around improving the economy, and promote an economy that gives gravitas to a constitutional and democratic South Africa.

8.2 ANALYSIS OF THE HISTORICAL CONTEXT OF SOUTH AFRICAN INDUSTRIAL POLICY

The industrial policy discourse is centred around the economy's prosperity or downswing - in this context, a vital component of a prosperous economy is international trade. The benefits of international trade for an economy are: making the economy competitive, generating revenue, creating job opportunities and enhancing productivity across different sectors. It is essential to reflect on South Africa's industrial policy operations during the apartheid regime and how these operations have persisted into democracy. The state promoted interests in mining and large-scale investments in electricity, fuel and chemicals - these interests were driven by the need to consolidate Afrikaner capital into large enough units to compete with English capital as well as the dependence on mining as a source of demand (Ashman and Newman, 2013). In the context of this statement, there was direct competition between the English and the Afrikaners. It was this form of competition that fueled the economy to grow. The crisis of apartheid in the 1980s precluded a state strategy for industrial promotion.

Consequently, the financial sector's development and expansion were fueled by surpluses from the MEC core that were trapped due to sanctions. In this way, the ANC government in 1994 inherited an economy with an industrial structure highly skewed towards capital-intensive industries connected to mining and a large and highly sophisticated financial sector (Ashman and Newman, 2013; Fine and Rustomjee, 1996). In essence, the strengths of the South African economy were associated with rigid banking structures, reliable financial services and the exploitation of precious metals. The South African government created initiatives to ensure that both the economy and the people of South Africa grew in prosperity. One such initiative is the Growth, Employment and Redistribution (GEAR) initiative. The GEAR program was based on redressing past injustices by promoting growth in economic performance and creating job opportunities. GEAR promised to reduce poverty and inequality via a

surge in economic growth (Streak, 2004). The purpose of GEAR was to ensure that the previously disadvantaged groups of people in South Africa would be in economically stable positions to improve the living standards of their households. The economic growth engine in GEAR takes the form of a demand stimulus led by a rapid expansion in private sector investment (Streak, 2004). The private sector investment aimed to generate revenue from these commodities: land, buildings and infrastructure, capital (human and physical), health care and education. Public sector investment can play a significant role in economic growth because it works alongside private sector investment. The role of public sector investment in the demand stimulus is small, with private investment being responsible for generating about 93 per cent of the total stimulus (Weeks, 1999).

Public sector investment is government-based and may generate profits differently than private sector investment can. Another critical form of investment is foreign direct investment. Foreign direct investment (FDI) triggers technology spillovers, assists human capital formation, contributes to international trade integration, helps create a more competitive business environment and enhances enterprise development (OECD, 2002). FDI was relevant to the GEAR programme because it considered creating job opportunities by using human capital and machinery. Additionally, the prioritisation of employment training and restructuring of wage policies within the GEAR programme opened avenues for potentially increasing employment. Streak (2004) states that job creation, vital to poverty and inequality reduction in the GEAR strategy, rests on three pillars: economic growth, institutional reform in the labour market, and government programs. GEAR enabled South Africa to strengthen its finances, lower its interest rates, and bring inflation under control (Francis *et al.*, 2022). GEAR's focus on economic growth paid off when the economy aligned with the program's vision. Inflation decreased from an average of 15 per cent in the late 1980s and early 1990s to an annual average of 5.2 per cent in 1999 (Francis *et al.*, 2022). At the start of the post-apartheid era, the South African government wanted to transform the political economy actively. South Africa experienced the end of apartheid in 1994 after its democratic elections, but the state of the economy was faced with numerous challenges. South Africa dealt with racial and economic inequality for over a century. In essence, the three pillars mentioned above that guided the creation of jobs had to be inclusive regarding employment equity and ensure the efficient production of goods and services within the government programs. Government debt decreased from 49.5 per cent in 1996 to 33 per cent in 2004 and 22.3 per cent in 2007 (Francis *et al.*, 2022). The decrease in government debt meant the government had more flexibility regarding expenditure allocated to public goods and the economy.

Competition and macroeconomic policies influence the country's political economy and economic performance. Roberts (2004) asserts that competition policy is vital in increasing competitive market pressures, leading to firms becoming more efficient and internationally competitive. Competition policy

is based on the fairness of companies and organisations within particular industries competing fairly and within their regulations. The macroeconomic policy discourse will be discussed later in the research context in conjunction with the Industrial Policy Action Plan and governmental policy frameworks. Based on the historical context of South Africa, there had to be a change in the creation and implementation of industrial policy. Orthodox laissez-faire economic reforms overwhelmingly dominated the economic policy between 1994 and 2007 but did not deliver significant investment (Zalk, 2014). In context to the previous statement, the purpose of laissez-faire is for the government to leave policy reforms in the state they were in (minimum or zero-government interference), hoping they will change the economy. As a result, the policies needed a heterodox approach to influence investment positively.

8.3. THE STATE OF THE SOUTH AFRICAN POLITICAL ECONOMY

This section discusses the demise of the apartheid system and the existence of a political economy defined by a democratic, post-apartheid South Africa. In 1994, South Africa had its democratic elections and became a democratic country led by the African National Congress (ANC). The demise of apartheid meant the newly elected government had to address the past inequalities experienced in the apartheid regime. The South African government implemented different initiatives to tackle these inequalities. In this section of the thesis, the focus is on the Growth, Employment and Redistribution Programme (GEAR), the National Development Plan (NDP) and the Industrial Policy Action Plan (IPAP). The purpose of these initiatives is to promote economic growth and socioeconomic development (GEAR), reduce poverty, unemployment and inequality (NDP), and create a rigid, cohesive industrial policy to bolster economic growth (IPAP).

Government programs worked alongside the institutional labour market reforms. Quality education was the key driver of human development. In sharp contrast, the division of quality education in South Africa has led to economic inequality and an uneven labour force. South Africa had its quality education reserved for the white population, whereas the African people (the majority of South Africa) were limited by inferior education. Inequality, as measured by the Gini coefficient, increased from 0.672 in 1993 and 0.685 in 1999 (Leibbrandt *et al.*, 2009). Educational inequality was defined as easy access to quality education for white people and the provision of inferior education to black people. The institutional labour market reforms were represented through the following Acts: the Basic Conditions of Employment Act of 1997, the Employment Equity Act of 1998 and the Skills Development Act of 1998. "The first Act laid down minimum working conditions and was directed at workers who fall outside collective bargaining. The second Act abolished discrimination in the workplace and provided for affirmative action by firms and the monitoring and reduction of wage differentials. The third Act provided the setting up of mechanisms to finance and promote skills development in the workplace"

(Streak, 2004:274). Looking back to the GEAR program, however, experienced challenges in its approach to combat inequality. "The GEAR strategy rests on the assumption that budget deficit reduction will kick-start growth via private sector investment responding to lower budget deficits and interest rates" (Streak, 2004:280). This statement is a criticism of GEAR that reflects the importance of practicality. Additionally, it was crucial for GEAR creators to consider fiscal policy, monetary policy, and macroeconomic policy before making such a big commitment. There was ambiguity concerning poverty and inequality reduction targets, and many conversations centred around job creation and fighting past injustices. The legacy of GEAR is not positively reflected as the whole point of it was to turn inequality on its head, but it had failed dismally. In the late 1990s, about 18 million people still lived below the poverty line, using an absolute measure of poverty pegged at R353 per month (Liebenberg, 2001). In essence, GEAR had not achieved what it hoped; a large portion of the population still lived in poverty despite efforts to create employment and reduce poverty and inequality.

The NDP is a long-term vision to grow South Africa economically, politically and environmentally using a holistic approach. Leadership, an active citizenry and effective government can help drive development in a socially cohesive environment (NDP, 2018:16). The NDP branches into heterodox economics; it discusses and analyses how South Africa can be grown in numerous aspects. The NDP recognises the need to tackle poverty as the government's priority due to South Africa's high inequality. The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030. "South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society" (NDP, 2018:14). In sum, the NDP takes on a holistic approach to building the South African economy. Furthermore, the NDP needs to consider strengthening public employment, such as the Expanded Public Works Programme.

The IPAP focuses heavily on the improvement of economic performance across all sectors. "South Africa's Industrial Policy Action Plan (IPAP) recognises the country's industrial financing incentive packages needed to be competitive in respect of their accessibility, costs, and conditions, to attract foreign direct investment" (DTI, 2018:71). The IPAP aims to grow the South African economy on the condition that the plans put on paper are practised. These constraints hold back the IPAP: lack of policy coherence and programme alignment, the concentration of ownership and control, high private sector input costs and electricity (DTI, 2018). In context to this statement, these constraints must be challenged for industrial policy to flourish. The challenges of these constraints need to be met with slight reliance on investing in the private sector and investment in job creation and education. In the context of IPAP, employment has been a staggering challenge. In order to maximise industrial policy success and enhance social and economic development, the NDP and the IPAP would be beneficial if

they worked in alignment. Davies (2021) asserts that NDP's broad vision had direct objectives - for example, increasing exports of diversified manufactures and stimulating a higher rate of industrial investment, which would require a high-impact IPAP.

In the face of deindustrialisation, the manufacturing sector has yet to deliver jobs to the labour force. South Africa's manufacturing employs 320,000 fewer people than in 2008; this decline in manufacturing employment arises not only because of the slow growth rate of output but also because the amount of jobs per unit of output needs to be higher (Kaplan, 2019). The slow growth rate of manufacturing output makes matters challenging for the economy because manufacturing was a significant contributor to the GDP during the twentieth century. In sharp contrast to the IPAP, which envisaged a growing manufacturing share, the manufacturing share of GDP has fallen from 16 per cent to below 12 per cent (Kaplan, 2019). The fall of the manufacturing share indicates that the strategies built within IPAP needed to be more stable to ensure manufacturing would prosper. South Africa's manufactured exports have grown far more slowly than its peers, and South Africa's manufactured exports are well below the country's potential (Kaplan, 2019). Additionally, manufactured export growth has made it difficult for the manufacturing sector to show any signs of growth. The lack of growth in the manufacturing sector begs the question: why has industrial policy planning failed to counteract manufacturing performance? The objectives and targets set out in the IPAP do not match the manufacturing sector's performance, so it is safe to conclude that the policy requires a rigorous review.

It is fundamental to analyse the industrial policy approaches taken at the beginning of the post-apartheid era. The ANC had an industrial policy initiative that they thought would work best for the economy. Fine (1997) states that a significant area for improvement in South African industry is the relative absence of productive capacity in intermediate and capital goods. It is worth noting that this will hurt employment and economic expansion because goods need to be produced optimally. The ANC-led government had embarked upon an ideologically-generated neoliberal policy, which would undermine the goal of redressing the gross inequalities of the apartheid period (Weeks, 1999).

The looting of public funds has fueled the social revolution in the post-apartheid state. Corruption has negatively influenced the state and has maintained the existing economic inequality. South Africa has been under fire due to state capture. State capture refers to obtaining, or capturing, state regulatory authority without democratic authorisation; a mix of politicians and private actors have gained influence over regulatory processes to serve private interests (Bracking, 2018). In essence, state capture represents the corrupt pursuit of self-interests that significantly impact the government's decisions. The looting of the state under Zuma's reign has cost South Africa an estimated $34 billion (Engel, 2021). The looting of public funds is a representation of stealing from the state. The looting of public funds signifies that

the political economy is seen as a means to an end. The political economy also needed to be fully committed to eradicating economic inequality.

8.4 SUMMARY AND CONCLUSION

This chapter presented an examination of the South African political economy. Examining the South African political economy is critically important because it gives direction as to whether or not South African industrial policy will succeed. This chapter also outlined the political and economic setting of South Africa. The democratic election of the ANC gave rise to the industrial policy initiatives that the government had to create and implement. The ANC-led government created GEAR and NDP, which focused on poverty-eradicating redistribution, and economic development, respectively. The creation of IPAP in 2007 created a need for industrial restructuring and an enhancement in sectoral performance, but the implementation of the IPAP was not precise as expected. Economic sectors participating in the global economy, and the impact of the IPAP, which will be discussed in the next chapter.

CHAPTER 9: INDUSTRIAL POLICY IN POST-APARTHEID SOUTH AFRICA

9.1 INTRODUCTION

Chapter 9 will discuss the initiatives, as well as the development, of South African industrial policy in a post-apartheid context. This chapter will critically analyse the Macroeconomic Research Group (MERG) Report. Furthermore, there will be an assessment of the origins and structure of the Industrial Policy Action Plan (IPAP) and how different IPAPs came into existence. The research will assess the 2007 IPAP and the 2018 IPAP. These documents will provide an outline of the challenges that were faced in terms of industrialisation and sectoral performance.

9.2 A CRITICAL ANALYSIS OF THE MERG REPORT

A vital area of the research context is the critical literature on industrial strategy in the post-apartheid period from 1994 to 2007. This critical literature refers to the path dependency debate and its relevance to the thesis. The path dependency debate talks about how South Africa ended up with consistent and continued support for capital-intensive and energy-intensive industrial sectors despite pronouncements to the industrial policy interventions for the following sectors: the clothing and textile sector and the automotive sector. The research will address path dependency in great detail throughout the IPAP discourse. The Macroeconomic Research Group (MERG) report, the Industrial Policy Action Plan (IPAP) and the National Industrial Policy Framework (NIPF) are documents that are integral to the state of industrial policy in South Africa. In this thesis section, the MERG report will be outlined in the context of the political economy and industrial policy discourses.

The MERG report is a document created to restructure the South African economy. According to Nattrass (1994), a vital strategy of the MERG report includes the implementation of a minimum wage. The performance of a minimum wage aims to reduce poverty levels and economic inequality in a country riddled with high inequality. The MERG assesses how the working class must earn as much income as possible to satisfy their household needs. The MERG has recommended the minimum wage to ensure that those who earn it can live well. The report recommends that the minimum wage be set at approximately two-thirds of the minimum living level for a household of five. The recommendation translates into a daily wage which exceeds that currently achieved by millions of farmworkers, domestic servants and participants in public works/drought relief programs (Nattrass, 1994). In light of this statement, this would prove problematic for employers because they risk incurring costs and retrenching a portion of their workforce. This setting aligns with the role of the IPAP - to advance work within economic sectors and the employment cluster. Simply put, the onus on the government to grow employment in all economic sectors will determine the progress of the South African economy.

Macroeconomic policy has become the epicentre of the post-apartheid South African economy through progressive initiatives, such as the Growth, Employment and Redistribution Programme (GEAR) and Reconstruction and Development Programme (RDP). Once in power, the ANC government implemented an orthodox macroeconomic policy which stressed deficit reduction and a tight monetary policy, combined with trade liberalisation (Weeks, 1999). Implementing a macroeconomic policy placed a lot of pressure on the country's economy to grow broadly. In the ANC government's context, they aimed to rebuild the country and expand the socioeconomic lives of the previously marginalised groups (in the apartheid era). The elements of macroeconomic policy shed light on the importance of social sciences in the political economy framework. Turok (1999:34) asserts that macroeconomic policy should entail five elements: "economic growth, fiscal policy, unemployment, inflation and balance of payments and human capacity development". The effects of the different macroeconomic policy elements impact individual and national development within the country. Therefore, it is essential to analyse these channels because they determine whether the government can eradicate economic inequality. The analysis of South African economic history offers guidance on the current thinking around the role of the state and the private sector in formulating policies that would ignite growth and help South Africa escape the economic stagnation of the past decade. The IPAP era (from 2007 onwards) is a critical discussion area in the more extensive argument. The IPAP focuses strongly on economic performance in the post-apartheid era and how the IPAP can take economic performance to new heights.

South Africa has achieved stable economic growth since 1994, accelerating to 5 per cent in 2005 and 2006 (DTI, 2007). Unfortunately, economic growth has been destabilised from 2007 onwards, reaching more lows than highs. In 2007, South Africa's economic growth went from 5.4 per cent to 3.2 per cent in 2008. In 2009, SA's economic growth took a further decline to -1.5 per cent and remained in the range of 3 to 0 per cent from 2010 to 2019 (World Bank, 2022). In closing, SA's economic growth has shown little promise in the last decade. Consequently, it is pertinent for the research to find the shortcomings of the IPAP and investigate why the economy has not been growing - like how it has grown modestly from 1994 to 2006 - in recent times.

9.3 OVERVIEW OF SOUTH AFRICA'S ECONOMIC PERFORMANCE

The economic performance of South Africa in the post-apartheid era has brought a sense of hope in terms of the country maintaining economic prosperity. However, much work needs to be done in different facets of the economy. According to World Bank (2022), South Africa's economic performance from 1994-2019 is reflected in the following major indicators:

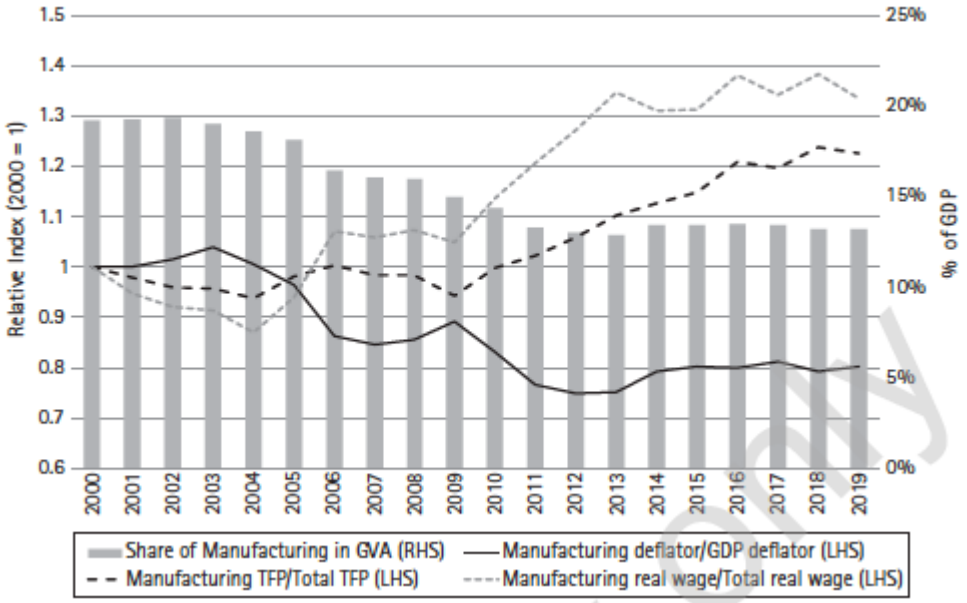
1. Income per capita: 12,999 US dollars.
2. Average annual growth in GDP: 2.7 per cent.

3. Average annual growth in manufacturing value added: 2.1 per cent.
4. Manufacturing value added as a ratio of GDP: 18 per cent.
5. Average growth in total exports: 2.9 per cent.
6. Total exports as a ratio of GDP: 29.9 per cent.

Based on the indicators above, it is also clear that the average annual growth in GDP is slightly less than the GDP growth rates of the apartheid economy (which are between 3 and 4.9 per cent). As a result, South Africa needs to improve domestically and globally. Since the start of the post-apartheid era, the manufacturing sector has also not produced substantial results to grow itself and other sectors that require (and rely on) manufacturing. When South Africa became a democracy in 1994, the manufacturing sector remained protected and relatively uncompetitive, dominated by several highly capital-intensive industries and concentrated amongst relatively few large firms (Black and Roberts, 2009; Mercer, 2020).

Manufacturing employment peaked at 1.79 million in 1981 and declined precipitously to 1.22 million in 2019 (Black, 2022). Consequently, the decline in manufacturing employment means that the manufacturing sector would suffer or grow minimally. In 2010 prices, employment per million Rand of manufacturing output declined from 3.1 in 1972 to 2.2 in 1990 and 0.8 in 2016 (Black, 2022). The decreasing numbers in the manufacturing sector make South Africa less attractive in collaboration with other countries, negatively impacting the sector's competitiveness domestically and globally. When assessing the export indicators, they indicate that South Africa needs to be stronger to become a powerhouse in the global economy and that the economy will find difficulty establishing a current account surplus. It is worth noting that the growth of the manufacturing sector has been very low relative to the country's GDP. The graph below depicts the marginal growth rates of the manufacturing sector and this indicates that there is a great deal of policy work that is improperly implemented.

Figure 9.1: Manufacturing relative to the aggregate economy, 2000-2019



Source: Burger (2022:898)

Based on the graph above, the share of manufacturing in gross value added (GVA) has been on a constant decline from 2000 to 2019. The manufacturing sector's contributions to the GDP have seen a decline from 20 per cent in 2000 to just below 15 per cent in 2019.

9.4 INDUSTRIAL POLICY ACTION PLAN (IPAP)

This section of the thesis will discuss the creation and implementation of the Industrial Policy Action Plan (IPAP) and the 10-year legacy it has set for the vision of industrial policy in South Africa. The objectives of different IPAPs (from 2007 onwards) will be discussed in great detail. The challenge is how the IPAP is on paper compared to its implementation. Moreover, it is imperative to assess whether or not the policies in the different IPAPs are based on best economic practices. The pursuit of successful industrial policy under the IPAP was defined by six key pillars: industrialisation, infrastructure, investment, innovation, inclusion and integration (Davies, 2021).

9.4.1 THE 2007 IPAP

The IPAP was first created in 2007 to combat industrial policy and sectoral obstacles. South Africa has implemented many industrial policy initiatives since 1994, but these initiatives have yet to produce a comprehensive statement of the government's approach to industrialisation and industrial policy (DTI, 2007). In context to this statement, the 2007 IPAP was to enhance industrial policy initiatives and formulate more critical plans than the government's industrial policy approach. Identifying sectors that are not performing at their best is fundamental to the success of the IPAP. South Africa's industrialisation process faces many constraints that have resulted in low manufacturing profitability,

low investment, low output and poor export and employment performance (DTI, 2007). In context to this statement, the country's poor economic results had to change positively. The government could do this by challenging the constraints that have inhibited effective policy implementation. The primary sector pointed out here is manufacturing, which has labour forces that vary in skillset. The availability of resources required in every facet of this sector differs significantly.

9.4.1.1 CONTEXT OF THE 2007 IPAP

The promotion of collaboration in achieving IPAP goals and objectives is highly relevant to the research conducted. Ongoing self-discovery processes with the private sector and other stakeholders will assist in identifying opportunities to grow and diversify manufacturing and services (DTI, 2007). A key challenge in the IPAP is policy implementation because the policy and the practice are distinct. The 2007 IPAP identified core sectors that have been supported since 1994; it is worth noting that the support of industries, particularly in a diversified economic base like South Africa's, must be considered. The adoption of the NIPF in 2007 was a key victory for the government, and the NIPF itself aimed to improve macroeconomic indicators in alignment with the goals of the IPAP.

Furthermore, the positive influence on macroeconomic indicators would provide hope for microeconomic indicators. The NIPF sets out the government's broad approach to industrialisation in the context of ASGISA and its targets of halving unemployment and poverty by 2014 through accelerated growth of at least 6 per cent from 2010 (DTI, 2007). The potential reduction of unemployment and poverty could grow the South African economy. The framework sets the industrial focus surrounding this possible achievement with clear objectives. The IPAP indicated that private credit extension for consumption purposes had expanded massively while that for fixed investment had declined to reach only 5.2 per cent of the total by 2008 (Davies, 2021). The NIPF's main objectives are as follows: to facilitate diversification beyond our current reliance on traditional commodities and non-tradable services, to contribute to industrial development on the African continent by building its productive capabilities, and to promote a broader-based industrialisation path (DTI, 2007). Furthermore, the NIPF aimed to intensify industrialisation, promote greater black industrialisation, and develop the country's marginalised regions (Morris *et al.*, 2022). In sum, the objectives of the NIPF aim to generate economic prosperity and encourage the economy to participate in trade with other countries.

When taking a closer look at the 2007 IPAP, it is vital to examine the performance of the economy's leading sectors. The 2007 IPAP recognised a few leading sectors that required attention to perform to the best of their ability: capital goods/transport equipment and metal fabrication, automotive and components, forestry, pulp and paper, furniture, plastic fabrication, pharmaceuticals and chemicals

(DTI, 2007). In the context of the manufacturing sector, the two sectors that will be analysed are automotives and clothing. Capital goods are fundamental to the livelihood and success of any organisation's production company within any economy. According to Samuelson and Nordhaus (2001:270), capital goods refer to "durable produced goods that are used as productive inputs for the production of goods and services". Capital goods are large contributors and significant assets to an economic sector. A prime example of a capital good is machinery, which produces goods traded in the economy.

The definition of foreign direct investment (FDI) needs to be outlined clearly to understand its role in industrial policy. FDI is defined as "a form of international inter-firm cooperation that involves a significant equity stake in, or effective management control of, foreign enterprises" (De Mello Jr., 1997:4). In context to this statement, FDI is not limited to the involvement of foreign enterprises due to the collaboration between the public sector and the private sector. FDI is also considered to encompass other, broader forms of non-equity cooperation involving the supply of tangible and intangible assets by a foreign enterprise to a domestic firm without foreign control (De Mello Jr., 1997). Industrial sectors are vital contributors to foreign direct investment, and these contributions help the economy compete globally, following the objectives of the IPAP. The 2007 IPAP states that the capital goods/transport equipment and metal cluster accounted for 11 per cent of manufacturing value added, contributed 18 per cent of jobs and about 2 per cent to the gross domestic product (DTI, 2007). This cluster of sectors has performed moderately with the available resources, but performance in this cluster has yet to reflect the engine of growth hypothesis. This cluster has underperformed for the following reasons: low expenditure on public infrastructure over the last 30 years, uncompetitive pricing of raw material inputs and lower-than-optimal mining investment (DTI, 2007).

The problem with having low-level public infrastructure is that it defeats the purpose of promoting industrialisation and enhancing industrial policy. On the other hand, high-level public infrastructure opens doors for the economy because the economy will industrialise and will benefit businesses and organisations that occupy and use this infrastructure. The NIPF outlines the consequence of having traditional and modern infrastructure as a prerequisite for industrialisation. Sufficient and competitively priced traditional and modern infrastructure (such as transport, electricity and water) and logistics systems are essential for a modern industrial economy - this is required for production efficiencies, the movement of goods and people, and for the cost-effective linking of people and businesses via the communication networks (DTI, 2007). There needs to be clear-cut coordination between the different types of traditional and modern infrastructure supplied [transport, electricity and water], and the sectors that need this infrastructure to ensure that there is cost-effectiveness in the production of goods and the provision of services.

When looking at the uncompetitive pricing of raw material inputs, a key consideration would have to be the monetary value and the type of raw material inputs used in the production processes. The input prices of raw material inputs such as steel, aluminium and scrap often need to be suitably competitive (DTI, 2007). Since inputs are not competitive, there is a need to upgrade or find reliable substitutes to ensure enrichment in the production process and competitiveness in terms of prices. The 2007 IPAP outlined the following recommendations to improve production processes: systems to support long-term product development, innovation, and research and development (R&D) must be strengthened - more robust coordination is required to match production capabilities to major planned investments, particularly in mining and infrastructure (DTI, 2007). The strengthening of production processes is pivotal to promoting industrialisation, especially in manufacturing, where the manufacturing sector is labour-absorptive. As much as South Africa needs to do the best it can to increase economic performance as a whole (primarily through the enrichment and subsequent implementation of industrial policy), the different sectors need to consider the global market. Innovation and technology can open doors in the global market through the domain of FDI, but this opportunity comes with challenges. Several industries are challenged to enter the global market without attracting the proprietary technologies involved via foreign direct investment (DTI, 2007).

9.4.1.2 THE AUTOMOTIVE SECTOR: 2007 IPAP

The sector that will be addressed is the automotive assembly and components sector. In 1995, the Government of National Unity (GNU) launched the Motor Industry Development Programme (MIDP), which sought and managed to achieve a significant change in production platforms (Davies, 2021). The MIDP reduced vehicle tariffs from 115 per cent to 65 per cent, reduced component tariffs, removed all local content requirements, and introduced a generous export incentive that essentially allowed vehicle assemblers (and component manufacturers) to earn import credits for exports, thereby allowing them to import duty-free products provided that they exported sufficient values of automotive products (Morris *et al.*, 2022). The automotive assembly and components sector contributed 7.4 per cent to the GDP in 2005, the automotive sector served as SA's leading manufacturing sector and became the largest attractor of foreign direct investment (FDI) in manufacturing (DTI, 2007). The MIDP sought to support the production of a few models at a high volume both for export and the domestic market (Davies, 2021). Moreover, the automotive sector is described as a sector that has an export-oriented GVC engagement and it is a sector that is import-intensive (Morris *et al.*, 2022).

The MIDP aimed for the South African automotive sector to compete within the global economy. Consequently, the MIDP lowered the tariff rate to 25 per cent and provided substantial rebates and financial incentives against export performance (Davies, 2021). As the leading sector around 2005, it is

essential to establish that there is no sole reliance on this particular sector but an improvement in economic production due to its significant FDI attraction. This sector's annual FDI between 2000 and 2005 more than doubled from 1.5 billion Rands to 3.6 billion Rands (DTI, 2007). The profit of the FDI will lead to enhanced productivity and capital growth for this sector. In essence, the components element of this sector will benefit because many products (leather, plastics, metal) are needed to make automobiles. The export performance of the automotive sector was strong between 1995 and 2005, and exports grew exponentially from 16,000 to 180,000 units (DTI, 2007).

Moreover, the significant increase in FDI is expected to come with several benefits, such as easy international trade, stimulation of economic development, an increase in employment, tax incentives, resource development, cost reduction, increased productivity and an increase in the country's income (Research FDI, 2021). As good as these benefits, not all were achieved in the context of the FDI increase. The automotive assembly and components sector has achieved substantial rationalisation and productivity growth. However, there have been some challenges: higher productivity growth needs to be achieved to match the growth rates of key competitors, there is insufficient local content present at the component end of the value chain, and the sector needs to shift to greater growth based on both domestic and export markets (DTI, 2007). Nissan, Toyota, Ford and General Motors joined Mercedes-Benz, Volkswagen and BMW in taking direct control of their South African operations and strategically repositioning them to take advantage of the MIDP (Morris *et al.*, 2022). Consequently, these car brands had the autonomy to determine how best they could enhance productivity and generate profits that would benefit both themselves and the South African economy.

The automotive sector positively complements the components sector, so these sectors need to enhance their respective manufacturing qualities to maintain high economic performance. The South African automotive sector is deeply engaged in GVCs and is undoubtedly the sector that currently offers tremendous potential for technological development, increasing skill intensity and upgrading (Morris *et al.*, 2022). Due to its synergies with several sectors (leather, textiles, plastics and metal), the automotive sector has a strong linkage pattern with the broader manufacturing sector - this has led to significant growth in component sectors such as leather seat covers, silencers, exhausts and catalytic converters (DTI, 2007). The automotive sector has showcased a significant increase in automotive production in the forthcoming years. By 2013, when the MIDP was replaced by the Automotive Production and Development Programme (APDP), it had supported an increase in automotive production from 376,000 units in 1995 to 550,000 units in 2013, creating employment for 100,000 people, with a further 200,000 employed in the retail and repair sectors (Davies, 2021).

Working with other countries fosters good relationships and helps uplift the African continent in every aspect possible, particularly in the economic realm. The facilitation of diversification gives an idea of how the economy is not limited to focusing on one sector or one particular group of sectors. The path dependency debate concerns the reliance on specific sectors in the economy. The approach that the IPAP implemented to avoid over-reliance on sectors went as follows: the government will single out sectors for particular focus, based on substantial growth and employment potential; potential for the diversification and export growth; and research and self-discovery processes having been completed (DTI, 2007). This approach, however, could only achieve so much success for particular sectors. In response to this matter, the IPAP implemented necessary action plans to ensure that investment in different sectors increases, reliance on these sectors is reduced, and these sectors gain independence to produce collaboratively with other sectors. A point of concern is the clothing and textile sector and the employment figures within those sectors. The clothing and textile sector worldwide is competitive, and the products made in this industry are highly demanded from a microeconomic perspective.

9.4.1.3 THE CLOTHING AND TEXTILE SECTOR: 2007 IPAP

Clothing and textiles are amongst the most labour-intensive industries in South Africa, employing approximately 127,000 people (11 per cent of total manufacturing employment) and contributing around 0.6 per cent to the gross domestic product [GDP] (DTI, 2007). It is vital to note that the competitiveness in this particular industry has proven to be arduous for the country. Even with this industry's international competitiveness, it must address the domestic market. The medium-long-term challenge for the industry is to undertake the upgrading and restructuring needed to become fully sustainable (DTI, 2007). Based on the production in the clothing and textile sector, there has been a strong call for government support to ensure that the industry's success is maintained. The National Economic Development and Labour Council (NEDLAC) found that there had been a discrepancy of 63 per cent in 2003 and 41 per cent in 2004 between the value of clothing exports to South Africa recorded by China and the amount recorded as imports by South African customs authorities, meaning that under-invoicing was rife (Davies, 2021).

The integrity of the industry's success required an adaptation of current support measures, such as the Duty Credit Certificate Scheme (DCCS), by the government but also a firm commitment by business and labour to make the necessary adjustments (DTI, 2007:23). However, the establishment of the DCCS did not guarantee any solution. Conceived as a way to reward export performance, the DCCS allowed firms to claim export credits that could be redeemed against duty-free imports (Davies, 2021). In sum, the challenges had to be confronted to ensure that the industry maintains and increases its economic performance, contribution to the GDP and competitiveness. The DCCS intended to encourage the acquisition of competitiveness-raising technology; most Duty Credit Certificates were

sold to clothing retailers, who used them instead to import finished products, adding to the challenge of surging imports (Davies, 2021). Consequently, the surge in imports led to an increase in the current account deficit, which meant that imports exceeded exports. The clothing and textile sector did not flourish the way the automotive sector did and experienced a period of decline. Between 1996 and 2005, clothing and textile factories shed more than 85,000 jobs as total employment fell from 228,053 in March 1996 to 142,863 in March 2005 (Davies, 2021).

9.4.2 THE 2018 IPAP

It is crucial to note that the 2018 IPAP contains a systematic self-critique of the IPAP years (2007 to 2018). The industrial policy aims to increase the economy's ability to produce more complex and high-value-added products with greater efficiency (DTI, 2018). The 2018 IPAP reinforced the thrust of trade policy, outlining the developmental trade policies envisaged to support and facilitate South Africa's revised industrial policy strategy. Dr Rob Davies, a former Minister of Trade and Industry, stated that the IPAP focuses on basic economic service delivery, institutional coordination, private sector partnership, industrial policy in the global context, and radical economic transformation (DTI, 2018). The purpose of the IPAP is centred around the achievements of economic stability and service delivery. Basic economic service delivery is a crucial springboard to the fruition of the plans and objectives within the IPAP. In the context of basic economic service delivery, Dr Davies states that state-owned companies must play a key enabling role in support of the general economic and industrial effort by providing competitive and efficient electricity, rail and port logistics (DTI, 2018). In an executive summary of a Trade and Industrial Policy Strategies (TIPS) research paper, Neva Makgetla points out South Africa's industrial policy challenges. She lambasts the electricity system by pointing out its flaws. Industrial policy in South Africa faces the challenge of overcoming profound inequalities while building a more dynamic, productive and competitive economy; the current disruption in the electricity system provides both opportunities and threats. The disruption in the electricity system arose from the failure of Eskom to adapt its business model to the slowdown in the mining value chain; growing contestation over coal rents; and the emergence of new, more competitive and cleaner electricity sources (Makgetla, 2021).

9.4.2.1 CONTEXT OF THE 2018 IPAP

The investment in different resources and factors of production allows for potentiality in sector-specific growth. Institutional coordination prioritises the government's involvement in industrial policy construction and implementation. Industrial policy in the global context touches on South Africa's competitiveness across different sectors of the world economy. A vital example of this is the automotive industry. In the case of the automotive sector, SA has made enormous progress in establishing a globally competitive, export-rich automotive sector. Despite the automotive sector's

long-standing production in South Africa, the domestic sector remains a marginal player globally, contributing only 0.64 per cent of global vehicle output in 2018 (Morris *et al.*, 2022). Nevertheless, the global market requires constant innovation and creativity, so efforts in the automotive sector must stand on (DTI, 2018). In context to the previous statement, it is clear that there is an excellent level of adaptability in the automotive sector and a significant promotion of healthy competition domestically.

Regarding the government's partnership with the private sector, it is crucial to partner with corporations that share mutual interests in growing the economy. The automotive sector has not seen significant growth to become a powerhouse in the global economy, and it has only improved minimally at a domestic level. Not only is the country's total production output of around 600,000 units (in 2018) insignificant globally, it has only increased slightly since 2005 (Morris *et al.*, 2022).

9.4.2.2 THE AUTOMOTIVE SECTOR: 2018 IPAP

In the context of the 2018 IPAP, the automotive sector remains a sector that can influence the economy positively in terms of industrialisation and improving the strength of its GVCs through GVC upgrading. The automotive sector contributes 33 per cent to the manufacturing GDP and about 6 per cent to the overall GDP, and it produces approximately 600,000 vehicles per year, thus creating 113,000 jobs (DTI, 2018). As stated earlier, the automotive sector is export-oriented. Therefore, the impact of exports plays a role in whether this sector is doing well globally. Exports in this sector (2018) are valued at 171 billion Rand (DTI, 2018). The automotive sector has experienced a rapid increase in exports, with its share of manufactured exports increasing from 4.3 per cent in 1995 to over 20 per cent in 2019 (Black, 2022). Exports have doubled in this period, which has also seen 45 billion Rands worth of investment by most of the world's leading global vehicle manufacturers – Mercedes-Benz, Toyota, BMW, Ford, and Isuzu, among others (DTI, 2018).

Although the automotive sector has grown significantly in exports, the sector has produced high import penetration ratios in the last fifty years. Kennedy and Thirlwall (1979) define an import penetration ratio as a ratio of imports to domestic output. According to Black (2022), the import penetration ratios for motor vehicles stood as follows: 32 per cent in 1972, 24.2 per cent in 1990 and 65.1 per cent in 2016. Consequently, an import penetration ratio of 65.1 per cent means that imports are quite high for motor vehicles and, therefore, pose a threat to South Africa's competitiveness in the global economy. This perspective is also reflected in the manufacturing sector, where the current account is negatively impacted. Although the exports of manufactures have increased at a pedestrian pace, the rapid increase in import penetration coupled with modest export growth has led to the manufacturing sector recording a 300 billion Rand trade deficit in 2017 (Black, 2022; DTI, 2018). In sum, the automotive

sector needs to utilise its resources better and enhance its GVCs if it wishes to be a mainstay in the list of South Africa's top sectors.

9.4.2.3 THE CLOTHING AND TEXTILE SECTOR: 2018 IPAP

The clothing and textile sector has performed relatively well under the 2018 IPAP. As a result of the conditional support measures offered under the Clothing and Textile Competitiveness Programme (CTCP), the sector employed 95,000 workers, contributing 8 per cent to manufacturing GDP, producing 24 billion Rand in exports and 2.9 per cent to overall GDP (DTI, 2018). The establishment of the CTCP has given this sector a drive to improve and become a significant participant in the global economy. Manufacturing value addition for companies receiving the incentive has grown by 60.8 per cent and productivity by 22.3 per cent - two national and eight regional clusters have been established, providing a platform for cooperation between government, labour and the textile and apparel manufacturers and retail value chains (DTI, 2018).

The import penetration ratios for the clothing and textile sector were recorded as follows: 16.4 per cent in 1972, 8.1 per cent in 1990, and 58.3 per cent in 2006 (Black, 2022). Like the automotive sector, the clothing and textile sector has a high import penetration ratio. Therefore, both sectors should push to have a low import penetration ratio and bolster their export growth rates. According to the World Bank (2022), the share of manufacturing value added in the clothing and textile sector has decreased from 7.8 per cent in 1996 to 1.8 per cent in 2018. The performance of the clothing and textile sector has caused the economy to slow down that is at an already slow-growing pace. This decrease in manufacturing value added needs to be considered a challenge that the government is aware of. As shares of total clothing and textile output, clothing increased marginally from 38.6 per cent in 1995 to 39.1 per cent in 2019, whereas textiles decreased marginally from 61.4 per cent in 1995 to 60.9 per cent in 2019 (Chitonge, 2022). Essentially, the onus is on the government to prioritise this sector in the IPAP because the decline in the sector also threatens employment in the sector and in the country as a whole. Black (2022) states that the clothing and textile sector was Eastern Cape's largest manufacturing employer, with 26,000 workers in 1996, equal to 19.8 per cent of the manufacturing labour force in the province. However, by 2012, employment had decreased to 10,700 workers, making up 11.8 per cent of a much smaller manufacturing labour force (Kaplan *et al.*, 2014).

9.4.2.4 PROGRESS OF THE IPAP

One of the fundamental principles that the government is drawing on is to form conditional collaborative partnerships with private sector companies that show substantial commitment to invest in areas aligned with policy objectives (DTI, 2018). Consequently, private sector companies pursue the goal of achieving profits. In the realisation of these profits, the government will achieve their policy

objectives, and the sector that the private sector company is involved in will thrive significantly. The 2018 IPAP highlights strong constraints that have hindered progress in the last decade and will be addressed in detail within the thesis. "Lack of policy coherence and programme alignment, extreme concentration of ownership and control, high private input sectors, water supply and availability, port tariffs, electricity, transports and logistics, customs are key constraints in the IPAP" (DTI, 2018:51-53). The IPAP focuses on what has been achieved in the last decade and what more can be done to ensure every sector within the economy performs optimally. In the research context, the purpose of analysing the IPAP is to identify the problems that extend beyond the specified constraints. It is important to look at critical sectors and whether they have achieved their targets from the previous IPAPs. Here, there will be a focus on one objective from the 2007 IPAP, which stated that unemployment would be halved by 2014 (DTI, 2007).

The progress of the IPAP has brought economic successes, but these successes have come with obstacles across different sectors within the South African economy. The manufacturing sector has delivered on most of its objectives within the IPAP. Davies (2021) asserts that the manufacturing sector recorded successes directly from the IPAP programs. These successes include:

1. Investments reached a total of 25.7 billion rands in the automotive sector, supporting around 300,000 jobs, with the APDP to embrace bus bodies, medium and heavy vehicles and minibus taxis.
2. The retention of 67,000 jobs and the creation of 7,000 new jobs in the clothing, textile, footwear and leather industries had lost 45,000 jobs between 2000 and 2010. The Clothing and Textile Competitiveness Programme provided government support to the clothing and textile sector to participate in competitiveness-raising initiatives.
3. Fundamental advances in metals fabrication industries, driven by a combination of infrastructure spending and localisation programs.
4. Significant investments in the agro-processing, household consumer goods, television manufacturing and pharmaceutical sectors, among others.
5. The film rebate programme supports a fourfold increase in the value of film productions.

The success mentioned above that Davies (2021) outlined indicates that the IPAP catalyses economic growth. However, it did not achieve all its objectives aligned with key action plans.

9.4.2.5 IPAP AND THE SOCIOECONOMIC CONTEXT

During the research context, the 2007 IPAP noted a decline across employment shares in different sectors, which proved to be a constraint in achieving the ultimate goal of halving unemployment. According to the World Bank (2022), South Africa's unemployment in 2007 stood at 26.5 per cent.

However, the country's unemployment rate in 2014 stood at 24.9 per cent. Poverty did not decrease as the 2007 IPAP predicted, but it increased. When measuring poverty in South Africa (with the unit of headcount ratio at 2.15 US dollars per day as a percentage of the population, the difference is as follows: 18.7 per cent in 2008 and 20.5 per cent in 2014 (World Bank, 2022). The increase in poverty meant that the economic livelihoods of people in South Africa and the 2007 IPAP would have to implement strategies to combat poverty.

9.5 AN OVERVIEW OF IPAP

The growth of the IPAP from 2007 to 2018 has provided direction on how well-developed South African Industrial Policy is. The 2007 IPAP failed in the implementation of its strategies. Consequently, it did no achieve the goal of halving unemployment and poverty. Furthermore, it needed to articulate how it would increase employment and decrease poverty. The National Development Plan 2030 is a macroeconomic policy that discusses reducing poverty, inequality and unemployment by 2030 without directly setting any specific numbers for the reductions. The overarching goal of such a policy is to ensure that South Africa's economy is at a high standard in the global landscape and a better place socioeconomically. The National Development Plan aims to eliminate poverty and reduce inequality by 2030; South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society (National Planning Commission, 2012:24).

Davies (2021) asserts that the experience of the IPAP between 2010 and 2014 indicated that industrial policy can and does, succeed if it is well-designed, adequately resourced and informed by robust and constructive stakeholder dialogue. This experience is highlighted by the domestic success of the automotive sector and the significant success of the manufacturing sector. There were a few hurdles present such as the marginal contribution of the South African automotive sector to the global economy and the economic decline of the clothing and textile sector. Economic growth does not exist without obstacles, but the IPAP requires rigidity and intent to be elucidated in its key action plans, especially regarding growing the economy in a socioeconomic context.

9.6 SUMMARY AND CONCLUSION

This chapter presented an analysis of the MERG Report and an examination of the IPAP's 10-year legacy. A discussion was provided on the 2007 IPAP and the 2018 IPAP - each of which provided contextual problems, successes and challenges in implementing the industrial policy.

This chapter also outlined the performance of specific sectors within the different IPAPs, the significance of sectoral performance, and the limits of industrialisation within the different IPAPs.

There was an identification of opportunities and threats within the objectives of the IPAPs, and the successes and failures would be reflected in the key action plans and performance indicators.

From the literature, it was noted that research and development (R&D), foreign direct investment (FDI) and high-level public infrastructure were key opportunities that needed to be exploited to succeed at executing the objectives of the IPAP. Moreover, these key opportunities must coordinate coherently. The modernisation of technology and infrastructure is a non-negotiable prerequisite for industrial restructuring. In the current context, there is a consistent issue of load shedding, which has been a constant threat to the South African economy because electricity not only serves as a necessity to the public but is fundamentally crucial to the production of goods and services.

CHAPTER 10: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

10.1 INTRODUCTION

Chapter 10 will provide a summary of the research. This chapter will address the study's main findings and how these have addressed the overarching research goal. Furthermore, it will outline the limitations of the study, and it will provide a set of recommendations that South Africa should consider to enhance industrial policy.

10.2 SUMMARY OF FINDINGS

From the research conducted, it is clear that South Africa has prematurely deindustrialised, which has led to the country being unable to move out of middle-income status. The definitions of industrialisation and deindustrialisation have given insight into the shortfalls in South African industrial policy. The discussion of the engine of growth hypothesis and global value chain upgrading were critical because they addressed the production capabilities in the research context. The engine of growth hypothesis was crucial to the study because it is labour-absorptive, and it drives the manufacturing sector's performance. The manufacturing sector in itself is a sector that is interlinked with different sectors, such as agriculture, clothing and textile, automotive and components, among others.

Furthermore, the research has established a positive relationship between premature deindustrialisation and the middle-income trap. The overarching research goal was to understand why South Africa failed to prevent premature deindustrialisation. The critical point to address was the achievement of the overarching research goal.

The two case study countries, Brazil and Korea, formed part of the research. The research focuses on these countries due to a comparative analysis to see what South Africa can do to transform their industrial policy. Brazil is rich in various resources and, consequently, used these resources to bolster economic growth. Brazil's resource richness meant that it could diversify growth in different sectors to grow its economy. The pivotal parts of the Brazilian economy and industrial policy are the import-substitution industrialisation, the protectionist regime, Embrapa, the PITCE, the PDP, the PBM, quasi-stagnation, and the middle-income trap.

According to Czarnecka-Gallas (2013), the technological policies of import-substitution industrialisation (ISI) were accompanied by attempts to improve human capital by eradicating illiteracy, increasing the number of skilled workers and promoting secondary and tertiary education. ISI's strategy was to align with the protectionist regime, whereby Brazil would grow its economy abundantly without relying on other countries. Brazil's protectionist government witnessed the creation of state-owned

enterprises that currently play an integral role in Brazil's economy. These state-owned enterprises are the Brazilian Development Bank [BNDES] (1952), Petrobras (1953), Usiminas (1956), Eletrobras (1962) and Embraer (1969). The establishment of Embrapa has become a triumph for the Brazilian agricultural sector and the economy. Embrapa promoted science-based agriculture, established the sector's modernisation, and enhanced research and development (R&D) falling under the same sector. This institution [Embrapa] did not become an overnight success because of its genuine efforts to solidify its vision in Brazilian industrial policy. Embrapa worked with numerous stakeholders (the media, politicians, and the government) to ensure it remained devoted to improving and expanding R&D within the Brazilian agricultural sector.

Brazilian industrial policy in the 2000s was defined by three strategies that followed each other: the PITCE, the PDP and the PBM. The PITCE focused on industrial development and implementing strategies to help Brazil industrialise. The PDP was based on GDP growth, devising strategies to make Brazil a global economic powerhouse and promoting healthy competition among other countries. The PBM aimed at fixing the problems that the PDP had, but it mainly focused on achieving sustained economic growth. In essence, these strategies made genuine efforts to improve industrial policy and enhance economic growth. However, these efforts could only go so far in achieving their goals. Therefore, the onus is on the Brazilian government to analyse the strengths and weaknesses of each strategy and use those strengths and weaknesses in future economic planning. When assessing the ability of the middle-income trap, the Brazilian economy has made efforts to combat the middle-income trap. However, these efforts proved fruitless because the economy was quasi-stagnated. A lack of economic investment, deindustrialisation, and a productivity reduction made up the critical causes of Brazil suffering from the middle-income trap.

The case study of Korea is significant because it is a country that has undergone rapid industrialisation. Korea is a country that has taken bold steps to grow its economy, and in doing so, it went on to ensure that its growth remained on an upward trajectory. The leadership of Korean President Park Chung Hee proved to be a positive determinant because he inspired economic growth with intent. The pivotal points of the Korean case study are the *chaebol*, the automotive sector, the HCI drive and POSCO. The growth of the *chaebol* was inspired by its management. The *chaebol* are conglomerates that comprise multiple businesses that are all managed by traditional families. The *chaebol* is portrayed as an organisation created and managed by the state for national interests, with President Park as the CEO (Baik *et al.*, 2011). In context to this statement, President Park let the CEOs of the *chaebol* lead, and he only led the *chaebol* in the political sphere.

The *chaebol* became a significant source of economic innovation after getting funding from the Economic Planning Board. Additionally, President Park decided to nationalise all commercial banks in Korea so that the *chaebol* could borrow as much money as possible to realise their growth as large conglomerates. Although funding was readily available for the *chaebol*, it created debt for some *chaebol*. The goal here was for the *chaebol* to grow and develop fully, become economic powerhouses in their own right, and later contribute to the Korean GDP. A few examples of successful *chaebol* include Hyundai, Ssangyong, Samsung, Lucky-Goldstar (LG), and Daewoo, among others.

Korea's automotive sector started as a humble sector before Hyundai Motor Company (HMC) began to grow. Hyundai's Pony Project became a huge success for the Korean economy when it sold models of the Pony in large quantities and increased the company's market share. HMC continued to grow after establishing subsidiaries with high-capacity production plants, Hyundai Motor India (in India) and Hyundai Motor Manufacturing America (in the United States of America), which then added to HMC's global production network.

The heavy and chemical industries (HCI) drive was integral to the growth of the manufacturing sector and the different subsectors that specialise in producing heavy machinery, metals and chemicals. Like the *chaebol*, the HCI drive had government support and extensive funding from the National Investment Fund (NIF). The HCI drive accumulated large loan shares in the Korean GDP, leading to a high debt accumulation. Nonetheless, the HCI drive became a success as it also became the leading export industry in Korea. Upon completion of the HCI drive, the top 30 *chaebols* were responsible for 41 per cent of total manufacturing sales by 1981 (Cho and Kim, 1995). The success of the HCI drive was based on the unbiasedness of targeting different sectors and not isolating resources to one specific sector.

The HCI drive also paved the way for the Pohang Iron and Steel Company (POSCO) to succeed. POSCO was established with rigid support and reparation funds from Japan. POSCO specialised in steel and looked to become a critical contributor to high-quality steel production. One of the reasons behind Korea's emphatic growth and industrial transformation was that the Korean government prioritised and promoted the steel industry in the country's early road to economic development (Cho and Kim, 1995). POSCO collaborated with Japan to ensure that it optimised productivity - it also learnt from its teacher and competitor, Nippon Steel Company, to grow from strength to strength.

The historical context of the South African industrial policy is integral to understanding the current context of South African industrial policy. The critical points of the research under this topic are the treaty of Vereeniging, the Natives Land Act of 1913, the establishment of ESCOM and ISCOR in the

1920s, and the minerals-energy complex. As Freund (2018) outlined, the focus of apartheid should not only be limited to race and segregation. The treaty of Vereeniging sparked the journey to the existence of the South African economy. After the second Anglo-Boer War, the treaty between the English and the Afrikaners became a stepping stone towards establishing a political [and economic] elite group and a power divide between the English and the Afrikaners. The English prioritised the attainment of mining and foreign control, whereas the Afrikaners prioritised state power (Fine and Rustomjee, 1996). In addition to the divide of power and the establishment of the elite group, the 1913 Natives Land Act led to the entirety of South Africa's land being controlled and owned by the elite. Consequently, this meant that the natives of the country could not use the land they once owned for agriculture and livestock farming.

In contrast, the elite used land to build a commonwealth of knowledge in the form of universities and learning institutions only for the English and Afrikaners. Subsequently, this grew the educational and knowledge divide between them and the natives. The building of banks, businesses and state-owned enterprises ensured that the English and the Afrikaners grew the economy for their benefit, industrial policy growth, and industrialisation promotion.

ESCOM and ISCOR became specialists in producing electricity and steel, respectively. The trajectory of the South African economy seemed to take a positive turn. The discovery of precious minerals opened a pathway for South Africa to establish a mining sector. The initiative of mining and mining-linked industrialisation has led the apartheid-era industrialisation discourse. Furthermore, Fine and Rustomjee (1996) have clarified this discourse by defining it as the minerals-energy complex. The minerals-energy complex meant so much more than just minerals and energy; this complex assessed the optimal use of minerals and energy to accumulate capital that would benefit the South African economy. The assessment of the 2007 and 2018 IPAPs presented a structure of how industrial policy is structured and implemented in a South African context.

Essentially, the 2007 IPAP was created to enhance industrial policy, identify underperforming sectors and devise strategies to ensure these sectors significantly contribute to the economy. Furthermore, the IPAP acted as a blueprint for South Africa to strategically place itself as an industrialising pioneer within the African continent. The sector that was analysed in the assessment of the 2007 IPAP was the automotive and components sector. The automotive and components sector became a key contributor to the GDP before establishing the 2007 IPAP and attracted much foreign direct investment. This sector was only a piece of the puzzle because South Africa had to improve its economy holistically.

The 2007 IPAP set a goal of halving unemployment and poverty by 2014, but this was not achieved. South Africa's unemployment in 2007 stood at 26.5 per cent, but the country's unemployment rate in 2014 stood at 24.9 per cent (World Bank, 2022). Consequently, this meant that the 2007 IPAP failed to achieve this goal. The failure to halve unemployment only meant that poverty was not reduced because there was no significant change in the unemployment rate. When measuring poverty in South Africa (with the unit of headcount ratio at 2.15 US dollars per day as a percentage of the population, the difference is as follows: 18.7 per cent in 2008 and 20.5 per cent in 2014 (World Bank, 2022). The 2018 IPAP highlights strong constraints that have defined the systemic issues that have prevented the government from enhancing industrial policy. These systemic issues are: "lack of policy coherence and programme alignment, extreme concentration of ownership and control, high private input sectors, water supply and availability, port tariffs, electricity, transports, and logistics, customs are key constraints in the IPAP" (DTI, 2018:51-53). The future of the IPAP rests on solving these issues because the 2018 IPAP focused on the government collaborating with the private sector.

Premature deindustrialisation and the middle-income trap have become critical defining concepts of South Africa's unequal economy. South Africa has been unable to move out of middle-income status despite the efforts of the IPAP to turn the economy. Thus the attempt to overcome the middle-income trap has not come to fruition. Structural adjustment programs have been introduced to take middle-income countries to higher heights in economic growth, but they have left the beneficiaries in large amounts of debt. In terms of the middle-income technology trap, South Africa has suffered from three structural challenges that have kept them from preventing premature deindustrialisation: breaking into globally concentrated industrial production; linking up with global value chains while linking back with local production systems; and keeping pace with technological change (Andreoni and Tregenna, 2020).

10.3 LIMITATIONS OF THE STUDY

The study was limited to the core focus of the overarching research goal. Because the research was publicly available data, the data comprises journal articles, working papers, policy documents, and books. Therefore the research had to be restricted to avoid broadening the overarching research goal and the sub-goals.

10.4 POLICY RECOMMENDATIONS

The research that has been conducted has provided a great deal of information that has given direction to South African industrial policy. The comparative analysis of Brazil, Korea and South Africa has indicated what South Africa should do to devise strategies to eliminate premature deindustrialisation, bolster the IPAP, and avoid the middle-income trap. Here are the policy recommendations:

- The South African government should consider being firm, direct, and detailed in reducing unemployment and poverty or increasing any major indicator (for example, the manufacturing share of the GDP). This approach can include a detailed key action plan or framework that has steps that the government can refer back to if the approach is not successfully executed.
- The IPAP should be reformulated to have a framework that will address the structural challenges of the middle-income technology trap. The IPAP should have a strategy that discusses how best innovation within the scope of the Fourth Industrial Revolution can be achieved in the South African economy.

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