



**VAAL UNIVERSITY  
OF TECHNOLOGY**

*Inspiring thought. Shaping talent.*

**THE CONTRIBUTION OF INNOVATION CAPABILITIES TO BUSINESS  
PERFORMANCE IN STATE OWNED ENTERPRISES IN SOUTH AFRICA**

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**April 2022**

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## **DEDICATION**

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## ABSTRACT

State owned enterprises (SOEs) form one of the largest sectors within the economy in many countries and are important contributors to national development. They globally make up a greater part of the national gross domestic product (GDP). However, the performance of most SOEs in developing countries, such as South Africa, is substandard, prompting practitioners and researchers to continue searching for lasting solutions. The aim of this study was to investigate the contribution of innovation capabilities to market and business performance in SOEs in South Africa. The study followed a quantitative survey research method. A self-completion questionnaire was distributed to a purposive sample of 278 professional employees and managers in a selected South African SOE who were based in three provinces, namely, Gauteng, North-West and the Free State provinces. The collected data were analysed using the Statistical Packages for the Social Sciences (SPSS version 25.0) and Analysis of Moment Structures (AMOS version 25.0). The techniques used to analyse the data include descriptive statistics, exploratory factor analysis, and structural equation modelling to test the hypotheses.

Out of the seven hypotheses tested in this study, six were accepted. Innovative strategy, market innovation and technological innovation all significantly predicted market competitiveness. Market competitiveness significantly predicted three business performance dimensions, namely, environmental, financial, and operational. The study proposes a unique model for managing the contribution of innovation capabilities to business performance in SOEs in South Africa. Theoretically, the study contributes to the existing body of knowledge since it is an addition to the available literature on innovation capabilities and performance of SOEs. Practically, in the study for the optimisation of market competitiveness and business performance, in SOEs, emphasis should be placed on understanding and considering the appropriate innovation capabilities as input factors.

**KEY WORDS: Innovation, Innovation capabilities, State-owned enterprises, Business performance, market competitiveness.**

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## ABBREVIATIONS

<b>ADB</b>	African Development Bank
<b>ANC</b>	African National Congress
<b>APICS</b>	American Production and Inventory Control Society
<b>ASGISA</b>	Accelerated and Shared Growth Initiative of South Africa
<b>B-BBEE</b>	Broad Based Black Economic Empowerment
<b>BBC</b>	Black Business Council
<b>BEE</b>	Black Economic Empowerment
<b>BEEAC</b>	Black Economic Empowerment Advisory Council
<b>CC</b>	Competition Commission
<b>CCs</b>	Chain Co-ordinators
<b>CPI</b>	Corruption Perception Index
<b>CSCMP</b>	Council of Supply Chain Management Professionals
<b>CSR</b>	Corporate Social Responsibility
<b>DSS</b>	Decision Support System
<b>DTI</b>	Department of Trade and Industry
<b>EDI</b>	Electronic Data Interchange
<b>EEA</b>	Employment Equity Act
<b>EFA</b>	Exploratory Factor Analysis
<b>EME</b>	Exempt Micro-Enterprises
<b>EO</b>	Entrepreneurial Orientation
<b>GCR</b>	Global Competitiveness Report
<b>GDP</b>	Gross Domestic product
<b>GEM</b>	Global Entrepreneurship Monitor
<b>GST</b>	General Systems Theory
<b>HOD</b>	Head of Department
<b>ICTs</b>	Information and Communication Technologies
<b>IDC</b>	Infrastructure Development Company
<b>IT</b>	Information Technology
<b>KMO</b>	Kaiser Meyer Olkin
<b>KPI</b>	Key Performance Indicators
<b>KZN</b>	KwaZulu Natal
<b>LEs</b>	Large Enterprises
<b>MD</b>	Managing Director
<b>MoTI</b>	Ministry of Trade and Industry
<b>MSBD</b>	Ministry of Small Business Development
<b>NDP</b>	National Development Planning
<b>NEF</b>	National Empowerment Funding
<b>NEPA</b>	Nsika Enterprise Promotion Agency
<b>NMAC</b>	National Manufacturing Advisory Centre
<b>NSBA</b>	National Small Business Act
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PCA</b>	Principal Components Analysis
<b>PESTEL</b>	Political Economical Social Technological Environment and Legislation

<b>PM</b>	Performance Measurements
<b>QSEs</b>	Qualifying Small Enterprises
<b>R&amp;D</b>	Research and Development
<b>RCM</b>	Reliability-Centered Maintenance
<b>RET</b>	Relational exchange theory
<b>SAICA</b>	South Africa Institute of Chartered Accountants
<b>SAPS</b>	South African Police Services
<b>SARS</b>	South African Revenue Services
<b>SBDC</b>	Small Business Development Centre
<b>SCA</b>	Supply Chain Agility
<b>SCBS</b>	Supply Chain Balance Scorecard
<b>SCC</b>	Supply Chain Costs
<b>SCE</b>	Supply Chain Execution
<b>SCM</b>	Supply Chain Management
<b>SCR</b>	Supply chain reliability
<b>SCR</b>	Supply chain responsiveness
<b>SCOR</b>	Scorecard and Operations Reference Model
<b>SCP</b>	Supply Chain Performance
<b>SCRM</b>	Supply Chain Reliability Measurements
<b>SD</b>	Standard Deviation
<b>SED</b>	Socio-Economic Development
<b>SEDA</b>	Small Enterprises Development Agency
<b>SEESA</b>	Small Enterprise Employers of South Africa
<b>SEFA</b>	Small Enterprise Financing Agency
<b>SIC</b>	Standard Industrial Clarification
<b>SMES</b>	Small to Medium Enterprises
<b>SMME</b>	Small Micro and Medium Enterprises
<b>SOEs</b>	State Owned Enterprises
<b>SPSS</b>	Statistical Packages for Social Sciences
<b>SPVs</b>	Special Purpose Vehicles
<b>SWOT</b>	Strength Weaknesses Opportunities and Threats
<b>TPM</b>	Total Productive Maintenance
<b>VAT</b>	Valued Added Tax
<b>VUT</b>	Vaal University of Technology
<b>WEF</b>	World Economic Forum
<b>YDA</b>	Youth Development Agency

# **CHAPTER ONE**

## **BACKGROUND OF THE STUDY**

### **1.0 INTRODUCTION**

State owned enterprises (SOEs) form one of the largest industries within the economy in many countries and are important contributors to national development (Balbuena, 2014:4). According to Budiman, Lin and Singham (2009:1), SOEs globally make up a greater part of the national gross domestic product. Florio (2014:201) defines SOEs as economic organisations ultimately owned or co-owned by national or local government, internalising a public mission, among other objectives. Black, Hashimzade and Myles (2012:1) view SOEs as firms founded on the initiative of the state and run by it, whilst Bolton (2010:101) conceptualises them as legal entities that tend to carry out business activities on behalf of the state. Terms such as government corporations, government business enterprises, government-linked companies, parastatals, public enterprises, and public sector units may be used interchangeably with the term ‘SOEs’ (McGregor, 2012:390; Kowalski, Büge, Sztajerowska & Egeland, 2013:8). These enterprises play a key role in promoting socio-economic development by providing a wide range of products and services to the nation (Muzapu, Havadi, Mandizvidza & Xiongyi, 2016:89). This is also noted by several scholars (Christiansen, 2014:89; McGregor, 2014:2; Murimoga & Musingafi, 2014:99; Muzapu, Havadi, Mandizvidza & Xiongyi, 2016:89; Sandada & Kambarami, 2016:45), who point out that SOEs are critical in the provision of public and social necessities, such as food, water, electricity, health, sanitation, telecommunications, transport, and employment, to mention a few.

State owned enterprises play a critical role in the economy as they promote the role of the state welfare, social inclusion, universal coverage and addressing regional disparities, and are instrumental to national industrial policy as well as investment in research innovation (Williams, 2010:34; Millward, 2011:377; Shabalala, 2011:2). In their endeavour to deliver public goods and services, SOEs enjoy full or partial budgetary autonomy and exhibit a certain extent of managerial discretion whilst operating in a market (Christiansen, 2011:56; Florio, 2014:201). According to Christiansen (2014:4), the competitive position of the private sector led economy, including small and medium enterprises, is heavily dependent on the services and infrastructure provided by these SOEs. However, despite their importance, the reality on the ground shows that most SOEs are

operating sub-optimally and have been posting perennial losses (Muzapu, Havadi, Mandizvidza & Xiongyi, 2016:93). Christiansen (2014:5) suggests that some concerns have been raised regarding the effectiveness and performance of these institutions, as some of them are perennial loss makers. Poor performance of SOEs is attributed to challenges, such as, *inter alia*, poor state of infrastructure and equipment, lack of critical skills and expertise, non-compliance to good corporate governance practices, conflicts of interest, outright corruption, lack of access to credit lines, high operating costs, especially bloated wage bills and poor debt recovery strategies (Christiansen, 2014:5, Muzapu *et al.*, 2016:93).

To overcome the challenges and revamp the performance and effectiveness in terms of competitiveness and commercial viability of existing SOEs, there is a need for innovation (Christiansen, 2014:5). Innovation is considered an essential corporate process that must be managed properly to get profit from it (Matias & Coelho, 2011:891). Rajapathiran (2017:1) is also of the same view as he notes that innovation is widely regarded as a pinnacle success factor in a highly competitive and global economy. Mir, Casadesus and Petji (2016:25) add that it is widely recognised that innovation is a key factor for corporate competitiveness. Baregheh, Rowley, Sambrook and Davies (2012:300) assert that innovation is increasingly recognised as having an important contribution to make organisations successful in terms of their performance and ultimate survival. Baregheh, Rowley and Sambrook (2009:1334) define innovation as that multi-stage process, whereby organisations transform ideas into new, improved products or services and processes in order to advance, compete and differentiate themselves successfully in their marketplace. Akgun, Ince, Imamoglu, Keskin and Kocaoglu (2014:889) view innovation as not only the creation and capture of new value but also the implementation of new methods in business practices, workplace organisation or external relations, and improvement and transformation of managerial mini-sets and business models to cope with changes.

Innovation is often driven by pressure from the external environment, including factors, such as competition, deregulation, resource scarcity and customer demand associated with adaptive behaviour that changes the organisation to improve its performance (Damanpour, 2009:650). Innovations in organisations vary considerably in their nature, from radical innovations to incremental innovations. They vary from product innovation, organisational innovation, process

innovation, marketing innovation and technological innovation, to mention a few (Rajapathiran, 2017:2).

Varis and Littunen (2010:128) posit that it has become commonplace in this contemporary, knowledge-based economy, characterised by both pace of change and increasing complexity and uncertainty, for the ability of firms to adapt to external pressures and remain competitive and is closely related to their capacity to innovate. Rajapathiran's (2017:2) view concurs with this, that the firm's capability to innovate is the most crucial factor for competitive advantage in a highly turbulent market condition. Innovation capability leads organisations to develop innovations continually to respond to changing market environments and is embedded with all the strategic systems and structures that support innovation in an organisation (Slater, Hult & Oson, 2010:551; Gloet & Samson, 2016:54).

South Africa, like any other country, has several SOEs that were created to contribute to the social needs of the nation and at the same time, were expected to operate on a commercial basis (Monde 2012:5). In South Africa, SOEs are critical mechanisms to assist government to achieve economic growth and service delivery, but also to reduce a country's tax burden (Fourie, 2014:30; World Bank, 2014:2). SOEs in South Africa are vital to the growth of the economy and in the development of the country's strategic sectors, especially energy, transport, telecommunications, and manufacturing, amongst others (Buge *et al.*, 2013:2; Balbuena, 2014:5; Fourie, 2014:30). SOEs, according to Chavez and Torres (2014:8), are significant vehicles for job creation and employment. Chavez and Torres (2014:8) further state that SOEs aid in the provision of vital services to the citizens at an affordable and cheap rate as well as protect them from being exploited by the private sector. However, like any other country, most SOEs in South Africa have failed to perform according to the expectations of the public as they are underperforming (McGregor, 2014:3). Poor performance of these government institutions is attributed to factors, such as corruption, conflicts of interest, political interference, lack of critical skills and poor debt recovery strategies (Fourie, 2014:30; McGregor, 2014:3; Christiansen, 2014:5; Muzapu *et al.*, 2016:93).

From the above discussion, it is evident that South African SOEs are underperforming due to several challenges (Thomas, 2012:448). To overcome these, SOEs must be able to develop innovation capabilities, which are drivers of economic growth and competitive advantage (Iacovoiiu, 2016:73). Several authors (Mir, Casadesús, & Petnji, 2016:35; Silva, Styles, & Lages,

2017:401) identify these innovation capabilities as innovation strategy, innovation culture, market innovation and technological innovation. It is anticipated that if these capabilities prevail in an organisation, they will influence market competitiveness, which in turn, leads to organisational performance in terms of economic performance, environmental performance, and operational performance (Potocan, 2009:119).

## **1.1 PROBLEM STATEMENT**

Since its birth as a democratic country in 1994, South Africa has been cited as one of the countries with SOEs used as ‘cash cows’ by their national treasuries (Chavhunduka, Fauzi, Muranda, Sifile, Mabvure & Dandira, 2014:105). SOEs contribute significantly towards the Gross Domestic Product. South Africa, as a country, has been cited as one of the countries with a large pool of SOEs. According to the South Africa Country Commercial Guide (2017:1), the Department of Public Enterprises has responsibility for oversight of approximately 700 SOEs that exist at the national, provincial, and local levels. However, amongst the 700, SOEs such as Denel, Rand Water, Alexkor, Eskom, South African Airways, Transnet, South African Broadcasting Corporation and the South African Forestry Company are the major ones (Department of Public Enterprises 2017:1).

According to McGregor (2012:34), the perception is that the performance of SOEs in South Africa is not up to standard as some entities are underperforming and are being criticised for failing to achieve the economic and social expectations of the nation. In addition, Mutize and Gossel (2017:1) noted that the prevailing economic crisis sweeping through South Africa is a direct result of the underperforming state entities. In support of this view, it was revealed in the 2017 Mini Budget that between 2011/2012 and 2016/2017, the combined profitability of SOEs declined from 7.5 percent to an estimated 0.2 percent (Mutize & Gossel 2017:1; Cordeur, 2017:1). Evidence to show that state entities are underperforming include failure to deliver on targets, bankruptcy by state entities, perennial losses, crisis management challenges, allegations of corruption and scandals, service delivery protests and the constant turnover of board members (McGregor, 2012:34; Chavhunduka *et al.*, 2014:105; Korhonen, 2017:1). Other indicators include poor financial performance, planning and reporting, too many bailouts, high turnover rates and numerous resignations among board members, few unblemished audits and frequent court cases

as well as scandals reflecting self-interest rather than commitment to the wellbeing of the entity (McGregor 2016:1).

The underperformance of these SOEs has given birth to dysfunctional relationships between the citizens who are taxpayers and state entities as people are not satisfied with the performance of public enterprises (Corruption Watch, 2016:1). In addition, both the printing and social media are brimming with cases and allegations of corruption and reports of demonstrations (Foster, 2016:1; Parkinson & Steinhauser, 2016:1). According to Monde (2012:6), one of the causes of underperformance is corruption. Monde (2012:6) went on to state that more than ZAR148 billion is lost to corruption in Africa every year. Mr Nombembe, the former South African Auditor General, in 2013, revealed that over ZAR32 billion were lost, wasted on unauthorised, irregular, and fruitless expenditure (Auditor General Report, 2013:29). In addition, serious questions are being asked about the legality of multi-billion-rand procurement transactions at Transnet and the state power utility, Eskom (De Vos 2017:1). Crisis management and incompetence are other factors that are responsible for poor performance of SOEs in South Africa. Cordeur (2017:1) stipulates that the finance minister has indicated the limits regarding government's expectations of the executives and board members who are running the country's state-owned companies into the ground due to corruption, political interference, lack of proper skills and mismanagement of funds by officials. According to Business Tech (2016:1), political godfathering and political interference are also to be blamed for the underperformance of SOEs as directors and board members are appointed, which creates a patron-client relationship between the political fathers and board members.

Against this background, this study intends generating information for dealing with the problems facing SOEs in South Africa. The underperformance of SOEs can be traced to lack of innovation capabilities within the public sector (Belloc, 2013:2). Consistently, Ferreira, Manso and Silva (2013:258) suggest that the implementation of innovation capabilities leads to better performance and competitive advantage. In view of this, the current study proposes that the adoption of innovation capabilities, such as innovation strategy, innovation culture, market innovation and technological innovation in the public sector can provide the missing spark to ignite performance in public organisations. Information is therefore needed that can be used to alleviate performance-related problems within state enterprises, thus leading to better economic performance.



Since 1994, in South Africa, various studies on innovation and SOEs have been conducted on different topics. Monde (2012) examined the key performance indicators within SOEs. Ngwenya and Mahlomolo (2012) focused their study on the relationship between CEO compensation and the performance of SOEs. McGregor (2012) directed their emphasis to corporate governance in SOEs. Moses, Sithole, Blankley, Labadarios, Makelane and Nkobole (2012) explored the state of innovation in South Africa. Thomas (2012) focused on the issue of governance in SOEs. Krause and Schutte (2015) researched open innovation in SMEs. Sadiki (2015) considered the issue of financial assistance of the state towards SOEs. Bolton (2016) examined public procurement as a tool to drive innovation in South Africa, whilst Chilenga (2016) surveyed the problems facing SOEs in South Africa. Van Wyk (2016) focused on state aid and the effects of completion law in state entities. From the reviews conducted from various digital academic databases, there is limited evidence of research on innovation capabilities in state entities. This study, therefore, seeks to fill that gap and establish the link between innovation, market competitiveness and business performance.

## **1.2 AIM OF THE STUDY**

The aim of this study is to investigate the contribution of innovation capabilities to business performance in state owned enterprises in South Africa.

## **1.3 Study objectives**

The following objectives were developed for this study:

### **1.3.1 Primary Objective**

The primary objective of the study is to investigate the relationship between innovation capabilities, market competitiveness and business performance in a South African SOE.

### **1.3.2 Secondary Objectives**

Two classes of secondary objectives, namely, theoretical, and empirical objectives, were formulated for the purposes of this study.

### **1.3.3 Theoretical objectives**

The following theoretical objectives were set for the study:

- i. to analyse literature on SOEs.
- ii. to explore literature on innovation capabilities that include innovation strategy, innovation culture, market innovation and technological innovation.
- iii. to conduct a literature review on market competitiveness; and
- iv. to conduct a literature review on business performance.

#### **1.3.4 Empirical objectives**

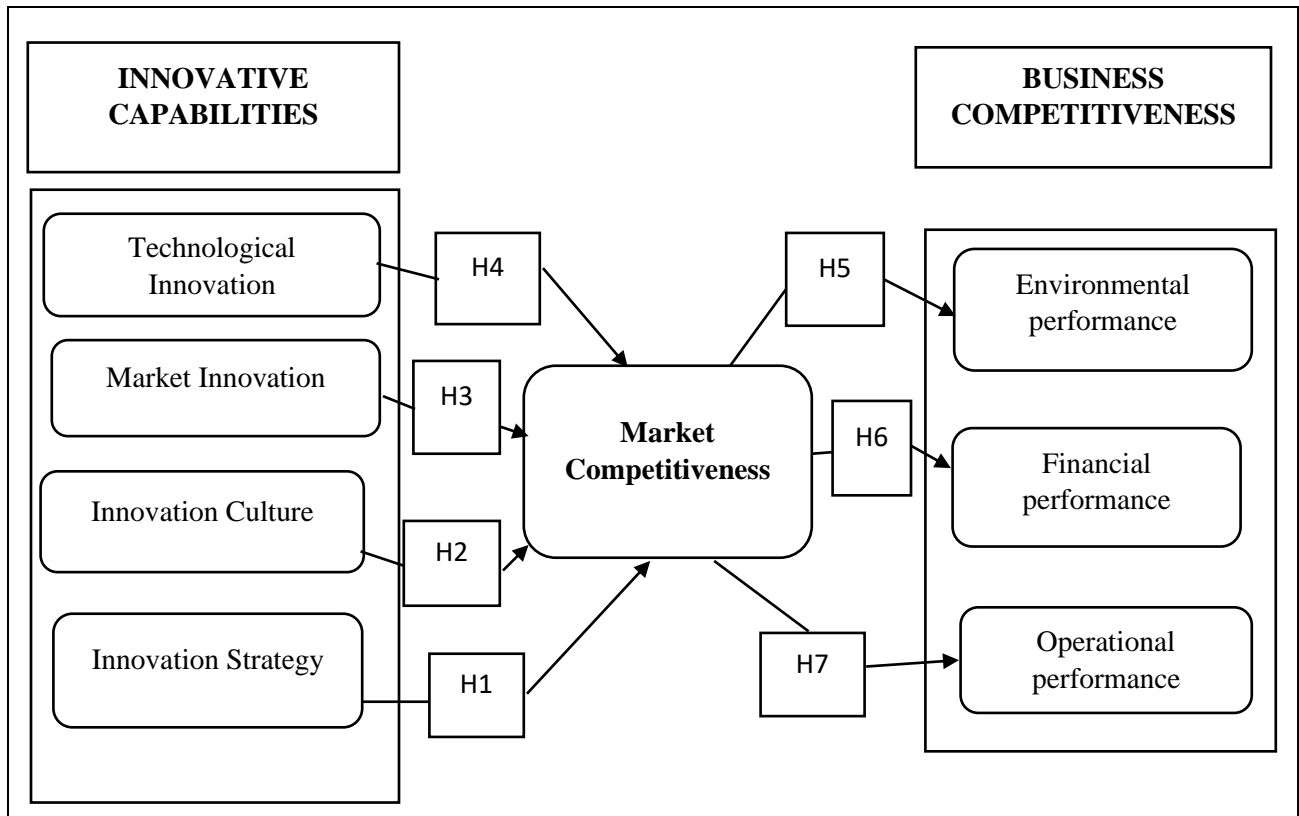
The following empirical objectives were set for the study:

- i. to establish the influence of innovation capabilities on market competitiveness in South African state enterprises.
- ii. to determine the influence of market competitiveness on environmental business performance in a South African state enterprise.
- iii. to determine the influence of market competitiveness on business performance in a South African state enterprise; and
- iv. to develop a model for improving the business performance of state enterprises using innovation capabilities and market competitiveness.

#### **1.4 CONCEPTUAL FRAMEWORK**

A conceptual framework illustrates what a study or research expects to find. It defines the relevant variables for the study and maps out how they might relate to each other. The theoretical and conceptual framework explains the path of a research and grounds it firmly in theoretical constructs. The overall aim of the two frameworks is to make research findings more meaningful, acceptable to the theoretical constructs in the research field and ensures generalisability. They assist in stimulating research while ensuring the extension of knowledge by providing both direction and impetus to the research inquiry. They also enhance the empiricism and rigour of a research. Thus, it is no exaggeration for Mutize and Gossel (2017:1) to say that both the theoretical and conceptual frameworks give life to research. This study considers the conceptual framework presented in Figure 1.1. The framework shows that innovation capability is the predictor variable, and is made up of four constructs, namely, innovation strategy, innovation culture, market innovation and technological innovation. The study proposes that adoption and implementation of these four activities will lead to market competitiveness, which is the mediator variable. In turn,

market competitiveness will lead to improvements in three areas of business performance, which are environmental, economic, and operational performance.



**Figure 1. 1: Conceptual Framework for Innovation Capabilities, Market Competitiveness and Business Performance**

**Source:** compiled by Author

### 1.5 RESEARCH HYPOTHESES

Based on the conceptual framework presented in Figure 1.1, the following hypotheses are put forward.

H1: Innovation strategy exerts a significant positive influence on market competitiveness in South African state enterprises.

H2: Innovation culture exerts a significant positive influence on market competitiveness in South African state enterprises.

H3: Market innovation exerts a significant positive influence on market competitiveness in South African state enterprises.

H4: Technological innovation exerts a significant positive influence on market competitiveness in South African state enterprises.

H5: Market competitiveness exerts a significant positive influence on environmental performance (business performance) in South African state enterprises.

H6: Market competitiveness exerts a significant positive influence on economic performance in South African state enterprises.

H7: Market competitiveness exerts a significant positive influence on operational performance in South African state enterprises.

## **1.6 SIGNIFICANCE OF THE STUDY**

This study was conducted in the context of rising trends towards a globalised world, where the performance of SOEs in a country has become a strategic activity in both the public and private sectors. In recent years, innovation has become a basic strategic tool for ensuring fiscal prudence in economic activities. In addition, innovation is central to the establishment of market competitive advantages, as well as the performance of public institutions (SOEs included). The general idea and view are that the implementation and utilisation of innovation capabilities and its best practices acts as a panacea to challenges facing public organisations, particularly the SOEs in South Africa. In the context of this study, the adoption and implementation of innovation capabilities in SOEs in South Africa is critical and imperative for enhancing market competitiveness, which in turn, leads to better financial, economic, and environmental performances. Therefore, the insights generated in this study allow innovation practitioners and SOEs management in South Africa to enhance their performance and enable researchers to broaden their understanding of the effects of innovation capabilities and their best practices in the public sector.

## **1.7 RESEARCH THEORIES**

This section briefly discusses the literature regarding the research theory selected for this study. A more extensive review of literature on research theories is presented in Chapter 3.

### **1.7.1 Resource- dependency theory**

The resource-dependence theory concentrates on a set of power relationships centred on the exchange of resources (Tehseen & Sajilan, 2016:60). The theory identifies that corporations do

not have all the resources they might need in the process of value-creation, therefore will repeatedly become reliant on each other (Xia, Wang, Lin, Yang & Li, 2016:557). The crucial matter then becomes how organisations administer their power-dependence relationships to sustain their operational and functional requirements (Pfeffer & Salancik, 1978:21; Dong, Gao, Sun & Liu, 2018:167). In this regard, RDT accepts that organisations often form alliances and partnerships to intensify and augment their power and make other organisations reliant on them (Xia *et al.*, 2016:558). Resource control and manipulation effort are the strategies provided by RDT to manage uncertainty, risks, and dependence in business transactions (Tehseen & Sajilan, 2016:60).

In their argument about resource dependence in supply chains, Dong *et al.* (2018:168) highlight the different environment of dependence in the conventional and best value supply chains. However, conventional supply chains have a propensity and affinity to act opportunistically and speculatively in connection to their power-dependence merit along the chain, best value supply chains apply dependency as a way of promoting trust and commitment to satisfy supply chain needs (Xia *et al.*, 2016:557; Dong *et al.*, 2018:169). This specifies a dramatic transformation in the resource-dependence forecast triggered by the realisms of modern business, such as the need for integration (Tehseen & Sajilan, 2016:61). The procurement of external resources is a significant precept of both the strategic and tactical management of an organisation (Yeager, Menachemi, Savage, Ginter, Sen & Beitsch, 2014:51). Resource dependency theory mentions that resource supply is dependent on the intricacy, dynamism, and fullness of the environment such that a deprived environment is endowed with scarce resources (Barnes, Cousens, & MacLean, 2018:312). The theory also proposes that resources are a foundation of power and that legitimately independent organisations can, therefore, be reliant on each other (Kash, Spaulding, Gamm & Johnson, 2014:251). An organisation is more reliant if the resource is crucial to its existence and firmly controlled (Babiak, Thibault & Willem, 2018:273). Pfeffer and Salancik (1978:33) and Yeager *et al.* (2014:52) highlight that dependence is dependent on how indispensable the resource is to the subsistence of an organisation and the extent to which other organisations have control of the resource. Furthermore, Kash *et al.* (2014:252) assert, “whoever controls resources has the power over those actors who need these resources”. An organisation’s major aim is to minimise its dependence on other organisations for the supply of limited resources by wielding influence to obtain resources, as well as to react to the requirements and needs of others in its environment

(Yeager *et al.* 2014:52). Therefore, the organisation attains this by either securing power over resources that reduce their reliance on other organisations, or compelling control over resources that reduce the dependence of other organisations on themselves (Pfeffer & Salancik, 1978:34; Barnes *et al.*, 2018:314).

### **1.7.2 Resource-based view theory**

The resource-based view (RBV) of the organisation postulates that the endowments and resources they have (Nason & Wiklund, 2015:34) mostly determine organisations' success and competitive advantage. That is, resource immobility and heterogeneity explain the performance discrepancy amongst organisations (Wang, Jin & Banister, 2019:204). Valuable, rare, inimitable, and non-substitutable (VRIN) resources permit the organisation to attain continuous competitive advantages (Nason & Wiklund, 2015:36). Current development of RBV submits that possessions and endowments only have potential values (Wang *et al.*, 2019:205). To comprehend a competitive advantage, resources require to be bundled, leveraged, and managed (Nilsson & Ritzén, 2014:185), a process that shapes and develops organisations' capability and eventually improves their performance. Henceforth, the progression and enhancement of innovation capability can be measured and regarded as a process of resource utilisation and management (Ju, Jin & Zhou, 2018:4). Resources are grouped into two essential groups that is tangible and intangible (Nason & Wiklund, 2015:206). Tangible resources encompass financial or physical value as measured by the organisation's statement of financial position while intangible resources are non-physical in nature (Ju *et al.*, 2018:5). Although most previous studies regarded tangible resources as less vital than intangible ones, the financial system in South Africa presents complications and challenges for organisations to gain access to financial capital, making it a valuable and rare resource (Wang *et al.*, 2019:207). Thus, financial resources are treated as one imperative type of tangible resource in South African organisations.

## **1.8 PRELIMINARY LITERATURE REVIEW**

This section briefly discusses literature on the research constructs under consideration in this study.

### **1.8.1 Innovation Capabilities**

Innovation capabilities are regarded as principal influences of economic growth and play an essential part in competitive advantage enhancement at both the national and organisational levels

(Rafique, Hameed & Hassan, 2017:46). Saunila (2016:163) defines innovation as the abilities of making new work processes, products, services, and management structures to obtain and sustain organisational competitive edge. Innovation capability, which is defined as an organisation's capacity to create, receive, and apply new processes, create new ideas, products, or services, is one of the important resources that determines an organisation's success in the global market (Perlines & Montes, 2019:221). Innovation is an important determinant of business performance in a changing competitive environment (Al-Ansari, Altalib & Sardoh, 2013:4). Innovation, according to Akgun *et al.* (2014:889), is not only the creation and realisation of new value but also the implementation of new methods in business practices, workplace organisation or external relations, and improvement and transformation of managerial mini-sets and business models to cope with changes. Others (Crossan & Apaydin 2010:1154; Souto, 2015:142) define innovation as the production, adoption, or assimilation and exploitation of value-added novelty in economic social spheres, renewal and enlargements of products, services and markets, development of new methods of production and establishment of new management systems. Innovation is one of the major drivers and tools for gaining competitive advantages in enterprises (Rosli & Sidek 2013:2; Prajogo & Oke 2016:243). Florio (2014:201) asserts that an organisation requires innovation; otherwise, it will gradually decay and eventually collapse. Hence, organisations, whether public or private, should be capable in terms of innovativeness.

Innovation capability entails the skills and knowledge required to effectively absorb, master, and improve existing technologies and create new ones (Lall, 1998:165; Coombs & Metcalfe 2000:209; Rajapathirane & Hui 2017:3). It involves the ability to quickly introduce new products and adopt new processes involving a wide variety of assets and resources (Sen & Egelhoff, 2000:174; Guan & Ma, 2003:737; Herrera, 2016:1725). Central to innovation capabilities is the ability of the firm to stimulate innovation successfully, which is the ability to react through adaptations of resources to changing requirements of customers or changing technologies (Lawson & Samson, 2001:377; Wang Lu & Chen, 2008:349; Goddard, Entwistle, Godman & Strachan, 2010:340; Ferauge 2012:85; Slater, Hult & Olson, 2010:551). Innovation is critical for creating competitive advantage in markets to allow firms to benefit from economies of scale and overcome the size and constraint in domestic markets (Kyläheiko, *et al.*, 2011:508; Fernández-Mesa & Alegre, 2015:148; Herrera, 2015:14). Im and Workman (2004:115) earlier had the same view that innovation renders a sustainable competitive advantage to firms. Innovation is a strategic resource

that is valuable, flexible, rare and inimitable or sustainable. Innovations in organisations are embedded within all the strategies, systems and structures that support it (Gloet & Samson 2016:54). Innovation capabilities range from market innovation, technological innovation, organisational innovation, leadership innovation, product innovation, process innovation, service innovation, innovation culture and strategy (Im & Workman 2004:115; Yildiz, Basturk & Boz 2014:787). Tepic, Fortuin, Kemp and Omta (2014:232) state that innovation capabilities facilitate the improvement of goals and plans and make prioritisation clear among the team members in firms who play a key role in the execution of day-to-day activities as well as equip and assure a firm's adaptation and dealing with uncertainties in the innovation process using available resources and skills.

This study focuses on four dimensions of innovation capabilities identified by various scholars (Jorge, Maderno, Martinez & Sancho, 2015:101; Mir, Casadesus & Petnji, 2016:41; Silva, Stles, & Lages, 2017:26). These are, namely, innovation strategy, innovation culture, market innovation and technological innovation.

### **1.8.2 Innovation Strategy**

Generally, literature concurs that an organisation with innovation strategies performs better than those without (Abdi & Ali, 2013:56). An innovation strategy has been described as a strategy that promotes the development and implementation of new products and services (Abdi & Ali, 2013:56). Others conceptualise it as the basic tool that determines the innovation direction of the business (Dodgson, Gann & Salter, 2008:373; Hittmar, Varmus & Lendel, 2014:1194). Innovation is one of the key factors for the success, sustainable competitive advantage and survival of firms and consists in principle of a certain knowledge about how to do things better than the status quo (Katz, Preez, Schutte, 2010:1; Jimenez & Sanz-Valle, 2011:408). Aksoy (2017:3) asserts that it will not therefore be easy to accept and practice innovation without having a suitable and befitting culture that can inspire the workers to innovate. As such, innovation culture is an important aspect that an organisation requires in its daily business functions (Parveen, Senin & Umar, 2015:336). According to Naqshbandi (2016:2256), culture has an influential impact on organisations and their competitiveness. It is one of the significant factors that influences the organisation's performance and success. According to Dayan *et al.* (2016:670), organisational culture has a considerable and significant role in the organisation by determining beliefs, values, and obligation of workers to



challenge competitors and accomplish the set aims. Concerning innovation culture, Parveen *et al.* (2015:337) pronounce it as an everyday exercise of innovation functions. Innovation strategies are based on business strategy and strategic goals and guide decision making on how resources are to be used to meet an organisation's objectives, thereby delivering value and building competitive advantage (Dodgson, Gann & Salte, 2008:373; Strecker, 2009:4, Lendel & Varmus, 2011:819; Hittmat, Varmus & Lendel, 2014:1194). SOEs tend to benefit much from having innovation strategies as they gain competitive advantage and improve their service delivery. Through innovation strategy, organisations attain and change a given knowledge or information to suit explicit managerial and functional initiatives that permit the organisation to innovate (Alexe & Alexe, 2016:1001; Prajogo, 2016:242). Through innovation strategy, organisations such as South African SOEs, expedite and accelerate the course and process of agility, flexibility and responsiveness to the market challenges and sustain competitive advantage in the process (Carlborg *et al.*, 2014:375). Innovation strategy also defines an organisation's success (Brunswicker & Vanhaverbeke, 2015:1243), and supports the achievement of unremitting innovation in both processes and products (Hilman & Kaliappen, 2015:48). Innovation strategy, if implemented effectively, also permits organisations in attaining high profits and growth and thereby establishes the fundamentals to advance the precise innovations in the face of market variations and competitive environments (Ricciardi, 2014:11).

### **1.8.3 Technological Innovation**

It is widely accepted that technological innovation is one of the core compositions of an enterprise's competitiveness (Chen & Zhao, 2012:65; Liu & Jiang, 2016:884). Guan and Ma (2003:737) assert that technological innovation capabilities are a firm's special assets that facilitate and support its overall strategies. Technological innovation capabilities include the interaction of many different resources, which depend not only on the technological factors, but also other critical factors in the areas of manufacturing, such as organisation management, strategy planning, knowledge and information, and resources allocation (Guan *et al.*, 2006:971; Wang *et al.*, 2008:349; Liu & Jiang, 2016:884). Others view technological innovation capabilities as abilities to adapt to unexpected technological change, develop new products and use new technological processes to meet current and expected future needs (Yam, Lo, Tang, & Lau, 2010:1009; Chen & Lin, 2012:287; Incea, Imamoglua & Turkcana, 2016:765). Chen and Zhao (2012:66) are of the

view that production efficiency in organisations can be improved only if technological innovation is realised. They further note that technological innovation offers potential paybacks to organisations to gain greater market share and increase profits through the establishment of new systems for production and operation with higher efficiency and lower cost. Al-Ansari and Sardoh (2013:2) also indicated that in this era for organisations to provide superior customer value and market pull effectively and efficiently with new and better products or services, they need to be technologically advanced, hence public enterprises should be able to use technology to satisfy their customer needs.

#### **1.8.4 Market Innovation**

According to Rosli and Sidek (2013: 4), market innovation deals with the market selection in order to meet customers' buying preferences. Market innovation plays an imperative role in fulfilling market needs and responding to market opportunities (Prifti & Alimehmeti, 2017:5). It has a positive effect on the sales growth of a firm (Atalay, 2013:226; Mbizi 2013:67; Ndesaulwa & Kikula, 2016:3). Market innovation is understood as innovating existing markets or creating new markets from scratch through entrepreneurial efforts, including the enrolment of support networks. It deals with the identification and choice of target markets aimed at satisfying customer needs (Kjellberg, Azimon & Reid, 2015:5). It focuses on customer market co-ordination and probability. It gathers corporate market information because of customer and other extrinsic factors (Al-Dmour & Ahmad Amin, 2012:233). SOEs tend to benefit from market innovation as it is aimed at the generating and implementing of new ideas for creating communication and the delivery of value services to customers, as well as managing customer relationships (Cascio 2011:4; Admasu, 2017:226). Therefore, organisations must develop their market innovation capabilities to contain and accept shifting and transforming technologies as they seek to provide new value propositions (Ekman, Rëndell, Kowalkowski, Raggio & Thompson, 2020:4). Market innovators use technology-enabled solutions as ways to affect the institutional provisions leading the behaviours of pertinent market players (Nenonen *et al.*, 2014:272; Nenonen *et al.*, 2019:4). Present markets can be understood as contexts for production and consumption (Kindström *et al.*, 2018:37). Furthermore, Gonçalves *et al.* (2019:182) consider markets as supple business environments concerning an array of market participants in which value is created from integrating resources

from different participants as well as from the knowledge and capabilities of such market participants.

### **1.8.5 Innovation Culture**

According to Simpson, Sigauw and Enz (2006:1133), organisations are like living organisms that constantly adapt to changing environments, require continuous innovation for them to survive in turbulent environments and to achieve that, they must have a set of organisation-wide shared beliefs. Thus, they must have a culture of innovativeness. Innovation culture in an organisation has been broadly defined as ranging from the intention to be innovative to the capacity to introduce some new products, services, or ideas through the introduction of processes and systems which can enhance performance (Dobni 2008:540; Xie, Wu & Zeng 2016:466). Innovation culture has been conceptualised as a multi-dimensional context, which encompasses the intention to be innovative, the infrastructure to support innovations, operational level behaviour necessary to influence a market, value orientations and the environment to implement innovation (Dobni, 2008:541; Sharifirad & Ataei, 2012:496). Thornherry (2003:44) considered innovation culture to be a synthesis of values, attitudes, beliefs, and ideas within the organisation, which aims to reward innovation, encourage risk taking and engage flexibility within a complex environment. Innovation culture also consists of values, ideas, systems, environmental advocacy, encouraging the safeguarding of technology innovation and tolerance of failure (Harbi, Anderson & Amomou, 2014:136; Xie, Wu & Zeng, 2016:466). An innovation oriented organisational culture provides a competitive advantage by increasing the emphasis on innovation and fostering receptiveness to new ideas (Kleinschmidt, Brentani, & Salomo, 2007:106; Stock & Six 2015:326).

### **1.8.6 Market Competitiveness**

A driving force for competitiveness in the present dynamic environment is innovation and a firm's innovation performance to depend on the opportunities provided by their environments (Olughor, 2015:90). Yee, Yeung, Cheng, and Lee (2013:574) are of the same view as they state that it is widely recognised that today's service environment is highly competitive. Market competitiveness is the extent of the attractiveness and effectiveness of the operating environment in which a service firm operates (Yee, Yeung, Cheng & Lee, 2013:575). Market competitiveness can be enhanced by intra-firm resource investment, such as research and development investment, human resource cultivation, equipment and facility investment, information management infrastructure

establishment and marketing activities (Yen & Hung, 2017:18). Market competitiveness influences firm performance and has a direct impact on employee and customer satisfaction (Homburg, Wieseke & Bornemann, 2009:64).

### **1.8.7 Business Performance**

The concept of performance describes how individuals or groups reach a conclusion to attain an aim. Yildiz (2010:180) views business performance as a description of a level of fulfilled task of a business's aim or target according to obtained output or conclusion at the end of a business period. Business performance refers to how efficiently and effectively a firm utilises its resources in generating economic outcomes (Abdi & Ali, 2013: 57). In the view of Al-Ansari and Sardoh (2013:4), business performance relates to the ability of the firm or an organisation to gain profit and growth in order to achieve its general objectives. Olughor (2015:91) conceptualises business performance in terms of the ability of the firm to gain profit and growth to achieve its general strategic objectives. Business performance is the result of the interplay between actions taken in relation to competitive forces that allow the firm to adapt to the environment, thereby integrating the efficiency and effectiveness (Green *et al.*, 2012:291). According to Zhu *et al.* (2008:244), the three major dimensions of business performance include environmental performance, economic performance, and operational performance. Environment performance deals with how organisations, in their endeavour to deliver goods and services, promote environmental sustainability. Economic performance relates to the firm's ability to reduce costs associated with purchased materials, energy consumption, waste treatment, waste discharge, and fines for environmental accidents. Operational performance relates to the manufacturing of a plant's capabilities to produce and deliver products to customers (Zhu *et al.*, 2008:244) more efficiently.

## **1.9 ABBREVIATED RESEARCH METHODOLOGY**

Research may be defined as a systematic way to solve a problem, a science of studying how research is to be carried out, or the study of methods by which knowledge is gained (Rutberg & Bouikidis, 2018:210). A research methodology assists in the understanding of the process of the research, thus giving it scientific merit (Diao, 2016:607). The objectives of the study are attained by reviewing and understanding the research methodology. The word 'methodology', is defined as the common approach applied to all the experiments and research processes, thus beginning

from the hypothetical and philosophy supporting the standard of the gathering and examination of the data (Saunders, 2016:30). Therefore, research methodology involves the gathering of information, the techniques used in that data gathering, what type of information is gathered and eventually how the information is going to be analysed (Petrovic, Koprivica & Bokan, 2017:183). All scientific research must be conducted using some relevant methodology (Neuman, 2014:8). Therefore, this section covers how the study was conducted and outlines the research design, sampling design, procedures to be followed in data collection, data analysis and ethical considerations to be used in the study.

### **1.9.1 Research Philosophy**

There are various philosophies relevant to research. These include positivism, phenomenology, pragmatism, ontology, transformative, epistemology, and axiology. This study was based on the positivism philosophy. Positivism philosophy is sometimes referred to as 'scientific method' or 'science research', is "based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, August Comte, and Emmanuel Kant" (Taguchi, 2018:27) and "reflects a deterministic philosophy in which causes probably determine effects or outcomes" (Daniel, 2016:93). It also works from the assumption that any piece of research is influenced by several well-developed theories apart from, as well as the one which is being tested (Saunders, Lewis & Thornhill, 2015:33). The pragmatism philosophy is relevant to this study because it is intuitive, holistic, abductive, and exploratory with findings that are both quantitative and qualitative in nature (Saunders *et al.*, 2015:34). The philosophy suits the objectives of the study, which involve determining, using numerical figures, whether any predictive relationships exist between various research constructs.

### **1.9.2 Research approach**

There are three approaches to conducting research (Tobi & Kampen, 2018:1211). These comprise qualitative, quantitative, and mixed approaches. All these methods are important, depending on the objectives of the research in question (Saunders *et al.*, 2015:33). In this study, a quantitative approach was applied. A quantitative approach was chosen since the study tests relationships between the innovation capabilities, market competitiveness and business performance in SOEs in South Africa. Additionally, the utilisation of a quantitative approach in research requires both the extraction of data in a larger volume using standardised methods that include more generalised samples where the emphasis is on statistical information rather than individual perceptions

(Johnson & Christensen, 2012:31). A quantitative method suits the objectives of this study as data is drawn from different large populations of SOEs in South Africa. Zikmund and Babin (2015:107) point out that such a method allows deductive approaches, thereby enabling hypothesis testing.

### **1.9.3 Research Design**

A research design is defined as the logic or master plan of a research project that highlights how the study is to be conducted (Bryman, 2012:409). The correlational and descriptive design, which is the use of questionnaires for the gathering of data or information for an explicit exploration or study from any specified sample of population features at a single point in time (Neuman, 2016:15), was used to collect data from the population. According to Bryman (2015:50), a survey research design encompasses the collection of data by means of a survey questionnaire. In the same light, Creswell (2014:6) states that research design is the researcher's overall strategy for answering the question or testing the research hypothesis.

### **1.9.4 Literature Review**

A literature review of relevant concepts was conducted in this study with the prime intention of addressing the theoretical objectives of the study. The literature review focuses on the theoretical issues underpinning innovation capabilities, innovation strategy, innovation culture, market innovation, technological innovation, environmental practices, and business performance. Data used in the study was sourced from internet sources, such as academic engines such as Google Scholar and Research Gate, digital databases such as Emerald Insight, Science Direct and J-Store. In addition, materials such as books, magazines and organisational records are considered as sources of literature.

### **1.9.5 Empirical Study**

The empirical study involves sections such as sampling design, procedures for data collection, data analysis, validity, and reliability.

### **1.9.6 Sampling design**

A sampling design entails the researcher's provisional plan for a quantitative description of trends, attitude, or opinion of a population by studying a sample of that total population (Creswell, 2013:235). In accordance with Uprichard (2013:4), the main purpose of sampling is to make some inferences about a given population using the chosen sample. Based on this view, the sampling

design for this study comprises the target population, sampling frame, sample size, sampling approach and sampling technique.

### **1.9.7 Target population**

A target population, according to Hair (2015:165), is the complete group of objects or elements relevant to the research project. The target population of this study included professional employees and managers in a selected South African SOE that operates within the rail industry. To be included in the study, managers and professional employees were expected to have knowledge of innovation, which enabled them to complete the questionnaire.

#### **1.9.7.1 Sampling frame**

A sample frame is a list that includes every member of the population from which a sample is to be taken or drawn and is essential to all sampling processes (Zikmund, Babin, Carr & Griffin, 2013). This implies that a sample frame is a master list of the entire population. Ott and Rongnecker (2015:26) view a sampling frame as a list of units for a study, such as home addresses or households in the city. Hair (2015:166) defines a sampling frame as a comprehensive list of the elements from which the sample is drawn. The sampling frame utilised in this study was a list of managers and employees in a selected South African SOE. The list was obtainable from the human resource database of that SOE.

#### **1.9.7.2 Sampling method**

According to Almalki (2016:291), sampling method is the process of selecting participants from the population. Sampling methods fall into two categories: probability and non-probability samples. Price and Lovell (2018:44) maintain that in non-probability sampling (also known as non-random sampling), not every element of the population has an opportunity of contributing to the study. In most cases, the outcomes of a study directed with a non-probable sample lead to skewed outcomes, which may not signify the preferred target population (Heale & Twycross, 2015:66). However, there are circumstances such as the introductory phases of the study or cost restraints for conducting a study, where non-probability sampling is much more beneficial than the other approach (Neuman, 2016:246). According to Tobi and Kampen (2018:1212), an inevitability for non-probability sampling can be enlightened in a way that for some studies it is not possible and practicable to draw a random probability-based sample of the population because

of time and/or cost concerns. In these circumstances, sample group elements are chosen on the foundation of convenience or the personal judgement of the researcher. Therefore, most non-probability sampling practices contain a component of subjective judgement. Non-probability sampling is the most helpful for exploratory stages of studies, such as a pilot survey (Price & Lovell, 2018:44)). This study, therefore, uses non-probability sampling because of the reasons outlined above. In terms of the sampling technique, respondents were selected using the purposive sampling technique, to ensure that only those respondents that possessed some knowledge about the area of study were included in the study.

### **1.9.7.3 Sample size**

Sample size refers to how many respondents should be included in the study and is an important consideration for researchers as it affects the quality and generalisation of the data (Neuman, 2016:246). According to Tobi and Kampen (2018:1212), the notion of sample arises from the inability of researchers to test all the individuals or elements in a given population. The sample must be representative of the population from which it was drawn, and it must have a good size to warrant statistical analysis (Heale & Twycross, 2015:66). The key purpose of the sample is to permit the researchers to pilot the study to elements or individuals from the population so that the outcomes of their study can be used to originate deductions that will relate to the whole population (Leedy & Ormrod, 2014:154). In other words, the sample size is the number of respondents included in an investigation. According to Singh and Masuku (2014:6), a sample size refers to the determination by the researcher of the number of participants who can be feasibly included in a statistical sample. The sample size estimation in this study was based on four criteria, namely historical evidence, precision, level of confidence, and the population ratios or 50% of the variability (Taherdoost, 2016:21). Hence a sample size of  $n=400$  respondents was determined to be optimum.

## **1.10 DATA COLLECTION METHOD AND PROCEDURE**

The data collection method is a research process that informs on how relevant information to address the research problem can be gathered and collected (Sani, 2013:40). In this study, data were collected through survey questionnaires administered through a combination of drop and collect as well as e-mail methods. The questionnaire was divided into four sections. Section A elicited information about the demographic details of the respondents. Section B elicited



information about innovation capabilities. Section C contained questions on market competitiveness and Section D sought information on business performance. Measurement scales in sections B, C and D were measured using five-point Likert-type scales, as indicated in Appendix 1. The adapted questions were adjusted and developed to contextualise them to the current study, using feedback from a pilot study. The questions were closed-ended to facilitate simplicity during answering. More detailed information about the original sources and validation of each of the measurement scales is provided in Section 5.11.

## **1.11 DATA ANALYSIS**

Data collected were analysed using both descriptive and inferential statistics. Data from Section A and B of the questionnaire, which sought to establish the demographic details of respondents and of the firm, were analysed using descriptive statistics. Data from sections C to H that sought to test the hypotheses were analysed using inferential statistics. The Statistical Package for the Social Sciences SPSS (version 25.0), the Analysis of Moment Structures (AMOS version 25.0) software were utilised in the data analyses. Since the measurements were adapted from previous literature and further developed for the study, a Confirmatory Factor Analysis (CFA) was performed to test the psychometric properties and the goodness of fit of the measurement scales. Relationships between the research constructs were tested using a Structural Equation Model (SEM). Several indices, such as the Comparative Fix Index (CFI), Goodness of Fit Index (GFI), Incremental Fit Index (NFI), and Random Measure of Standard Error Approximation (RMSEA) were used to establish whether the data supports the conceptual model.

### **1.11.1 Validity**

Validity and reliability are tools for measuring or assessing the appropriateness of research instruments and increasing reader confidence. Their inclusion in this research is because they are concepts typically linked to quantitative research. According to Bryman (2015:50), validity is concerned with the integrity of the conclusions that are generated from a piece of research. Validity is used to test the instruments for face, content, and construct validity. In this study, academic staff at a selected South African University of Technology who are the experts in management sciences reviewed the questionnaire to establish face validity. Content validity was determined through a pilot study, where the questionnaire was tested with a conveniently selected sample of 50 respondents. Construct validity includes both convergent and discriminant validity. Factor

loadings of above 0.5 were accepted for the testing of convergent validity on each of the test items. Correlations computed in the CFA were used to test for discriminant validity.

### **1.11.2 Reliability**

Reliability is concerned with testing whether the results of a study are repeatable (Bryman, 2015:49). Franzen (2013:15) views reliability as the level of consistence or stability in the values of the scores that an instrument elicits. Several methods of ensuring reliability have been identified, which include test and retest method, alternative–form method, split-half method, internal consistency method and correction for attenuation (Carmines & Zeller, 1999:37). In this study, reliability was measured using the internal consistency method since a single instrument was utilised to collect data from the respondents. The Cronbach’s Alpha coefficient, Composite Reliability and the Average Variance Extracted (AVE) were used to test for internal consistency. The recommended values of 0.7 for the Cronbach’s Alpha and the Composite Reliability and 0.4 for the AVE (Fraering & Minor, 2006:284) were used as thresholds.

## **1.12 CONTRIBUTION OF THE STUDY**

The study is important in several ways. Theoretically, the study provides information on the importance of innovation to business performance in business enterprises. The study also is a source of literature on the relationship between innovation capabilities, market competitiveness and business performance. On the management side, the study provides information on how innovation can be used to stimulate business performance in state owned enterprises. Given the performance related challenges facing SOEs in South Africa, the study contributes to the economy in that its results may be used by these enterprises to improve their business performance, resulting in higher employment and productivity in the country.

## **1.13 ETHICAL CONSIDERATIONS**

Ethics refers to reasonable approaches adopted by the researcher before collecting data, during data collecting and during reporting of research results to avoid violating the rights of respondents (Creswell, 2013:92). In this research, several ethical considerations were observed in collecting and reporting data. First, authority to collect data was granted by the responsible authorities in the selected South African SOE (refer to Appendix 2). The researcher also provided full details of the research to the respondents and made them aware that their involvement in the study was

voluntary. The identities of the respondents were not required in the survey questionnaire. However, where this may have happened inevitably, the identities were kept in confidence throughout the study and thereafter. In addition, respondents were protected from victimisation by maintaining their anonymity and keeping all collected data secure. Ethical clearance was secured from the Vaal University of Technology's central ethics committee. Confidentiality and privacy of the test scores were assured, with only the promoters of the study and the researcher having access to the data, and codes were used to safeguard the respondents' identities. Since respondents and the researchers come from different races and cultural groups, the beliefs, culture, customs, and languages of respondents were valued and respected throughout the research. The respondents were encouraged to complete the questionnaires, but the right to withdraw at any stage and time was respected, without giving any reasons or having to face unfair or negative consequences. Ethical interpretation and reporting of the results are also major concerns in research, as the deliberate falsification and misuse of data for the researcher's ends are serious offences (Graziano & Raulin, 2010). Thus, an effort was made to report the facts and interpret data as they have been presented without any bias towards any particular outcome, group or methodology.

#### **1.14 DEFINITIONS OF TERMS**

**A State-Owned Enterprise** or government-owned enterprise is a business enterprise where the government or state has significant control through full, majority, or significant minority ownership (Padilha & Gomes, 2016:285).

**Innovation capabilities** are regarded as principal influences of economic growth and play an essential part in competitive advantage enhancement at both the national and organisational levels (Rafique, Hameed & Hassan, 2017:46).

**Market innovation** - is the process of introducing significant and continuous changes in the marketplace with the view of improving product and service awareness to customers (Weill, Apel, Woerner & Banner, 2019:41).

**Innovation strategy** - refers to how organisations turn to new technology or product development to survive rapid, dynamic, and volatile market transformations (Kudret & Zafer, 2019:773).

**Innovation culture** - refers to commonly shared inventive ideas, values, behaviours, beliefs, characteristics information and shared assumptions of organisational members, which can enable and support the organisational innovation process (Padilha & Gomes, 2016:285).

**Business performance refers** - to how efficiently and effectively a firm utilises its resources in generating economic outcomes (Abdi & Ali, 2013: 57).

**Technological innovation** capabilities are a firm's special assets that facilitate and support its overall strategies (Kudret & Zafer, 2019:773).

**Market competitiveness-** is the extent of the attractiveness and effectiveness of the operating environment in which a service firm operates (Yee, Yeung, Cheng & Lee, 2013:575).

## **1.15 CHAPTER CLASSIFICATION**

This study culminated in a comprehensive thesis document, the chapters of which are divided as follows:

### **Chapter One: Background to the study**

This chapter discusses the introduction and background to the study. The problem statement, the research objectives, the conceptual framework, and the hypotheses were spelt out. A preliminary review of literature was provided, and the research methodology used in the study was discussed.

### **Chapter 2: Literature Review on State Owned Enterprises**

This chapter reviews literature on SOEs from both the international and South African perspectives and environments. The literature explores issues that include the background of SOEs, economic contributions of SOEs, their structures and challenges.

### **Chapter 3: Literature Review on Innovation Capabilities**

This chapter analyses literature on innovation capabilities and its various dimensions. Special attention was given to the four dimensions of innovation capabilities that were under consideration in this study. These are innovation strategy, innovation culture, market innovation and technological innovation.

### **Chapter 4: Literature Review: Market Competitiveness and Business Performance**

This chapter analyses literature on market competitiveness and business performance. Regarding business performance, special attention was directed to the three-business performance sub-scales, namely, operational performance, economic performance, and environmental performance.

### **Chapter 5: Research Methodology**

This chapter outlines the research methodology used in this study. Issues such as the research philosophy, research approach, research design, sampling design, procedures for data collection, instrumentation, data analysis and ethical procedures were discussed in detail.

### **Chapter 6: Data Analysis and Interpretation**

This chapter presents the results of the study, how they were achieved and their meaning. Issues that are outlined include the response rate, demographic details of respondents, frequency analysis of constructs and inferential statistics. Detailed discussions of each set of results were provided.

### **Chapter 7: Conclusions and Recommendations**

This chapter presents the review of the study, conclusions for each theoretical and empirical objective of this study, recommendations, and contributions of the study, limitations, and suggestions for future research.

## **1.16 CHAPTER SUMMARY**

Chapter one provided the introduction, context, and background of the study. Study objectives were stated, and the statement of the problem was highlighted. It also outlined the hypotheses to be examined and provided a brief review of literature. A summary of the research methodology, the ethical considerations and chapter classification was provided. The next chapter presents the literature review on innovation capabilities.

## **CHAPTER TWO**

### **A LITERATURE REVIEW ON STATE-OWNED ENTERPRISES**

#### **2.1. Chapter Overview**

This chapter of the study reviews the literature on SOEs. The chapter opens by discussing the nature of SOEs in terms of their definitions and identities. Thereafter, the operations of SOEs in selected countries, namely Zimbabwe, Nigeria and China, are discussed to provide a basis for comparison with South Africa. The discussion then proceeds to discuss the identities and roles of various SOEs in South Africa. This is succeeded by a review of the literature on the importance of SOEs in terms of economic and social contributions as well as political significance. The chapter also discusses the challenges faced by SOEs in South Africa and other selected countries. These challenges include corruption, the lack of skills, and political interference, amongst others. Also put in the spotlight is the application of supply chain management to SOEs in South Africa as a possible solution to the challenges they face. The literature used in this chapter was derived from completed dissertations, academic books and scholarly articles in academic journals and other official documents.

#### **2.2. THE NATURE OF STATE-OWNED ENTERPRISES**

There is no standard definition for an SOE as there are many definitions regarding their nature. According to Nhema (2015:247), the term SOE in its broadest sense refers to all industrial and commercial firms, mines, utilities, transport companies and other concerns that are controlled by the government and earn most of their revenue through the sale of goods and services. Owens (2013) views them as independent bodies partially or wholly owned by the government, and they perform specific functions and operate in accordance with a particular Act. Fourie (2014:33) defined them by alluding to some essential characteristics that include their status as established legal entities operating within a commercial environment, and the fact that the government is the shareholder. Other scholars conceptualise SOEs as legal, economic entities ultimately owned or co-owned by national or local government internalising a public mission, among other objectives (Bolton, 2010:101; Hashimzade & Myles, 2012:1; Florio, 2014:201; Madekutsikwa, 2015:28). Several terms and names, such as, government corporations, government business enterprises,

government-linked companies, parastatals, public enterprises, and public sector units are also associated with SOEs (McGregor, 2012:390; Kowalski *et al.*, 2013:8, Madekutsikwa, 2015:28). They are created by governments to perform and carry out specific responsibilities, such as the provision of public and social infrastructure that is essential to humanity such as food, water, electricity, health, sanitation, telecommunication, and transport, to name a few (Christiansen, 2014:89; McGregor, 2014:2; Murimoga & Musingafi, 2014:99; Sandada & Kambarami, 2016:45). Mbo (2017:1) who notes that the history of State-owned enterprises spans decades, and they have evolved to serve different purposes in various economic sectors across the world, even more so in less developed territories, also supports this.

### **2.2.1. State-owned enterprises in Other Selected Countries**

This section analyses literature on SOEs in other selected countries, namely Zimbabwe, China and Nigeria. This analysis provides a basis for comparison with SOEs in South Africa. Zimbabwe, China and Nigeria were selected since they are South Africa's largest trading partners.

#### **2.2.1.1. State-owned enterprises in Zimbabwe**

The idea of SOEs in Zimbabwe has its origins in the British system of governance, particularly the socialistic ideas of the twentieth century and the related development of the concept of the welfare state (Dube, 2011:30). According to Hadebe (2015:35), SOEs were considered as agencies for the delivery of services to the public. They were viewed as essential tools to control economic planning and development. In other words, according to the protagonist and ideologues of a welfare state, they are a means of industrial power and influence, economic self-reliance, implementation of policy safeguarding public interest, maintenance, and enhancement of morality (Shana, 2006:18; Chiripanhura, 2014:6).

Zimbabwe has 78 public enterprises that are diverse regarding their objectives. These enterprises can be classified into three categories according to the objectives they pursue (Godana & Hlatshwayo, 1999:1). Some are of strategic importance such as the Grain Marketing Board and Zimbabwe Electricity Supply Authority while some are purely developmental and promotional like Agricultural and Rural Development Authority and Agribank (Chavunduka, Fauzi, Muranda, Sifile, Mabvure, & Dandira, 2014:105). The third group is the largest and is composed of those that are predominantly for commercial purposes like the Zimbabwe Steel Company, National

Railways of Zimbabwe, and Minerals Marketing Company of Zimbabwe. It is argued that if put together, these enterprises can contribute 40% to the country's Gross Domestic Product if fully operational. Some of these SOEs are monopolies in their sector and are expected to convert the monopolies they enjoy to a stream of fiscal revenues. However, most of these companies share one thing, they have benefited from government subsidies extended to cover their cost resulting from their lossmaking and inefficiencies (Sikwila, 2012:2; Zhou, 2012:175). Mandaza (2015:3) put forward that in Zimbabwe, the government reduced the SOEs mostly into agencies of political and economic patronage and therefore rendered them loss-making and parasitic organs.

#### **2.2.1.2. State-owned enterprises in China**

In China, SOEs have a long history, as they were an alternative means for economic and social development (Gang & Hope, 2013:1). According to Gang and Hope (2013:4), when the Republic of China was established in 1949, the country was on the verge of bankruptcy and no infrastructure to speak of existed, industrial capability was minimal, education and healthcare were scarce and social security was non-existent. The government moved to establish government entities to fulfil outputs targets assigned by state planners and sold their products at predetermined prices. However, in the 1970s, when China transformed into a socialistic market economy, it started to restructure, and reform and in the late 1990s, the pace for reform gathered momentum under the principle of "grasping the big and letting go of the small" (Gang & Hope, 2013:5; Dobson, 2014:2). The World Bank (2012:26) also states that in the 1990s SOEs in China were rationalised with the closure, merger, or privatisation of tens of thousands of smaller loss-making enterprises, many of them owned by lower levels of government. Today, China's SOEs are distinguished by their ownership with 113 very large monopolies and oligopolies remaining in the hands of the central government and an uncertain number of smaller ones in the hand of provincial and municipal governments. Some scholars argue that China's state-owned economy remains significant and the exact contribution to the industrial output is debated but has been estimated at between 25% and 30% (Lardy, 2012:18; Leutert, 2016:86).

#### **2.2.1.3. State-owned enterprises in Nigeria**

According to Okeke, Onuorah and Okonkwo (2016:45), the origin of the involvement of the Nigerian government in the setting up of public enterprises can be placed within the context of Nigeria's colonial and post-colonial experiences. During the colonial rule and after independence,



it was discovered that it was imperative that the government be involved in the business as an entrepreneur to perform some business roles, secure economic freedom and economic development for the nation (Adeyemo, 2005:5). Thus, public entities were set up to act as pivots to propel economic and social growth in areas of need (Okeke, Onuorah & Okonkwo, 2016:45). This is supported by other scholars who note that state-owned enterprises in Nigeria were created explicitly by the government to address deficits and capital shortfalls, promote economic development, reduce mass unemployment and ensuring national control over the economy (Khan, 2005:12; Nwachukwu, 2007:20). These public co-operations were established to address specific issues in the society, which were particularly difficult for private individuals to handle (Sebbs, 2015:43). However, evidence abounds that the government has not performed well as a manager of resources (Nwachukwu, 2007:8). For instance, the failure of public enterprises such as Nigeria Airways, NITEL, National Electric Power Authority and Nigeria Railways, among others, indicates that most of the public entities have failed woefully to live up to the expectations of the Nigerian public (Nnamdi & Nkwede, 2014:191). The performance of public enterprises in Nigeria over the years has been abysmal and marred by gross inefficiency (Omoleke, Salawu & Hassan, 2011:182; Okeke, Onuorah & Okonkwo, 2016:45).

### **2.2.2. State-owned enterprises in South Africa**

South Africa has a long-standing history of using State-Owned Enterprises (SOEs) as a mechanism for socio-economic advancement (Fourie, 2011:205); the establishment of SOEs in the early decades of the twentieth century was premised on providing the state with the necessary instruments that would enable the building of a sustainable industrial economy (Ritcken, 2014:5-6). Tsheola *et al.* (2012:14) argue that at first glance, the state was concerned with the security of supply of strategic inputs at competitive prices where mining was dominant economically. Tsheola *et al.* (2012:14) further argued that the establishment of state-owned enterprises stemmed from the desire by the state to move away from the state's dependency on existing privately owned mining houses and foreign enterprises. SOEs established during this period focused mainly on the mining sector. This was according to the government, in the interest of industrialisation, hence the need for investment from the very same mining sector (Ritcken, 2014:17).

According to Ritcken (2014:42-43), one of South Africa's first SOEs was the Department of Post and Telegraphs which was established in 1910 and tasked with the transmission and receipts of

mail. When the British took over control in 1806, they inherited infrastructure that was publicly owned, including this SOE, and mandated it to oversee the development of postal, telephone as well as broadcasting infrastructure and related services. The rationale of doing this was to provide the state with the instruments to enable the building of a diversified industrial economy. The rail sector also became critically crucial because of the desire to connect a country that could transport goods from the “Cape to Cairo”, thereby fostering economic development (Ritcken, 2014:2-4). The South African Railways and Harbours (SAR&H) was established in 1918 and was mandated with the responsibility of further expanding the country’s rail systems. According to Akiwande (1997:44), during this era, South Africa’s rail network expanded into neighbouring countries such as Northern Rhodesia, which is present-day Zambia. In 1922, the Electricity Supply Commission (ESCOM) was established to build, generate, transmit and distribute electricity infrastructure (Ritcken, 2014:7). Akiwande (1997:53) posits that in tandem with the expansion of South Africa’s rail sector, the electrification of railway commenced in the early 1920s with the establishment of the Colenso Power Station for the Glencoe to Pietermaritzburg rail route. The Iron and Steel Corporation (ISCOR) was established in 1928 to promote industrial development (Ritcken, 2014:17).

During the apartheid era, SOEs become strategic sites for racially based job reservation, which empowered whites, mainly the Afrikaner, at the expense of the black majority (Ritcken, 2014:17). The South African Synthetic Oil Limited (SASOL) was established in 1950 to beneficiate coal, alleviate the balance of trade and enhance national fuel in South Africa. However, this SOE was struggling until the rise of energy-intensive resource processing industries like ESKOM, which implemented a major programme to beneficiate the country’s coal (Bratton, 1999). In 1973, the Companies Act was passed to consolidate laws relating to companies in South Africa, and it classified companies, regarded as being for-profit or non-profit companies (Bratton, 1999:345). According to Akiwande (1999:9), the act further led to the establishment of the Industrial Development Corporation (IDC), which was a state-owned financial institution, aimed at funding development. Akiwande (1999:8) further notes that before sanctions were formally declared against the apartheid government, the IDC reported that the energy and the rail sector accounted for 30% of GDP and up to 95% of South Africa’s exports.

Mokwena (2012:16) observed that in the 1980s, the National Party (NP) led government in South Africa was facing challenges due to international economic sanctions, leading it to restructure. In 1987, the government released a White Paper which sought to reduce the size of the public sector, lessen government spending, open investment opportunities for the private sector and raise money from selling different assets (White Paper, 1987:3). According to Mtshali (2016:18), this marked the beginning of public sector reforms such as full and partial privatisation of some of South Africa's SOEs such as Iscor and Sasol. The White Paper (1987) also resulted in the establishment of the Department of Privatisation and Deregulation to oversee public sector reforms in SOEs. The premise behind privatisation was the belief that government no longer had to be the key driver of economic development (Mtshali, 2016:18). In 1994, the democratic dispensation inherited about 300 SOEs across the three spheres of government, namely, national, provincial, and local government (Fourier, 2012:34-35). According to the Human Science Research Council (HSRC) (2015: 203), it is reported that South Africa in post-apartheid now has about 713 SOEs. It is believed that this ballooning is because of the development agenda enshrined in the National Development Plan (2012:43). Gumede (2012:16) is of the view that the increase of SOEs in post-apartheid South Africa is premised on their potential to drive economic policy direction of the country. Makuta (2009:16) earlier mentioned that the rationale for this increase is to improve socio-economic development in a manner that addressed the historical imbalances and transformation.

In post-apartheid South Africa, state-owned enterprises continued to operate in all spheres of production and the new government advocated for the nationalisation of key sectors (Mokwena, 2012:17). According to the RDP (1996:2), the privatisation and commercialisation of many agencies in the public sector injure basic services of the poor. According to Chilenga (2016:29), in South Africa, public entities are divided into three categories: 3A, 3B and 3D. Schedule 3A and 3B are regarded as agencies of government departments with a mandate of ensuring the fulfilment of a particular social or economic responsibility of government. These entities depend on government for funding through statutory money transfers from the Revenue Fund, and they have the least autonomy of all SOEs. Schedule 3B is also known as provincial public entities, which include entities at provincial levels from all the nine provinces in South Africa. The other entities that do not fall under the schedules mentioned above fall under schedule 3D entities. The SOEs in South Africa are presented in Table 2.1.

**Table 2. 1: State-owned Enterprises in South Africa.**

<b>State-owned enterprise</b>	<b>Duty and area of specialisation</b>	<b>Year Established</b>
Airports Company of South Africa	Owner of major airports in South Africa.	1993
Armcor	Defence sector that focuses on arms procurement	1968
Denel	Aerospace and defence sector.	1991
Eskom	Energy sector (National Electricity Utility)	1922
National Parks Board	Nature conservation	1926
Passenger Rail Agency of South Africa	Transport sector that focuses on passengers in the railway sector.	1990
PetroSA	National oil and gas company	2002
Post Office	Postal sector	1792
Rand Water	Water utility	1903
Sentech	Telecommunications infrastructure	1992
South African Airways	Transport sector (an international airline)	1934
South African Broadcasting Corporation	Telecommunications sector	1923
South African National Roads Agency	Responsible for maintenance and development of the national road network	1998
South African Forestry Company	Manages forestry on state land.	1948
Transnet	Responsible for transport and related infrastructure sector (railways, oil/fuel pipelines, terminals and harbours.	1990
Telkom South Africa	National telephone network.	1960
Alexkor	Mining sector (diamond mining)	1992
Development Bank of Southern Africa	A bank owned by the government responsible for accelerating sustainable socio-economic growth.	1983
Pebble Bed Modular Reactor	Energy sector and development of Pebble Bed Modular Reactor nuclear energy technology.	1994
SA Express	Transport sector (regional and feeder airline)	1994

**Source:** National treasury 2015 & Department of Public Enterprises 2017

Table 2.1 provides a summarised picture of SOEs in South Africa and their roles. The table shows that the South African Post Office is the oldest SOE in the country as it was formed in 1792 and the Petro South Africa is the youngest, being formed in 1998.

### **2.3 A Brief description of Selected South African State-owned Enterprises**

This section provides summary descriptions of some of the South African SOEs. The selected SOEs include Denel, Eskom, and South African Airways.

### **2.3.1 Denel**

The Denel group was formed in 1992, when the manufacturing subsidiaries of Armscor were divided to structure Armscor as the procurement agency for the former South African Defence Force (now the South African Defence Force), while the manufacturing divisions were combined under Denel as divisions, which included properties and engineering services, informatics, aerospace, and systems manufacturing. Denel is a major participant in South Africa's defence-related industries and a strategic supplier of unique products and full lifecycle support within the military environment. According to Fourie (2014:37), Denel as a state-owned aerospace and defence technology concern has not performed optimally for many years, primarily due to a decrease in local defence spending, the restructuring of the international arms industry and the current state of the world economy, which influences armaments procurement and development.

### **2.3.2 Eskom**

Eskom is the largest producer of electricity in South Africa (approximately 95%) and Africa (approximately 45%) (Eskom, 2011:13). Eskom ranks among the top 20 utilities in the world regarding its electricity generation capacity (Fourie 2014:35). Electricity generation forms the core function, but the company is also active in all elements in the electricity supply chain which includes the transmission and distribution of electricity (Eskom, 2011:13). Despite the imperative role being played by Eskom, the utility has been questioned over its performance. The utility is being marred by impediments, such as high electricity prices charged by municipalities, continued labour unrests at its power stations, irregular and wasteful expenditure among others.

### **2.3.3 South African Airways**

South African Airways (SAA). is the country's national airline. The airline flies to numerous destinations within and beyond the borders of South Africa, from its base in Johannesburg. However, the company has been making significant operational losses in the past number of years and has survived through capital injections from the government each year. For example, during the 2011/2012 financial year, South African Airways (2012:4) did not present optimal figures. The entity incurred a fruitless and wasteful expenditure of R4 million, R3 millions of which was due to baggage claims, penalties, and fines. Numerous issues currently impede optimal performance especially high airport taxes, landing, parking, and handling costs, the lack of a co-ordinated

government strategy, fuel cost, monetary fluctuations, competition law, outdated and ageing aircraft, the lack of strategic planning and innovate thinking, financial inefficiency and skills shortages (The Conversation, 2017:1).

#### **2.3.4 Transnet**

Transnet is a full government-owned integrated entity, operating as a freight transport company, that was established around five core complementary divisional units, comprised of freight rail, rail engineering, the national ports authority, ports terminals and pipelines, supported by various interrelated projects that reinforce the group (Transnet 2012:1). According to Matshali (2016:60), it is currently regarded as the largest and most essential part of freight logistics chain that delivers goods and services across South Africa. This was supported by Transnet (2011:2) which noted that the organisation helps to deliver over thousands of tons of goods per day all around South Africa. Thus, the main goal of the entity is to a dedicated freight transport entity, delivering goods safely, efficiently, reliably, in a cost-effective way to bring about economic growth to the nation. Matshali (2016:60) posits that Transnet operates as an entity aimed at supporting and controlling the country's freight logistics network and is responsible for ensuring that the country's transport industries work in line with excellent principles. To add more, Transnet as a State-Owned Enterprise is responsible for economic and social growth. This is also noted in the Transnet Report (2012:1) which states that Transnet is oriented on promoting the economic growth of South Africa and it is investing R110. 6 billion in extending its infrastructural development project. Such projects include widening and deepening ports, building a new pipeline, and buying hundreds of new locomotives. Thus, it plays a significant role not only in South African transport but also in the national economy of African countries that use its transport networks and harbors (Transnet, 2012:2).

Transnet has five subsidiaries. The first subsidiary is the Transnet National Ports Authority. This subsidiary is responsible for the effective, safe, and sufficient economic functioning of the national port system. This operating division provides port infrastructure and marine services at the eight commercial seaports, namely, Richards Bay, Durban, Saldanha, Cape Town, Port Elizabeth, East London, Mossel Bay and Ngqura. This sector of Transnet is guided and regulated by the National Ports Act (Act 12 of 2005). The act mandates the entity to perform functions such as:

- To plan, provide, maintain and improve port infrastructure.
- To provide or arrange marine-related services.
- To ensure the provision of port services, including the management of port activities and the port regulatory function at South African ports and,
- To provide aids to navigation and assistance to the manoeuvrings of vessels within port limits along the coast.

The second subsidiary is the Transnet Port Terminal (TPT), which is responsible for the commercial handling services of sea-route freight across imports, exports and shipments in containers, bulk, break-bulk and automotive. The operations of the TPT covers imports and exports across containers, mineral bulk, and agricultural bulk (Pierse, Farole, Odendaal & Steenkamp 2016:3). It also operates in a broad spectrum of the economy including shipping lines, the container industry, and the general shipping industry and cargo agents, which are regulated by legal entities (Chilenga, 2016:27). According to Matshali (2016:62), in 2015, it was reported to have achieved level two Broad-Based Black Economic Empowerment status.

The third segment of Transnet subsidiaries is Transnet Engineering which is cited as the backbone of South Africa's rail industry with eight product-focused businesses and is comprised of 150 depots, seven factories and 15,000 employees countrywide (Transnet, 2011:4). This subsidiary replaced the engineering department of the former SAH&H and had a long-standing history of actively supporting the expansion and technical management of railways in the country and continues to be an integral part of South Africa's economy. Transnet Engineering has become a key supplier of customised rolling stock for the coal, iron ore, and intermodal, agricultural and cement industries (Transnet, 2017:6). The entity is also known for developing some of the most innovative bogies and wagons for over a decade. This subsidiary is dedicated to in-service maintenance, upgrading and manufacturing of freight wagons, main line and suburban coaches and diesel. The segment focuses not only on the South African market but also on investment in research and development to service Africa and the rest of the world with stock products and to enhance organisation's international reputation (Transnet 2016:2).

The fourth subsidiary is Transnet Pipeline, which is mandated to manage the strategic pipeline assets of the country, servicing two key industries by transporting petroleum and gas. The petroleum liquid products include crude oil, diesel, lead, and unleaded petrol. The pipeline network

includes a farm tank with a capacity of 30 million litres used to store and the distribution of liquid products in neighbouring countries, such as Botswana (Matshali, 2016:63).

The fifth subsidiary is Transnet Freight Rail, which is the largest division of Transnet. It is tasked with managing the extensive rail network across South Africa, which connects with other rail networks in the sub-Saharan region and constitutes about 80% of Africa's rail network (Transnet, 2011:3; Baloyi, 2014:3). This subsidiary has positioned Transnet as a profitable and sustainable freight railway business, which continues to drive the competitiveness of the South African economy (Pierse, Farole, Odendaal & Steenkamp 2016:5). This enabled Transnet, particularly in the early 2000s, to play a positive role in the transformation of society, given the historical background of South Africa.

In the last decade, Transnet has gone under a restructuring programme, which resulted in the decentralisation of functions and responsibilities to improve localised accountability and to expedite service delivery (Matshali, 2016:62). Before reforms, Transnet was becoming too big an entity to manage, and this restructuring was initiated with the principles of the New Public Management paradigm. The restructuring was oriented towards optimising the equity that was embedded in the historical imbalances and the vision to rethink its brand, which was influenced by the desire to realign with its divisions adopting sub-brands. In line with the NPM, Transnet identified new core values such as customer focus, reliability and flexibility, cost-efficiency and competitiveness, transparency, improved communication and divisional alignment and an integrated solution of bulk freight transportation (Van Eeden, 2018:32). Transnet, as a public entity has been applauded for an impressive set of financial results, driven by strong volumes in general freight, export coal and manganese (Transnet, 2017:1). This commendable performance has been attributed to the collaborative efforts of all stakeholders (Transnet, 2017:1). However, challenges such as technological changes, regulatory changes, fraud, and corruption have been referred to as impediments to its success (Transnet, 2017:24). In addition to challenges is poor financial management. Fourie (2014:35) supports this by noting that that Transnet, as a state-owned enterprise, has been criticised for fruitless and wasteful expenditures. Other challenges that impede optimal performance currently include delays and cost escalations in construction ventures, and the performance of board members (Republic of South Africa, 2013:1).



## **2.4. IMPORTANCE OF STATE-OWNED ENTERPRISES**

Most SOEs are created to play critical roles in the countries in terms of economic, social, political contributions. Obadan (2008:8) postulates that the creation and proliferation of SOEs particularly in developing countries were motivated by the need to achieve economic and social objectives. Other scholars also imply that SOEs were created in Africa for much the same reasons as in most countries to correct market failures, provide public goods, control natural monopolistic tendencies, and seize the commanding heights of the economy (Hemming & Mansoor, 1988:4; Nhema, 2015:249). Throughout the world, SOEs are regarded as a mechanism to improve or at least contribute to social and economic development (Fourier, 2012: 245). Madekutsikwa (2015:29) posits that the rationale of establishing SOEs is mixed in a variety of social, economic and political objectives.

### **2.3.1. Economic contributions of State-Owned Enterprises**

In South, Africa SOEs play a critical role in the economy as they promote the role of state welfare, social inclusion, universal coverage and addressing regional disparities, as well as being instrumental to national industrial policy, investment in research and innovation (Williams, 2010:34; Shabalala, 2011:2). Moeti (2013:3) argues that SOEs play a critical role in nurturing economic growth not only in developing countries, but in developed countries too. According to Marrez (2015:2), SOEs play an active role in a country's economic growth. SOEs make essential contributions towards economic development, not only locally, but also regionally and internationally in that they attract and source capital equipment, finance, and partnerships (Fourie, 2014:32). According to Fourie (2014:30), SOEs are critical mechanisms to assist governments to achieve economic growth and service delivery as well as reducing the country's tax burden. Fourie (2014:30) further states that in South Africa, SOEs are vital to the growth of the economy and in the development of the country's strategic sectors, especially energy, transport, telecommunications, and manufacturing.

Most SOEs are now important stakeholders and contributors towards supporting and promoting urban growth and development. Some SOEs also provide highly significant structuring elements, which may influence development patterns within the city, such as transportation networks, bulk infrastructure, energy, and ICT infrastructure. Examples include Eskom, Telkom, PRASA,

Portnet, and Petronet. Organisations such as Transnet and PRASA perform an essential function in terms of improving urban efficiencies through the provision of public transport systems. Given the extent of their influence, effective and efficient planning thus becomes essential for managing consistent urban growth and development.

#### **2.4. Social contributions of State-Owned Enterprises**

SOEs have a different purpose, mission, and objectives, which relate to some aspect of public service and social outcomes. They are likely to remain an important instrument in any government's toolbox for societal and public value creation given the right context, collaborating with other stakeholders (Price Waterhouse & Coopers, 2015:1). SOEs contribute to socio-economic transformation through the creation of jobs and skills development (Makuta, 2009:45). The Public Sector Research Centre (PSRC) (2015:15) observed that SOEs influence economic development and industrialisation through job creation in various sectors of the economy. Mostert, (2002:5) was of the same view as he noted that in undertaking government's commercial activities, they provide employment and the transfer of skills which are crucial elements for development. Other scholars also put forward that SOEs are important vehicles for job creation and employment because of the extent of the work they undertake; they provide the citizens with employment opportunities since these are entities; they must employ people in these companies (Chavez & Torres, 2014:6).

According to the World Bank (2010), not all SOEs are established for commercial activities; others are oriented in responding to the social needs of the people and life improvement through delivering the expected quality of services. Other scholars who note that SOEs are assigned or created to fulfil specific social objectives, which have their roots in the periods of colonisation (Balbuena, 2014:40; Bala, 2015:1; Madekutsikwa, 2015:30), also note this. SOEs are often established to provide relevant and essential services that are vital to the competitiveness of the economy such as energy and transportation. According to Chavez and Torres (2014), SOEs aid in the provision of critical services to the citizens at a somewhat affordable and cheaper rate, also they prevent the citizens from being exploited by private companies. Khan (1993:5) was of the same view as he observed that SOEs often produce essential public goods at a lower cost. Other scholars contend that they (SOEs) are often established to ensure that the government is in control of the strategic sectors of the country's economy, in order to avoid the abuse of private industries

monopolising these sectors at the expense of citizens (Buge *et al.*, 2013:1; Chilenga, 2016:11). They contribute to rural development and poverty eradication through skills development and ultimately, employment. In South Africa, the then National Party-led government used SOEs to “contribute to the process of industrialisation and economic growth by direct intervention in the economy” (Mathsali, 2016:26). Interestingly, Chavez and Torres (2014:8) support this by putting forward that SOEs are established to remove foreign and private control over the domestic economy.

#### **2.4.1. The political significance of State-owned Enterprises**

Although SOEs are constituted by public resources, they are endowed with a political significance as they have a public interest (South African Institute of International Affairs, 2014:102). They are powerful tools in state developmental inventories, and the way they operate has considerable influence on the wider business and corporate governance landscape. They are the means through which the government implements its policies and laws. In other words, they are institutions through which governments institute good governance. Good governance refers to how a government exercises its power to manage countries’ economic social and political resources (World Bank, 1992:2). The concept of good governance is regarded as an essential element of achieving socio-economic development and is centred on principles of accountability, transparency, the rule of law and public participation (Mathsali, 2016:26). The government, to save the public from the private sector exploitation, institutes SOEs. Therefore, the government, to address the market failure of the private sector, creates SOEs. In South Africa, policies such as the Broad Black Based Economic Empowerment, which aims to address the historical imbalances, are implemented through state-owned enterprises activities. Hence, state-owned entities have a political significance in every state.

#### **2.5 Challenges faced by State-owned Countries in other selected African countries**

This section analyses literature on the challenges faced by SOEs in other selected African countries. This provides a picture regarding whether these challenges are like those faced by SOEs in South Africa. The two sampled countries are Nigeria and Zimbabwe since these are South Africa’s major trading partners in Africa.

### **2.5.1. Challenges faced by State-owned enterprises in Zimbabwe**

Since the dawn of the new millennium, Zimbabwe has seen a sharp decline in the growth of strategic economic sectors (Mutanda, 2014:1). Government-run institutions are in shambles, and this has significantly contributed to the economic chaos confronting the country. Although the challenges being faced by Zimbabwean SOEs are multifaceted and multidimensional, there is no qualm about the fact that corruption dominates them all (Mutanda, 2014:1). Corruption is a tumour in the brain that has and is troubling many African countries and Ngwakwe (2012:315) described it as a cancer that appears to be endemic in African countries that bedevils public sector organisations. According to Mutanda (2014:7), corruption and looting are unmistakably Zimbabwe's worst enemies as self-aggrandisement and egocentrism mainly drive many people in government. Other scholars also believe that the country is off the rails because critical departments such as education, the registrar's office, police force, immigration, vehicle inspection and city councils easily accept bribes (Farawo, 2012:2; Mutanda, 2014:7).

Militarisation of state entities is one of the challenges that have contributed immensely to the troubles of state entities in Zimbabwe. Mutanda (2014:5) who peddled that the militarisation of parastatals has contributed significantly to the decay of Zimbabwean SOEs has supported this. Top managers and executives in the state institutions are not appointed on merit bases, but history has proved that the retired military personnel, especially war veterans, are the only ones eligible for these positions (Majaka, 2013:1.). The appointments of Air Commodore, Mike Kararkadzai, who left the Air Force to revive the National Railways of Zimbabwe has been the most referenced as the most obvious failure as nothing improved during his tenure but instead he compounded the challenges facing the institution (Majaka, 2013:3; Mhandu & Kudzedzereka, 2013:1; Mutanda, 2014:6). According to Mandaza (2015:17), the deployment of military officers in SOEs appears to have exacerbated rather than improved their performance. Moreover, the abuse of SOEs for political advantage at the expense of economic realities has inevitably resulted in institutions that become less efficient even as sources of rents, let alone service providers.

The dismal performance of SOEs in Zimbabwe has also been ascribed to the effects of political influence, as there is the absence of political will to address the gross anomalies in the public sector (Mutanda, 2014:8). Zhou (2012:182) observed that viability problems currently dogging State-owned Enterprises in Zimbabwe should be interpreted in the context of political interference and

abuse. Zhou (2012:182) further states that SOEs are often used as patronage-dispensing instruments where there is a lack of commitment and shared vision within the leadership line ministries and management of the enterprises. More often than not, these board appointments have been riddled with cronyism; where the appointment of members to the boards has largely been based on political expediency and rarely on pure merit (Zvavahera & Ndoda, 2014:14; Chimbari 2017:215). According to Chidavaenzi (2014:1), in addition to political interference, there is also a lack of political will which was revealed by the then Media, Information and Broadcasting Services minister, Jonathan Moyo, at a presentation of a public lecture when he said “politics of slogans” was over as the country now needed “informed debate” pertaining to the economic challenges. Mambo (2013:5) also notes the same as he highlighted that the collapse of parastatals in Zimbabwe was largely based on ZANU PF’s politics of patronage where it rewarded top military with little or no expertise to manage them, and this is apparently detrimental to the economy if politicians abuse the entities to achieve their political ends at the expense of the struggling masses.

Mismanagement of funds is another challenge cited by many scholars as a cause of misfiring of state entities in Zimbabwe. Mutanda (2014:3) posits that misappropriations of finances have heavily injured SOEs in Zimbabwe by the parastatals leaders as they award themselves with hefty salaries and allowances that do not relate to the performance of their companies. Mutanda (2014:3) further elaborates that most of these companies are reeling under a heavy debt burden and workers could go for months without receiving their meagre salaries, yet the bosses receive hefty salaries. Chipunza and Murwira (2014:1) also allude to that by putting forward that what the parastatal bosses say regarding salaries and allowances contradicts what is paid to Chief Executive Officers (CEO) in Zimbabwe’s private sector. Mugabe (2014:1) stated that state enterprises are besieged, yet top managers take a lot of money in salaries and other benefits such as fuel, school fees, entertainment, and other allowances. This compelled the government to set a new salary structure for government CEOs in March 2013, but it remains to be seen if there are serious mechanisms to enforce it.

### **2.5.2. Challenges faced by State-owned enterprises in Nigeria**

Like in any other African country, SOEs in Nigeria face many challenges and have been heavily rebuked for their underperformance. One of the challenges is that of political influence (Emeh 2012, Okeke, Onuorah & Okonkwo, 2016:50). According to Shebbs (2015:48), in the 21<sup>st</sup>-century,

politics in Nigeria has generally abused the relevance of bureaucracy as politics takes centre stage of influence in almost every activity of public corporations ranging from employment to promotion, training, and transfer, among others. Politicians use the public entities as patronage to those who support their political ambitions (Anyadike, 2013:68; Shebbs, 2015:48). According to Anyadike (2013:70), politicians, instead of professionals, are seen on most management boards of public corporations who would subsequently neglect credibility and effective service delivery in pursuit of profits for themselves. Over the years, the influence of politics in the corporations has played down the effectiveness of public corporations in Nigeria as organisations are sometimes forced to embark on projects that are not of real value to the corporation and forced to donate money to the ruling party for elections and their events (Anyadike 2013:69).

Market changes is a challenge to Nigerian public enterprises. According to Shebbs (2015:49), one of the factors that squeeze the survival of Nigerian public corporations is an unstable market. Agabi and Orokpo (2014:148) put forward that these market changes are seen in areas of market twist, inflation, and deflation in that, unlike private enterprises, public corporations are not at liberty to make a hasty price adjustment to meet the sophisticated system of the global and domestic market. Public corporations in Nigeria cannot cope with these market sophistications, they run bankrupt and rely on the poor government for funding to pay staff and take care of other overhead costs (Dakare, Sulaimon, Kuye & Iwuji, 2011:4).

Another challenge that has been stoking public enterprises in Nigeria is that of personnel challenges. According to some scholars, SOEs in Nigeria are overstaffed to the extent beyond their financial capacity (Shebbs, 2015:50; Okeke, Onuorah & Okonkwo, 2016:50). High levels of unemployment in the country have been blamed for putting pressure on government institutions and entities to employ many people. Shebbs (2015:50) further notes that in the worst-case scenarios, we see situations whereby poor and untrained personnel fill up the entire organisation and more often the personnel activities become more like a burden to the organisation, leading it to look to the government for support and bailouts. In addition, Okeke, Onuorah and Okonkwo (2016:50) supports this by noting that some government corporations are like over-indulged children who cannot do anything for themselves to the extent that most of them depend on the government for everything, including the payment of staff salaries and the maintenance or replacement of equipment, even though they were established to provide services to the public and

to make a profit. Personnel challenges, rather than enhancing the productivity of the organisation, ill-motivated personnel structure, and overblown systems, are manifestations of the challenge, and this affects the organisation negatively (Okeke, Onuorah & Okonkwo, 2016:49).

Most state corporations are victims of red tape and officiousness, which the system bequeaths (Adeyemo, 2005:244). This is caused by the excess emphasis on bureaucratic models, which strictly apply while doing office works. Red tape causes enormous delays to the organisation, and personal initiatives are deflected from official duties. Staff are not allowed to make inputs to the order of business but are always constrained to the protocols of the system (Omoleke & Adesopo, 2005:65; Shebbs, 2015:50). Red tape has been fingered to the collapse of certain organisations as it does not guarantee quick action on treading issues within the organisations. It also limits innovations, as the system is rigid and not easy to change.

## **2.6. CHALLENGES FACED BY STATE-OWNED ENTERPRISES IN SOUTH AFRICA**

Despite the imperative role SOEs play in the South African economy, it is evident that they are operating sub-optimally and some of them have been posting perennial losses (Muzapu, Havadi, Mandizvidza & Xiongyi, 2016:93). Muzapu, Havadi, Mandizvidza, and Xiongyi (2016) concur with Christiansen (2014:5) by noting that some concerns have been raised regarding the effectiveness and performance of SOEs as some of them are perennial loss makers and rely on government bailouts every year. Different scholars have cited challenges, such as poor state of infrastructure and equipment, lack of interest, outright corruption and poor debt recovery, among other challenges, as impediments to their success of SOEs (Christiansen, 2014:5; Muzapu *et al.*, 2016:93).

### **2.6.1 High turnover of top management and board members**

High turnover of top management and board members is one of the challenges being faced by South African SOEs. According to Thabene and Snyman Van Deventer (2018:15) of the government SOC portfolio, the mass exodus of CEOs and board members has affected most SOEs. Like other SOEs, the SABC had an unhealthy turnover of both board and executive management members, having experienced a mass exodus because of resignations or dismissals (Thabane & Snyman Van Deventer, 2018:17). Also, the SAA has had seven CEOs within four years (2011 to 2015), and this made it difficult to implement any of its turnaround strategies. McGregor (2015:7)

postulates that the constant turnover of key players disrupts the necessary build-up of competencies and institutional memory of good practice behind the efficiencies that produce consistent and constantly improved results.

### **2.6.2 Political interference**

Another challenge faced by SOEs is that of shareholder interference in the operations and running of public enterprises in South Africa. According to Thabane and Snyman Van Deventer (2018:21), not only did the Eskom board fire a senior executive under questionable circumstances, but the shareholder has also chopped and changed the board every time a new public minister of public enterprises is appointed. The board and shareholders have been pointed out as culprits in the interference of organisations' operations and running. For instance, in Eskom, the board has been implicated in meddling in the utility's day-to-day affairs, a case is that of the former chairperson who was accused of placing orders and making contractual commitments on Eskom's behalf (Zibi, 2015:1; Thabane & Snyman Van Deventer, 2018:21). This profoundly influences organisation's performance as antagonistic, hostile, conflicting relationships and abusive power that draws the focus away from the collaboration needed to achieve good results, leading to unwarranted resignations and sour working relationships (McGregor, 2015:8).

### **2.6.3 Corruption**

Corruption is another challenge facing SOEs in South Africa. According to Ngwake (2012:315), corruption is a cancer that appears to be endemic in African countries. It remains the chief threat to achieving sustainable socio-economic growth, not only in South Africa, but also on the entire continent. According to Bloomberg (2016:1), South Africa, as a nation, loses an estimated 20% of its GDP annually through corruption. Mkokeli (2017:1), a former South African Chief Procurement Officer, also noted that fraud and inflated prices from suppliers consume as much as 40% percent of the country's R600 billion budget for goods and services. The African Check (2016:1) further reports that every year, about 20% of the overall government procurement budget of R150 billion is lost through fraud and corruption. This clearly shows that public institutions are under siege by corruption and there is a need to combat it.



#### **2.6.4 Poor Debt Recovery**

Poor debt recovery is also another challenge that has been beleaguering South African SOEs. Thabane and Snyman Van Deventer (2018:20) who indicated that the difficulties being faced by SOEs are also inextricably linked to their weakened ability to raise the necessary capital due to poor debt recovery strategies, support this. They further elaborate that SOEs, such as Eskom, which generates about 95% of South Africa's electricity, the SABC and SAA, have received negative credit ratings due to poor and weakened ability to raise the necessary capital for expansion and operation. Most of them have been relying on government bailouts for them to remain afloat in their operations.

#### **2.6.5 Lack of Qualified Personnel**

Another cancerous challenge that has severely troubled the performance of SOEs not only in South Africa, but the whole of Africa, is a lack of qualified top management. In South Africa, there are increased scandals of bogus and fake qualifications being held by both executive and board members and this have negatively affected the performance of the SOEs as incapacitated manpower is leading them. This is noted by Landu (2013:1), indicated that the fact that the qualifications ascribed to some board members are allegedly false or non-existent, lead to arguments regarding functionality in the running of the entity and irregularities in critical processes, such as awarding of tenders. Additionally, Howard and Seith-Purdie (2005:3) indicated that in SAA, as some board members allegedly lack appropriate qualifications and commercial experience, it is thus tempting to argue that some SAA board members are political appointees deployed from the ranks of political parties in an insidious system of political patronage. This is also noted by McGregor (2015:6) who pointed out that the South African Board on SOCs has accused government ministers of making political appointments without due consideration of the mix of knowledge and expertise needed on the board. Thus, the public good is sacrificed at the altar of political patronage instead of appointment-based competence leading the SOEs to underperform as the relationship between the executive, and the minister will be that of a patron and a client. McGregor (2015:6) further noted that shortage of competent directors on the board and the executive means that necessary skills are missing and without contingency plans to ensure that the required skills are provided, SOEs will continue to be caught in the intensive care of underperforming.

### **2.6.6 Non-compliance to Supply Chain Management policy and regulations**

Non-compliance to supply chain management policy and regulations is one of the major challenges that has troubled the performance of state-owned enterprises. According to Ambe and Badenhorst-Weiss (2012:11012), the issue of compliance is a major problem in the implementation of SCM as it affects other activities. Issues regarding non-compliance to SCM policy and regulations can be attributed to lack of the requisite SCM skill and competencies as well as the absence of a strict regulatory culture. Irregularities, such as lack of appropriate bid committees, use of unqualified suppliers, kickbacks, and bribes in procurement activities have been fingered in the causes of underperformance at state-owned enterprises (Van Zyl, 2006:2; Matthee, 2006:3). According to the Business Day (2011:1), government institutions have spent millions of Rands in ways that contravened laws and regulations and many government enterprises do not have clean audits.

### **2.7. SUPPLY CHAIN MANAGEMENT IN SOUTH AFRICAN STATE-OWNED ENTERPRISES**

In the past two decades, supply chain management (SCM) has gained significant recognition as a strategic source of a firm's competitive advantage (Hugo, Badenhorst-Weiss & Van Biljon, 2011:39; Saunders 1997:137). The significant role played by SCM in public organisations and entities fosters strategic thinking and planning (Lysons & Farrington, 2013:42; Fawcett, Elram & Ogden, 2014:19). In recognition of this, in 2003, the South African government introduced the SCM system, following the two financial Management Reform processes (Setino & Ambe, 2016:380). According to Mkize (2004:3), the introduction of SCM was meant to address the challenges and gaps originating from the previous procurement policy and to replace the past procurement practices and policies altogether. Setino and Ambe (2016:382) allude that the government's SCM was designed to add value at each phase of the process and includes elements of demand management, acquisition management, logistics management, disposal management, risk management and regular assessment of the supply chain performance.

In South Africa, the implementation of SCM in government and its entities is decentralised, thereby granting public sector managers' authority and powers to make decisions in line with the PFMA and other Acts governing SCM (Setino & Ambe, 2016:382). Other scholars also postulate that the government's integrated SCM applies to all departments and SOEs which play an imperative role in economic development, service delivery and development of the country's

strategic sectors (Fourie, 2014:33; Setino & Ambe 2016:380). However, in recent years there have been pressures on the South African SOEs to improve their operational efficiencies and service delivery, which are aggravated by countrywide service delivery protests, reports of corruption, fraudulent activities, collusion, fronting bribery and maladministration of public funds (Treasury, 2015:15). Other scholars contend that there is substantial misalignment between SOEs current SCM practices and the government SCM legislative environment, resulting in weaknesses in controls, poor compliance, poor policy implementation and missed transformation targets (Boateng, 2009:1; Liebenberg, 2012:2; The Presidency, 2012:39). Setino and Ambe (2016:8) are of the view that the South African government's supply chain management (SCM) system is not adequately implemented in SOEs, hence their dismal performance.

## **2.8 Legislative framework**

There is no one Act that regulates SOEs in South Africa. Different Acts and policy frameworks regulate the operation and management of SOEs. SOEs are business enterprises and are therefore subject to general legislation pertaining to companies. In addition, they are publicly owned entities, so they are bound by legislation that pertains to the public sector. Since SOEs operate in specific sectors, they are further regulated by sector-specific legislation and policies. SOEs exist in all spheres of government. As such, provincial and local government legislation may further regulate the operations of such SOEs. The following is a brief discussion of some of the key policies that have a direct bearing on SOEs.

### **2.8.1 National Legislation and State-Owned Enterprises**

Regulations are designed to solve economic, political, and social challenges and attain policy goals that the undocumented, unregistered, and malfunctioning markets might be incapable of solving. These planning goals encompass full employment, economic growth, equitable income distribution, and price stability (Muriithi, 2017:37). Harris (2017:4) notes that policy formulations are designed to achieve current government objectives, such as poverty alleviation, employment creation, community participation, and investment. Most SOEs in South Africa are looked at as a panacea to the socio-economic challenges faced by the economy because of their labour-intensive orientations (Muriithi, 2017:37). Therefore, the government policies formulated at the national level enable SOEs' policies to be implemented at a national level, which is deliberated and reviewed in subsequent sections.

### **2.8.1.1 The Public Financial Management Act (Act 1 of 1999)**

The Public Financial Management Act (Act 1 of 1999), hereafter referred to as the PFMA, is not limited to SOEs only. Section 1 of the PFMA (as updated in 2008) defines an SOE as a national government enterprise which:

- is a juristic person under ownership and control of the national executive,
- has assigned financial and operational authority to carry on as a business entity,
- has its principal business, provides goods and services in accordance with ordinary principles?
- is financed fully or substantially from services other than the National Revenue Fund or by way of tax, levy, or other statutory money. Section 48 provides for classification of public entities.
- The Minister may by notice in the national Government Gazette classify public entities listed in Schedule 3 in accordance with the relevant definitions set out in section 1, as—
  - national government business enterprises.
  - provincial government business enterprises.
  - national public entities; and
  - 46 provincial public entities.

Before the PFMA, there were a myriad different policies and Acts that regulated the management of public resources. The introduction of the PFMA brought uniformity in terms of financial reporting and accountability procedures across the public sector, including SOEs (Marrez, 2010: 16). Section 55 of the PFMA requires that SOEs submit their audited annual financial statements to the executive authority within five months of the end of the financial year (Public Financial Management Act, 2010). This is how SOEs are expected to be financially accountable for their operations. Moreover, section 65 requires the executive authority to table the annual financial statements in parliament within one month of a year having received them (Ibid). This process enables transparency and accountability in accordance with the developmental agenda. According to the Department of Public Enterprises (DPE), the PFMA is aimed at improving financial governance, accountability and reporting which applies to SOEs (Department of Public Enterprise, 2011).

### **2.8.1.2 The Companies Act (Act 71 of 2008)**

The Companies Act (Act 71 of 2008) at first classifies companies as either for profit or non-profit. According to Section 1 of the Companies Act, a state-owned company means “an enterprise that is registered in terms of the PFMA or MFMA” (Ibid). The Companies Act requires that the SOE name should always end with designation “LTD”. In principle, while SOEs are regulated in terms of the PFMA (including the MFMA at municipal level), SOEs also have to abide by the Companies Act. In cases of conflict between the Companies Act and the PFMA, the PFMA is more pertinent because it pertains specifically to the management of public finances, whereas the Companies Act regulates private and public companies. Hence, Section 5(4) (a) of the Companies Act states that “the provisions of both Acts apply concurrently to the extent that it is possible to apply and comply with one of the consistent provisions without contravening the second” (Companies Act, 2008). The Companies Act provides that any provision of the Act that applies to public companies also applies to SOEs, except to the extent that the Minister has been granted an exception in terms of the Act (Companies Act, 2008). From the PFMA and Companies Act, it appears that there is a considerable need to strengthen SOE legislative framework.

### **2.8.2 Local Government Legislation and SOEs**

It is crucial to note that the national legislative framework pertaining to SOEs also regulates municipal SOEs. In other words, municipalities must comply with the requirements of the PFMA as well as the Companies Act. There is a proposed bill to replace PFMA by the Department of Public Enterprise (DPE), which deals with matters of shareholding and powers. Changes, which will be forthcoming from the Bill, will also regulate SOEs at municipal level. However, there are several local government Acts, namely the Municipal Systems Act (as amended 2000), the Municipal Financial Management Act, the Municipal Structures Act which further provide regulations for the establishment and management of municipal SOEs. The Municipal Systems Act refers to SOEs in their jurisdiction as municipal entities. The Act identifies a municipal entity as being as a company, a corporation, a Trust or other corporate entity established in terms of any applicable national or provincial legislation, which operates under the control of municipalities (Section 2 of Municipal Systems Act, 2003). Prior to this Act and the PFMA, municipalities used to establish Trusts as the main legal entity tasked with delivering services and to manage the functions they perform (ENS, 2012). The National Treasury (2014) suggested the need to review

municipal entities to monitor their performance as a legislative requirement and whether there are too many. The objectives and purpose of the respective municipal entities, as well as the activities performed by such entities, need to be determined to consider the necessity of the various municipal entities.

According to the Municipal Systems Act, a municipal entity may be established if the municipal manager and municipal council approve the need for such an entity in accordance with section 21 of the Act. Section 21 requires municipalities to set out the municipal operational plans of the municipal entity, in consultation with the local population. Municipal entities are accountable to the municipality that established that entity. The National Treasury (2010) stressed that municipal entities must perform their functions according to a service delivery agreement and performance-based objectives set forth by the municipality. Moreover, given that their debts and decisions are made on behalf of the municipality, they must be disestablished if they fail to perform satisfactorily or to the municipal expectations. The Municipal Systems Act also classifies municipal entities into three categories, namely, private companies, service utilities and multi-jurisdictional service utilities.

Structures such as a Trust should be incorporated into a municipal entity or disestablished altogether if it is not meeting its intended objectives. Ritcken (2014:16) argues that this classification seems to meet the needs of municipalities in their pursuit of providing municipal services when the municipality may not have the requisite capacity as the national entities. He further observed that service utilities are municipal entities with separate board of directors who are appointed by the municipal council to manage the SOE (Municipal Systems Act, 2000). Multi-jurisdictional service utilities can be constituted by a form of written agreement between one or more municipalities (Ibid). A local municipal entity can be a private company. According to the Municipal Systems Act, such a company may have more than one parent municipality. However, the problem starts when a municipality is not the only shareholder (Municipal Systems Act, 2000). From this legal perspective, for a company to be classified as a municipal entity, it is crucial for the municipality to have “effective control” of the entity in a sense that it has powers to:

- Appoint or remove most of the board of directors of the private company, or
- Control at least most of the voting rights at a general meeting of the private company (Section 86 of Municipal Systems Act, 2000).

The legal framework for municipal entities states that to delegate municipal functions to a company, this must be justified through similar terms to the decision to use a service utility. In terms of section, 86 D (2) of the Municipal Systems Act: “a company which is a municipality entity-

- Must restrict its activities to the purpose for which it is used by its parent municipality in terms of section 86 E (1), and
- Has no competence to perform any activity which falls outside the functions and powers of its parent municipality contemplated by section 8.

### **2.8.3. Competition Act**

The Competition Commission (CC) came into existence, complementing and cementing the roles of the Competition Act. The CC was sanctioned and designed to inspect, monitor, and review deterring and preventive enterprise practices, exploitation of overriding business situations, mergers, and acquisitions. The CC policy was again designed to attain and realise effectiveness, efficiency, and equity in the performance of economic activities in the country (Van Niekerk, 2019:13). Its principal drive is to stimulate and uphold business competition in the economy (Competition Commission, 2018:11), which resulted in the emerging of various SMEs in the economic space. SMEs, especially those of black people, were restricted entry into the sector before independence; hence, the enactment and promulgation of the CC enabled SMEs of the formally underprivileged majority to participate in the manufacturing sector. The Act opened the once restricted sectors to new emerging black-owned SMEs, thereby offering competition to the once dominant SOEs. In support of this, by rendering to a Global Competitiveness Report (GCR) brought together by the World Economic Forum (WEF), South Africa has upheld an ascending tendency in its commercial competitiveness, rising five levels from 2016 to dwell at 44th place given 140 economies (Nieuwenhuizen, 2019:668). This may perhaps specify that not every upward movement in the competition trajectory is underwritten to SOEs, and that they do still have constrictions. Therefore, some studies may argue that there is an undeviating essential required to

put resources together and to promote productive skills and SOEs (Guliwe, 2018:23, Van Niekerk, 2019:36).

#### **2.8.4. Employment Equity Act**

During 1996, a necessity arose that saw the involvement of the once underprivileged black South Africans into the national economic activities. This has directed to the instituting and promulgating of the EEA in 1998 to stimulate the involvement of the majority into the economic activities in South Africa (Guliwe, 2018:23). The main intention and purpose of EEA policy is to realise fairness and impartiality in the working environment by supporting the equal opportunities interventions and impartial job-treatment initiatives (SAICA, 2017:5). Thus, the Act ensures that there is the elimination of unfair discrimination in the workplace. Van Niekerk (2019:14) states that the Act ensures the implementation of affirmative exploits and processes to amend and reconfigure the detriments and setbacks encountered by entitled classes of the underprivileged people from the apartheid era. Guliwe (2018:23) notes that the Act is to ensure and promote justifiable and impartial representation in all work-related positions and levels by the once suppressed labour force. The EEA, though not fully effected and implemented in some quarters of the economy where white supremacy is still visible, has led to black people being involved in the once white dominated economic activities. Before 1994, the Whites, a few Coloureds, and Indians mostly dominated SOEs. The promulgation of the EEA not only achieved equity in workplaces but assisted also for the once underprivileged blacks to take leading roles in South African SOEs.

#### **2.8.5 The public financial management bill**

The Public Financial Management Bill (PFM) is set to replace the current PFMA. The National Treasury has drafted an explanatory memorandum as an attempt to explain what this Bill is set to achieve. According to the explanatory memorandum, the PFM Bill is aimed at bringing about transparency and expenditure control from each sphere of government and uniform treasury's norms as required by section 216 (1) (c) of the Constitution, 1996. Private sector institutions argue that this Bill will transform the PFMA from a financial oversight instrument to a governance legislative framework (Sunday Times, 2015). Given the current poor performance of SOEs in South Africa, the Bill approves the National Treasury and Department of Public Service Administration (DPSA) initiative to conduct a governance review of all entities listed in Schedule 3A and 3B to the PFMA (Public Financial Management Bill). The Bill also aims to clarify



distinctions between public entities and government enterprises. In addition, the Bill also aims to shed clarity on the mechanisms for the establishment of SOEs and elucidate the relationship with their governing authorities (Ibid). However, the effectiveness of these SOEs has been questioned in recent times.

One critique raised by the Presidential Review Committee (2012: 15-16) was that there are many different terms used when discussing SOEs. For example, the PFMA refers to these entities as business enterprises whilst the Companies Act refer them as SOEs. Mokwena (2012: 24) argues that the legal framework does not only address matters of fiscal accountability and reporting, but it also contains non-financial and governance issues, such as service delivery or social responsibility initiatives by the government. In post-apartheid South Africa, there are SOEs that are performing badly compared to the apartheid period, even though they were benefiting only the few. It has been argued that some poor performance of certain SOEs like ESKOM and South African Airways (SAA) can be blamed on the incapacity of the government of the day (Sunday Times, 2014). According to the Sunday Times (2014), the failing of public enterprises can be attributed to the politics of patronage and family ownership as opposed to government ownership.

However, Bratton (2014: 42-43) argues that some SOEs, such as Iscor, are battling to survive due to competitive global corporate initiatives. There is a prevailing need to, among others, restructure SOEs, as suggested in the National Development Plan (NDP) for SOEs to compete globally effectively. Hence, Gumede (2012: 16) raised a valid concern that “how do we reinvent governance in the post-apartheid?” According to Edward Nathan Sonnenbergs (ENS) (2012), though PFMA is to be applied where there are inconsistencies, this remains an ongoing challenge. They argue that this is because it requires the sophisticated legislative interpretation, which is often lacking in the government or public space (Ibid). Hence, from the legislative perspective, government is expected to act in accordance with these legal principles.

### **2.8.6 Policies guiding operations of State-Owned Enterprises**

Besides formal Acts, there are several policies that guide the operations of SOEs. In overseeing the implementation of SOE regulations, the Department of Public Enterprises (DPE) has drafted policies that detail the national government’s strategic objectives. Such policies are meant to inform the actions of SOEs. For example, the DPEs Medium Term Strategic Framework (MTSF) 2015-2019, positions the Industrial Policy Action Plan (IPAP) and the National Development Plan

(NDP) as key pillars of development in South Africa. These policies provide the overarching framework required to change the structure of the economy (National Treasury, 2015). SOEs are regarded as key vehicles to bring about a structural change in the economy and SOEs are crucial to achieving the developmental goals set out in the NDP (PRC, 2012: 17). The argument is that SOEs can be leveraged to support growth in the short-term. According to the DPE's 2015/19 Medium Term Strategic Framework (MTFS), SOEs should be used to redirect the economy in line with South African Government's NDP. A policy framework on restructuring SOEs in four major sectors, namely, telecommunication, transport, energy, and defence-related industries was released in August 2000 (National Treasury, 2009). This policy framework is "an accelerated agenda towards the restructuring of state-owned enterprises" which sets out guiding principles for the restructuring programme. These objectives are:

- At the enterprise and sector level, restructuring involves improving the efficiency and effectiveness of the entity, accessing globally competitive technologies where possible.
- At the macroeconomic level, the initiative aimed to attract foreign direct investment, to contribute to the reduction in the public borrowing requirement, and to promote industrial competitiveness and ultimately growth.
- Social imperatives included the need to ensure growth in employment and to develop new skills within the labour force. This restructuring further aimed to ensure the wider ownership and participation in the economy (National Treasury, 2009).

The NDP states that by 2030, South Africa should have financially sound SOEs (National Planning Commission, 2012). To achieve this, SOEs must be commercialised. This means that SOEs objectives should be profit oriented, as alluded above, but still make a room for non-commercial SOEs as long as the latter do not run at a loss. The NDP holds that every SOE needs to have a clearly defined and transparent mandate that will outline its role and how it will serve the public interest (Ibid). Moreover, it requires a clear and unequivocal governance structure which entails identifying and managing the government's role in policymaking (National Planning Commission, 2010). The NDP requires serious consideration on the various roles, ranging from policymaking to governance, to ensure sustainable well-balanced priorities and co-ordination between different policy priorities. Although clear governance structure may reduce the financial burden, there is a need to develop the skills required by SOEs and to ensure that they are financially sound (Ibid).

They also draw from National Growth Plan (NGP) which is set to “deepen the domestic and regional market by growing employment, increasing incomes and undertaking other measures to improve equity and income redistribution” (National Growth Plan Policy, 2009: 14).

The NGP is government’s response to insufficient job growth and the need to accelerate income growth and the reduction of inequality (Ibid). This policy identifies six priority areas of job creation with SOEs as essential players. As established in chapter two that SOEs often undertake governance commercial activities and create jobs, the NGP challenges South Africa to do more to create job opportunities like the fast-growing economies of China, India and Brazil (Ibid). Indeed, the NGP sets out a range of practical measures to achieve this and draws from the growing economies with view of realising the NDP. The PRC (2012: 14) noted that when assessing the potential of SOEs to achieve the developmental agenda, especially over key SOEs, the issue was that the PRC did so without the power of any legislation positioning the PRC as a shareholder Ministry.

However, other Ministries are given that authority through SOE founding legislation which specifies that a particular minister from which level of government is their shareholder. It is argued that the DPE has stretched its mandate and developed a paper called Centralised Shareholder Management (CSM) to further explain the Government Shareholder Management Bill (GSM Bill). The CSM articulates how SOEs can be governed but stemming from the GSM Bill. From the GSM Bill, the investigation conducted by the DPE into the current legislative framework found that there is a need to strengthen the SOEs’ policy framework. The CSM notes that to devise such a policy framework, the DPE would need to co-ordinate with National Treasury. According to the CSM document, the GSM Bill will provide for, *inter alia*.

- Shareholder management and accountability while enabling SOEs operational flexibility.
- Establishment of new SOEs and restructuring of existing SOEs.
- Publication of annual strategic intent statements and thus continuously aligning SOE planning and performance with such strategic intent and objectives.
- Board appointment by the shareholder minister in the relevant SOE.

- SOE procurement policies that are based on principles of strategic sourcing and long-term planning.

## **2.9 CHAPTER SUMMARY**

The purpose of this chapter was to review the literature on SOEs. The literature revealed that SOEs play a critical role in the development of a nation as they are used as pivots for social, economic, and political growth. It was shown that SOEs are established through Acts of Parliament and other statutory instruments that guide them. The literature further revealed that despite their importance in socio-economic contributions and political significance, SOEs in South Africa and other countries, face numerous challenges that have led to their under-performance and to be labelled as government liabilities. These challenges include political interference, corruption, overstaffing, red tape and lack of qualified and skilled leaders, to mention a few. The study also revealed that to resuscitate the institutions, there is a need for the adoption and proper implementation of public SCM, which aims at improving service delivery in government entities.

## **CHAPTER THREE**

### **A LITERATURE REVIEW ON INNOVATION CAPABILITIES**

#### **3.0 Chapter overview**

This chapter of the study reviews the literature on innovation capabilities and its sub-constructs. The chapter opens by discussing the nature of innovation capabilities in terms of their conceptualisation and definitions. Thereafter, the theories on innovation capabilities in SOEs are discussed. The discussion then proceeds to discuss the constructs of innovation capabilities, that is innovation culture, innovation strategy, market innovation and technological innovation. The definitions and importances of these constructs are discussed in detail in the respective subsections. On each construct, the previous studies are outlined. The chapter also discusses the research gaps that motivated the conducting of this study, particularly on the innovation capability and its constructs in SOEs in South Africa. Also put in the spotlight is the application of innovation capabilities to SOEs in South Africa as a possible solution to the challenges they face. The literature used in this chapter was derived from completed dissertations, academic books and scholarly articles in academic journals and other official documents. The chapter summary therefore concludes the chapter.

#### **3.1 Innovation capabilities**

The increasing dynamics and transformations in technological advances, worldwide economic integration and customer needs cause business organisations and public entities to encounter many challenges and difficulties (Jia, Chen, Mei & Wu, 2018:8; Le & lei, 2018:307). Organisational innovation is developing as a hot topic that is attracting increasing attention from academics, professionals, and researchers (Khalili, 2016:2278; Prasad & Junni, 2016:1545; Charterina, Basterretxea & Landeta., 2017:736; Le & Lei, 2018:308; Tian, Deng, Zhang & Salmador, 2018:1091). An organisation's innovation capability is regarded as a central way of attaining the organisation's competitive advantage and sustainable success (Colino, Benito-Osorio & Rueda Armengot, 2014:315; Liao, Chen, Hu, Chung & Liu, 2017:591; Le & Lei, 2018:308). Consequently, many organisations try to find effective and appropriate ways to effectively

innovate but they are still imitators and are struggling to become innovators (Song, 2015:99; Le & Lei, 2018:309). Given this background, the identification of strategic factors that meaningfully promote and stimulate organisations' innovation capability becomes more significant and essential.

### **3.1.1 Conceptualisation of innovation capability**

Conceptualising innovation capabilities is a newly developing intricate field of study, and the topic has attracted interest and attention from several researchers and academics (Zheng, Liu & Gong, 2016:913; Podrug, Filipovic & Kova, 2017:633; Yang, Nguyen & Le, 2018:958). Still, there remains a lack of agreement in the literature and an unrelenting need to elucidate what type of capabilities drive innovation (Breznik & Hisrich, 2014:371), and how these capabilities are utilised and developed (Wang, Yang & Xue, 2017:1112). This conceptual study, therefore, aims to create the contemporary understanding of innovation capability and affords an outline to discuss the type of innovation capabilities necessary for innovation success in South African SOEs. Due to the present ambiguities of the conceptualisation of innovation capabilities (Breznik & Hisrich, 2014:372), this study discusses the dimensions of innovation capabilities that are necessary for successful innovation performance in South Africa's SOEs. Furthermore, due to the overlay of interrelated concepts from the innovation and performance literature, such as absorptive capacity (Podrug *et al.*, 2017:633; Yang *et al.*, 2018:958) and dynamic capabilities (Breznik & Hisrich, 2014:372; Khalili, 2016:2278), this study also provides an enhanced understanding of the innovation-performance link in SOEs.

The present literature includes a diversity of dimensions to innovation capability, with a wide distinction in definitions and conceptualisations (Khalili, 2016:2278; Prasad & Junni, 2016:1545). Yang *et al.* (2018:958) reveal that, two contingency variables could account for different approaches to innovation capability. Variation in definitions and conceptualisations might be constructed on an effort to frame and define innovation capability within diverse contexts, without clarifying how the understanding of the concept might be contingent on these contextual differences (Hogan & Coote, 2014:1611; Appu & Kumar Sia, 2015:2). Therefore, this study proposes that the innovation capabilities essential for a positive performance in SOEs depend upon innovation uniqueness and market characteristics. The contexts that emerge from the combination of the innovation capability variables explain some of the inconsistencies in the literature.

### 3.1.2 Innovation

It is important from the onset that before discussing and explaining the innovation capabilities, to define and explain the term ‘innovation’. According to Ritala, Husted, Olander and Michailova (2018:1105), innovation is viewed as a reiterative development that aims at generating new knowledge, processes, and products, by the application of new or even prevailing knowledge and information (Kusiak, 2009). Innovation is regarded as imperative for businesses and other non-profit organisations to address crucial challenges projected by the transformations in socio-economic and environmental issues (Zheng *et al.*, 2016:912; Alsharo, Gregg & Ramirez, 2017:481). Anderson, Potocnik and Zhou (2014:1298) note that innovation is mainly understood as an imperative source for creating sustainable competitive advantage. Akgunduz, Alkan and Gok (2018:106) define innovation as a key driver of economic development and that it plays an essential part in competition at both the organisational and national levels (Hogan & Coote, 2014:1612). Drucker (2014:14) defines innovation as the abilities of generating new work processes, products and management polices to expand organisational competitive advantage. Akgunduz *et al.* (2018:107) argue that innovation is tactical for organisations on the reconceptualisation of the existing business model and adjusting prevailing markets by reassessing and re-examining the earlier guidelines and instructions to expand organisational growth and value creation (Leavy, 2015:25, Suifan, Abdallah & Al Janini, 2018:115). According to Akgunduz *et al.* (2018:107), innovation may transpire in different presentations including process, product, marketing, and organisational performance. Table 3.1 outlines the different innovation presentations.

**Table 3. 1: innovation formats**

<b>Innovation format</b>	<b>Description</b>
<b>Product innovation</b>	is innovation in terms of goods or services that are new or significantly improved from existing ones, including improvements to technical specifications, components and materials, user friendliness or other functional characteristics.
<b>Process innovation</b>	is the application of new or improved methods of production. This includes significant changes to the techniques, equipment and / or software used.
<b>Organisational innovation</b>	is the adoption of new methods in the company's business practices workplace or external relationships with other institutions
<b>Marketing innovation</b>	is the implementation of new marketing methods that involve significant changes in product or packaging design, product placement, promotion, or pricing

**Source:** Akgunduz *et al.* (2018:107)

In general, innovation is referred to as the key reason for economic growth in the global market (Bessant & Trifilova, 2017:1095). Benitez, Castillo, Llorens and Braojos (2018:133) highlight those international businesses and organisation are concentrating on innovation to participate and gain competitive advantage on the global markets. Innovation can take various forms in terms of a new process, or a new structure, a new procedure, a new operating system or a new product or service (Saunila, 2017:904). Antunes, Quirós and Justino (2017:1476) note that a lot of organisations and businesses accept the impression of progressing their competitive position and uphold innovation as it is an imperative influence for success and survival (Wang & Dass, 2017:128). Over the years, various studies have focused on the significance of innovation from the profit-making organisation's perspective in creating and supporting value creation and competitive advantage (Saunila, Pekkola & Ukko, 2014:235; Behnam, Cagliano & Grijalvo, 2018:952).

Prior literature conversed on how organisations innovate, transfer innovation, and deal with innovation to expand their competitive advantage and market share (Donate, Peña & Sanchez de Pablo, 2016:931). This was viewed from the outlook of the corporate background of innovations and the organisational framework, that is organisational external and internal capabilities (Rasiah, Shahrivar & Yap, 2016:73). On the other hand, Wang and Dass (2017:128) point out that less attention was paid on the result of the innovation process itself. However, the clarification of the innovation concept in literature cannot be interpreted as it fails to provide understanding in various types of innovation and its association with sustainable performance and competitive advantage. In fact, there are two main aspects that define innovation, that is better performance and newness (Menguc, Auh & Yannopoulos, 2014:314).

### **3.1.3 Importance of innovation in organisations**

It can be contended that innovation has developed as one of the conventional research topics in the last decade (Ali, Musawir, & Ali, 2018:454). In this 21st century, innovation happens to be imperative for businesses to address the main challenges projected by the deviations in socio-economic and environmental matters (Menguc *et al.*, 2014:315, Ali *et al.*, 2018:455; Liu, Zhao & Zhao, 2018:1788). Chandrashekar, Subrahmanya and Hil (2017) specify that innovation also generates value for customer as it contends the requirements of current markets and customers in creative ways. Various studies (Lowik, Kraaijenbrink & Groen, 2017:1321; Ali *et al.*, 2018:455) suggest that innovation cascades into the expansion of new product, new production systems,



opening of new markets, the use of new supply chain management sources and new arrangements of competition (Cui & Wu, 2016:517). Several studies (Menguc *et al.*, 2014:315; Liu, Shen, Ding & Zha, 2017:476; Liu *et al* 2018:1789) outline that innovation leads to transformation in business and non-profit organisations and supports them in establishing competitiveness. Liu, Lin and Joe (2018:1473) establish that both the new innovative products and designs promote the maintaining and sustaining market share of the organisation and increase profits in those markets (Al-Husseini & Elbeltagi, 2015:182). Over the years, several studies (Kafetzopoulos & Psomas, 2015:105; Zheng, & Liu, 2016:914; Úbeda-García, Claver-Cortés, Marco-Lajara, García-Lillo, & Zaragoza-Sáez, 2018:3609) have revealed that innovation influences organisations' performance. Conceição, Costa and Miran (2018:412) argue that innovation capabilities influence performance improvement.

Organisational performance can be enhanced and advanced through innovation buoyed by numerous influences such as environment, organisational culture, top management support, technology, social and economic aspects (Daspit, & Zavattaro, 2015:207; Dranev, & Chulok, 2015:321; Comez, 2016:77). Reflecting on that, various studies paid attention to the influence of innovation on organisational performance (Comez, 2016:77). Conceição *et al.* (2018:413) highlight that organisational innovation, efficacy, effectiveness, and performance are interconnected. To illustrate more, studies by Daspit and Zavattaro (2015:207); Chang (2016:571); Chen and Su (2017:4); Conceição *et al.* (2018:413) and Liu *et al* (2018:1789) confirm that innovation and performance are positively correlated. Comez (2016:77) also highlights that the innovative organisation has higher levels of productivity, organisation's value, and development than old non-innovating organisations. Cui and Wu (2016:517) indicate that newness and better performance are two important notions defining innovation. In the global economy, innovation is consequently perceived as an antecedent of organisational growth and imminent success for businesses (Conceição *et al.*, 2018:413).

In contrast, some studies have revealed that the performance relationship with innovation is influenced by other factors such as political, cultural, and environmental issues (Al-Husseini & Elbeltagi, 2015:182). Zheng and Liu (2016:914) offer an evolutionary viewpoint for innovation capabilities and propose a measurement instrument using knowledge embodied in machinery, training, processes, and products. Their findings recommended that the innovation capability is

associated with institutional support, and it affects the organisational performance in the context of exports. Cui and Wu (2016:517) suggest that practitioners and decision makers must consider factors related to innovation to increase their operational performance.

### **3.1.4 Innovation capability definitions**

Innovation capabilities are regarded as the principal influences of economic growth and play an essential part in competitive advantage enhancement at both the national and organisational levels (Rafique, Hameed & Hassan, 2017:46). Saunila (2016:163) defines innovation as the abilities of making new work processes, products, services, and management structures to obtain and sustain organisational competitive edge. Innovation capability, which is defined as an organisation's capacity to create, receive, and apply new processes, create new ideas, products, or services, is one of the important resources that determines an organisation's success in the global market (Perlines & Montes, 2019:221).

Reid (2018:135) asserts that, in practice, organisations attempt to improve and develop their innovation capabilities. For example, according to the PWC Global Innovation 1000 study, worldwide research, and development (R & D) spending has progressively increased over recent years, reaching more than \$700 billion United States dollars in 2017. On average, the top five most innovative corporations (that is, Apple Incorporation, Alphabet Incorporation, 3M Company, Tesla Motors Incorporation, and Amazon.Com Incorporation) spend over 15% of their entire sales revenue on R&D activities (Perlines & Montes, 2019:221). The Marketing Science Institute (2018:4) submits that understanding the part of innovation on creating superior organisational performance should be a top research precedence. Organisations exploit their capabilities and resources for the development of innovations, such as new processes, procedures, methods, products, or services (Menguc *et al.*, 2014:315; Ali *et al.*, 2018:455).

Various studies specify that there is a positive association between the application of innovation aspects and imminent organisational performance (Alexander,2015:754; Wang & Tsai, 2017:732; Wang, Yang & Xue, 2017:1112). The capabilities and resources required to thrive in innovation activities differ extensively amongst organisations (Sigala & Kyriakidou, 2015:297). Wang *et al.* (2017:1112) argue that some organisations attest to be better at replicating innovation success than others, and the ability to do so can be outlined as an innovation capability. Reid (2018:135) thus defines innovation capability as an organisation's aptitude to recognise new concepts, notions,

processes and transmute them into new/better-quality products, processes or services that benefit the organisations.

### **3.1.5 Types of innovation capabilities**

Contemporary descriptions and explanations of innovation capabilities overlay the concept of dynamic capabilities (Wang & Tsai, 2017:732), making these notions hard to differentiate. Dynamic capabilities refer to a universal concept within the field of strategic management. The term ‘dynamic capability’ was coined by Lee, Woo, and Joshi (2017:251) and is defined as “the organization’s ability to incorporate, create, and transform external and internal abilities to face hastily changing business environments and global markets”. However, a detailed assessment by Lee and Xuan (2019:74) acknowledged some other definitions of the concept that are often alluded to, and thus resolved that the theoretical foundations of dynamic capabilities are under-developed. Fontana and Musa (2017:5) note that, despite the recognised conceptual obscurities, dynamic capabilities are fundamental to innovation capabilities (Fonseca, Faria & Lima, 2019:617). Furthermore, existing literature also calls for an enhanced understanding of the relationship between strategy and innovation (Perlines & Montes, 2019:221).

An organisation’s ‘innovation capability’ can be perceived as the latent ability to innovate (Lee *et al.*, 2017:252), or precisely the “ability to incessantly change knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders” (Alexander, 2015:754). It has been proposed that innovation capabilities are so-called higher-order capabilities or “the ability to shape and manage multiple capabilities” (Sigala & Kyriakidou, 2015:297). Organisations that own these capabilities have “the ability to integrate key capabilities and resources of their organisation to positively kindle innovation” (Zheng & Liu, 2016:914). Thus, efforts to define innovation capability have overlapped with the theory of dynamic capabilities (Ershova, Yutkina, Pashkov & Ivanova, 2018:2). Furthermore, within the conceptualisation of innovation capability is the impression that capability is associated with performance and renewal of an organisation over time, particularly with shifting, transforming markets and the knowledge that it is essential for an organisation to be flexible and adapt services and products offered (Fonseca *et al.*, 2019:617). Moreover, innovation capability embraces a mixture and composition of resources and endowments to sustain aptness, along with external transformations (Ershova *et al.*, 2018:3). Again, the above definition appears to overlap with dynamic innovations; however,

innovation capability concentrates more directly on the organisation's capacity to transform its contributions, while dynamic capability highlights environmental suitability as a signal of performance (Behnam *et al.*, 2018:953).

A current bibliometric study offered by Saunila (2017:904) discovered 19 various definitions for 'innovation capability' and resolved that the inconsistency in descriptions of the term make an integrated definition difficult. Innovation capabilities are alienated into different classes by different academics. For instance, Behnam *et al.* (2018:953) propose that innovation capabilities comprise seven aspects (competence base, creativity, culture and climate, idea management, management of technology, organisational intelligence, organisational structures, and vision). Saunila (2017:904), on the other hand, proposed just two classes, that is, knowledge transfer and collaboration. Ershova *et al.* (2018:2) recognised and acknowledged six dynamic service innovation capabilities (signalling used requirements and technological choices, conceptualising, (un)bundling, (co)producing and orchestrating, scaling, and stretching, and learning and adapting), maintaining for innovation capability as depending on the context (that is, whether the innovation is pointing at processes, knowledge, product, or service improvements). Therefore, the various approaches defined above, and the different frameworks from which innovation capabilities can be regarded may account for the haziness and ambiguity of definitions in the literature.

### **3.2 Resource-based view and innovation capability**

The resource-based view (RBV) of the organisation postulates that the endowments and resources they have (Nason & Wiklund, 2015:34) mostly determine the organisation's success and competitive advantage. That is, resource immobility and heterogeneity explain the performance discrepancy amongst organisations (Wang, Jin & Banister, 2019:204). Valuable, rare, inimitable, and non-substitutable (VRIN) resources permit the organisation to attain continuous competitive advantages (Nason & Wiklund, 2015:36). Current development of RBV submits that possessions and endowments only have potential values (Wang *et al.*, 2019:205). To comprehend a competitive advantage, resources require to be bundled, leveraged, and managed (Nilsson & Ritzén, 2014:185), a process that shapes and develops organisations' capability and eventually improves their performance. Henceforth, the progression and enhancement of innovation capability can be measured and regarded as a process of resource utilisation and management (Ju, Jin & Zhou, 2018:4). Resources are grouped into two essential groups, which are tangible and intangible

(Nason & Wiklund, 2015:206). Tangible resources encompass financial or physical value as measured by the organisation's statement of financial position while intangible resources are non-physical in nature (Ju *et al.*, 2018:5). Although most previous studies regarded tangible resources as less vital than intangible ones, the undeveloped financial system in South Africa presents complications and challenges for organisations to gain access to financial capital, making it a valuable and rare resource (Wang *et al.*, 2019:207). Thus, financial resources are treated as one imperative type of tangible resources in South African organisations.

While there is no consent over what incorporates intangible resources, an organisation's knowledge resources, that is, its intellectual capital, are vital intangible resources and have substantial and noteworthy inferences for innovation (Ju *et al.*, 2018:5). Intellectual capital can be further classified as organisational capital and human capital (Liu, Gong, Zhou & Huang, 2017:1165). Human capital is the abilities, skills and knowledge inherent in and applied by individuals, whereas organisational capital presents a context for workers to work in and interconnect with each other (Liu *et al.*, 2017:1165). Furthermore, the worth of institutional resources, particularly support from the government, is emphasized in the South African public sector (SOEs in particular), given the centrally administered capitalism in South Africa where the state plays a critical part in many facets of the business sector (Wang, Sheng, Wu & Zhou, 2017:100). Therefore, this study takes an all-inclusive approach with respect to endowments, in view of how financial resources, human capital, organisational capital (that is, innovation management and concerted culture) and institutional resources (that is, government support) influence the development of innovation capability in South African SOEs.

### **3.3 Innovation capabilities in SOEs**

State-owned enterprises contribute an extensive and substantial share to the employment, gross domestic product (GDP) and market capitalisation of emerging economies, such as South Africa (OECD, 2015). Such state-ownership is mostly present in sectors as infrastructure and utilities, but they also exist in high-technology areas such as shipbuilding, aerospace, automotive industries, and sectors strictly associated with the military-industrial complex (Genin, Tan & Song, 2020:4). In many aspects, SOEs are leading players, or even occupy (natural) monopoly spots, in their corresponding fields (Bambang & Noorlailie, 2018:874). Nevertheless, they can also give the impression as expanded industrial groups, whose functions (including R&D and innovation) are

partially or totally financed and controlled by the government (Genin *et al.*, 2020:5). Given their standing and significance in the economy, governments have high prospects for SOEs to enhance native technological capabilities and encourage innovation, specifically governments in emerging economies (Zhou, Gao & Zhao, 2017:376). Due to their scale effects and influences on customers and suppliers, these governments consider SOEs as the main actors in promoting industries and regions (Wang, Jin & Banister, 2019:204).

Given their extensive and imperative investments in R&D and innovation, shared with their noteworthy potential for global market reach and strategic intelligence, the possible involvement of SOEs to the advancement of national and regional economies and industrial structures is well thought-out to be important (Meissner *et al.* 2018). Consequently, SOEs are under pressure to play an active part in creating and applying innovation, and in leading the expansion and international competitiveness of comprehensive swaths of domestic industry and frequently consist of small and medium-sized enterprises (SMEs) with no global capabilities or even determinations (Wang *et al.*, 2019:205). Until now, the literature has shed little light on innovation governance in developing economy SOEs. Only in current years, there is a more organised movement to address the part played by the state and SOEs in taking innovation risks (Lenihan, McGuirk, & Murphy, 2019:3). South African SOEs, in particular, have attracted much consideration with respect to involvement to innovation, industrial development and diversification (Lee & Nam, 2016:451). Attention has also increased in other countries (Musacchio, Lazzarini, & Aguilera, 2015:117), including Brazil (e.g., Fischer *et al.*, 2018; Silva *et al.*, 2018 and several European economies (e.g., Antonelli *et al.*, 2014).

### **3.3.1 Importance of innovation capabilities in SOEs**

In contrast to SOEs from developed countries, which transfer organisations' resources to subsidiaries, SOEs from developing countries often transfer knowledge from subsidiaries to parent organisations (Lee & Nam, 2016:252). This is especially true for SOEs organisations whose determination is to attain cutting-edge technologies and knowledge-based skills (Lenihan *et al.*, 2019:3). To convert exogenous resources, such as information and knowledge, from business affiliates into endogenous information assets and further change them into innovation performance, organisations require owning and developing dynamic innovation capabilities (Musacchio *et al.*, 2015:117). Thus, dynamic innovation capabilities allow organisations to

generate and renew the attained resources and transform them as required to innovate and retort to variations in the global business markets (Löfsten, 2014:6; Li *et al.* 2020:918).

Following the dynamic capability theory, dynamic innovation capabilities are indispensable and necessary to performance enhancement because they permit organisations to render their resources and endowments into competitive advantages (Muafi & Uyun, 2019:2). As an explicit type of dynamic capability, innovation capability is predominantly imperative for process and product innovation (Elia & Santangelo 2017:113). Muafi (2020:328) asserts that innovation capability captures organisations' capacity to generate new concepts and notions to yield new products and/or expand their processes to enable better performance outcomes (Lintukangas, Kähkönen & Hallikas, 2019:102). As a type of organisation-specific advantage, innovation capability can impact organisations' strategic behaviours, such as, transnational development and organisational learning (Hanifah, Halim, Ahmad & Zadeh, 2019:24). Unlike overt knowledge, which is without difficulty transferable and accessible, strategic information and knowledge assets attained from foreign direct investments (FDI) are more possible to comprise implicit knowledge that is profoundly entrenched in organisational routines (Liu, Pang, & Kong, 2017:323). Thus, when an investing organisation is involved in SOE FDI, knowledge transmission does not happen inevitably (Michaelis, Aladin & Pollack, 2018:116).

From the organisational learning perception, SOEs must have adequate organisation-specific advantages to allow efficient knowledge learning and transfer (Li & Yu, 2018:25). Organisations with sturdier innovation capabilities would be more adroit at absorbing and understanding new information and knowledge (Liu *et al.*, 2017:324; Li & Yu, 2018:26). Furthermore, organisation's innovation capability would enable the amalgamation of prevailing acquaintance and the new knowledge expanded from their SOEs aspects, which would in turn, enhance the organisation's innovation capability performance (Michaelis *et al.*, 2016:117). Experiential evidence from the South African context has also confirmed that when investing organisations own a high level of technology and production-related capability, they are more involved in and more expected to thrive in incisive searches for innovative strategic assets abroad through FDI (Michaelis *et al.*, 2016:117).

### 3.3.2 Drivers of innovation capabilities

The effects of the financial crisis, the knowledge economy, and transformation in technology in the last decade have vividly affected the outcomes of conventional business models (Michaelis *et al.*, 2016:117). Oluwatobi, David, Olurinola, Alege and Ogundipe (2016:1508) note that the technological evolution and the extraordinary developments of the Internet have improved the value of information and knowledge. Innovativeness knowledge is renowned as an antecedent of productivity, and it is influencing and driving the development of a new economic structure that is built on technological and/or computer-generated information (Ota, Hazama & Samson, 2017:276). Organisations have revealed that efficiently handling knowledge intensifies their profitability and competitive advantage (Oluwatobi *et al.*, 2016:1509). Knowledge management has the purpose of apprehending, distributing, and manipulating knowledge to advance business choices and organisational performance (Ota *et al.*, 2017:277). Although knowledge management is implemented largely by big private corporations, SOEs, particularly in South Africa, are also progressively integrating it (Villaluz, & Hechanova, 2018:3) with the backing of information and communication technology (ICTs). Uz Kurt, Kumar, Kimzan and Eminog̃lu (2017:94) argue that these tools permit organisations to fortify their methods and intensify their competitiveness.

Amongst the key benefits of ICT in a knowledge management process is the efficient apprehension of outside information and the transmission of information amongst managers, workers, suppliers and customers (Simpson, Siguaw & Enz, 2016:1134). Information is one of the chief assets of corporations and organisations, and this intangible endowment is progressively achieved, stored, protected, and managed by technological applications (Oluwatobi *et al.*, 2016:1509). Some techniques applied to advance these functions are artificial intelligence, data mining and databases (Ota *et al.*, 2017:277). These technological apparatuses can progress organisational and individual learning, product design, quality management, innovation, and productivity in information-creating businesses (Simpson *et al.*, 2016:1135). The capital and size of an organisation describe the practice of ICT in knowledge management arrangements, which determine business growth and innovation capabilities (Villaluz, & Hechanova, 2018:3). These technological transformations are revealed by the theory of capabilities and resources (TRC) (RBV — resource-based view) and the theory of dynamic capabilities (TDC), which illustrate that ICT and knowledge management have a robust association with innovation capability functions and with the administration of



intellectual property (IP) (Uzkurt *et al.*, 2017:94). These business resources provide organisations with improved viability and continued competitive advantage (Uslu, 2015:1464).

In the literature, the theory of absorptive capacity (AC) and RBV highlight that internal and external information form a learning process, thus augmenting innovation capabilities (Seo, Dinwoodie & Kwak, 2018:734). Nevertheless, in addition to offering support, ICTs are determining factors in the quest of incremental and essential innovations (Simpson *et al.*, 2016:1135). With the new paradigm of uncluttered innovation, SOEs are attempting to progress intellectual capital through the creation of more patents and enhancements in the design of new processes and products (Uzkurt *et al.*, 2017:94). Intellectual capital has been abstracted as an organisation's incorporeal endowment that increases its value (Uslu, 2015:1464). The summation of these incorporeal or intangible resources, the integration of ICTs and an effective knowledge management permit SOEs in South Africa to realise better innovation capabilities (Shane, 2018:31). By nature, SOEs concentrate their capabilities and resources on the expansion and incremental innovation of their products (services) and, to a lesser extent, on their procedures and systems; thus, it is a challenge for them to acquire resources and information from abroad (Subramanian, 2017:224). These organisations usually apply traditional and conventional business models that limit their solidity in the present competitive business setting (Seo *et al.*, 2018:735).

With a new global business approach, organisations can progress and set high-level tactics to change their resources into dynamic capabilities (Shane, 2018:32). These strategies are engrossed in the implementation and embracing of knowledge management processes, systems, learning (co-specialisation of staff) and the exchange of information with other organisations, thereby improving the innovation capabilities (Sugandini, Muafi, Susilowati, Siswanti, & Syafri, 2020:81). This new TDC founded approach primes SOEs to improve processes, products, IP development and customer satisfaction and to increase a continued competitive advantage (Subramanian, 2017:225). However, South African SOEs encounter restrictions that thwart them from implementing new business systems, being more innovative and gaining better organisational performance outcomes (Seo *et al.*, 2018:735). The key blocks are a lack of financial capital, a lack of qualified human capital, poor administrative management, and obsolete technological infrastructure (Padilha & Gomes, 2016:256). These obstacles hinder the institution of effective connections between knowledge management, ICT, and innovation (Shane, 2018:32).

Furthermore, the restricted vision of SOEs managers has led to meagre investment in R&D (Sugandini *et al.*, 2020:82). These entrepreneurial practices have hindered the development of SOEs, instigating a lack of innovation and culture to exploit and protect their capabilities (trademarks, patents, licences and processes) (Subramanian, 2017:225).

### **3.3.2.1 Seniority-based management, innovation capability and financial performance**

Seniority-based management is one of the most imperative determinants in influencing a person's authority and status in an organisation (Ortiz-Villajos & Sotoca (2018:1419). Top management enjoys that leeway and autonomy in originating a notion, a subject, or a decision in organisations (Stephan, Schmidt, Bening & Hoffmann, 2017:10). Top management not only controls whether the message is regarded as significant, but also commands respect and neutralises criticism (Sandén & Hillman, 2017:404). Organisations in the information era function in more challenging business environments and, therefore, developing innovation capability is essential for well-informed customers (Stephan *et al.*, 2017:11). Dialoke (2017:141) asserts that innovation means the embracing, accepting and adoption of new ideas. Adams, Kewell, and Parry (2018:127) conclude that organisations that enjoy high innovation orientations participate in value creation strategies, for example, developing new products/services.

Innovation can be considered as an organisational capability because it is a function or activity that organises and utilises resources with a novel capacity to generate value in a process or product (Stephan *et al.*, 2017:11). Creating innovation capability is imperative, as innovation plays an important part in the growth, development, and survival of organisations (Sandén & Hillman, 2017:405). Thus, top management in organisations will influence innovation functions within the organisation (Ortiz-Villajos & Sotoca, 2018:1419). On the other hand, since innovation is frequently linked to younger generations, seniority-based management inclines to undesirably influence innovation capability (Stephan *et al.*, 2017:11). Studies by Smink, Hekkert and Negro (2015:86), Sandén and Hillman (2017:404) and Stephan *et al.* (2017:11) have recognised the common aspects shared by innovative organisations and the influences that impact on the ability to manage innovation. More specifically, it is stated that innovation capability has been divided into seven aspects, that is, work climate and wellbeing, participatory leadership culture, knowledge, development, ideation and organising structures, external knowledge, regeneration, and individual activity. All these aspects have each an influence on the adoption of innovation

activities in organisations. Ortiz-Villajos and Sotoca (2018:1419) have conclude that innovation capability affects financial performance in a positive way. Therefore, innovation capability in an organisation is influenced by the management, which in turn, affect the performance of the organisation (financial performance).

### 3.4 Previous Studies on innovation capabilities

Innovation capability has been proposed to be an intricate construct. Sugandini *et al.* (2020:82) reflect innovation capability as activities that can be considered to improve the success of innovation functions. Subramanian (2017:225) applies innovation capability to pronounce the imperative success influences of innovation processes. These essential factors can be construed as business innovation capability drivers, and the capability can be measured with the factors. Therefore, the main objective of this study is to examine the relationship between organisational innovation capability and SOEs’ performance in South Africa. The study contributes to the current understanding by presenting the significant characteristics of organisational innovation capability that have a direct relationship to organisational performance and goes one step further by studying the determinants of innovation capability and their relationship with SOEs’ performance in South Africa.

**Table 3. 2: An outline of selected prior studies on innovation capabilities**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Behnam, Cagliano, & Grijalvo (2018)	Innovation capability	Manufacturing
Lee & Nam, (2016)	Innovation capability	Manufacturing
Shane (2018)	Innovation capability	Manufacturing
Musacchio, Lazzarini & Aguilera (2015)	Innovation capability	Manufacturing
Seo, Dinwoodie & Kwak (2018)	Innovation capability	Hospitality

**Source:** Author’s compilation

Table 3.2 outlines the few studies on innovation capabilities. There is scarce literature where innovation capabilities have been applied in South African SOEs. Thus, this fact motivated the investigation on innovation capabilities in this study. The concept advanced over time from the simple consideration of relationships or strategic alliances between just two business organisations, towards the description of interactions between several corresponding relevant stakeholders within a supply network, that is, suppliers, organisations, buyers, customers or

manufacturers. However, no clear consensus has emerged in the field of the contribution of the concept of innovation capability towards the performance of SOEs in South Africa. For that reason, this literature review presents an understanding in the applicability of innovation capabilities in South African SOEs. Besides unfolding common facts about innovation capabilities in organisations, that is, the importance, the essential assumptions, the description of an empirical test recovered from the literature, a central notion of the concept is recognised to present comprehension in the most imperative hypotheses and variables of the innovation capability concept. These factors helped to disclose the contribution of the innovation capability concept in determining innovation's influence on performance of SOEs in South Africa.

### **3.5. Innovation culture**

Innovation is a new paradigm for traditional practices, strategy, and management (Dayan, Zacca, Husain & Ryan, 2016:669). This is because innovation improves and inspires the embracing of new philosophies or behaviour in the organisation (Rossberger, 2014:332), and can only be done when an organisation implements this process in its business practices (Rohlfers & Zhang, 2016:41). Aksoy (2017:3) asserts that it will not therefore be easy to accept and practice innovation without having a suitable and befitting culture that can inspire the workers to innovate. As such, innovation culture is an important aspect that an organisation requires in its daily business functions (Parveen, Senin & Umar, 2015:336). According to Naqshbandi (2016:2256), culture has an influential impact on organisations and their competitiveness. It is one of the factors that influences an organisation's performance and success.

According to Dayan *et al.* (2016:670), organisational culture has a considerable and significant role in the organisation by determining beliefs, values, and obligation of workers to challenge competitors and accomplish the set aims. Concerning innovation culture, Parveen *et al.* (2015:337) pronounces it as an everyday exercise of innovation functions. Rossberger (2014:332) defines it as a culture that can generate new-fangled concepts, philosophies, values, and support. Dedahanov, Lee, Rhee, and Yoon (2016:2311) argue that innovation culture is the capability to detect and advance new products and services and distribute them to the market. According to Gomes, Machado, and Alegre (2015), an innovation culture can be a helpful and efficient element of organisational culture that certainly influences innovation and creativity. Meyer (2014:7) discovered that financial availability and time management can be significant resource

fundamentals that influence innovation behaviour. Moreover, inspiring innovation behaviour of the organisation's followers can lead to the expansion of philosophies, which is a key driver for performance enhancement (Dedahanov *et al.*, 2016:2312). For this study, innovation culture is multi-dimensional; and comprises the longing to be innovative, a set-up that promotes innovation, functional behaviour to influence the market, as well as value positioning and atmosphere to comprehend innovation (Efrat, 2014:13). In view of this, to cultivate and maintain an innovation culture, South African SOEs have to implement a participative management culture in which networking and communication are upheld, and flexible structures, empowering workers, risk taking, orientation, learning and knowledge are hailed. It is envisioned that the correct mix of these factors will cause innovation to flourish in South African SOEs.

### **3.5.1. Definitions of innovation culture**

Innovation culture is a commonly applied and thus far inadequately defined concept (Griffith & Rubera, 2014:6). Brem, Maier and Wimschneider (2016:134) propose that the most suitable basis for analysing such institutions is through the idea of workplace or organisational culture. Barczak, Lassk, and Mulki (2017:334) state that culture can be applied by industrial management as a mechanism to control the wanted and anticipated behaviour (and skills) of stakeholders and their future engagements. Bates and Khasawneh (2015:97) argue that innovation culture is an intangible strategic endowment that can be evaluated by the following four dimensions, that is, an alignment in the direction of technological innovation, a knowledge orientation, a disposition to take risks and an impending market orientation. Brem *et al.* (2016:135) regard an innovation culture as an imperative feature for organisations in supporting market orientation and organisational learning, promoting sincerity to new resolutions and answers, markets and risk taking, technology, as well as accepting failure. In general, the definition of an innovation culture comprises several scopes linked to the inspiration of new philosophies and worker innovation capacity, market orientation, organisational learning and risk taking (Barczak *et al.*, 2017:335)

### **3.5.2 Culture**

Although the definition of culture has been deliberated and discussed by anthropologists and sociologists over a long time, “few anthropologists are in agreement as to what to include under the general rubric of culture” (Dedahanov, Lee, Rhee & Yoon, 2016:2311). In a pioneering study on cultural issues, Darvish and Nazari (2016:3) define culture as a set of parameters of collectives

which are linked to “patterned ways of thinking, feeling and reacting that constitute the distinctive way of life of a group of people” (Dayan, Zacca, Husain & Ryan, 2016:668). In the same vein, culture comprises “the collective programming of the mind that distinguishes the members of one group or category of people from others” (Dedahanov *et al.*, 2016:2312), in which the lifestyle and collective programming of the mind are “handed down from one generation to the next through means of language and imitations” (Darvish & Nazari, 2016:3). Culture is an intricate perception, and there is no generally recognised definition of culture in the academic literature (Dayan *et al.*, 2016:670). In general, “culture seems to differentiate one group from another based on a specific set of beliefs, values, behaviours, characteristics and attitudes; which is shared, construed, and communicated over time within a collective; and that makes the collective unique, exclusive and separates that collective from other collectives” (Cerne, Jaklic, Skerlavaj, Aydinlik & Polat, 2017:194). Therefore, the cultural environment in which they live, at both organisational and national levels unavoidably affects people in a certain cultural environment. In other words, “the various facets of culture are interconnected and if one touches a culture in one place everything else is affected,” as well detected by Barczak *et al.* (2017:335).

### **3.5.3 Organisational culture and innovation culture**

Ingenuity, innovation, and novelty are imperative in supporting innovation capabilities and this is customarily stirred by organisational culture (Pivcevic, & Prancevic, 2017:338). Organisational culture is an important tool (Nieves, Quintana & Osorio, 2015:4). Furthermore, organisational culture performs as a control device to institute organisational promise as well as support the organisation in acclimatising to the external transformations. As such, SOEs are presumed to have sturdy organisational structures due to their size and the presence of government influences (Nieves, Quintana & Osorio, 2015:4; Oke, 2017:565; Pivcevic, & Prancevic, 2017:338). Simultaneously, organisational culture is also implied as essential for innovative functions applied by the organisation (Pasunon, 2015:377). What does an innovative organisation look like? It is where its entrepreneur is passionate and converted to keep on experimenting and investigating new ideas (Nieves, Quintana & Osorio, 2015:4). Here, the relevant stakeholders of an organisation possess the right information, skills, knowledge, and aptitude to positively articulate and apply new ideas and philosophies (Oke, 2017:565). However, innovation can only flourish if the work atmosphere supports the efforts (Nybakk & Jenssen, 2017:4). This means that for SOEs to come

out with inventive processes, methods, products, and service, they must be given the opportunity to examine, study and research (Alharbi, Yusoff, & Al-Matari, 2017:351). In a wider sense, innovation is significant for the existence of businesses, government interventions and institutions (Akbaba & Altındağ, 2016:321).

Thus, to certainly compete and supporting local and global markets, the organisations must have the structures and processes that permit the development of innovation. Innovation management circles around creating a culture where new thoughts are expressed, treasured, and reinforced (Nuansate, 2016:54; Ropret, Sukič, Fatur & Likar, 2019:71). To realise innovation performance is not easy as it requires a suitable road map or strategies and they are practiced (Adeoye, Kolawole, Elegunde & Jongbo, 2014:39). Here, organisational culture might influence innovation, rendering it prevalent or uncommon in parts of organisations. (Nuansate, 2016:54). In fact, organisational culture must be properly nurtured as it may encourage or stop creativity and innovation (Akbaba & Altındağ, 2016:321). This study's model of organisational culture is based on four cultural traits, which are involvement, consistency, adaptability, and mission; and these traits have been found by the literature to affect performance (Ahmed, Shah, Qureshi, Shah & Khuwaja, (2018:21).

### **3.5.4 Importance of innovation culture**

Culture is a comprehensive communication arrangement, which ties human living and technical characteristics and behaviours with verbal and non-verbal communicative behavioural structures (Buenechea-Elberdin, 2017:263; Edsand, 2017:4). Brettel, Chomik and Flatten (2015:868) assert that culture is the total number of customs of life, such as beliefs, expected behaviour, language, values, characteristics, and life practice, which are commonly shared by community adherents and members. Gupta, Malhotra, Czinkota and Foroudi (2016:5671) define culture as a pattern of characteristics, behaviours, traits, values, or beliefs possessed by people in a particular area (Halim, Ahmad, Ramayah, Hanifah, Taghizadeh & Mohamad, 2015:86). The connection between organisational culture and organisational performance has become a significant subject debated in the SCM literature (Petrakis, Kostis & Valsamis, 2015:1436; Pan & Li, 2016:137). Various studies were dedicated to study the role of culture as organisational assets or resources, which influence organisational performance (Halim *et al.*, 2015:87; Souto, 2015:144; Gupta *et al.*, 2016:5671; Pan & Li, 2016:137). Padilha and Gomesi (2016:285) explain that organisations who have an innovation culture will surpass in their performance, although they still rely on a comparatively

steady environment. Innovation culture refers to commonly shared inventive ideas, values, behaviours, beliefs, characteristics, information, and shared assumptions of organisational members, which can enable and support the organisational innovation process (Padilha & Gomes, 2016:285).

Innovation culture is applied to describe an organisation's propensity to acquaint itself with new production processes, systems, procedures, products, or philosophies (Sattayaraksa & Boonitt, 2017:731). It is a cultural aspect, which can influence the organisation's tendency to innovate (Sarooghi, Libaers & Burkemper, 2015:715). Recent studies on the role of innovation-oriented organisational culture in improving business innovation confirms the ways in which innovation culture positively influences organisational performance (Azar & Ciabuschi, (2017:324; Lee & Xuan, 2019). Warrick (2017:396) analysed organisational culture, innovation culture and organisational performance and established that an innovation culture has a positive significant influence on the performance of the entire organisation in question. This outcome is buoyed and maintained by Sarooghi *et al.* (2015:715) who ascertain that organisational culture and innovation culture improves and enhances the financial performance of an organisation Padilha and Gomes (2016:286) explain that an innovation culture can provide a greater result on organisational performance in the innovation process than performance in product innovation.

Similarly, Sattayaraksa and Boonitt (2017:731) find that an innovation culture improves the performance of the organisation, both indirectly and directly, intermediated by ambidexterity. Innovation culture is also significant in improving and refining SOEs performance (Ali & Park, 2016:1670). Innovation culture is one of the keys for an organisation's success and in improving its performance. In addition, Pan, and Li (2016:137) prove that innovation culture in supply chain management (SCM) directly influences the supply chain performance when the level of supply chain integration of organisations is relatively operative in developing supply chain practices as required. Ali and Park (2016:1670) mention that organisation with high-performance supply chains will have very different cultural profiles in six cultural extents (process, employee, open, tight, norm, and market). In contrast, a low-performing supply chain organisation has a profile which is almost identical in six cultures.



### 3.5.5 Prior studies on innovation culture

An innovation culture that summaries how organisations aim to attain their innovative goals is imperative for organisations to achieve competitive advantage (Darvish & Nazari, 2016:2). However, organisations have progressively recognised that it is not easy to have an innovation culture. The way organisations sense and behave towards the environment has been identified as an important cause of difficulty in enhancing an innovation culture (Dayan, Zacca, Husain & Ryan, 2016:668). The literature proposes that to permit innovation culture implementation and attain greater innovation performance, organisations should combine their shared norms and values with the strategy requirement (Ropret, Sukič, Fatur & Likar, 2019:68). This shows that the fit between innovation culture and organisational culture is vital for efficient and effective development of an innovation culture (Darvish & Nazari, 2016:2). However, many organisations are still encountering the tough challenges of managing organisational culture in ways that effectively permit and generate innovation culture (Desmarchelier & Fang, 2016:121). Although this subject is of great theoretical and practical significance, the existing understanding about how organisational culture should be achieved to enable innovation culture development and how this influences innovation performance is still limited.

**Table 3. 3: An outline of prior studies on innovation culture**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Aksoy (2017)	Innovation culture, marketing innovation and product innovation	Manufacturing SMEs
Abdul Halim, Ahmad, & Ramayah, (2019)	Innovation culture	A variety of SMEs industries
Ropret, Sukič, Fatur & Likar (2019)	Innovation culture	Manufacturing
Desmarchelier & Fang (2016)	Innovation culture	Manufacturing
Darvish & Nazari (2016)	Organisational culture and innovation culture	Manufacturing

**Source:** Author's compilation

Various studies on innovation culture are present in the research literature; however, studies that link innovation culture as an antecedent of innovation capabilities and SOEs performance in South Africa are still limited or scarce. Many studies on innovation culture are on large manufacturing industries (Desmarchelier & Fang, 2016; Darvish & Nazari, 2016; Ropret, Sukič, Fatur & Likar, 2019) as outlined in Table 3.4. Studies on SOEs's innovation culture and SOEs' performance,

notably in South Africa, are rare. Consequently, there is a growing necessity for academics to contribute towards an understanding of the innovation capabilities (innovation culture included) as well as the nature of SOEs' performance in South Africa. This study, therefore, focuses on the associations between innovation capabilities (e.g., innovation culture) and performance.

### **3.6. Innovation strategy**

An innovation strategy that summarises how organisations propose to attain their innovative objective is imperative for organisations to achieve and sustain competitive advantage (Alexe & Alexe, 2016:999). However, organisations have progressively comprehended that it is more difficult and challenging to formulate innovation strategies than to implement them (Kanungo, Sadavarti & Srinivas, 2017:31). The way organisations sense, interact and act towards the business environment has been recognised as an imperative reason for poor innovation strategy implementation (Aloini, Pellegrini, Lazzarotti & Manzini, 2015:24). The literature suggests that to effectively allow innovation strategy implementation and realise superior innovation performance, organisations should associate their shared values, customs and norms with the strategy prerequisites and requirements (Kanungo *et al.*, 2017:31). Thus, Hertenstein and Williamson (2018:47) indicate that the relationship between organisational culture and innovation strategy is important for efficient and effective implementation of innovation strategy (Alexe & Alexe, 2016:1000). However, more organisations are currently encountering the trying challenges of managing organisational culture in ways that positively permit innovation strategy implementation (Aloini *et al.*, 2015:25).

#### **3.6.1 Concept of innovation strategy**

Innovation, creativity, and value creation are significant aspects influencing the success of organisations (particularly, SOEs in South Africa) operating in today's highly dynamic unpredictable and volatile environment (Brunswicker & Vanhaverbeke, 2015:1242). Innovation strategy is a vital factor in upholding and sustaining global competitiveness (Carlborg, Kindström, & Kowalkowski, 2014:374). Prajogo (2016:241) states that innovation strategy has been selected as the art of detecting and implementing new techniques, methods, processes, procedures, behaviours and products within an organisation, a cluster or society, to improve performance (Brunswicker & Vanhaverbeke, 2015:1243). Hence, Chen (2015:644) contends that innovation is not only about an expertise or skills, but it involves processes, systems, procedures, competence

and even luck and surprising findings. Therefore, innovation strategy leads to the improvements in the amount and quality of products, reduces costs, prevents loss of endowment, assets and resources, increases productivity and efficiency, enhances motivation and workers' job satisfaction (Prajogo, 2016:242). Through innovation strategy, organisations attain, and change a given knowledge or information to suit an explicit managerial and functional initiative that permits the organisation to innovate (Alexe & Alexe, 2016:1001; Prajogo, 2016:242). Through innovation strategy, organisations, such as South African SOEs, expedite and accelerate the course and process of agility, flexibility and responsiveness to the market challenges and sustain competitive advantage in the process (Carlborg *et al.*, 2014:375).

Innovation strategy also defines an organisation's success (Brunswicker & Vanhaverbeke, 2015:1243), and supports the achievement of unremitting innovation in both processes and products (Hilman & Kaliappen, 2015:48). Innovation strategy, if implemented effectively, also permits organisations to attain high profits and growth and thereby establishes the fundamentals to advance the precise innovations in the face of market variations and competitive environments (Ricciardi, 2014:11). Ndubisi, Capel and Ndubisi (2015:549) note that innovation strategy improves the organisation's ability to generate new production methods, processes and products which enable the organisation to innovate ahead of its competitors and achieve financial performance. Hilman and Kaliappen (2015:48) ascertain that the lack of innovation strategies in organisations means failure is unavoidable in the current dynamic and highly volatile business environment. However, innovation is a function of several influences, including concerted R&D and strategic association, networking between SOEs and other business organisations, be it private or public and amongst the SOEs themselves, as well as effective, functional, and efficient supply chain management (Carlborg *et al.*, 2014:375).

Commonly, innovation strategy has been defined in several arrangements (Hilman & Kaliappen, 2015:48). For example, Yusr (2016:3) argues that innovation strategy comprises methods, processes, products, organisational and marketing innovation, while Ziggers and Henseler (2017:796), categorise innovation strategy into technical and administrative. Ndubisi *et al.* (2015:550) functionalise innovation strategy as involving the product, process, and administrative innovation. Similarly, Shakeel, Kannan, Brah and Hassan (2017:1055) label innovation strategy as embracing business processes, systems, products, services, and the investment in R&D.

However, this study focuses on product and process innovation. Shakeel *et al.* (2017:1056) regarded product innovation as an essential strategic function that sanctions organisations to attain higher competitive advantage. It monitors and regulates the organisation's process of evolving new products, the production of high-quality productivity, confirms effective and efficient delivery time to the market (Ndubisi *et al.*, 2015:550) and enables effective retorts to shifting competitive environments (Shakeel *et al.*, 2017:1056). While organisations focus entirely on process innovation to certify effective production cost and efficient resource allocation and utilisation, this provides temporary lower risk and better real results to management (Ziggers & Henseler 2017:796). Thus, process innovation influences positively on cost decrease and application of resources and empowers the organisations to develop product innovation and achieve product differentiation (Yusr, 2016:3).

### **3.6.2 Definitions of innovation strategy**

Innovation strategy refers to how organisations turn to new technology or product development to survive rapid, dynamic, and volatile market transformations (Kudret & Zafer, 2019:773). In the present markets, organisations usually encounter the challenge of integrating various resource requirements to reply to market competition and changes (Vaz, Rauen & Lezana, 2017:880). An innovation strategy could aid the organisation to control the arrangement and configuration of present processes, resources, systems, and products to adapt to the market (Anderson & Markides, 2017:83). Meanwhile, an innovation strategy leads the organisation in making suitable and immutable decisions on which work activities should be made in the future market (Vaz *et al.*, 2017:881). Organisations are mandated to formulate several strategies to discover new prospects, opportunities and exploit prevailing capabilities at the same time (Kudret & Zafer, 2019:774).

### **3.6.3 Organisational innovation strategy**

Innovations are complex, as they are not only about new products presented to the market but are considered together with many different aspects, such as management innovation, organisational innovation, and financial innovation (Anderson & Markides, 2017:83). For example, grouped innovations under diverse groups as organisational structure, service innovation, product and manufacturing processes, and innovations in the management processes are intricate (Kudret & Zafer, 2019:774). Furthermore, there are also innovations in the form of technical and managerial innovations. Vaz *et al.* (2017:881) define technical innovations as outcome-based on processes,

service, product, and production technologies. Anderson and Markides (2017:83) describe administrative innovations as new philosophies and initiatives associated with control and management of the organisation (Dogan, 2017:291). By following the definitions, it can be said that if innovation is to be demarcated as a process, it is also an effort to strategize, implement, eradicate problems, and take appropriate and proactive action (Shakeel *et al.*, 2017:1056). One of the main arguments discussed in the dissemination of innovations is that for innovation to spread within existing processes, it is necessary for other actors to have the advantages of innovation (Hamel, 2018:7). Furthermore, trying to adopt innovations because of different pressures to other organisations in the organisational field by other players or participants in the environment (e.g., government, financial markets, etc.) can mean that propagation continues, and the innovation is legitimised and recognised as it spreads (Dogan, 2017:291). On the other hand, an organisation's innovation strategy plays a significant part in developing organisational precedences and supply-chain actions (Tidd & Bessant, 2014:10). The strategic, artful, and operational alliance of inter-organisational activities often results in new, valuable, and frequently introduced innovative products. This can only be achieved if the organisation in question relies on the robust innovation strategy (Ahmed & Shepherd, 2018:19).

### **3.6.4 Types of innovation strategies**

The literature suggested that the essential element of innovation strategy is the comparative importance found in exploratory innovation against exploitative innovation (Wood, 2017:22). In this view, various studies have acknowledged exploitative and exploratory innovation strategies as basic forms of innovation strategy (Anderson & Markides, 2017: 83; Kudret & Zafer, 2019:774). Wood (2017:22) maintains that because of unpredictable business environments, market dynamics and organisational resource limitations, encompassing the consideration on the modes, the organisations' move between exploitative and exploratory innovation strategies is significant and essential (Ahmed & Shepherd, 2018:19). Several studies (Tidd & Bessant, 2014:10; Anderson & Markides, 2017:83; Wood, 2017:22) have emphasised the difference between exploitation and exploration. It is proposed that “exploration implies organisation behaviours characterised by search, discovery, experimentation, risk taking and innovation, while exploitation implies organisation behaviours characterised by refinement, implementation, efficiency, production and selection” (Burgelman, Christensen. & Wheelwright, 2015:48). In this

interpretation and understanding, organisations with an exploratory innovation strategy focus on presenting and providing new processes, designs, generating new markets, and forming new distribution channels to satisfy the transformed requirements of emerging markets and customers (Tidd & Bessant, 2014:10). In contrast, organisations with an exploitative innovation strategy would enthusiastically participate in expanding prevailing knowledge, information, expertise and skills, refining and enhancing conventional designs, escalating present products and services, and increasing the effectiveness of present distribution channels to reply to market transformation (Ahmed & Shepherd, 2018:19).

Since exploitative and exploratory innovations compete for resources in organisations, pressure exists between exploitative and exploratory innovation strategies (Burgelman *et al.*, 2015:49). Given this condition, organisations are required to make trade-offs or collaborations between exploitative and exploratory innovation strategies (Markides, 2017:10). The empirical and theoretical evidence further designated that too little of either exploitation or exploration would compromise organisational performance (Ahmed & Shepherd, 2018:19). Consequently, various studies (Tidd & Bessant, 2014:10; Burgelman *et al.*, 2015:49; Markides, 2017:10) have appreciated the profits of harmonising and integrating exploitative and exploratory innovations (Keupp, Palmié & Gassmann, 2017:368). Ahmed and Shepherd (2018:19) recommend that an organisation should instantaneously invest and balance both exploratory and exploitative innovations to realise the best organisational performance.

Therefore, organisations can distinguish their innovation strategy between their exploitative strategy, which refers to currently working and applied activities, functions, tasks and technologies, and their exploratory strategy, which comprises activities, technologies and processes that are new or essential (Keupp *et al.*, 2017:368). To shape their innovation strategies, organisations, such as SOEs in South Africa, need to capture new information and knowledge from the external environment and apply it within (Hamel, 2018:7). Thus, exploratory innovation strategies are related to the search for new information and ideas, non-routine problem solving and experimentation with new business models, while exploitative strategies are associated with efficiency, refinement, and the implementation of new solutions in the extant business (Kodama, 2015:236). This study conceptualises innovation strategy on an SOE level (Kodama, 2015:236; Hamel, 2018:7) and demonstrates how the innovation strategy shapes business model redesign in

response to current, dynamic, and volatile global and local business environments. This study, therefore, does not emphasize determining whether South African SOEs follow an exploratory and an exploitative innovation strategy in parallel (that is, the degree to which organisations are ambidextrous), but on recognising the influence of the entire innovation strategy package on the redesign of extant South African SOEs business models.

### **3.6.5 Combinative competitive capabilities as an innovation strategy**

The essential of defining competitive strategy is interconnecting an organisation to its environment. Even though the applicable environment is extensive, adjacent sociable right along with economic desires, the main feature of the organisation's environment is the business or industries in which it operates (Abu Bakar & Ahmed, 2018:978). Since there are benefits in having strong competitive advantages, an organisation must develop the dynamic capacity to link information and knowledge into areas of proficiency and sustain competitive advantages (Yusr, 2016). This enables the organisation to learn and protect private knowledge without expropriation and simulation by competitors (Iddris, 2016:235). Organisational competitiveness is described as the extent to which an organisation enters in a marketplace, compared to its major competitors (Hilman & Kaliappen, 2015:48). Within this context, organisations can achieve a competitive advantage by obtaining valuable, rare, non-imitable resources from the external environment (Salisu, Abu Bakar & Abdul Rani, 2017:37). Comparing these two theories, the environment approves a focused perception on how organisations stipulate resource requirements and enables organisations to evaluate a complete perception of how they can attain these valuable resources (Namusonge, Muturi & Olaniran, 2016:41).

Other parties' governing resources can be unreliable, particularly when resources are inadequate. Organisations deal with others for essential resources and govern resources by empowering others on the organisation (Atalay, Anafarta & Sarvan, 2018:227). Since industry-based theory highlights the inimitability of in-house resources and organisations for this proposition and supportable competitive advantage, it forms the foundation known today as resource-based theory (Neely, Filippini, Forza, Vinelli & Hii, 2017:114). Organisational resources must be combined to make an impressive innovative element of "innovation capability". Innovation oriented organisations can apply their technical expertise to develop new determinations to satisfy the new and prevailing

demands of the markets through the formulation and implementation of combinative competitive capabilities as an innovation strategy (Ferraresi, Quandt, Santos & Frega, 2018:688)

### **3.6.6 Importance of innovation strategy**

Overall, innovation has a profound effect towards organisational performance (Dogan, 2017:291; Abu Bakar & Ahmed, 2018:978). Innovation strategy is a summation and totality of strategic selections concerning its innovation function for developing new products and services, processes, designs, creation of new approaches, establishing new markets, the source of supply and managerial framework to improve its performance (Kodama, 2015:236, Dogan, 2017:291; Hamel, 2018:7). It is commonly accepted that innovation strategy is essential in providing the process effectiveness that subsequently supports and sustains organisational competitive advantage (Lin, Cheah, Azali, Ho & Yip, 2019:12). Similarly, innovation strategy, if implemented in a good way, can help the SOEs. particularly those in South Africa. to improve service quality, customer satisfaction and increases the level of innovation within them (Leal-Rodríguez, Eldridge, Roldán, Leal-Millán, & Ortega-Gutiérrez, 2015:804). Several studies establish that innovation strategy has a positive significant influence on organisational performance (Leal-Rodríguez *et al.*, 2015:805; Dogan, 2017:291; Lin *et al.*, 2019:13; Leal-Rodríguez *et al.*, 2015:805).

### **3.6.7 Innovation strategy and organisational performance**

The significance of innovation strategy in improving performance and competitive edge has been confirmed in numerous studies (Nybakk & Jenssen, 2012; Iddris, 2016:235; Namusonge *et al.*, 2016:41; Yusr, 2016:2; Salisu *et al.*, 2017; Abu Bakar & Ahmad, 2018:978.). Equally, the positive influence of innovation on organisational performance have been sufficiently outlined by several studies (Auken, Madrid, Guijarro & Garcia-Pérez-de-Lema, 2008; Suliyanto & Rahab, 2012; Rosli & Sidek, 2013; Huang, 2014; Hilman & Kaliappen, 2015:48 Atalay *et al.*, 2018: 227). Aggressive organisations are determined to be market leaders. Abu Bakar and Ahmad (2018:978) posit that resource dedication, R&D investments and innovativeness point out the aggressiveness that an organisation might have. The aggression dimension of innovativeness is associated with the organisation's innovation strategies. Analysis shows that a firm can conduct SWOT analysis to implement an innovation strategy for competitiveness. Defensiveness shows that innovative firms try to protect their market positions. Futurity shows that firms can make long term plans to make innovation to succeed. Proactive firms seize market opportunities and innovate to take advantages



of these. They initiate innovations and become leaders. Being innovative is a risky choice for a firm to succeed. However, taking risks can lead a firm to reach and sustain high performance.

### 3.6.8 Previous studies on innovation strategy

Innovative strategies are key drivers of new and novel products, services, and ideas in existing industries (Chen, Huang, Liu, Min & Zhou, 2018:2). The pursuit of innovation is often characterised as extremely indefinite, equated to the implementation of previously established capabilities, or investing in known technology (Müller, Buliga & Voigt, 2020:2). While innovations originating from internal markets relate positively to long-term performance, a firm's innovation strategy may weaken because of governance changes that occur during the growth stages of an organisation (Galloway, Miller, Sahaym & Arthurs, 2016:2). When seeking support from outside corporate investors, organisations face a trade-off between satisfying the need for capital and disclosing private information about their innovation capabilities. In this regard, a robust innovation strategy should be formulated and implemented. Table 3.4 outlines some of the previous studies on innovation strategy.

**Table 3. 4: An outline of selected prior studies on innovation strategy**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Chen, Huang, Liu, Min & Zhou (2018)	Organizational Culture and Innovation Strategy	Variety of industries
Salisu & Abu Bakar (2018)	Innovation Strategy	Manufacturing SMEs
Müller, Buliga & Voigt (2020)	innovation strategy	Manufacturing industries
Galloway, Miller, Sahaym & Arthurs (2016)	Innovation strategies	Variety of private sector industries

Source: Author's compilation

Various studies on innovation strategy are present in the academic literature; however, studies that link innovation strategy and SOEs performance in South Africa are still limited or scarce. Many studies on financial performance are on the manufacturing sector (Salisu & Abu Bakar, 2018; Müller, Buliga & Voigt, 2020) as outlined in Table 3.4. Studies on SOEs' innovation strategy and performance, notably in South Africa, are rare. Consequently, there is a growing need for researchers to contribute towards understanding the innovation capabilities as well as the nature

of SOEs' performance in South Africa. This study, therefore, concentrates on the relationships among innovation capabilities (e.g., innovation strategy) and performance.

### **3.7 Market Innovation**

In history, markets have been portrayed as inert showgrounds, waiting to be explored and exploited (Zeithaml, Jaworski, Kohli, Tuli, Ulaga & Zaltman, 2020:33). Innovative organisations tactically intend to change existing market structures and market players' behaviours, to increase competitive advantages (Kjellberg, Azimont, & Reid, 2015; Storbacka & Nenonen, 2015; Zeithaml *et al.*, 2020:34). Progressively though, markets are documented as developing, flexible environments, continuously in the making (Humphreys & Carpenter 2018; Zeithaml *et al.*, 2020:34). For instance, organisations can apply digital technologies to develop new value propositions and change socio-technical frameworks, not just technical designs, and processes to generate market opportunities (Svahn, Mathiassen, & Lindgren, 2017:240). For instance, Spotify and Tesla, essentially transformed the music and automotive markets, respectively (Nenonen, Storbacka & Windahl, 2019:4). Therefore, marketing studies have begun to appreciate and comprehend market variations and transformations as the result of institutional changes introduced by companies' institutional work. Vargo, Weiland, and Akaka (2015:64) describe market innovation as the continuing institutionalisation of newly co-created value proposals. This process is reliant on the capabilities and institutional provisions of the value-proposing organisation.

#### **3.7.1 Definitions of market innovation**

Kjellberg, Azimont and Reid (2015:10) present a comprehensive definition of market innovation as “changes in the way business is done,” covering a broad range of functions on multiple levels, both within the organisation and throughout the extensive business network (Kindström, Ottosson, & Carlborg, 2018:37). Market innovation necessitates and involves processes of institutional work by various individual players (Gonçalves, da Silva & Teixeira, 2019:182), legally and casually, and internal and outside the organisation. As stakeholders' activities shift, so do the linked institutions, and vice versa (Baker, Storbacka & Brodie, 2019:303). Various conceptual terms have been used to describe such change processes, such as market shaping (Nenonen, Kjellberg, Pels, Cheung, Lindeman, Mele, Sajtos & Storbacka, 2014:271), market making (Vargo & Lusch, 2016:7), market scripting (Baker *et al.*, 2019:303), market performativity (Nenonen, Brodie, Storbacka & Peters, 2017:1131), game-changing (Nenonen *et al.*, 2014:272), and market plasticity

(Nenonen, Gummerus & Sklyar, 2018:571). Overall, though, this study concedes that market innovation forms and reforms through technological developments and improvements outside of their control, as well as through their own institutional processes and that of their competitors. Therefore, organisations must develop their market innovation capabilities to contain and accept shifting and transforming technologies as they seek to provide new value propositions (Ekman, Rödell, Kowalkowski, Raggio & Thompson, 2020:4).

Market innovators use technology-enabled solutions as ways to affect the institutional provisions leading the behaviours of pertinent market players (Nenonen *et al.*, 2014:272; Nenonen *et al.*, 2019:4). Present markets can be understood as contexts for production and consumption (Kindström *et al.*, 2018:37). Furthermore, Gonçalves *et al.* (2019:182) consider markets as supply business environments concerning an array of market participants in which value is created from integrating resources from different participants as well as from the knowledge and capabilities of such market participants. Rather than predefining markets, studies on market-innovation and shaping highlights their dynamic designs, processes, developing through collections of marketing functions and utilisation of diverse resources (Ekman *et al.*, 2020:6). Furthermore, “the location of specific market interfaces is neither given nor arbitrary” (Kjellberg *et al.*, 2015:5). For an organisation to innovate in markets, it is imperative to understand the institutions and institutional configurations that direct the characteristics of the market participants (Kindström *et al.*, 2018:38). As Ekman *et al.* (2020:6) put it, “A stable institutional framework acts as a (temporary) platform for establishing a connection between actions and outcomes, for reshaping supply and demand”.

Market innovation is thus defined as the process of introducing significant and continuous changes in the marketplace with the view of improving product and service awareness to customers (Weill, Apel, Woerner & Banner, 2019:41). Generally, market innovation involves the incremental transformations that are presented into a particular given market, and the positive influence such variations have on market performance and competitiveness (Storbacka, 2019:5). According to Weill *et al.* (2019:42), there exists a positive significant relationship between market innovation and organisations’ competitive advantage. As markets continue to innovate, only market participants who can keep up with the transformation pace in the market structure can keep on enjoying competitive advantages and remain relevant (Vargo & Lusch, 2016:7). There are several aspects of a market that are affected by innovation. These include market orientation for goods

and services, exploitative innovations, and competition. The following subsections discuss the aspects of market innovation.

### **3.7.2 Market Orientation**

Market orientation is described as the distributing of products and services founded on customers' requirements in addition to the product efficiency and functionality requirement for a particular market segment (Purchase & Volery, 2020:764; Storbacka, 2019:4). Recently, studies have started to assess the influence of an organisation's market orientation on the innovation strategies adopted by organisations. For instance, Storbacka and Nenonen (2015:74) find that market orientation cascades into higher levels of innovation performance through stimulating higher levels of service innovativeness (Jaakkola & Aarikka-Stenroos, 2019:28). A growing body of research has begun to examine the impact of market orientation on innovation (Chaney, Carrillat, & Zouari, 2019:244). However, most of these studies have failed to distinguish between customer and competitor orientation when investigating such market innovation issues and have applied general measures of market innovation or have focused virtuously on customer orientation (Shan, Song & Ju, 2016:684).

One of the key changes in the market innovation is the way in which products are distributed to customers (Shan *et al.*, 2016:685). Technology is one of the main determinants of market innovation (Purchase & Volery, 2020:764). For example, most organisations are providing online platforms through which their goods and services are brought to their customers. Tronvoll, Sklyar, Sörhammar and Kowalkowski (2020:295) point out that organisations (e.g., SOEs) that trail in terms of innovation in conjunction with market innovation might find themselves lagging and losing their competitive advantage. How products are delivered to markets and customers is no longer limited to the traditional way of physical distribution, but rather to the adoption of online platforms, websites, and social media platforms (Purchase & Volery, 2020:765). Therefore, to achieve competitive advantage, SOEs in South Africa must uninterruptedly re-orient themselves to orientations in the market innovation.

### **3.7.3 Exploitative orientation**

Exploitative innovations are progressive innovations that concentrate on the requirements of the present markets and customers (De Luca & Atuahene-Gima, 2017:96). They build on current

information and skills through acts of refinement and gradual improvement and involve increasing the efficiency of existing processes and expanding extant product and service offerings (D'Antone, Canning, Franklin-Johnson & Spencer, 2017:67). In contrast, exploratory market innovations are re-engineering innovations, which satisfy the requirements of new or incipient customers or markets (Cui & Wu, 2016:517). Exploitative orientation involves the conception of new processes, goods and services, and the growth of new markets and delivery conduits (Cruz-Ros, Garzon & Mas-Tur, 2017:1032). Exploratory market innovations rely on research and testing new philosophies and methods of doing things that create novel information, knowledge expertise and skills in the process (De Luca & Atuahene-Gima, 2017:96). Accordingly, exploratory market innovations are linked to greater deviating or “out of the box” thinking than exploitative market innovations (Wang, Chiu, & Chen, 2015:511), and have been revealed to have robust impacts on the financial performance of organisations.

While market orientation is abstractly interrelated to exploitation and exploration innovation strategies, they are different hypothetical ideas and have been revealed to establish divergent validity through empirical observations (Cruz-Ros *et al.*, 2017:1033). Although market orientation is an organisation-level attribute, exploitation and exploration innovation strategies are formulated and applied by organisations to innovate (D'Antone *et al.*, 2017:68). Thus, market orientation generates the customs, standards, and norms by which organisations (e.g., South African SOEs) can get positive feedback from their competitors and customers, which in turn, enable the organisation in question to be involved in exploitative and exploratory market innovation (Bortoluzzi, Kadic-Maglajlic, Arslanagic-Kalajdzic & Balboni, 2018:215). It is the responsibility of SOEs to warrant that they are cognisant of market manipulations and how to allay, mitigate and moderate the negative effects of such exploitations while simultaneously advancing positive features for their organisation to achieve competitive advantage (Claudy, Garcia & O'Driscoll, 2015:530).

### **3.7.4 Exploitative orientation in State-owned enterprises**

In as much as exploitative market orientations tend to disrupt market structures, most of the time they are hastened and triggered by customer requirements, and the urgency amongst industry players to offer these requirements (Bortoluzzi *et al.*, 2018:215). Sometimes, exploitative behaviours, in SOEs, are advocated for by one player who has the influence to interrupt the markets

for their own competitive advantage making it a challenge for SOEs to compete (Jürgensen & Guesalaga, 2018:255). In such cases, SOEs' strategic elements must be ready and prepared to innovate from their present functional positions to address the encounters and problems postured in the markets (Heiskanen & Matschoss, 2016:665). If not, there is a greater possibility that the chief player in the sector can over-run the weakest SOEs, driving them out of competition (Kafetzopoulos & Psomas, 2016:165). Exploitative orientation occurs quite often in practice and intellectual capital as well as in the capabilities of their organisations; the organisation's aims are also obstructed by the market environment together with demand patterns, technological transformation, and competitive gravities (Han, Kim & Srivastava, 2018:31). For innovations to be competitive, SOEs need to be worried about advantages in design, swiftness to markets, reduced product development periods, persistent advancement that take in flexibility in R&D processes and technological leapfrogging.

#### **3.7.4.1 Determinants of market innovations**

Seven design innovation strategies were acknowledged in Taiwanese SOE computer and electronic enterprises (Grimpe, Sofka, Bhargava & Chatterjee, 2017:361) that is, adding product value, simplifying manufacturing and maintenance, reducing production costs, uplifting product quality, refining product design and development, elevating marketing information collection, agility and responsiveness. Market orientation was depicted to be positively correlated to process innovation, proactive market orientation and technological innovation is required for market innovations to prosper (Gupta, Malhotra, Czinkota & Foroudi, 2016:5671). Thus, SOEs in South Africa need to bestow time to non-customers as well as customers in order to bring out innovation successes (Grimpe *et al.*, 2017:362). Under market orientation innovations, there happens to be a high possibility of innovator's impasse (Geldes, Felzensztein & Palacios-Fenech, 2017:56). Innovator's impasse or dilemma is a situation where successful organisations can pay too much attention on customers' existing requirements and be unsuccessful in adopting new technology or business models that will address customers' unspecified or impending needs (Griffin, Josephson, Lilien, Wiersema, Bayus, Chandy, Dahan, Gaskin, Kohli, Miller, Oliva & Spanjol, 2016:324). Thus, this failure to introduce re-engineering processes eventually do lead to SOEs falling behind other players in the market (Geldes *et al.*, 2017:57).

Innovation dilemmas in public entities, such as SOEs, occur frequently when disruptive technologies emerge (Griffin *et al.*, 016:324). Gupta *et al.* (2016:5672) assert that customer co-creation could aid in making break-through innovations. Griffin *et al.* (2016:324) contend that additional budgeting for R&D is a significant element that requires top management support and attention, both in terms of the number of projects that can be chased by R&D concurrently, as well as the budget per R&D projects. Research and development investments should be tweaked to provide for optimal base cost of the products from the designing stage to the production stage and optimal transfer cost from the production stage to marketing of the product (Fernandes & Remelhe, 2016:312).

A product innovation strategy should be part of an overall organisation's marketing innovation strategy with aims and objectives originating from the vision and mission of the organisation; optimum resource utilisation, allocation and specific project selection, a thoughtful choice of competitive advantages or strategic drives to be followed (Fernandes & Remelhe, 2016:312). Elliot, Ngugi and Malgwi (2018:620) believe that a clear and vivid product strategy with a comprehensive examination of end user functionality necessities, an implementation team for the product innovation strategy, feedback and incentive apparatuses must be put in place. Marketing strategists can also consider and examine other types of innovation in the marketing offer (Han, Kim & Srivastava, 2018:31). For example, Avon established distribution innovation with its door-to-door selling operations for its cosmetics to challenge leaders such as Revlon, Estee Lauder, who were well established in retail space (Eggert, Thiesbrummel & Deutscher, 2015:174). The company also delivered its products through the multi-level marketing process thereby generating sales and distribution systems and not just a sales system and thus out-manoeuvring interruption in their market and lasting relevant and competitive (Fuentes-Blasco, Moliner-Velázquez, Servera-Francés & Gil-Saura, 2017:652). State-owned enterprises in South Africa should vie with this kind of approach in dealing with disruptive orientations in the markets.

### **3.7.5 Competition**

Market orientation facilitates firm competition to the markets (Chung, 2018:2)). Players who can match market vicissitudes and transformations with their own innovation boost their levels of competition, making it hard for other companies to succeed (Fernandes & Remelhe, 2016:312). Elliot *et al.* (2018:620) note that in any given market, innovation affects competitors, customers,

and suppliers. In the public sector, those mostly affected by competition are the unprotected SOEs themselves (Chung, 2018:2). When other organisations can apply market fundamentals, their métier in capitalisation, customer base, or regulatory benefit, they can figure a challenging competition that SOEs can find difficult to beat (Han *et al.*, 2018:31). As such, Eggert *et al.* (2015:174) argue that devising strategic ways to out-manoeuvre competition means remaining relevant and competitive. Nevertheless, this is always not the case because other market fundamentals also play a part in establishing how a market operates (Ekman *et al.*, 2020:1). For example, the development of an economy is administered by the level of technology in different markets (Ernst *et al.* 2015:66).

### **3.7.6 Importance of market innovation**

The level of technology is a function of the rate of industrial innovation, which depends on the share of GDP invested in R&D (Aksoy, 2017:2). Therefore, if organisations can tap into developing technology and use it to their advantage during economic growth seasons, they can benefit immensely and remain competitive in the markets. Thus, if organisations invest in market innovation, they become competitive and achieve high profitability. Conversely, if organisations (e.g., SOEs in South Africa) fail to take advantage of changes in the technological world and fail to invest in market innovation capability, they will slump even in economic growth times (Hilman & Kaliappen, 2015:48). In other instances, the incentives for SOEs to innovate is a function of the institutional framework of the economy and the degree of competition in the economy (Cui & Wu, 2016:517). This determines the degree to which organisations can gain returns from their market innovation, and thus help their organisations keep on enjoying the competitive advantages in the market (Coccia, 2017:1048). All organisations, including competitors, benefit from knowledge flows and technology spillovers across economic agents and markets through investing in market innovation (Storbacka, 2019:4). Therefore, market innovation is strongly related to the overall performance of the organisation. Hence, it is imperative for SOEs in South Africa to invest in their market innovations, for growth, survival, and the acquisition of competitive advantages.

### **3.7.7 Previous studies on market innovation**

Extant literature focuses primarily on deliberate, proactive market-shaping efforts to understand changes in markets. This study explores how innovation capabilities (e.g., market innovation) can prompt the interactions of innovation capability development and performance of SOEs in South



Africa. Following this reasoning, market innovation could be an outcome of various actors' deliberate efforts to change the market as well as being an unintended outcome of South African SOEs development. Table 3.5 depicts an outline of a few selected previous studies on market innovation.

**Table 3. 5: An outline of selected prior studies on market innovation**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Ekman, Røndell, Kowalkowski, Raggio & Thompson (2020)	Market Innovation	Real estate.
Chung (2018)	Market orientation and innovation	Variety of industrial sectors
Aksoy (2017)	Innovation culture, marketing innovation and product innovation	Manufacturing SMEs

**Source:** Author's compilation

Table 3.5 outlines some of the studies carried out on market innovation. Previous studies focused mainly on the private sector (Chung, 2018:2; Ekman *et al.*, 2020:1), but studies on market innovation in South African SOEs are rare. This study does not limit innovation practices to certain scopes of sustainability, but limits practices to those linked to and applied by a South African SOE's innovations and performance. Academics have called for more research on the topic. For instance, Aksoy (2017:2) states that more research is needed on how innovation practices influence the performance of SOEs. Chung (2018:3) argues that agreement regarding how to measure market innovation and performance in SOEs local government authorities is lacking. However, with such a wide range of previously identified market innovation practices (Eggert *et al.*, 2015:174), it is not reasonable for organisations to adopt all of them.

As a result, organisations should choose which practices to implement (Fernandes & Remelhe, 2016:312) by identifying which market innovation practices are the most important and influential in SOEs' set-up. Considering the topic more widely, Storbacka (2019:4) states that although the traditional best market innovation aspects and practices are tied to all elements of better performance, not all best practices are necessary for becoming the best performing SOE in South Africa. In this study, a three-dimensional market innovation structure (market orientation, exploitative orientation, and competition) for understanding and defining South African SOEs market innovation aspects is considered. Previous studies examined the impact of market innovation on firm performance (Chung, 2018:2; Storbacka, 2019:4; Ekman *et al.*, 2020:1;

Purchase & Volery, 2020:764;). However, this study investigates the implementation of innovation practices and its effects on performance of SOEs. Therefore, the aim of this study is to find out how the adoption of innovation capabilities might contribute to SOEs performance in South Africa.

### **3.8 Technological innovation**

Humankind faces a growing and imperative requirement to manage threatened, scarce natural, and important man-made resources, such as the ecosystem, energy, agriculture, education, healthcare, housing, transportation, and many others, in the state of population increases and natural resource over-exploitation and utilisation (Coccia, 2017:1048; García-Sánchez, García-Morales & Martín-Rojas, 2018:770). Technological innovations are being advanced in various fields to improve the utilisation of these resources in civilisations chasing socio-economic development and growth (Lopes, Scavarda, Hofmeister, Thomé, Vaccaro, 2017:477; Utterback, 2017:77; García-Sánchez *et al.*, 2018:771) and aiming for maintainable development in bio-ecological and societal terms. The technological innovations are novel ways for the effective, clean and optimum utilisation of scarce resources (Klewitz and Hansen, 2014; Sirilli & Evangelista, 2018:882).

Several studies (Utterback, 2017:77; Anwar, 2018:187; Kraśnicka, Głód & Wronka-Pośpiech, 2018:737; Omri, 2020:3) have by now confirmed the significance of technological innovation in realising sustainability. This interest is born from diverse domains of knowledge, such as engineering, supply chain management, energy, risk management, economics, entrepreneurship, policy, among others (Anwar, 2018:188). These domains include the social influence of technology, ICT and sustainable growth, technologies for sustainable development, e-learning and education, globalisation and prognostication technology, social entrepreneurship and technology, green energy technology and sustainability, among others (Anwar, 2018:187). For example, Bekhet and Abdul Latif (2018:28) analyse the influence of institutions' quality and technological innovation on attaining sustainable development and find that the collaboration between governance and technological innovation certainly underwrites sustainable growth. Furthermore, Omri (2020:3) also discovers that technological innovation in high-income nations inspires ecologically responsive production by reassuring investors that utilising innovative technologies is best for a kinder environment. Therefore, technological innovation is an important antecedent of economic growth and human development.

### 3.8.1 Conceptual technological innovation foundations

The technological innovation systems approach has been established to explicate and clarify the development and emergence of new technologies (Bekhet & Abdul Latif, 2018:28). The approach is also applied to evaluate the performance of a designated technological innovation system and to come up with policy recommendations on how to improve it, every so often at a national level (Li *et al.*, 2016:681; Bekhet & Abdul Latif, 2018:28; Omri, 2020:3). A technological innovation can be conceptualised as a set of networks of organisations and institutions that mutually interrelate in a precise and technological field and subscribe to the creation, dissemination, and utilisation of alternatives of a technology and/or product (Camisón & Villar-López, 2014:2891; Coccia, 2017:1049; Chae, Koh & Park, 2018:525). The essentials of a technological innovation are thus networks, institutions, and actors (Omri, 2020:3). Networks include inter-organisational webs for information exchange as well as prescribed associations and support alliances (Singh, Mathiassen & Mishra, 2015:643). Institutions encompass the prescribed frameworks, such as technology standards, regulations, or public policies, as well as casual structures such as collective expectations, cognitive frames, user practices, social norms or culture (Coccia, 2017:1049). Actors consist of technology manufacturers, suppliers, vendors, research institutes, associations, public authorities, NGOs, etc. (Omri, 2020:4). Chae *et al.* (2018:525) reveal that the technological innovation approach is conceptualised on evolutionary theorising and systems theory.

The basic causal mechanism is a close collaboration of system elements, which in the case of complementary elements, creates positive feedback outcomes (Camisón & Villar-López, 2014:2891). As a result, institutional structures appear at the system level, which again influence further development of the technology (Singh *et al.*, 2015:643). The technological innovation framework pays specific attention to both prescribed and casual institutions (Coccia, 2017:1049). Besides the significance of institutions, the technological innovation approach accepts strategic and entrepreneurial accomplishment, including competition and alliance of an extensive range of organisations, engaged at system building and technology development (Camisón & Villar-López, 2014:2891; Singh *et al.*, 2015:643; Chae *et al.*, 2018:525). To analyse and conceptualise technological innovation performance, academics have recommended a set of vital processes, so-called system functions, to be applied as performance pointers (Li *et al.*, 2016:681; Yang, Guo, Zhong & Zhang, 2018:3; Hollen, van den Bosch & Volberda, 2018:35). These include influence

on the direction of search, information development and dissemination, entrepreneurial experimentation, market development, legalisation, development of positive externalities and resource organisation (Yang *et al.*, 2018:3). All these functions need to display a positive level of activity and quality for technological innovation to be a success (Li *et al.*, 2016:681).

Various studies have established performance indicators for the different functions with the goal of detecting system weaknesses and to notify policymakers on how to enhance the development of a specific technology (Singh *et al.*, 2015:643; Chae *et al.*, 2018:525; Yang *et al.*, 2018:3). A technological innovation system is positioned in a grander setting, which can be perceived as an unlimited range of ‘other’ actors, networks, institutions, and technologies (Hekkert & Jacobsson, 2015:76; Markard, Wirth & Truffer 2016:33; Haneda & Ito, 2018:195). Of a certain interest are semi-coherent framework structures that also display systemic and universal features and characteristics (Bergek, Hekkert, Jacobsson, Markard, Sanden & Truffer 2015:51). These consist of other technological innovation systems, other sectors (SOEs) and businesses, geographical framework structures, as well as educational, political, and financial systems (Bergek *et al.*, 2015:52). Deviations in framework (for example, shifting policy priorities or the emergence of complementary technologies) hamper the focal technological innovation system, meanwhile the same system may also influence its context, as revealed by the case of biogas technologies which had both positive and negative effects for the agricultural sector (Markard *et al.*, 2016:331)

### **3.8.2 Definitions of technological innovation**

Technological innovation is considered as an important driver of human progress and economic growth (Lee, Ooi, Chong & Seow, 2014:6983). Contemporary studies (Coccia, 2014:52; Lee *et al.*, 2014:6983; Markard *et al.*, 2015:63; Huenteler, Schmidt, Ossenbrink & Hoffmann, 2016:102; Clow, 2018:141) understand technological innovation as an important pathway for realising sustainability in processes, methods, designs, products, and services. The significance of technological innovation as a driver of economic and societal transformations is not new in the economic theory. Clow (2018:141) refers to technological innovation as “the process of implementation of an idea for a new product or a new service or the introduction of new elements in an organization’s production process or service operation.” Similarly, McGahan, Argyres and Baum (2017:2) define technological innovation as a process that includes “the generation, development, and implementation of new ideas or behaviours”. Furthermore, Markard *et al.*

(2015:63) state that technological innovation is considered as a way of transforming an organisation, either as a response to variations and transformations in the external environment or as a pre-emptive or proactive stance to impact on the market environment. Thus, according to Huenteler *et al.* (2016:102), technological innovation is a component of the entire innovation discipline. Negro and Hekkert (2018:465) claim that technological innovation focuses precisely on technology and how to integrate it effectively in the organisation's processes, services, and products. According to McGahan *et al.* (2017:2), technology is a body of knowledge that can be perceived as an essential tool for technological innovation, thus, serving as a cornerstone to research, design, development, manufacturing, and marketing.

Technological innovation includes functions that contribute to the research, development and design of new products, services, or techniques, or to the improvement of existing products, and generates new technological knowledge (Bento & Wilson, 2016:95). Bento and Fontes (2015:159) define technological innovation as the process of new product or service development through incorporation of complementary technologies for adoption by the organisations in a marketplace. Sandén and Hillman, (2017:403) refer to technological innovation as the process where an organisation (or a group of people working outside a structured organisation) go on a journey where the significance of technology as a foundation of innovation has been recognised and appreciated as an imperative success factor that increases its market competitiveness. According to Andersen and Markard (2017:33), the term "technological innovation" is preferred to "technology innovation".

Technology innovation provides a sense of working on technology for the sake of technology (Bento and Wilson, 2016:95) whereas the term "technological innovation" better replicates the business reflection on refining business value by working on technological features of the product or services. Furthermore, in a massive mainstream of services and products, there is not one single technology that is at the core of the process or system (Stephan, Schmidt, Bening & Hoffmann, 2017:4). In the current business world, technological innovation has become an essential focus of top management in numerous organisations (Vaccaro, Jansen, van den Bosch, Volberda, 2017:30). It is argued that organisations that succeed in the turbulent markets are those that implement modern technology on their products and services (Ryu, 2016:27). In literature, mostly from an RBV outlook, an organisation with inimitable capabilities and resources may attain a maintainable

competitive position in a tempestuous and volatile market and outclass its close industry rivals and competitors (Kemp, 2014:1023; Son, Kim, Park & Kim, 2018:36). Technological innovation helps organisations to produce a diversity of new processes, designs, products, and services. These new processes and products in turn, are imperative for the achievement of higher profits and organisational performance (Vaccaro *et al.*, 2017:31).

In dynamic, turbulent and volatile markets, those organisations become leaders of the markets and benefit from high profits, which has high informational technological capabilities (Kim *et al.*, 2018:37) Mainly, in developing markets, an organisation's goal of high profit can be achieved through technological innovation (Son *et al.*, 2018:37). In an indeterminate environment, technological innovation empowers organisations to become leaders of a particular industry and take hold of market profit without difficulty (Ryu, 2016:27). On the other hand, having no or little technological innovation can weaken organisations and halve sales growth (Hervas-Oliver, Sempere-Ripoll, Boronat-Moll & Rojas-Alvarado, 2018:569). Technological innovation is not only achievable in a specific industry (Wang, Umar, Akram & Caglar, 2021:3) but various sectors, such as SOEs in South Africa, can increase their performance by implementing technological innovation approaches (Lewis, 2016:2172). Compared to non-technological innovation, technological innovation has a more significant influence on organisational success and performance (Kim, 2018:450). Technological innovation is regarded as a significant antecedent or factor that meaningfully contributes to organisational performance (Su, Naqvi, Shao, Li & Jiao, 2020:111).

In turbulent business environments, organisations have to respond to that uncertain environment efficiently and competently. Nevertheless, a better response is difficult and challenging unless organisations can adopt technological innovation (Lewis, 2016:2172). Wang *et al.* (2021:3) confirm that technological innovation assets configure an organisation's internal processes, absorptive capability and practices that eventually enable an organisation to attain its goals (economic and social) in an easier way (Imaz & Sheinbaum, 2017:3). Kim (2018:450) argues that business model innovation includes non-technological and technological innovation. Considering its technological attributes, Su *et al.* (2020:112) assert that business model innovation is regarded as a control device for sustainability in organisations. Similarly, Kim (2018:451) claims the technological innovations have obligated business organisations to transform, thus business

models have to be combined, thus considering the dynamics, chances and volatilities of markets, business environments and the industry. According to Wang *et al.* (2021:2), “sustainability is a mother lode of organisational and technological innovations that yield both bottom-line and top-line returns”. Imaz and Sheinbaum (2017:3) maintain that technological innovation does not only assist the businesses in enhancing and improving their profits but also inspires them to make ways and expand economic activities, subscribe to employment and environmental factors (Imaz & Sheinbaum, 2017:3; Lewis, 2016:2172).

Technologically innovative practices are desirable to address the environmental pressures and enhance organisational sustainability (Almeida & Melo, 2017:395). Walker, Chen, and Aravind (2015:407) claim that technological innovation empowers organisations to figure a sustainable position and reach environmental achievement in a stormy and volatile market, which in turn, constitutes profitability and high organisational performance. For example, Cheng, Awan, Ahmad, and Tan (2021:121) maintain that technological innovation capabilities enable organisations in the attainment of valued resources that can even the internal structure and processes of an organisation, which in turn, meaningfully progresses and improves financial performance. Furthermore, it is contended that technological innovation plays an important part as it can yield greater productivities from the same resources to spur and organise sturdy sustainability and growth, which in turn, improves organisational performance (Baden-Fuller & Haefliger, 2018:420). For example, it is shown that novel and innovative technologies allow organisations to obtain different types of resources that are imperative for high organisational performance and environmental competitiveness (Cheng *et al.*, 2021:121).

**Table 3. 6: Characteristics of technological innovations**

<b>Characteristic</b>	<b>Description</b>
A technological innovation can be a state-maintaining system:	“This is one that (1) can react in only one way to any one external or internal event but (2) it reacts differently to different external or internal events, and (3) these different reactions produce the same external or internal state (outcome).”
A multi-goal-seeking technological innovation is a system:	“That is goal-seeking in each of two or more different (initial) external or internal states, and which seeks different goals in at least two different states, the goal being determined by the initial state”
A purposeful system	“is one which can produce the same outcome in different ways in the same (internal or external) state and can produce different outcomes in the same and different states. Human beings are the most familiar examples of such systems.”

**Source:** compilation by author

In developing economies, organisations use numerous sources and resources to enhance competitive advantages and environmental success (which spur organisational performance). However, technological innovation is the perspective that is the most known factor that configures an organisation to have sustainable competitive advantage and success (Nemlioglu & Mallick, 2017:1016). Table 3.6 outlines some of the characteristics of technological innovations. Therefore, a technological innovation can be state-maintaining, goal-seeking, multi-goal seeking, or purposive, but is not a purposeful system.

### 3.8.3 Previous studies on technological innovation

The phenomenon of innovation has attracted numerous management sciences scholars. Beyond the universal product and technological innovation, a variety of innovations have been introduced such as service innovation (Nemlioglu & Mallick, 2017:1016), business model innovation (Baden-Fuller & Haefliger, 2018:420) and process innovation (Cheng *et al.*, 2021:121). However, technological innovation is a well-known factor in strategic management literature that can change and improve organisations performance. For instance, Walker *et al.* (2015:407) establish that technological innovation presents one of the most significant sources of competitive advantage and sustainable performance in the business world. Similarly, it is argued that technological innovation is an essential tool for a sustainable position in the present time of globalisation (Baden-Fuller & Haefliger, 2018:420). Astonishingly, current studies still claim a lack of research in terms of technological innovation (Omri, 2020:3). Considering the supposition that technological innovation does not always directly contribute to firm performance, this study therefore, contends that technological innovation helps organisations (particularly SOEs in South Africa) in acquiring sustainability in SOEs performance which in turn, provides high profits. Table 3.7 outlines the previous studies on technological innovation

**Table 3. 7: An outline of selected prior studies on technological innovation**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Zhang, Khan, Lee & Salik (2019)	Management Innovation and Technological Innovation	Manufacturing, trading, and services firms.
Coccia (2016)	Technological innovation	Pharmaceutical industry
Rosenzweig (2016)	Technological innovation	Computers and communications industry and in the drugs and biotechnology industry
Omri (2020)	Technological innovation and sustainable development	Manufacturing industries

**Source:** Author's compilation



Even though SOEs are part of organisations and economic contributing settings, most studies on technological innovation and performance are mainly in the private sector, as depicted in Table 3.6. According to Omri (2020:3), the technological innovation literature has concentrated entirely on other organisations relative to SOEs. More recently, Zhang, Khan, Lee, and Salik (2019:4) note “a lack and scarcity of SOEs literature on technological innovation in developing countries” focused on the public sector let alone on the technological innovation and performance on SOEs in South Africa. There is a particular lack of empirical evidence on the associations between technological innovation and SOEs performance. These gaps in the literature have inspired this study, which develops and tests hypotheses on the use of technological innovation and organisational performance involving SOEs in South Africa.

### **3.9 Chapter Summary**

The purpose of this chapter was to review the literature on innovation capabilities and the dimensions involved in the conceptual framework. The literature revealed that innovation capabilities play a critical role in the performance of SOEs in South Africa. It was shown that innovation culture, innovation strategy, market innovation and technological innovation are the main constructs of innovation capabilities in organisations. These antecedents are important in determining the performance of organisations, particularly the SOEs in South Africa. The literature further revealed that despite their importance in socio-economic contributions and political significance, SOEs in South Africa and other countries face numerous challenges in implementing and developing innovation capabilities. Previous studies were included at the end of each section and study gaps were identified. The next chapter discusses in detail, the literature review of market competitiveness and business performance.

## **CHAPTER 4**

### **A LITERATURE REVIEW ON MARKET COMPETITIVENESS AND BUSINESS**

#### **PERFORMANCE**

##### **4.1 CHAPTER OVERVIEW**

The main aim of the current chapter is to assess and review related literature on market competitiveness, business performance (financial, environmental, and operational performance) and hypotheses development appropriate for this study. The chapter first discusses competitiveness in detail and involves the review of its conceptualisation, explanation, and description. This section also sets out to discuss the factors affecting market competitiveness, outcomes, and importance of the variable. The subsequent sections explore the literature on business performance. The literature review on business performance provides information on the financial performance, operational and environmental performance. Research gaps are drawn by reviewing some of the studies conducted by different academics and scholars, not only confined to South Africa, but also worldwide. The research gaps reviews are observed as buttressing and provide the motivation to conduct this study. Hypotheses formulation on the relationship between innovation capability practices and market competitiveness follows in the next subsection. The proceeding section discusses the relationship between market competitiveness and business performance dimensions. The intention of exploring this connection is to formulate hypotheses, thus the subsection that follows discusses the development of hypotheses that interlink innovation capability functions, market competitiveness and business performance practices. A chapter summary follows, which concludes the chapter.

##### **4.2 Competitiveness**

Currently, the absence of competitiveness is one of the major challenges of any country's industry and organisations (Kucher, 2019:100). One of the pillars of this challenge is the lack of a vivid and clear method to improve the competitiveness (Lisowska, 2013:158). One of the characteristics of today's successful business organisations refers to having competitiveness power, while the non-existence of this aspect is the main characteristic of unsuccessful companies (Trica, Banacu & Busu, 2019:1114). The competitiveness power, more than anything else, comes from a new

perspective about it, however, the context of environment and time has created significant changes in competitiveness indicators (Sasongko, Huruta & Gultom, 2019:1428). Currently, competitiveness is regarded as a key issue around the world markets, and it is revealed as a way of attaining economic growth, robust business performance and justifiable development. In the globalised economy, being competitive entails the likelihood of obtaining a suitable and constant position in the market (Trica et al., 2019:1115).

#### **4.2.1 The conceptual definition of competitiveness**

This question "Why are some organisations more successful than others in international competition?" has involved the minds of many academics, economists, managers of industries, organisations and even the governments. In other words, Wojtaszek and Miciuła (2019:5850) accept as true that competitiveness is one of the main concerns of trade and activity in today's dynamic and competitive market environment. The prompt and incessant transformations in the world economic environment and subsequently, the conception of powerful competition in the global economy and markets are characteristics of the present world (Shved & Bila, 2017:405). There are various definitions of competitiveness (Leśniewski, 2017:77). Although, a general definition of competitiveness is not yet provided, some scholars assert competitiveness as a macroeconomic phenomenon and consider factors such as markets, exchange rates, interest rates and budget deficits of countries as its origin.

From other perspectives, competitiveness is due to the abundant labour force and low wages in the country or organisation (absolute advantage). From another perspective, competitiveness is a function of the richness of the organisations in terms of having a lot of endowments and resources (Heksher - Ohlin). Some studies (Shved & Bila, 2017:405) consider competitiveness as predisposed by government policies (Leading Theory). There is no agreement on a single definition of competitiveness. In fact, instead of defining and explaining the concept of competitiveness, the factors influencing competitiveness have been outlined (Shved & Bila, 2017:405). In this study, competitiveness addresses the dimensions of the specialised environment of the SOE organisation in South Africa (internal factors of organisation) and factors of industry that are typically its cognitive aspects on effectiveness in market competitiveness.

## **4.2.2 Market competitiveness**

Market competitiveness is an intricate economic category that is correlated to the organisation's sustainability and performance (Zelga, 2017:301). Sustainability and strong business performance can be reached through the creation of benefit, the nurturing of quality management and the implementation of philosophies of social responsibility, and each area of the activity trying to be competitive at the same time (Zelga, 2017:301). It follows that both market competitiveness and business performance are dependent on several factors at both micro and macro levels (Wojtaszek & Miciuła, 2019:5850). Thus, the objective of this study is to assess the impact of innovation capability factors on market competitiveness and consequently, on the performance of the SOEs in South Africa. In addition, the following tasks have been implemented: to analyse the theoretical aspects of market competitiveness; to reveal the main factors that have an influence on the market competitiveness; to assess the influence of factors on competitiveness fostering the SOEs performance.

### **4.2.2.1 Measures of market competitiveness**

In the modern world, while competitiveness and growth are one of the most popular subjects, this phenomenon is hard to measure. Many scientists are analysing competitiveness in various ways and trying to assess possibilities of growth. The term 'competitiveness' became known in the 20th century but reached popularity only in the 8th decade of the 20th century. At that time, competitiveness was defined as the ability to deliver services and products to the market on time, in the right place and in the right form (Lotfi & Karim, 2016:142). Mobius and Althammer (2020:454) add that competitiveness must be measured by market size, prices and expenses, market share, market dominance and productivity. According to Leśniewski (2017:77), the above-mentioned measures change over time, but it is essential to highlight that competitiveness is correlated to the performance of business, because it is influenced mostly by innovation capabilities, economic, environmental, and operational factors (Zhou & Lu, 2020:142). This gave rise to a new approach to competitiveness through the optical prism of market competitiveness. Innovation capabilities and business performance (financial performance) become the cornerstone of market competitiveness based on productivity and other operational principles (Kucher, 2019:100). It follows that competitiveness is the ability to achieve a competitive advantage, higher income levels and higher employment in various ways (Lotfi & Karim, 2016:143). In this context,

it is essential to identify and assess the impact of factors influencing productivity and, accordingly, attain justifiable development of the business organisation. This is where the requirement for a sustainable market competitiveness analysis becomes significant.

#### **4.2.2.2 Characteristics of competitiveness**

At the present time, corporations and businesses with better performance results face progressively grimmer and more complex development circumstances (Utami & Lantu 2014:305). These include amplified business ferociousness and so-called corporate volatility, turbulence, dynamics of globalisation, new requirements, intensity of competition and quick technological progress. To succeed, every organisation is forced to efficiently use its real capital, finances or employee potential and evaluate the environment in which it operates (Leśniewski, 2017:77). This makes growing organisations continuously advance, adapting the functions, activities, goals and tasks of the organisation and management approaches to transforming business conditions (Komarkova, Pirozek & Pudil, 2014:513). Competitiveness has always been a vital aspect for the success of organisations. Uncompetitive businesses are in most cases, unable to create value at least on a normal level, thus eventually they just fall and fail (Zelga, 2017:301). Therefore, the significant function of managing an organisation is to guarantee that it is competitive (Leśniewski, 2017:77).

The processes leading to the anticipated level of competitiveness must not be impulsive and haphazard, but must be methodically premeditated, instigated and meticulously measured (Wojtaszek & Miciuła, 2019:5850). Henceforth there is a growing significance of competition strategies, understood as inclusive, long-term notions of generating everlasting advantages for all participants of the competitive environment. It is imperative to underscore and highlight that new theories and research go towards a more comprehensive view of market competitiveness, going beyond the context of competitiveness understood exclusively as an aspect of market actors (Zelga, 2017:301). Intricacy and the changing aspects of economic processes at the turn of the twentieth and twenty-first century, globalisation, and the development of the knowledge-based economy, suggest the requirement for a comprehensive outlook on competitiveness, taking into consideration not only the international features but also the overall conditions of the macro and microeconomic economy (Wojtaszek & Miciuła, 2019:5850).

A definition of competitiveness, proposed by the OECD, could be an answer to this requirement, as it states that this concept should be understood as the capability of corporations, segments,

regions, nations, and supranational areas to produce comparatively high income from production factors and a moderately high level of employment under circumstances of lasting submission to international competition. Determining a high level of competitiveness of businesses, sectors, whole economies and/or its regions is one of the most significant challenges of the modern economy and economic theories describing it (Shved & Bila, 2017:405). Competitiveness is a quality of an organisation expressed in terms of effectiveness, and efficiency. In the same way, Kucher (2019:100) regards competitiveness as the ability of an organisation to design, manufacture, market and sell better products and services than those provided by competitors, considering price and non-price prominence criteria in the evaluation. Leśniewski (2017:77) defines the competitiveness as "the ability to take quick and adequate actions to manage resources efficiently". Other definitions of competitiveness are given in Table 4.1.

**Table 4. 1: Definitions of competitiveness**

<b>Author</b>	<b>Definition</b>
Dictionary of the Polish language	Competitive - relating to competition, particularly in the economic field, competing with other businesses, goods, etc.; also: able to compete positively with them because of their advantages
Penc (2008)	Competitiveness is a process of rivalry between various entities pursuing similar objectives and carrying out activities, which make it difficult or impossible for rivals to achieve them (Penc, 2008).
Lisowska (2013)	Competitiveness of small and medium-sized enterprises is the ability to take quick and adequate actions to manage resources effectively (Lisowska, 2013).
Cyrkon (2014)	The competitiveness of enterprises is a process, in which market participants seek to pursue their interests by seeking to make better offers of price, quality or other characteristics that are more favourable than others are to their trading decisions (Cyrkon, 2014).
Pierścionek (2015)	Competitiveness is an attribute of a company, expressed in terms of efficiency, effectiveness, and agility (Pierścionek, 2015).
Ambastha & Momaya (2017)	Competitiveness is the ability of a company to design, manufacture and sell better products and services than those offered by its competitors considering in the assessment price and non-price quality criteria (Ambastha <i>et al.</i> , 2004).

**Source:** Author's compilation

The outlined definitions of competitiveness demonstrate that the authors view competitiveness in various aspects, that is, as a skill, a feature, a process, a characteristic and as an ability. Various studies view competitiveness as the ability of an organisation to gain a competitive advantage, and thus to realise profits and market shares better than the competition (Nykolyuk, 2014:608; Utami

& Lantu 2014:305; Wojtaszek & Miciuła, 2019:5850). Competitiveness as a microeconomic, complex category is displayed in the relationship between the host organisation and its potential, possibilities, skills, the market structure, and strategic opportunities. This is replicated in the position stated by Utami and Lantu (2014:305). They distinguish between basic and key competitiveness. The first of these includes processes and systems that give an organisation a leading position in the industry and are connected to the capability of the business to intensify the customer's professed value (Markovics, 2005:13; Gunasekaran, Rai & Griffin, 2011:5490; Sekerin, Burlakov, Dzyurdzha & Gorohova 2015:55; Zelga, 2017:301). The second is related to the skills vital to advance a permanent competitive advantage in each market.

In turn, in terms of other approaches to the competitiveness in the market, encountered in the literature on the subject, permit this study to understand it as the capacity of the organisation to develop sustainably in the long run. Market Competitiveness (MC) has the tendency to maintain and increase market shares, the relative ability to push its own system of objectives, targets, or values. MC facilitates the ability of activities to increase the effectiveness of its internal operation by consolidating and improving its position in the market. MC can design, manufacture, and sell goods whose prices, quality and other qualities are more attractive than the pertinent characteristics of the goods provided by its competitors (Yang, Pinglin, Chan & Sheu, 2010:210; Zitkus, 2011:423; Matysek-Jedrych, 2012:49; Ambastha & Momaya, 2014:45; Kucher, 2019:100). In a comprehensive effort to specify the essence of a business's market competitiveness, it can be specified that this concept infers the ability to resourcefully pursue objectives in the competitive marketplace. In this aspect, the competitiveness of an initiative/organisation should be regarded as a proper feature of the business, playing an imperative role in formulating the business's development strategy (Banyte & Salickaite, 2008:48; Ungerman, Dedkova & Gurinova, 2018:133). In the same way, competitiveness has been considered as the capacity to attain and/or sustain a competitive advantage in the aspect of the concept identical to competitive capabilities (Balkyte & Tvaronavieiene, 2010:341; Ambastha & Momaya, 2014:47).

#### **4.2.2.3 Theoretical concepts of market competitiveness**

Market competitiveness is a complex, multidimensional category that is meticulously interrelated to the capacity to adapt to a continuously changing economic and business environment. Economic development is a precondition for productivity and accordingly for growth in market

competitiveness (Kiselařková, Šofranková, Čabinová, & Onuferová, 2018:581; Korauš, Mazák & Dobrovič, 2018:1070; Mikhaylov, Mikhaylova & Savchina, 2018:754; Havierniková & Kordoš, 2019:1681; Voronkova, Yankovskaya, Kovaleva, Epishkin, Iusupova & Berdova, 2019:663; Zeibote, Volkova & Todorov, 2019:33).

Market competitiveness can be measured at different levels, that is, at industry, company or at national level, but in this study, market competitiveness is viewed and measured at the macro level. According to Zeibote *et al.* (2019:33), competitiveness is a multifaceted and intricate phenomenon grounded on the philosophies of innovation and productivity. The concept, based on productivity principles, is substantial in its capability to combine the value of products and services and to evaluate it globally to increase operational efficiency (Chu, Wu & Qiu, 2016:1916). The industry's market competitiveness is also perceived as a composite category branded by market fundamental functions, high volume and effective use of production resources, high income, high employment, and economic effectiveness (Borowiecki & Siuta-Tokarska, 2017). It follows that the market competitiveness concept is a requirement for certifying robust business performance, high productivity, a high standard of living and adequate wage and income growth in an economy.

#### **4.2.2.4 Determinants of market competitiveness**

The international environment faced by countries in Africa and in particular, South Africa, is increasingly becoming more competitive. This growing competition is not only between firms in the same country but also between countries across many industries. The inter-country competition is particularly intense in SOEs where the economic benefits are becoming significant because of the increasing trade and investment flows between countries. Several factors are responsible for this increasing international trade and investment flows, including the increasing growth and openness of countries in Africa and beyond, increasing globalisation and deregulation, continued industrialisation of the newly emerging economies and improvements in transportation technology. The four major determinants of market competitiveness are as depicted in Table 4.2.



**Table 4. 2: Determinants of market competitiveness**

<b>Determinant</b>	<b>Description</b>
<b>Comparative advantage</b>	The destination's comparative advantage includes factors associated with both the macro and micro-environments that are critical to market competitiveness.
<b>Demand orientation</b>	The destination's ability to respond to the changing nature of market demand will influence its competitiveness.
<b>Industry structure</b>	The existence or absence of an organised tourism-related industry structure can be associated with the destination's ability to compete.
<b>Environmental commitment</b>	The destination's commitment to the environment will influence the potential for sustained market competitiveness.

**Source:** Compiled by Author

The main reasons for increasing the importance of market competitiveness determinants are highlighted by Möbius and Althammer (2020:453) as:

- the globalisation of the economy opens to the distribution of goods, services, capital, labour, and knowledge, which is stirred by developments in information technologies and transport systems.
- increasing the potential of the population and highlighting new necessities, requirements, and prospects.
- Effective improvement of scientific outcomes into practice and market growth.

Dynamic usage and integration of market innovation and technology are vital fundamentals for market competitiveness, company survival and economic development (Bilen, Yilanci & Eryüzlü, 2017:27). Möbius and Althammer (2020:453) note that organisations (SOEs in particular) must emphasise the need to focus on the sustainability of development as an economic, political, and territorial autonomy alongside the sustainability analysis of system or process development, where growth in market competitiveness becomes an important lever for maintainable development in the organisations and economy.

#### **4.2.2.5 Sustainable market competitiveness**

Sustainable market competitiveness includes innovative measurement, finding new intuitions, visions and promotes sustainable market development (Möbius & Althammer, 2020:453; Pierros, 2020:50). Sustainable market competitiveness is reached through innovation, specialisation, and modernisation (Havierníková & Kordoš, 2019:1680). The purpose of market competitiveness is to

generate opportunities for learning, new market knowledge and applying market innovative technologies (García-Sánchez, David Siles & María de Mar Vázquez-Méndez, 2019:201), to adapt to market technological development and to increase the quality and quantity of production (products) through innovation, advanced market management processes and motivated employees to work productively (García-Sánchez *et al.*, 2019:202). This, in turn, intensifies competitiveness, reduces deficits, and improves the quality of life of consumers (Lotfi & Karim, 2016:142). Evaluating macroeconomic and sustainable competitiveness in a macro-business environment is not only a requirement for sustaining high living standards in the long-term, but it is essential to measure the survival and business environmental conditions of organisations (particularly the SOEs in South Africa).

It follows that numerous factors must be considered when evaluating the level of market competitiveness of an organisation (Havierníková & Kordoš, 2019:1680). This study uses sustainable market competitiveness as an outcome of the collaboration between competitiveness and market sustainable development, which shows how an organisation can use its resources proficiently, be competitive, but not limit its use to future generations. Such an evaluation is aimed to structure and complement the factors influencing market competitiveness (as well as sustainability), therefore resulting in sustainable market competitiveness.

#### **4.2.2.6 Factors influencing sustainable market competitiveness**

Sustainable market competitiveness is a multi-layered concept and is influenced by numerous factors at both micro and macro levels. Sustainable market competitiveness is also affected by specific factors. Figure 4.1 displays the factors that impact sustainable market competitiveness.



**Figure 4. 1: Macro-level factors affecting sustainable competitiveness**

Source: Compiled by the author based on several authors (Borowiecki & Siuta-Tokarska, 2017; Abreu-Novais, Ruhanen, & Arcodia, 2016; Lotfi & Karim, 2016; Toppinen *et al.*, 2019).

Figure 4.1 highlights that external factors are perceived to fall at a national (or global) scale and are divided into several groups (Abreu-Novais *et al.*, 2016:492; Lotfi & Karim, 2016:141; Borowiecki & Siuta-Tokarska, 2017; Toppinen, Sauru, Pätäri, Lähtinen & Tuppurä, 2019:27). The groups include productivity (understood through refining work organisation) and positive transformations in the quality of production factors. The other factors include improving the production course or efficient resource allocation and efficiency factors (quality of higher education, market size, market efficiency). Political factors (legal norms, custom tariffs), trade liberalisation (global demand, allowing foreign partners to choose appropriately) and exchange rates (dropping exchange rates influence exports and limit externalities, while devaluation encourages development and international market competitiveness) are some of the factors. Foreign influence (foreign capital is a source of funds for creating a dynamic advantage and investment stimulates technological innovation and improves factor productivity), economic factors (macroeconomic stability, price level, consideration of competitor’s behaviour, meeting customer requirements) and demographic factors add to the list of factors. Technological and innovation factors (technological supply, level of business and innovation development), natural factors, cultural factors, country policy towards the region, globalisation, communication networks, ecological factors, financial circumstances sum up the factors (García-Sánchez *et al.*, 2019:201).

Therefore, market competitiveness is a multidimensional and intricate concept that is more involving and one of the main factors influencing the development of an organisation and subsequently the growth of the entire economy. The ability to remain competitive and to be more efficient in carrying out the functions entrusted to it is an indispensable objective for each organisation (Abreu-Novais, Ruhanen, & Arcodia, 2016:493). Linking market competitiveness with the immediate business environment can be argued that interrelating with the social, environmental, and economic situation generates the concept of sustainable market competitiveness, which is about satisfying customer requirements without restraining the ambitions of future generations to meet their desires.

#### **4.2.2.7 The necessity and significance of market competitiveness**

The globalisation process, the creation of the World Trade Organisation (WTO) and the integration of global markets have changed the dynamics of market competitiveness. Asuamah, Pinkrah and Abbey (2016:3) note that technological advances, new developments in information technology, improvement of swift transformations in demand and consumption patterns, explaining the environmental pollution controls and preservation of energy resources, resource scarcity and their high costs, are obstacles with which numerous businesses and industries in the field of trade and economic activities are confronted. Their survival hinges on making precise and appropriate decisions in the face of these transformations (Yusof, 2008:250). In the interim, the globalisation process and the development of consumer markets as well as increasing numbers of competitors and the extent of competition has led to the significance of concepts such as market competitiveness (Zeibote, Volkova & Todorov, 2019:34). This has caused companies, industries and different countries to try to identify factors affecting competitiveness and to strengthen them to improve their competitiveness (Flores, & Falcade, 2019:03023).

#### **4.2.2.8 Studies on market competitiveness**

Numerous emerging countries encounter challenges on municipal service delivery (Joshi & Moore, 2004; Mangai, 2016; Mangai, 2017; Masiya *et al.*, 2019). In many of these countries, poor delivery of service has triggered a rise in public protests (Morudu, 2017; Alexander *et al.*, 2018). It is in this context that many municipalities in South Africa have witnessed service delivery protests characterised by amplified violence in the past decade. Several studies have maintained that these protests can be ascribed to organisational failure to deliver satisfactory fundamental

services (Akinboade, 2012; Peyper, 2016; Nkomo, 2017), while others embrace that citizen satisfaction is also an expectation of the government’s performance (Mangai, 2016). Some of the previous studies on market competitiveness are presented in Table 4.3.

**Table 4. 3: Previous studies on market competitiveness**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Enwereji & Uwizeyimana (2019)	Strategic management	Public sector (South African municipalities)
Nzimakwe & Ntshakala (2017)	Strategic performance management	Local governments
Masiya, Davids & Mangai (2019)	Service delivery management	Public sector (South African municipalities)
Ologede, Agbola & Samuel (2019)	Technological innovation	Public sector (South African municipalities)
Luthuli, Nyawo & Mashau (2019)	Training and development	Public sector (South African municipalities)
Biljohn (2019)	Social innovation	South African municipalities
Masenya, Mokoete & Makalela (2018)	Strategic performance management	Local governments

**Source:** compiled by author

There is a lot of literature on competitiveness in the world; however, studies that link market competitiveness practices and business performance in South African SOEs are scarce. Many studies on market competitiveness are on strategic marketing management (Nzimakwe & Ntshakala, 2017; Masenya, Mokoete & Makalela, 2018; Enwereji & Uwizeyimana, 2019), market technological innovations (Ologede, Agbola & Samuel, 2019), training and development (Luthuli, Nyawo & Mashau, 2019) and social innovation (Biljohn, 2019) as outlined in Table 4.2. Consequently, there is a growing need for researchers to contribute towards understanding the market competitiveness as well as the nature of business performance in South African SOEs.

### **4.3 Business performance**

The business world is repetitively evaluating its approaches to find business processes that are more efficient in terms of cost and the achievement of goals (Guesalaga, Gabrielsson, Rogers, Ryals & Cuevas, 2018:160). The practice of creating metrics to measure performance is just one of the ways that business owners and managers attempt to get a better return on investment for their business processes. Business performance is a way of monitoring the approaches an organisation applies to achieve its goals and then using data to find better methods (Hadi, Hadi,

Handajani & Putra, 2018:74). The knowledge of monitoring business performance management measures to develop operative approaches for the attainment goals has been around since business first began (Guesalaga *et al.*,2018:161). Even the great warriors of ancient China understood the need to monitor processes and adjust, based on the results (Guesalaga *et al.*,2018:161). Business performance management was developed to restructure this monitoring process and develop a more effective way of attaining business goals.

#### **4.3.1 Business performances definitions**

Organisational performance (known as business performance) is defined as the ability of the organisation to attain success with its stated goals (Gawankar, Kamble & Raut, 2017:258). Grudinschi, Sintonen and Hallikas (2014:82) state that business performance is regarded as an achievement to which all businesses aim, for the survival and success of the entire organisation. A company's performance can be measured in a number of ways, including financial performance, product performance, and market performance (Grudinsch *et al.*, 2014:83). Business performance (also known as "corporate performance" and "enterprise performance") is a set of performance management and analytic processes that allows the management of an organisation's performance to attain one or more pre-selected goals (Guesalaga *et al.*, 2018:161). Business performance management is the act of setting corporate goals, monitoring the methods used to achieve those goals, and then creating ways for managers to achieve those goals more effectively.

By collecting and analysing data, an organisation can determine what influences managerial transformations had on performance and then adjust those transformations to support the creation of a more effective process. The knowledge or notion of business performance is a comprehensive impression, but it is best applied to evaluate precise goals and aid an organisation to save on operating costs, while generating more revenue at the same time. The significant thing to remember about business performance concept is that it is applied to improve the performance of personnel and management. The usage of metrics is just a way to an end, with that end being higher profitability. Profitability is the core objective in organisational performance (Florio & Leoni, 2017:56). Therefore, in general, business performance should be based on effectiveness, efficiency, economy, quality, consistency of behaviour, and normative measures (Grewatsch & Kleindienst, 2017:384). In this study, three business performance measurement or dimensions are

used, and these are financial performance, operational and environmental performance. The following sub-sections discuss in detail these three performance practices.

#### **4.3.2 Financial performance**

The term “performance” originates from the old French word ‘parfournir’; whose denotation is to carry out, to bring through, to bring forth or to do (Danso, Adomako & Larney, 2019:653). Feng, Yu, Wang, Wong, Xu and Xiao (2017:213) view performance as an action of implementing, performing, fulfilling and achieving of the specified activities or functions that are required to be measured against anticipated sets of precision, timing, fullness, and money. In finance, it refers to the measurements of the business’s activities, policies, operational and functional outcomes in financial terms (Florio & Leoni (2017:56). Florio and Leoni (2017:57) state that financial performance is used to assess and evaluate a company’s financial position, compliance, and success. These outcomes are reflected in the organisation’s assets, profitability, return on investment, capital employed and equity (Feng *et al* 2017:214). Grewatsch and Kleindienst (2017:384) define financial performance as an extent to which an organisation’s financial health and stability is measured over a period.

In other words, Danso *et al.* (2019:652) refer to financial performance as a financial action used to generate profits, higher sales, and add value to a business entity for its shareholders through the management of financing, current and non-current assets, expenses, revenues, and equity. Lee, Cin and Lee (2016:41) define financial performance as the organisation's financial condition or situation over a specified period that embraces the use and collection of financial resources measured by numerous indicators of liquidity, profitability, capital adequacy ratio, solvency and leverage. Financial performance is the organisation's capacity to manage, allocate and control its resources (Grewatsch & Kleindienst, 2017:383). The main purpose of financial performance as purported by Hategan, Sirghi, Curea-Pitorac and Hategan (2018:1042), is to make available complete and to the point information to shareholders and relevant stakeholders to embolden them in making immutable business decisions. Kim, Kim and Qian (2018:1098) argue that financial performance can be applied to assess similar business organisations from the same industry or to compare industries in aggregation. Thus, financial performance primarily mirrors business sector results and outcomes that indicate the general financial stability and health of the sector over a certain period (Muhammad, Scrimgeour, Reddy & Abidin, 2015:1022). The financial performance

concept specifies how good an organisation is in allocating, utilising, and controlling its resources to maximise profits and the shareholders' wealth or value (Kim *et al.*, 2018:1099). Lee *et al.* (2016:42) reveal that although a complete evaluation of an organisation's financial performance considers many other different forms of measures, the most common performance measurement used in the fields of finance and statistical inference are the financial ratios. The following subsection therefore discusses and explains the measures of SOEs financial performance.

### **4.3.3 Measures of financial performance**

Financial performance measures or indicators are metrics organisations use to assess, measure, track and evaluate the financial stability and health of the organisation (Pascareno & Siringoringo, 2016:370). Ranjbar, Espeed and Bagheri (2017:43) note that financial performance measures fall under a variety of categories, including liquidity, profitability, solvency, leverage, valuation, and efficiency. Almagtome and Abbas (2020:6778) affirm that by understanding these metrics, the organisation can be better positioned to know how the business is performing from a financial perspective. Ryan, Robinson and Grigg (2018:90) state that the knowledge gained from measuring financial performance is then used to adjust the goals of the organisation, department or team and contributes to critical strategic objectives and decision-making. Ranjbar *et al.* (2017:44) assert that financial performance measures are always drawn and outlined in the financial statements of organisations.

The statement of comprehensive income, the statement of financial position, and the statement of cash flows can be used in a variety of ways through horizontal, vertical and ratio analysis to determine the best ways for organisations to grow, set goals and become more profitable (Hadi, Handajani & Putra, 2018:75). Turley, Robbins and McNena, (2015:2) define four key indicators of financial condition: service-level solvency, budgetary solvency, cash solvency and long-term solvency. Turley *et al.* (2015:3) reveal that the last three are standard financial indicators, while the first, service-level solvency, is explicit to local government. Pilcher (2017:451) claims that the justification behind financial performance measures is the determination of a mechanism that can permit deterrence of fiscal disasters and crises. Financial performance measurements allow swift reaction to fiscal emergencies (Turley *et al.*, 2015:3; Pilcher, 2017:452; Pollanen, Abdel-Maksoud, Elbanna & Mahama, 2017:726). The financial condition of an organisation is therefore extrapolative and predictive in nature (Almagtome & Abbas, 2020:6779). While financial



performance measurement makes available warnings about fiscal distress, the efficiency of the measure is controlled by the measurement method (Ryan *et al.*, 2018:91).

#### **4.3.4 Determinants of financial performance**

Financial performance, as the dependent variable, was measured by using Pilcher (2017:451) argues that there are five financial ratios and such an approach might be the elements that make up the financial performance by categories, namely financial performance is strong or not bankrupt, the financial performance was good or a gray area, and weak financial performance or bankrupt. The financial statements presented by the organisation each year depict written information that quantifies the financial condition of the organisation's performance, so that the management knows the strength of the organisation's financial performance in the category of strong, medium, and weak (Pilcher, 2017:451). For factor analysis that influences the financial performance, this study used several independent variables of financial statement items that influence financial performance. Variables used to show the impact on financial performance in both the magnitude of these effects as well as the significance level of influence, to explain the company's financial performance and alternative policies that can be used are the implications of this research. The following sub-sections therefore discuss in detail the factors that influence the financial performance in organisations.

#### **4.3.5 Capital Structure or Leverage**

Capital structure is measured by the ratio of total debt to capital, and it has been established that this variable has a significant negative effect on the profitability in companies listed in Ghana (Almagtome & Abbas, 2020:6779). The findings specify that the application of debt can decrease the level of profitability, so the choice of funding is through the usage of capital own priority or to sell shares in the stock market (Almagtome & Abbas, 2020:6779). Capital structure influence on the profitability of the SOE in this study predicted a positive effect for practical reasons; the use of debt cost of capital is lower than the cost of equity using its own capital. It is also supported by the investment return rate that is more favorable than the interest rate debt so that the use of debt will increase the acquisition of shareholder dividends in an amount that exceeds the cost of capital of the debt, thereby further strengthening the position of company's financial performance. Leverage indicates the level of the debt. It is directly related to the capital used in a company, so it is an issue of interest by many people like managers, shareholders, investors, creditors.

Therefore, there has been research carried out to identify the influence of that variable on financial performance of a company, but there is no conclusion to that problem. Matar and Eneizan (2018:3) posit that advantage is negatively interrelated to financial performance; the reason is that high debt entails more resources to pay the debt. However, Coetzee and Kleynhans (2019:3) argue that extra debt can be implemented in a good investment, which eventually can improve the financial performance of the organisation in question.

#### **4.3.6 Profitability**

More than any other accounting measure, profits determine how well management is doing in financing and investment choices and decisions (Coetzee & Kleynhans, 2019:3). Profitability ratios measure how efficiently an organisations' management is producing profits on total assets, sales and, most significantly, shareholders' investment. Therefore, any investor whose economic benefits are linked to the long-run existence of an organisation will pay attention to profitability ratios (Matar & Eneizan, 2018:3). In most studies, return on assets (ROA), return on earning (ROE) and return on investment (ROI) are used as outcome variables, while gross profit margin, cost to revenue ratio and return on costs are chosen as independent variables to reveal the association between financial performance and profitability. Therefore, SOEs that are profitable are regarded as doing well in their financial performance aspect.

#### **4.3.7 Asset utilisation**

Asset utilisation, as an organisational factor that determines the financial performance of the organisation, is established on the interpretation of assets that are vital to the production or service processes needed to drive the financial performance (Belanova, 2016:142). The consideration of asset utilisation is significant towards identifying and measuring the capability and different functions of these assets owned by the company in ensuring the attainment of financial returns (Ellis, 2018:15). Al-Shboul, Garza-Reyes and Kumar (2018:1482) affirm that when assets are not resourcefully employed, it cascades into poor financial performance, such as losses in the build-up of income from investments. Ellis (2018:22) posits that agency costs are likely to increase when assets are inadequately and ineffectually exploited which is a sign of management not upholding and advancing the interests of the business owners. A study carried out by Lee (2018:3) on fixed assets investment and its link to the profitability of organisations, points to a positive correlation between the two variables. Lee (2018:4) based their research on examining the importance of

attaining business performance from the optimum apportionment of the assets structure and the statistical testing revealed a significant correlation. Moreover, studies conducted by other researchers have established and confirmed the significant influence of effective and efficient utilisation of assets on the financial performance of an organisation (e.g., Fleming & McCosker, 2015:29; Lee, 2018:3).

#### **4.3.8 Corporate governance**

Corporate governance practices are the arrangements, configurations and actions that lead how an organisation sets its goals, aims, develops plans and strategies, assesses, and accounts for its financial performance, and manages its risk (Lee, 2018:5). Ellis (2018:24) is also of the view that good corporate governance practices improve the financial performance of an organisation. Fleming and McCosker (2015:29) explore the influence of corporate governance on organisational performance by generating indices for board characteristics, transparency and disclosure, shareholder, and ownership characteristics. The results of the study specify a significant relationship between indices and performance apart from the transparency and disclosure index.

#### **4.3.9 Outcomes of financial performance**

Financial performance outcomes have been demonstrated as the significant priority in all economic decision making relating to private and public organisations (Masete & Mafini, 2018:3). Miroshnychenko, Barontini and Testa (2017:341) point out that financial performance measurement is based on several decisions, such as stock prices, leadership, executive compensation, risks, outcomes linked to investment, and various other cases. Rao-Nicholson, Vorley and Khan (2017:228) argue that one of the main functions of top management is decision making. Thus, management should decide to plan, strategise, organise and run an institution (Zhao, Feng & Wang 2015:162; Matar, & Eneizan, 2018:2). Podhorska and Siekelova (2020:2) therefore assert that decision-making is an outcome of notably, financial performance and indicators in accordance with the organisation's operations. Constant evaluation of financial performance results in the development of suitable and valued financial information necessary for managers to make informed decisions with the motive to promote organisations and improve municipal activities (Rao-Nicholson *et al.*, 2017:229). Mbulawa (2019:4) posits that understanding the significant standards for assessing the SOEs' financial performance and its indicators provides the

essential decision-making outcome valuable for SOEs managers, supply chain partners, investors, and financial creditors, such as banks.

To accomplish the organisational goal outcomes, financial performance measurement plays a central role. In addition, SOEs' profitability, customer satisfaction and efficiency are the main interests of stakeholders in SOEs (Mbulawa, 2019:5). State-owned enterprises, in the long-term, can be a very useful aid to management decision making. Thus, SOEs developments are an outcome of profitability, which profitability emanates from robust financial performance. Podhorska and Siekelova (2020:2) affirm that in today's competitive world, the sole necessity for survival and participating in economic activities is accuracy and providing efficiency in all supporting activities. Accuracy is an outcome of financial performance (Nattinger, Mueller, Ullrich & Zhu, 2018:98). Accordingly, therefore, robust financial performance measurements breed informed decision-making, accuracy, and efficiency. State-owned enterprises in South Africa should embrace the concept of financial performance to enable solid and immutable decision-making and ultimately provide efficiency and productivity.

#### **4.3.10 Importance of financial performance**

The following are reasons why SOEs should consider implementing performance measures, along with a brief description of what the positive benefits associated with performance measures might bring to SOEs.

#### **4.3.11 Previous studies on financial performance**

Financial performance is the conception of a planned, organisation-wide budget constructed from the ground up through inter-departmental co-operation and attaining full accountability and transparency to stakeholders and other taxpayers (Nattinger, Mueller, Ullrich & Zhu, 2018). Miroshnychenko, Barontini and Testa (2017) describe financial performance as an outline or structure that increases the conveyed value for a given taxpayer's money. Potanin and Sidorov (2020) contend that financial performance management surpasses the act of budget planning to integrate financial reporting, management reporting, disclosure, outsourcing, performance management, financial consolidation, and strategy management. Financial performance is an ambitious undertaking that requires fundamental changes to traditional state budgeting paradigms

– far more than just deploying a new software application (Podhorska & Siekelova, 2020). There is a lot of literature on financial performance. Table 4.5 outlines some of the studies.

**Table 4. 4: Previous research and industry on financial performance**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Wijesilo, Campillo & Wanke (2016)	Financial performance	Financial sector (public commercial banks)
Mafini & Muposhi (2017)	Supply chain collaboration, risk management and financial performance	Manufacturing SMEs
Miroshnychenko, Barontini & Testa (2017)	SCM and financial performance	Manufacturing sector
Nattinger, Mueller, Ullrich & Zhu (2018)	Financial performance	Health sector
Martinez, Alvarez & Neto (2019)	Corporate social innovation and financial performance	Research and Development sector
Podhorska & Siekelova (2020)	Financial performance	IT sector
Potantin & Sidorov (2020)	Financial performance	Iron and steel industry

**Source:** compiled by author

Various studies on financial performance are present in the academic literature; however, studies that link innovation capability practices, market competitiveness and business performance in South African SOEs are still limited or scarce. Many studies on financial performance are in the manufacturing sector (Mafini & Muposhi, 2017; Miroshnychenko, Barontini & Testa, 2017; Potantin & Sidorov, 2020) as outlined in Table 4.3. Studies on SOEs’ financial performance, notably in South Africa, are rare. Consequently, there is a growing need for researchers to contribute towards understanding market competitiveness, innovation practices as well as the nature of business performance in South Africa. This study, therefore, concentrates on the relationships among innovation capability practices, market competitiveness and business performance.

#### **4.4 Environmental performance**

The attention on environmental costs has been amplified suggestively over the past few decades for various reasons including regulatory compliance needs, social and customer requirements (Li & Chan, 2016:248). However, there are numerous environmental outlays which have not been embraced by organisations yet, but could possibly be in the future, such as higher costs for

pollution control equipment as constituted standards become stricter, higher costs linked to public concern over environmental matters, or the introduction of “eco-taxes” (Cheng, Wang, Keung & Bai, 2017:209). Such expenses enact a risk for organisations and provide inspiration for organisations to engage in environmental costing practices (Li & Chan, 2016:248). Additionally, since countless environmental costs are now understood by organisations, there is a requirement for organisations to account for these costs to afford improved evaluations of product outlays and convey the increased expenses to customers through suitable pricing policies (Cheng *et al.*, 2017:2010).

Nevertheless, in conventional costing systems, environmental expenses are often concealed in overhead accounts or are not documented, resulting in a dearth of responsiveness and consideration by managers with respect to the nature and the extent of the environmental costs produced by their organisations (Cai, Chen & Gong, 2016:86). Therefore, in response to the insufficiency of conventional accounting systems in presenting correct environmental information for managers to make justifiable business decisions, a new field of accounting called environmental management accounting (EMA) has emerged. Environmental management accounting is normally defined as the identification, gathering, examination, and application of physical information on the use, movements and destinies of energy, water, and materials, and monetary information on environmental costs, earnings, and savings (Cai *et al.*, 2016:87).

#### **4.4.1 Organisational environmental performance**

Environmental performance refers to an environmental effect that the business’s activity has made on the natural environment (Long & Hu, 2014:132). Khan, Gang, Fareed, and Yasmeen (2020:19314) define organisational environmental performance as a performance measurement of the organisation to evaluate positive environmental management. Environmental performance assesses the positive influences of the implementation of green innovation practices on the natural environment (Long & Hu, 2014:132; Khan *et al.*, 2020:19315), which has an impact on either the internal or external environments of the organisations (Khan *et al.*, 2017:19315). There are noteworthy projections in enhancing the environmental performance of organisations through environmental management strategies, such as green innovation practices. These environmental practices allow the organisations to intensify their power to stay in the industry. Organisations would become more resilient and adaptable to the changes when they grasp how to continually

improve their processes, reduce the costs, comply with the regulatory requirements and stakeholders' expectations, and explore new market opportunities. When organisations encounter environmental problems, inspiring sustainability values to them has direct impacts on securing sustainable economic success. Apart from the recent emerging environment issues, the environmental key performance indicators and audits are critical components of environmental management systems (EMS) as these components determine the long-term success of an organisation (Khan *et al.*, 2017:19315). Nonetheless, only a few organisations are willing to make their environmental performance information accessible. Furthermore, standardised reporting measures are unclear.

#### **4.4.2 Importance of environmental performance**

The benefits of environmental performance include more informed decision-making, the identification of opportunities for cost savings and raising revenue, improved product mix and pricing decisions, and the circumvention of imminent costs connected with investment decisions (Nguyen, 2020:877). The clear and vivid consideration of environmental costs that are frequently unnoticed and invisible in old and conventional costing systems offers more correct information for decision making and exposes prospects for raising incomes through reprocessing or the use of waste in other activities (Que, Zhang, Liu & Yang, 2018:402). In addition, robust environmental performance may result in benefits that are more indirect (imperceptible) and less easily quantified, such as improved organisational image and status, augmented competitive urge, minimisation of regulatory consideration, employee's retention and attraction, and the generation of societal benefits (Nguyen, Nguyen, & Nguyen, 2020:270).

Environmental consideration has been encouraged by a variety of national and international bodies (e.g., Japanese Ministry of Environment, International Federation of Accountants, Society of Management Accountants of Canada, United Nations Division for Sustainable Development,) through the publication of numerous control credentials (Nie, 2018:65). Despite the encouraged benefits and the advancement of environmental performance practices, empirical research concerning SOEs' environmental performance is partial and scarce (Nguyen, Nguyen, Nguyen, Le & Nguyen, 2020:22) with most of the research on the application and efficiency of environmental performance tools being limited to case studies of precise organisations (Nguyen *et al.* 2020:22; Nguyen *et al.*, 2020:271). For example, Nie (2018:65) examined two Japanese organisations that

had instigated environmental performance practices and maintained that the usage and implementation of these practices could benefit organisations in enhancing material effectiveness and decreasing waste more efficiently. Environmental performance is regarded as the most essential and well-developed environmental tool (Zhang & Zhong, 2014:89), which measures the movements and stocking of resources in processes or production lines in both non-monetary and monetary terms (Nguyen *et al.*, 2020:271).

Zhang (2018:23) involved the trial of environmental management for six months in four Australian organisations. It was established that the modification of prevailing management accounting systems to embrace environment-related outlays, using some form of ABC, can result in transformation of strategies that improve both environmental and financial performance. In the same way, Zhang (2017:539) found that environmental management tools were pertinent and beneficial for examining explicit decision situations, such as environmental investments or the designing of carbon emissions reduction policies. Zhang and Zhong (2014:89) reveal that a moderate level of environmental management information was gathered and applied for waste management, with the mainstream of the councils detecting between 30 and 60 per cent of the listed environmental information items (e.g., quantity of waste collected, waste collection costs, etc.).

#### **4.4.3 State-owned enterprises and environmental performance**

Various studies suggest that it is the mounting pressures from relevant stakeholders that governs the level of environmental performance in organisations (Yao & Yang, 2017:445), while the government is alleged as the utmost imperative stakeholder, who puts enormous pressure on business organisations through policymaking (Yao & Cheng, 2014:56). What is more distinguishing in South Africa's case is that due to its different institutional background, other influences, such as outside public pressure and media attention, have little effect and impact on the environmental behaviours of organisations, and environmental polices play an overwhelming part in controlling organisations' environmental activities, compelling organisations to act upon the policies (Yao & Yang, 2017:445).

Therefore, for their own advantage, SOEs are stirred to search for political backing to escape the legal constraints and evade environmental responsibilities (Yao & Cheng, 2014:56; Zhang & Zhong, 2014:90). In addition, in view of the prevailing assessment system, officials at SOEs and



other governments institutions have the motivation to destroy the environment for economic development (Yang, Chen, & Zhou, 2008:15; Deng & Xu, 2013; Zhang & Zhong, 2014:91; Zhang, 2018:24). In this situation, the government-business involvement on environmental welfare concerns both the requirement of government officials for patenting political accomplishments and that of the organisation for profit expansion (Long & Hu, 2014:131; Zhang & Zhong, 2014:91). Several studies mention that organisations, such as SOEs, that have a political link to their local government can without difficulty figure a conspiracy association with them, which permits them to gain privileged environmental policies under the wing of local governments and reduce their environmental responsibilities (Yang et al., 2008:16; Deng & Xu, 2013:156; Zhang & Zhong, 2014:91; Nie, 2018:66).

Compared with private business organisations, the management of SOEs has a political role because they are appointed by the government, which encodes the accepted political link between the SOEs and their governments (Cheng, Wang, Keung & Bai, 2017:211). Li and Chan (2016:249) illustrate that by virtue of their natural and intimate political relationship with governments, SOEs are not only capable of creating a business-government collusion effortlessly, but too, can secure lower environmental costs and penalties in negotiation. Therefore, generally, SOEs perform worse than private businesses environmentally (Nie, 2018:66). Nevertheless, meanwhile, publicly listed firms in South Africa receive extra regulation and personal intercession from the central government (Li & Chan, 2016:251).

#### **4.4.4 Previous studies on environmental performance and research gaps**

Expounding different organisations' views on environmental performance is key and imperative to SOEs in South Africa. Previous studies report those diverse organisations have different operation processes and regulatory environments, and each has intrinsic measures and values of environmental performance (Yang *et al.*, 2008:16; Deng & Xu, 2013:156; Zhang & Zhong, 2014:91; Nie, 2018:66; Nguyen *et al.* 2020:22; Nguyen *et al.*, 2020:271). This specifies that, as organisations are driven in a different way, environmental performance measurements should line up with individual organisations insights, standards, and values of environmental performance.

## **4.5 Operational performance**

In emerging countries like South Africa, the success of SOEs plays a substantial part in gross domestic product (GDP) growth, economic development, reducing poverty, and creating jobs, because there are many personnel involved in these organisations in developing countries (Bai, Satir & Sarkis, 2019:1038). For a nation's economy, the public sector is a growth engine (Chandrasekar, 2011:3). The growth of SOEs has a favourable relationship with value-added quality of life and improved earning capacity (Alhurra, Robledo & Kobi, 2017:325). In the present era of globalisation and stiff business competitiveness, different practices play a significant part in the survival of any organisation and in supporting its long-term performance (Bai *et al.*, 2019:1039). To compete worldwide, an organisation must embrace all performance measures and refine its functionality and processes (Abu, Gholami, Saman, Zakuan & Streimikiene, 2019:661). Therefore, the main objective of an organisation should be to improve its operational performance (Buer, Semini, Strandhagen & Sgarbossa, 2020:3). Nevertheless, the problem with SOEs is that operational performance is not pleasing due to varying customer expectations, an increasing demand for innovativeness, unpredictability in the market, growing complexity, risks and uncertainty, and a repressive leadership style in the existing era of strong global competition (Bai *et al.*, 2019:1039). In SOEs facilities, different operational performance measures are quality, cost, delivery, flexibility, and rate of introduction of a new product (Buer *et al.*, 2020:3).

### **4.5.1 Factors influencing operational performance in organisations**

There are several practices that influence operational performance, but organisations cannot put their efforts equally into all these practices. Past studies have discussed the impact of different practices individually on operational performance, such as human resource management, supply chain management, enterprise resource planning, and total quality management practices, but have overlooked the investigation of comparative effects. Therefore, there is a dearth of literature that discusses those practices on enhanced operational performance. However, this area remains unexplored. There is thus a need to identify and monitor such practices for performance optimisation and competitiveness with the available resources.

#### **4.5.2 Operational efficiency**

To face changing market conditions, organisations, especially the SOEs, require learning processes and structures to build the flexible capability to reconfigure and transform their processes. In dynamic and volatile environments, organisations need to continuously scan their environment and government policies so that they can develop agility in terms of behaviours or competencies to swiftly achieve operational performance (Dieste, Panizzolo & Garza-Reyes, 2020:741). A growing number of factors are instigating organisations to search for ways that enable them to operate more efficiently and to certify that they have effective operational processes as these processes influence their operational performance (Gopalakrishnan & Gurumurthy, 2017:598). This involves the requirement to provide value-adding products or services of excellent quality, on time and at a competitive price (Hadid & Mansouri, 2014:751).

Consequently, organisations trying to achieve these objectives need to pay particular attention to their operational efficiency, as this is a principal key to business operational performance (Dieste et al., 2020:742). Operational efficiency refers to the capability to create processes, built on fundamental capabilities within the organisations, which function well (Gopang, Nebhwani, Khatri & Marri, 2017:127). Gijo and Antony (2019:417) state that operational efficiency encompasses the improvement of process performance by controlling and leading the processes within the organisation as well as improving and measuring the processes. A better allocation of resources through these principal processes allows the organisation to eradicate waste, decrease costs, adjust more to proper technological innovation and, perform better than competitors thereby improving the operational performance (Gopang *et al.*, 2017:128).

#### **4.5.3 System effectiveness**

The efficiency of technological innovation implementation or system effectiveness is the extent to which information systems contribute to attaining organisational goals and benefits (Ghobakhloo & Azar, 2018:3). Organisations receiving the supreme benefits from their systems are those that from the start, view the significance of technological innovation, primarily in strategic and organisational terms. These companies stress the importance of operational effectiveness, not the system. The high failure rate, however, in implementing such systems is a major concern (Gopang *et al.*, 2017:128). The medical informatics literature presents a picture of the successful implementation of health information systems (HIS) (Hadid & Mansouri, 2014:751).

Nevertheless, the literature has neglected to report the failures found after the implementation of information systems (Ghobakhloo & Azar, 2018:3). Failure rates for large-scale system development projects have been extremely high and many information systems projects have failed to achieve their stated outcomes (Gopalakrishnan & Gurumurthy, 2017:598). However, as it is difficult to quantify, the real level of information system failure could be far greater than is reported (Dieste *et al.*, 2020:742). This indicates the need for the development of a better understanding, through the evaluation of its dimensions, of the measures that assist managers in assessing the performance of an enterprise information system. Accordingly, it is important to associate the four operational performance points with technological innovation efficiency dimensions that is, system quality; information quality; service quality and user satisfaction.

#### **4.5.4 Operational performance measurements**

In the process of measuring operational performance, managers either do not evidently understand what it incorporates or are encumbered with an affluence of expensive measures, knowledge and information that do not contribute to improvement in efficiency and response to transformations (Laitinen, 2017:66). Measuring operational performance is defined as the “process of quantifying action” (Kuong, Meier & Wettstein, 2016:318), which involves the assortment of functions to measure (what will be measured, how and why), performance values and standards (Kwaku & Satyendra, 2018:386). Management accounting systems have conventionally been applied to measure operational performance which emphasizes data such as costs, return on investment, profit and cash flow (Khan, Bali & Wickramasinghe, 2017:345). These types of measures purely depend on financial performance and do not replicate either the necessities that an organisation must achieve in competitive business environments, or operational needs. The five performance dimensions, objectives, or measurements an organisation seeks to justify achieving operational effectiveness are speed, quality, cost, flexibility, and reliability (Ittner, Larcker & Rajan, 2017:231). Generating competitive advantage and refining operational performance is not a short-term task (Hudson, Smart & Bourne, 2018:1096). Therefore, outrivaling some of the purposes and being competitive on each of these measurements gives an organisation a competitive advantage in the market (Hudson, Lean & Smart, 2018:804).

Enhancing cost performance means that an organisation pursues the programme of waste elimination from proficiencies achieved in processes such as production, purchasing, risk

management and human capital performance (Ittner *et al.*, 2017:232). A suitable disaggregation of the cost mechanisms affecting the entire cost performance of an organisation gives the prospect of identifying the areas for improvement (Hudson *et al.*, 2018:1097). Improving on quality provides organisations with the chance to link the gap between what they are proficient in contributing and what customers demand (Kwaku & Satyendra, 2018:386). Quality is regarded as the reliable provision of services and products that satisfy customers, rather than only curtailing imperfections and meeting the requirements to stipulations without any vivid or clear market orientated unremitting improvement (Laitinen, 2017:66). Reliability refers to the organisations' processes constantly performing as anticipated, that is, customers are contented by organisations that offer services or products as approved and do not fail over a period (Hudson *et al.*, 2018:1097).

The fourth operational performance objective concerns being flexible, which embraces an organisation's capability and the degree to adjust (what it does, how it does and when it does) to transformations in response to customers' needs (Ittner *et al.*, 2017:232). Improving on speed prompts an organisation to be able to curtail the time between the service request and delivery of the service, with the occurrence and at times demanded by customers (Laitinen, 2017:66). Improving in time mirrors an increasing pressure on organisations not just to present new products or services but also to do it better than the competitors (Kwaku & Satyendra, 2018:386). Therefore, new product or service development is a significant capability as the environment is repeatedly shifting and can enhance the operational performance of an organisation (Laitinen, 2017:66).

#### **4.5.5 The operational performance best practices**

This section briefly discusses the short-listed practices that have the greatest impact on the operational performance in most SOEs.

##### **4.5.5.1 Human resource management**

Various studies have established that different human resource management (HRM) practices have an influence on performance in any business (Wadongo & Abdel-Kader, 2014:680). Operational performance metrics may include delivery, unit cost, quality, flexibility, or how quickly the new product is presented in the market; and an imperceptible performance, such as pledge of an organisation to deliver quality (Weiblen & Chesbrough, 2015:67). In modern business settings, operational performance management is more imperative than financial performance, because

operational dimensions consist of innovation, customer satisfaction and better internal processes, which leads to future financial returns (Taticchi, Balachandran, Botarelli & Cagnazzo, 2018:58). Previously, most studies were conducted to analyse the influence of human resource management practices on organisational performance, but there is a scarcity of literature that discusses the effects of these practices on operational performance (cost, quality, flexibility, and delivery). In both SOEs and private organisations, the management of human resources is correspondingly important for improving operational performance (Weiblen & Chesbrough, 2015:67). Diverse human resource management practices, such as human resource planning, teamwork, performance appraisal, training and development, results in an enhanced operational and financial performance. For this reason, on HRM practices, an organisation can retain capable and gifted personnel, which, in turn, leads to its competitiveness (Taticchi *et al.*, 2018:59).

#### **4.5.5.2 Supply chain management**

Currently, the real competitors are the supply chains rather than individual organisations (Zhu, Sarkis & Lai, 2012:1377). The operational performance of all organisations is predisposed by supply chain management (SCM) practices, which are considered as important to performance enhancement in any organisation (Zhong, Tan, & Bhaskaran, 2017:1779). Four practices in the SCM concept that improve the operational performance of an organisation are process integration, long-term relationships, co-operation, and information sharing. The SCM concept has a positive and significant relationship with all dimensions of operational performance (Zhao, Feng & Wang, 2015:163). Zhao *et al.* (2015:163) also established that SCM practices have a significant influence on the operational performance of SOEs.

#### **4.5.5.3 Organisational culture**

It is a common fact that, when employees feel good, inspired and motivated, they deliver quality (Yuliansyah, & Razimi, 2015:135). This is the reason why business owners and their management always want to generate an organisational culture in which there is gratification, flexibility in working hours, innovation and inventiveness. Zamil and Shammot (2018:33) assert that shared beliefs, traditions, values, symbols, assumptions, language, and attitudes in an organisation make an organisation's culture. Different forms of organisational culture have various effects on performance. For example, a competitive and innovative culture has a sturdy, substantial, and direct influence on an organisation's operational performance (Yuliansyah & Razimi, 2015:136).

Others, such as a group culture and a rational culture, have a direct effect; a developmental culture has an indirect connection with operational performance; and a hierarchical culture has both a direct and an indirect influence on operational performance (Zhang, Dan & Zhou, 2019:3).

#### **4.5.5.4 Innovation**

To obtain a steady competitive advantage in the present era of globalisation, innovation or an idea-creation process is a vital element (Zaherawati, Zaleha, Mohamed, Fajil, & Zuriawati, 2015:84). Process innovation, product innovation and overall organisational innovation are three diverse types of innovation (Yeniyurt, Wu, Kim & Cavusgil, 2019:46). In SOEs manufacturing organisations in particular, an emphasis on process innovation is endorsed to improve operational performance (Zaherawati *et al.*, 2015:85). Yeniyurt *et al.* (2019:47) state that product innovation and process innovation are contained within the technological innovation, and there is a positive and significant relationship between technological innovation and the operational performance of an organisation. Yan, Ribbink and Pun (2018:37) earlier confirmed that process innovation influences operational performance to such a level that it must be there for survival in current volatile environments.

#### **4.5.5.5 Knowledge management**

Superior performance and core competency can be attained in any organisation if there are one or more value-added areas in that organisation (Wijesiri, Martinez-Campillo & Wanke, 2016:145). Wang, Ye, and Kim (2014:7046) contend that knowledge management (KM) is a value-added tactic that improves organisational competitiveness. Knowledge management is an intricate process and can be clarified as how an organisation can attain and distribute knowledge or information. Better performance and competitiveness can be realised if an organisation can acquire external vital knowledge faster than its competitors (Wijesiri *et al.*, 2016:146). In the same way, knowledge spreading plays a significant role in attaining improved performance through the device of knowledge circulation, as employees gain access to the essential knowledge. Wang, Wang, Jiang, Yang and Cui (2016:5588) affirm that codification and personalisation knowledge management strategies are the two key strategies with a direct and indirect (through innovation) association with operational performance. Improved administrative and technical innovation performance may be realised by enabling the dynamic forces of knowledge acquisition, allotment, and application, all which cascade into favourable operational performance (Wang *et al.*,

2014:7047). It means that the relationship between knowledge management and operational performance is arbitrated by innovation performance (Turley, Robbins & McNena, 2015:3). Wang *et al.* (2016:5589) also detected that there is a positive association between the active participation of logistics operations personnel in knowledge process behaviour and operational performance. Therefore, to be more competitive, productive, and innovative, an organisation requires efficient and purposeful plans to manage its knowledge resources so that strong operational performance can be achieved.

#### **4.5.5.6 Total quality management practices**

To compete globally, quality is an authoritative strategic tool or armament that is required by business organisations (Beckmann, Otto, Schaarschuch, & Schrödter, 2017:78). Perfection in quality has become a requirement for attaining competitiveness; and operational performance plays a significant and central role in obtaining this competitive advantage (Bhuiyan & Alam, 2015:173). In the literature, there is enough consideration of the relationship between total quality management and operational performance in this age of aggressive competition (Bernardo, Marimon & Alonso-Almeida, 2016:342). The major variance in operational performance of an organisation (62 per cent) is because of quality management practices (Benner & Veloso, 2018:611). Some studies presented the effect of techniques and tool-oriented TQM practices (called ‘hard TQM practices’) on the quality and inventory management performance dimensions of operational management (Beckmann, Otto, Schaarschuch & Schrödter, 2017:78). Beckmann *et al.* (2017:79) assert that continuous improvement, statistical process control (SPC), process management, and quality tools and techniques are hard TQM practices. All of these have a bearing on the operational performance of particularly, SOEs manufacturing organisations.

#### **4.5.5.7 Six sigma**

In 1985, Motorola Inc., invented the ‘six-sigma’ concept partly due to the threat of Japanese competition (Vinod, 2015:315). In manufacturing organisations, six sigma plays a significant part in decreasing expenses and shortcomings, cementing employee satisfaction, and refining customer satisfaction and these are the dimensions of operational performance (Grima, Marco-Almagro, Santiago & Tort-Martorell, 2014:198). Realising the purposes of six sigma must be long-term (Soni, Mohan, Bajpai & Katare, 2013:404). Attaining less than 3.4 defects per million prospects is the target of six sigma, and numerous organisations claim that having a six-sigma programme



is healthy for business operations (Fogarty, 2015:473). The application of lean six sigma and lean practices has a robust relationship with operational and financial performance (Fogarty, 2015:2).

#### **4.5.5.8 Lean management**

Lean discerning is vital in the whole supply chain (Gima *et al.*, 2014:199). Its key objectives are to eradicate waste and improve competitiveness (Dao, Abhary & Marian. 2017:14). Lean management also entails more production with fewer resources (Dahlgaard & Mi Dahlgaard-Park, 2016:264). Lean manufacturing (LM) originated on the shop floor of Toyota, with the names 'Toyota production system' (TPS) or just-in-time (JIT) manufacturing. Therefore, LM, JIT, and TPS are used interchangeably because of their similar practices. The practices encompassed in LM are related to operational performance and other business performance practices (Fogarty, 2015:473). As the impression and philosophy behind lean manufacturing is to yield the right objects in the right quantity and at the right time with a well-made equipment arrangement, it could decrease the level and cost of inventory, which brings about an enhanced competitiveness and better performance (Dao *et al.*, 2017:14). Even the incomplete application of lean practices makes an important contribution to an organisation's operational performance (Gima *et al.*, 2014:199).

#### **4.5.5.9 International Organisation for Standardisation (ISO 9001 QMS)**

The International Organisation for Standardisation (ISO) formed the family of ISO 9000 standards, which are linked to the most recent technology and practices. The ISO 9001 standard was revised in 1994, 2000, 2008, and 2015 in view of the necessities of corporations and the market, and to make it more responsive and proactive (Antunes, Machado & Pires, 2018:81). The International Organisation for Standardisation (ISO 9001) certification often becomes a requirement for the continuation of business associations, because the main reasons for seeking ISO 9001 certification are customer demand and satisfaction (Ataseven, Prajogo & Nair, 2014:5). If QMS (ISO 9001) is well-organised and applied in its accurate sense, the operational performances of organisations will improve. The financial and operational performance of ISO 9001-certified organisations is meaningfully better than that of non-certified organisations (Antunes *et al.*, 2018:81).

#### **4.5.5.10 Research and development**

Realising new information and knowledge about prevailing or new-fangled products, processes, and services, is the consequence of research and development (R&D) actions (Gumus & Celikay,

2015:205). Prasad and Mailankody (2017:1570) assert that the ability to restructure the existing knowledge and create new information in an organisation is called its R&D capability. Truong, Sameiro, Fernandes, Sampaio, Duong, Duong and Vilhenac (2017:177) note that to some degree or scope there is investment in R&D in every form of organisation. Research and development practices have a substantial relationship with the operational performance of many organisations; but this association is mediated by intellectual property rights (IPR), displaying that this connection cannot be generalised to all sectors (Truong *et al.*, 2017:178). Gumus and Celikay (2015:205) reveal that investment in R&D functions is positively related to the operational and financial performance of an organisation. Research and development practice is an illustrative determinant of operational performance, and this investment (an intangible asset) in R&D is vital for the achievement and even for the survival of an organisation (Prasad & Mailankody, 2017:1570).

#### **4.5.5.11 Change management**

In this prevailing age, there is strong competition because of incessant and unavoidable variations in customer taste, products, services, and technology (Tarafdar & Qrunfleh, 2017:926). Any new ways of working or any new processes are included in an organisation as a regular feature. As transformation is imperative, management of that transformation is also essential and important to circumvent resistance (Tatoglu, Bayraktar, Golgeci, Koh, Demirbag & Zaim, 2016:181). By exploiting transformation strategies, the operational performance of an organisation can be improved through the efficacious management of transformation. There are diverse approaches for managing different changes, and the weaknesses and strengths of any strategy must be known before its adoption (Tatoglu *et al.*, 2016:182). Not only do cost reduction and quality enhancement relay to operational excellence, but the treatment of human capital and resources is also a factor (Tarafdar & Qrunfleh, 2017:926). Sturdy leadership and a strong transformation management ability is essential to attain operational performance excellence in organisations (Tatoglu *et al.*, 2016:182). Employees' solid pledge to transformation is a state for a significant and positive association between the management of different transformation influences and an organisation's operational performance excellence (Tarafdar & Qrunfleh, 2017:926).

#### 4.5.5.12 Enterprise resource planning system

Enterprise resource planning (ERP) systems is regarded as a way or tool for enhancing operational performance in organisations. Finance, human resource, operation, asset, inventory management and distribution are different modules of an ERP system (Tan & Zhan, 2017:470). After applying the different elements of an ERP system, the performance of an organisation progresses in its cost reduction, quality and the accessibility of information, inventory management, cycle time reduction standardisation and on-time delivery, because an ERP system automates the business processes (Syapsan, 2019:1337). In addition, besides controlling cost, the development and introduction of a new system may well be possible because of an ERP system (Swierczek, 2018:1380). The prior practices play a vital part in the operational performance of an organisation, but it is very difficult to attend fully to all of these practices at the same time. So, it is crucial to recognise those practices that are central to improving operational performance metrics if inadequate resources are to be used prudently (Syapsan, 2019:1337).

#### 4.5.6 Previous studies on operational performance

The current forward-looking organisations are dynamic; they work together with customers, suppliers, even with competitors and other relevant stakeholders; share knowledge and information in ways to create a concerted supply chain that is able of contending, if not leading a certain industry (Tatoglu *et al.*, 2016:182). Henceforth, gaining competitive advantage through effective implementation of operational performance practices in a highly competitive environment becomes all the time more difficult and decisive to enhance and improve the organisation's operational performance, if not impossible (Syapsan, 2019:1337). There is a lot of literature on operational performance. Table 4.6 outlines some of the studies on operational performance.

**Table 4. 5: Previous research and industry on operational performance**

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Miroshnychenko, Barontini & Testa (2017)	SCM and operational performance	Manufacturing sector
Wijesilo, Campillo & Wanke (2016)	Business performance	Financial sector (public commercial banks)
Potantin & Sidorov (2020)	Organisational performance	Iron and steel industry
Podhorska & Siekelova (2020)	Operational performance	IT sector

<b>Authors and Year of Publication</b>	<b>Area of Focus</b>	<b>Industry</b>
Martinez, Alvarez & Neto (2019)	Corporate social innovation and operational performance	Research and Development sector
Mafini & Muposhi (2017)	Supply chain collaboration, risk management and operational performance	Manufacturing SMEs
Nattinger, Mueller, Ullrich & Zhu (2018)	Operational performance	Health sector

**Source:** compiled by author

Various studies on operational performance are present in the academic literature, however, studies that link market competitiveness, and operational performance in South African SOEs are still limited or scarce. Many studies on operational performance are on manufacturing companies (Mafini & Muposhi, 2017; Miroshnychenko, Barontini & Testa, 2017; Potanin & Sidorov, 2020) as outlined in Table 4.2. Studies on operational performance, notably in South Africa, are rare. Consequently, there is an increasing requirement for academics to contribute towards understanding the market competitiveness strategies or practices, as well as the nature of SOEs performance in a South African perspective. This study, therefore, concentrates on examining the relationships between innovation capability practices, market competitiveness and business performance in South African SOEs.

#### **4.6 Environmental, operational, and financial performance**

Following previous studies (e.g., Syapsan, 2019:1337), this study applies measures such as growth in sales, growth in profit and growth in market share to represent the financial performance of SOEs in South Africa. Previous research (e.g., Tatoglu *et al.*, 2016:182) suggests that improvement in the total financial performance of an organisation comes from the investment in operational resource effectiveness and marketing of environmental benefits. In this study, environmental performance means the reduction in the levels of environmental contaminants, such as a drop in air, water and solid pollution, a reduction in ingesting of hazardous/harmful/ toxic materials, and fewer environmental accidents (Swierczek, 2018:1380). Improved environmental performance offers legality for organisations to operate and even contribute to better profit margins by coming up with new industry standards (Swierczek, 2018:1380). When it is difficult for competitors to replicate such high standards, organisations may expand their market share by contributing to environmentally kinder products produced by ecologically responsive production processes (Tarafdar & Qrunfleh, 2017:926). Better financial performance can also be realised through

resource and cost efficiency (Antunes *et al.*, 2018:81). Tarafdar and Qrunfleh (2017:926) argue that improved environmental performance can be obtained by applying pollution-prevention technologies, leading to zero waste, thus, cascading to little or no money being expended on pollution control programmes and high-cost payable to waste disposal, which means less cost for addressing environmental liability and spillage (Antunes *et al.*, 2018:81).

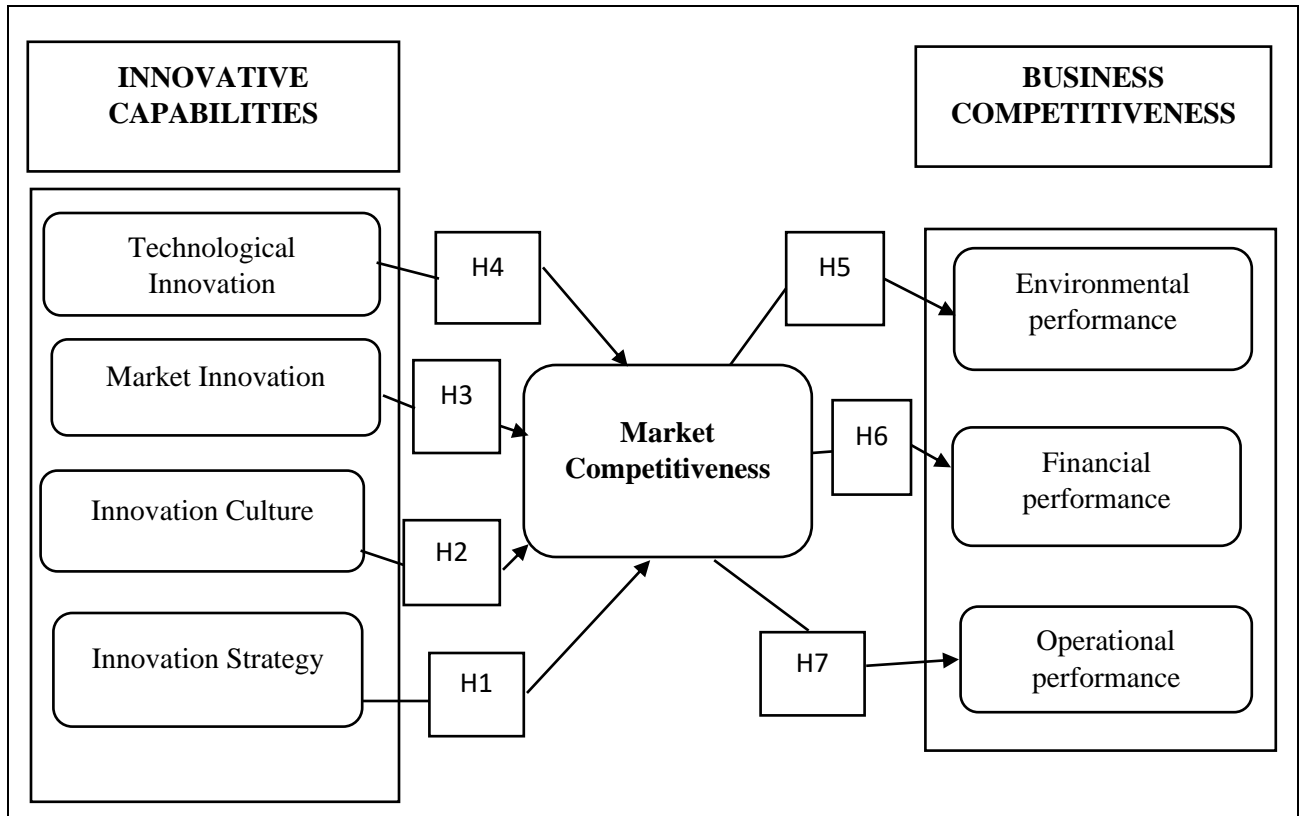
Less money is also spent on raw materials and energy consumption and/or treatment of waste due to the usage of harmful materials (Swierczek, 2018:1380). Prasad and Mailankody (2017:1571) assert that most organisations in business have the prospect of growing their profit margins and market share at a complete lower cost through attaining better environmental performance. Improved operational performance replicates the capacity to mollify customers in terms of time and swift delivery of high-quality products and services, waste elimination and operational flexibility in production methods (Prasad & Mailankody, 2017:1570). As with environmental performance, operational excellence produces cost savings while also sustaining and transforming customer demands for ecologically maintainable products and services, which, in turn, lead to enhanced financial performance (Tarafdar & Qrunfleh, 2017:926). Therefore, Prasad and Mailankody (2017:1570) posit that flexibility and quality, delivery reliability aspects are the foundation for customer satisfaction, cascading to long-term customer loyalty and financial increases.

## **4.7 CONCEPTUAL MODEL AND HYPOTHESES DEVELOPMENT**

In this section, a conceptual model for the research study is developed, based on the literature reviewed from the previous chapters and sections of this chapter. An exploration of the posited relationships between the research variables is outlined in detail in the following sub-sections. The significance of each relationship is supported by evidence from prior studies.

### **4.7.1 Background of the conceptual framework**

The study is intended to test the conceptual framework indicated in Figure 4.1. In the conceptual model, the predictor variable is innovation capabilities practices, which is sub-divided into five dimensions. The mediating variable is market competitiveness, and the outcome variable is business performance (that is, financial, environmental, and operational performances).



**Figure 4. 2: Conceptual Framework for Innovation Capabilities, Market Competitiveness and Business Performance**

Source: compiled by author

#### **4.7.2 The nexus between innovation capabilities and market competitiveness**

Market competitiveness can be a derivative of the extent to which business entities gain market-related results that are better than their rivals with respect to loyalty, new customer acquisition, customer satisfaction, market expansion, market share and product development (Anning-Dorson, Hinson, Amidu & Nyamekye, 2019:1277). Market competitiveness practices essentially proposed that greater judgemental performance (customer satisfaction, quality, employee satisfaction, profitability) is the prerequisite or benefit for superior market performance and financial stability (subjective performance) of the firm. Akimova (2020:1131) infers that market competitiveness and financial stability of an organisation cannot be achieved without the robust performance of innovation capabilities. Innovation capabilities can enable business organisations to produce market competitiveness in several ways through identifying technological opportunities with refining products, service quality and a superior value product to the customer can assist in

acquiring new customers. Thus, customer satisfaction improves the market position of an organisation (Akgün, Keskin & Byrne, 2017:182).

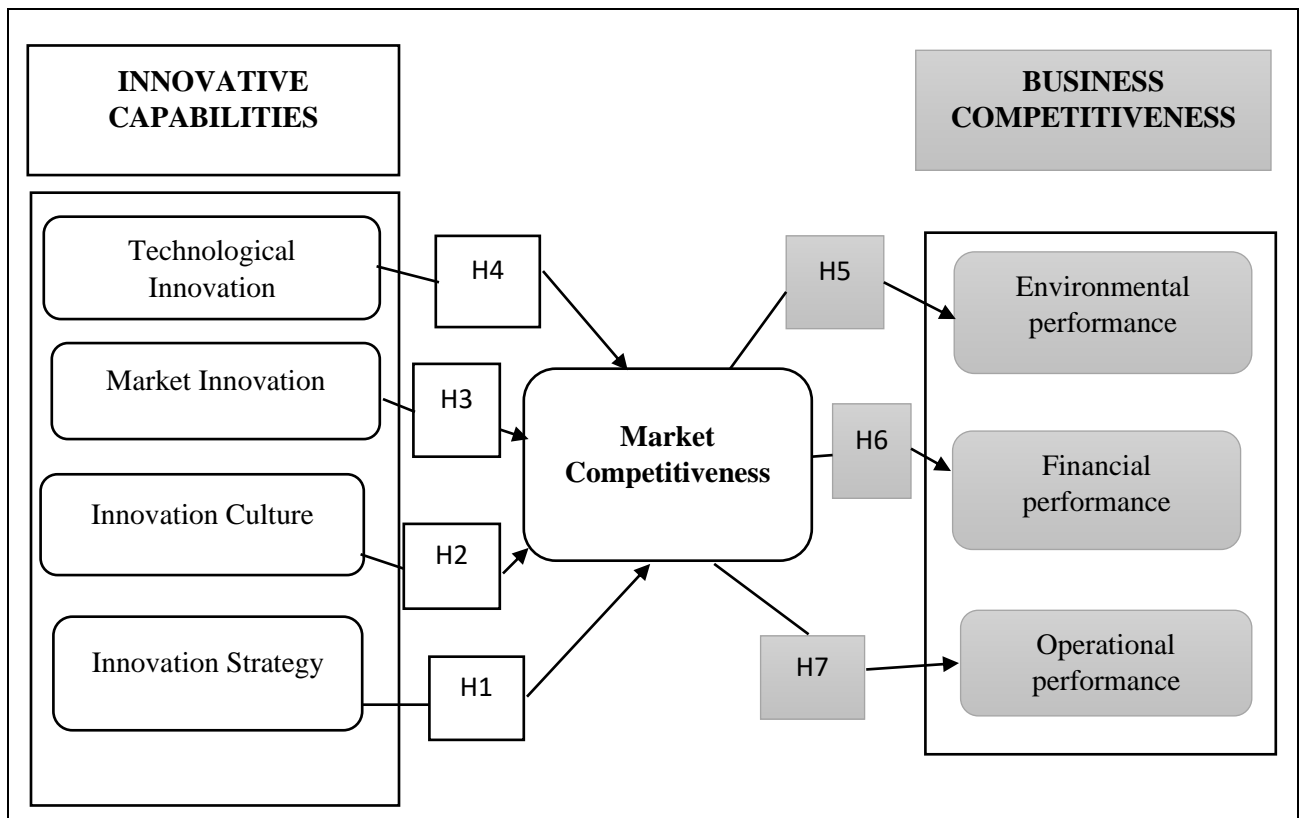
Innovation capabilities are initially associated with the non-financial characteristics of business performance, for example, customer issues, satisfaction and subsequently, the innovation capabilities will result in an accelerated financial performance (Anning-Dorson *et al.*, 2019:1278). Although the implementation of innovation capabilities (especially in SOEs) in the short-run may result in possible business losses (Yi, Han & Cha, 2018:138), but in the long-run, the same innovation capabilities will expedite positive effects in the market, production, and a sturdy financial performance (Ogunkoya, Hassan & Shobayo, 2014:33). Lestari, Leon, Widyastuti, Brabo and Putra (2020:369) confirm that the relationship between innovation capabilities and market is not direct but mediated or arbitrated by innovation capability performances. Yi *et al.* (2018:139) observe that innovation capability performance can lead sustainable market competitive advantage through creating quality value to customers immeasurably that can eventually facilitate superior profitability and market competitiveness.

Nevertheless, in the academic literature, there is limited research that has explained the positive relationship between the innovation capabilities and market competitiveness (Lestari *et al.*, 2020:371). Ogunkoya *et al.* (2014:34) establish a positive relationship between innovation capabilities and market competitive advantage in their study on the service industry. Recent evidence of the research revealed that positive relationship between application of innovation capabilities and market performance (Nwachukwu, Chladkova & Olatunji, 2018:151), in most cases, given a proof in which innovation shows a statistically significant impact on the firm's market competitiveness and profitability (Nwachukwu & Chladkova, 2019:81). On the other hand, Basuki, Pulungan and Udin (2020:252) explained that the greater the market share, the better the return on investment, which resulted in greater profit margin.

#### **4.7.3 Hypotheses formulation and evidence supporting the hypothesized relationship**

Innovation capabilities are a key element of market competitiveness in the 21st century, and have therefore attracted distinct consideration from researchers, management, organisations, and other professionals. While this aspect has been in the limelight over the past few years, its discussion is in no way recent. This section, therefore, explores the relationship between innovation capabilities and market competitiveness. Nwachukwu *et al.* (2018:152) stress that innovation capabilities

enable organisations to implement suitable process technologies, develop new products, achieve the market needs and eradicate competitive threats. Innovation capabilities in organisations help to shape up and manage multiple organisational capabilities for supporting and integrating market competitiveness functions and incentives to innovate successfully (Akimova, 2020:1131). Nwachukwu and Chladkova (2019:81) identify that superior innovation capability tends to implement and develop a new product diversity to the current product portfolio appropriate for robust market competitiveness. Basuki *et al.* (2020:252) explain that an organisation must improve the leadership, people, enhance partnership and organisational capability before engagement of the new product development and innovation process. Lestari *et al.* (2020:371) have conceptualised that innovation capability is the organisation’s capacity to enhance market competitiveness and develop new product through the amalgamation of internal technological processes, strategic capability, and innovation performance.



**Figure 4. 3: Conceptual Framework for Innovation Capabilities, Market Competitiveness and Business Performance**

**Source:** compiled by Author



Moreover, a considerable amount of research has indicated that an organisational innovation culture is positively related to the market competitiveness and performance (Breznik & Lahovnik, 2016:172; Afzal, Siddiqui & Dutta, 2018:6) and helps the better understanding of which type of innovation capabilities can result in competitive advantage (Kocak & Oflazoglu, 2017:251). Leavy (2018:12) has investigated the relationship between innovation capabilities and market performance in SOEs. The result of their study shows that innovation capabilities (technological innovation, innovation strategy, innovation culture) have a positive and significant influence on market competitiveness and performance in terms of market share, financial growth, product development, customers and internal processes. In addition, innovation capabilities play an effective role on organisational performance. In general, innovation is considered as a factor that can generate multiple benefits for the organisation to achieve competitive advantage (Ferdinand & Wahyuningsih, 2018:968).

However, some businesses (SOEs in South Africa, in particular) have adopted the implementation of innovation practices or capabilities without much success. In most cases, SOEs in South Africa specified that moderate, very little or no result in market competitiveness at all through their innovation capabilities, for instance. Most of the research studies tend to focus on process and product innovation (Kajalo & Lindblom, 2015:581; Kachouie, Mavondo & Sands, 2018:1009) rather than the importance of innovation capabilities on market competitiveness in the literature. Little research has adopted organisational innovation capabilities in identifying the effect on organisational market competitiveness and performance. Among them, Ferdinand and Killa (2017:154) confirm that the adoption of innovation culture and technological innovations are more important for the organisation to improve their market performance level. Ferdinand and Wahyuningsih (2018:968) suggest that marketing innovation strategy is given a pivotal significance for the organisations to increase their sales and improve the market competitiveness and profitability.

Previous studies revealed that there is a positive relationship between innovation capacity and a firm's market competitiveness (Cacciolatti & Lee, 2016:5602; Alford & Duan, 2018:2398; Chang, 2019:333). Nevertheless, some of them specified that there is a negative relationship between the innovation capabilities and market competitiveness (Ahmadi & O'Cass, 2018:99). Innovation activities result in the improvement of firm performance in different aspects. Past research has

explored four types of performance (Cacciolatti & Lee, 2016:5602; Alford & Duan, 2018:2398) which consists of production performance, market performance, financial performance and innovative performance which accommodates providing a broader explanation in terms of performance. Ahmadi and O'Cass (2018:98) assert that innovation capacity can lead to sustainable competitive advantage through creating superior value to customers that can cascade into greater market performance and profitability. Martin, Javalgi and Cavusgil (2017:531) find a positive relationship between innovation capabilities and market competitiveness in the service industry. However, in the academic literature, there are limited studies which have clarified the relationship between the innovation capabilities and market performance in SOEs in South Africa. Against this background, the following hypotheses were developed in this study.

**H1:** Innovation strategy exerts a significant positive influence on market competitiveness in South African state enterprises.

**H2:** Innovation culture exerts a significant positive influence on market competitiveness in South African state enterprises.

**H3:** Market innovation exerts a significant positive influence on market competitiveness in South African state enterprises.

**H4:** Technological innovation exerts a significant positive influence on market competitiveness in South African state enterprises.

#### **4.7.4 Market competitiveness and business performance**

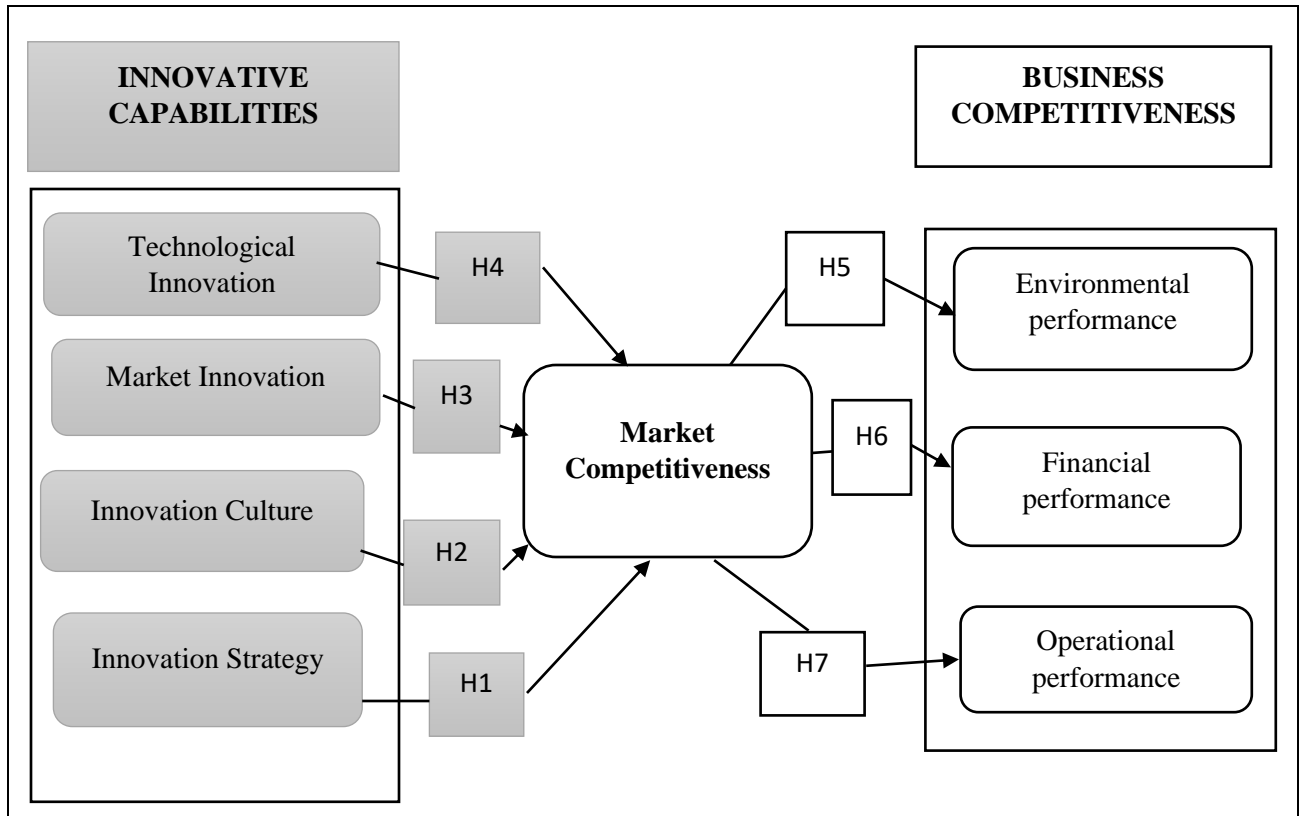
Business performance can be perceived as a multi-dimensional construct, comprising more than merely financial performance (Luiz dos Santos & Vieira Marinho, 2018:119). Business performance is pronounced as the degree to which the organisation is capable to meet the requirements of its shareholders and its own requirements for growth and survival (Kuhl, Cunha, Macaneiro & Cunha, 2016:168). Kamboj and Rahman (2017:690) describe market competitiveness as marketing's explanation of performance differentials between business firms. Market competitiveness enhances an organisation's performance by providing cost and differentiation advantages (Kuncoro & Suriani, 2018:187). There is significant empirical evidence that has associated market competitiveness with business performance. It is established from prior studies that there is either a significant positive relationship (Kuhl *et al.*, 2016:168; Kamboj &

Rahman (2017:690), or indirect influences (Kuncoro & Suriani, 2018:187), or dual influences (Lakhal, 2019:638), or no effects (Kumarawadu, 2019:257) between the two constructs. In the market competitiveness literature, various measures of business performance have been utilised, such as productivity (Tanriverdi, 2017:314), profitability (Kamboj & Rahman, 2017:690), customer service (Ma, 2020:17), employee satisfaction (Valmohammadi & Ahmadi, 2015:144), service quality, market share (Tseng & Lee, 2014:160), sales, net income (Wang, Hult, Ketchen & Ahmed, 2019:101), and size and age of the firm (Yousif Al-Hakim & Hassan, 2016:62).

In addition, most of the performance measurements identified, focused on macro level-business performance (Budhi, Lestari, Suasih, & Wijaya, 2020:2303), a more micro performance perception is dealt with in several studies, for instance, new product performance (Rahman & Ramli, 2017:134), financial performance (Byukusenge, Munene & Orobia, 2016:84), retail performance (Aziz & Samad, 2016:257), and explicit product performance (Sachitra, 2017:4). Mzoughi, Bahri and Ghachem (2018:26) note that to measure a business's performance; it shall reflect on customer preference, customer satisfaction, customer perception, share of customer mind, and so on. Business performance is the outcome of the market competitiveness operations executed by the members of the organisations (Budhi *et al.*, 2020:2303). Therefore, market competitiveness does not only influence many forms of business performance procedures, but it also influences performance on numerous different levels from the entire organisation to individual products and individuals within the organisation (Aziz & Samad, 2016:257).

#### **4.7.5 Hypotheses formulation and evidence supporting the hypothesised relationship**

This sub-section outlines the importance of the hypothesised relationship and the empirical evidence that supports the hypotheses. The relationship between the predictor variable (market competitiveness) and business performance constructs as proposed in this study is depicted in Figure 4.5.



**Figure 4. 4: Conceptual Framework for Innovation Capabilities, Market Competitiveness and Business Performance**

**Source:** compiled by Author

In their research, involving business entities, Abdi, Yassin, and Ali (2019:56) establish significant differences between groups of businesses, indicating that the more innovative business organisations are, the greater the potential value to their industry. In another study on state enterprises in Tunisia, Mzoughi, Bahri and Ghachem (2018:27) establish that market competitiveness (particularly, superior product development and market agility), turned out to be the most important factor in explaining sales performance and profitability. Nevertheless, previous studies on the relationship between market competitiveness and business performance have produced mixed results, some negative, some positive, and some showed no relationship at all (Yousif Al-Hakim & Hassan, 2016:62; Wang, Hult, Ketchen & Ahmed, 2019:101). Thus, this study is another effort at re-examining this relationship. Muafi and Roostika (2019:10) find that incremental market technological competitiveness helps to improve business's competitive advantage with the definitive purpose of enhancing the business performance and value. Majeed (2018:92) reports that continuous work on process marketing innovation was the most significant

achievement for improving short-term profitability. Similarly, Hana (2019:84) posits that an incremental market strategy is the major driving force behind any improvement effort and business performance. Adopting radical market innovations and competitiveness initiatives have diverse outcomes (Russell & Millar, 2018:41) as well. Ibrahim (2018:4) states that breakthrough or radical market innovations provide the drive for long-term growth. A study by Moghavvemi (2018:27) on state-owned businesses, established that a bottom-up continuous improvement market strategy is the preferred strategy to improve productivity and customer satisfaction. A top-down market competitiveness strategy is considered appropriate for increasing relative technological competitiveness. A more recent study on the implementation of structural market competitiveness changes to organisations in the form of downsizing has produced negative results on long-term business performance (Aslizadeh, 2017:1596). Also, Russell and Millar (2018:41) find that an innovative use of cross-functional teams has resulted in the improvement in operational performance. Hence, against this background the following hypotheses are developed for this study:

**H5:** Market competitiveness exerts a significant positive influence on environmental performance (business performance) in South African state enterprises.

**H6:** Market competitiveness exerts a significant positive influence on economic performance in South African state enterprises.

**H7:** Market competitiveness exerts a significant positive influence on operational performance in South African state enterprises.

#### **4.8 CHAPTER SUMMARY**

The aim of this chapter was to carry out a literature review on the other main constructs of the study that is, market competitiveness and business performance. The first section provided an overview, which covered, in essence, the introduction. The section that followed reviewed competitiveness in general. The term ‘competitiveness’ was described and defined here as it is considered important in the development of the subject SOE’s growth and development. Relevant previous studies on market competitiveness were reviewed and outlined. The importance of the discipline on market competitiveness to the study was also highlighted in the subsequent subsections. A literature review on competitiveness exposed that there is no agreed single

definition on the subject and researchers are yet to finalise a universal definition. Financial performance, environmental and operational performance, were explained and defined in the sections that followed. The concepts of market competitiveness and business performance is new in the field of SCM, with scarce literature on the practice. The significance of financial performance was highlighted and a few studies on the concept were outlined and reviewed. The subsequent subsections explained the relationship between innovation capability practices and market competitiveness, resulting in the formulation and development of hypotheses to the study. Business performance is crucial in the SOE's supply chains as it allows the measurement of efficiency in supply chain processes. The next chapter discusses the research methodology.

## CHAPTER 5

### RESEARCH METHODOLOGY

#### 5.1 Chapter Overview

Research methodology is a way to scientifically resolve the research problem. It may be understood as a science of studying how research is done systematically. In it, researchers study the various steps generally adopted in studying the research problem along with the logic behind them. Research methodology has its starting point with the delineation of the main philosophy, choosing approaches, methods, and strategies as well as defining time horizons, which altogether take the research logic to the research design – the main techniques and procedures of data collection and analysis. Therefore, the overt aim of this chapter is to highlight the research methodologies followed in this study. The chapter primarily addresses the different forms of research reasoning, followed by an overview of the paradigm selected for the study. It then pays attention to the research approach implemented, where a choice is made of the three main methods, namely quantitative, qualitative, and mixed methods. It also discusses the research design and the establishment of the time frame or horizon for the completion of this study. The section that follows pays attention to the literature review, whereby an overview of the main themes and their sources are outlined. This is followed by a discussion of the methods used in the empirical part of the study, which deals with the sampling design, procedures for data collection, how the data are to be analysed, and the ethical considerations that safeguard the practical completion of the study. A summary of the chapter follows thereafter.

#### 5.2 Research Reasoning

Research reasoning, known also as scientific reasoning, is a practice of rational and plausible thinking when expressing reasonable judgements and qualifying precise positions to attain the anticipated objective of a study (Leedy & Ormrod 2015:32). Research reasoning is the process of applying the prevalent knowledge and information to construct explanations, make predictions, and draw conclusions. Cooper and Schindler (2014:52) confirm that research reasoning, in brief, is a process that concludes the information available in a set of observations or premises. Therefore, research reasoning can be viewed as a process of obtaining scientific deductions

established on a summarising and organised research arrangement (Blumberg, Cooper & Schindler, 2014:27). Irrefutable (scientific) observations are derived from the adoption of either inductive, deductive, or abductive approaches (Cooper & Schindler, 2014:53).

### **5.2.1 Inductive Reasoning**

Inductive reasoning is a basis from which broad empirical assumptions are derived from the assessment of individual factual events considered as authentic. It is mostly supported in qualitative research because of the subjectivity of its premise that underpins its overall rationale (Flick, 2014:27). In this approach, an empirical observation takes the researcher to a result. Here specific observations will reach more generalisations and forming of theories (Saunders, Lewis, & Thornhill, 2009:29), from specific to general. This method is mainly used in qualitative research (Blumberg *et al.*, 2014:31).

### **5.2.2 Deductive reasoning**

Deductive reasoning is centred on the principle that individual accurate observations are drawn from general empirical findings (Akhtar-Danesh & Mirza, 2017:199). Deductive reasoning starts with the assertion of general rule and proceeds from there to guaranteed specific conclusions (Osman, Mohammad, Abu, Mokhtar, Ahmad, Ismail & Jambari, 2018:2378). Akhtar-Danesh and Mirza (2017:200) claim that deductive reasoning transforms from the general rule to the specific application. As such, it is the leading research reasoning approach in the social and natural sciences, where rules and regulations present the foundation of clarification, permit the expectation of phenomena, forecast their occurrence, and therefore allow them to be controlled (Hwang, Hong, Ye, Wu & Tai, 2019:34). Thus, deductive reasoning is generally employed in quantitative research because its process begins with a hypothesis (premise) or an assumption, and reasonable and rational deductions are then drawn, established on the confirmations presented after testing the premise (Stephens, Dunn & Hayes, 2018:1014).

### **5.2.3 Abductive reasoning**

An additional incipient school of thought is abductive reasoning. Abductive reasoning (also known as abductive inference, retrodution, or abduction) is a form of coherent, rational, and analytical inference founded and developed by American philosopher, Charles Sanders Peirce, in the late 19th century (Osman *et al.*, 2018:2378). The abductive reasoning process begins with an observation or set of observations and then is pursued to discover the most likely and simplest



conclusion from the observations. This practice, unlike deductive reasoning, produces a conceivable, plausible, and reasonable conclusion, although the process does not certainly verify it (Hwang *et al.*, 2019:35). Abductive conclusions as noted by Stephens *et al.* (2018:1016) are thus capable of having a vestige of doubt or uncertainty, which is articulated in retreat terms such as "best available" or "most likely". One can comprehend abductive reasoning as extrapolation, inference, and interpretation to the best clarification or explanation (Wheeldon, 2010:89) though not all usages of the terms inference and abduction to the best explanation are precisely corresponding. Therefore, abductive reasoning provides a summarising outlook from which facts and ideas are a resultant of a mixture or blend of both deductive and inductive reasoning practices (Osman *et al.*, 2018:2379). This reasoning approach is further referred to as a problem-solving process intended to obtain conclusive and general facts centered on the creation of concepts from diverse perceptions (Hwang *et al.*, 2019:35). Abductive reasoning thus is related to mixed methods research where a probe or study is founded on both quantitative and qualitative approaches (Wheeldon, 2010:89).

Considering the discussion above, following prior studies (Mariadoss, Chi, Tansuhaj & Pomirleanu, 2016; Mafini & Muposhi, 2017; Jacobs & Mafini, 2019; Ni & Sun, 2019) on SCM and as established by the framework of this study, deductive reasoning is appropriate, since it seeks to provide accurate and relevant scientific results based on the assessment of research hypotheses. The deduction approach allows this study to explain causal relationships between variables (Saunders & Thornhill, 2012:47). Nachmias and Nachmias (2008:38) assert that to pursue the principle of scientific rigour, deduction dictates that the researcher should be independent of what is being observed. Johnson and Christensen (2010:26) claim that an additional important characteristic of the deduction is that concepts need to be operationalised in a way that enables facts to be measured quantitatively. Another essential advantage of deductive reasoning is generalisation (Saunders & Thornhill, 2012:47). To be able to generalise statistically about leadership styles in this study, it is necessary to select samples of sufficient numerical size. The present study is prefaced on the assumption that there is a link between innovation capabilities, market competitiveness, and business performance. Logistical conclusions are only drawn after these hypotheses have been tested to either confirm or repudiate the suggested relationships. This can be done using deductive reasoning.

### **5.3 Research philosophy**

Before considering the paradigmatic outlooks, assumptions, and validations of this study, it is important to begin with a discussion of paradigms by defining the concept ‘paradigm’, its components, as well as several insights. Rehman and Alharthi (2016:52) define a paradigm as a worldview or philosophy. Kivunja and Kuyini (2017:27) define a paradigm as an elementary set of assumptions and beliefs that guides the inquiries of the study. Creswell (2007:15) specifies that the research design process commences with theoretical or paradigmatic beliefs that the enquirers assume when determining to undertake a study. Researchers bring their philosophies, paradigms, worldviews, or arrays of beliefs to the research project, and these inform the writing and conducting of the study. Creswell (2007:15) points out that in outlining a paradigmatic viewpoint as a researcher, the interaction amongst epistemological and ontological assumptions, meta-theoretical underpinnings, research methodology, and the research objectives become necessary. Carpenter (2013:121) postulates that paradigms entitle a model, philosophy, pattern, and typical examples include worldviews, mindsets, cultural themes, and ideologies.

#### **5.3.1 The fundamentals of a research paradigm.**

A paradigm or a philosophy entails two fundamental elements, that is, ontology and epistemology (Lincoln & Guba, 2015:14). Saunders *et al.* (2015:41) postulate that it is important to have a strong appreciation and understanding of these fundamentals since they consist of the elementary beliefs, assumptions, values, and norms that each paradigm holds. Therefore, in uncovering this study in a particular research paradigm, the understanding is that the study will uphold, and be directed by the assumptions, beliefs, norms, and values of the chosen paradigm. It is thus important to briefly discuss what the elements mean. The following sub-sections explain and discuss the two commonly used paradigm elements in academic studies.

##### **5.3.1.1 Ontology of a Paradigm**

Ontology is that part or sub-section of philosophy that studies the assumptions people make to accept as true that something makes sense or is real, or the very nature or essence of the social phenomenon investigated (Scotland, 2012:11). Clotty (2008:10) reveals that ontology is the philosophical study of the nature of existence and reality, of becoming or being, as well as the fundamental classifications of elements that exist and their relationships. Similarly, Cohen, and Creswell (2009:8) claim that this philosophy assists a researcher to conceptualise the nature and

form of reality and how an individual ascertains what can be known about that reality. Cohen *et al.* (2007:7) believe that the philosophical expectations and assertions about the nature of reality are essential in considering, understanding, and comprehending how the study creates implications on the data collected. Ontology is indispensable as a philosophy because it aids in providing an understanding and comprehension of the elements that institute the universe as it is known (Howe, 2009:431). Positivism, post-positivism, and pragmatism philosophies are the common sub-elements of ontology paradigms (Mertens, 2005:18) and are briefly explained in the subsequent sub-sections.

### **5.3.1.2 Epistemology of a Paradigm**

This paradigm, according to Kivunja and Kuyini (2017:29), is concerned with the very foundations of knowledge – its forms, nature, how it can be acquired, and how it can be transferred and conversed with other people. Saunders *et al.* (2015:42) state that epistemology pays attention to the nature of human knowledge and understanding that the researcher can probably acquire to be able to broaden, deepen and extend understanding in his/her field of study. Epistemology has its foundation, etiology, and roots in Greek where the term ‘episteme’ denotes knowledge (Kivunja & Kuyini, 2017:28). In simple terms, in research, epistemology is applied to pronounce how the researchers come to recognise something; how they know reality and the truth (Rehman & Alharthi, 2016:53). Cooksey and McDonald (2011:29), in simpler terms, put it as what tallies as a body of knowledge within the world. Simpson (2009:1331) defines it as the study of the nature of knowledge and justification. Epistemology philosophy is significant since it supports and assists the researcher to institute the confidence and belief she or he puts in the gathered data.

### **5.3.1.3 Post-positivism**

Post-positivism materialised and emerged from positivism (Grover, 2015:3). Post-positivism has comparable epistemological and ontological philosophies as positivism, although it varies in several ways. As a result, “every scientific statement must remain tentative forever” (Popper, 1959:280). Initially, the certainty fashioned by the scientific paradigm is our credence in the fact of currently tested hypotheses (Popper, 1959:415; Mertens, 2009:14). Furthermore, the belief of misrepresentation and falsification disputes that scientific models can never be upheld as true (Ernest, 2014:22). Lastly, to comprehend some scientific concepts and models, more than pragmatic data is required (Grover, 2015:4). For instance, Heisenberg's uncertainty principle

mentions, “it is incredible to know both the exact position and velocity of a subatomic particle at the same time” (Crotty, 2008:29). Correspondingly, according to Grover (2015:4), post-positivists pursue to understand and comprehend underlying and causative associations; hence, correlational and experimental studies are used. However, accurate data is gathered, respondents’ perceptions are frequently sought (Mertens, 2015:10). Mertens (2015:11) notes that post-positivism (scientific paradigm) searches for generalisations and predictions about which methods frequently produce quantitative data. Illustrations include standardised tests, close-ended questionnaires, and descriptions of phenomena using homogenous observation techniques (Pring, 2000:34). Using a post-positivism philosophy analysis consists of inferential and descriptive statistics (Grover, 2015:4), which permit sample outcomes to be generalised to populations.

#### **5.3.1.4 Pragmatism**

The philosophy of pragmatism, according to Maxwell (2013:136), maintains that the most imperative contributing factor of the epistemology, axiology, and ontology adopted in a study is the research objective. Pragmatism accounts for lived experience and is part of the history of social science (Walsh, 2019:4). This suggests that the research questions and objectives are the most important factors in research philosophy. Hence, according to Pappas (2017:14), it can be contended that mixed methods, both qualitative and quantitative, are conceivable, and perhaps exceedingly applicable, within one study (Maxcy 2003:57; Johnson & Onwuegbuzie 2004:15; Teddlie & Tashakkori 2009:26; Morgan 2014:45). For that reason, Creswell (2013:76) asserts that instead of concentrating on research approaches, researchers should underscore the research problem and use all methods offered to comprehend and understand it. Pragmatism therefore provides an appropriate structure within which to understand research constructs’ relationships (Tashakkori & Teddlie, 2008:21; Morgan 2014:45).

#### **5.3.1.5 Phenomenological Research**

The important objective of the paradigm is to reach an explanation of the nature of the specific phenomenon (Creswell, 2013:77). According to Cook and Campbell (2017:24), normally, interviews are directed with a group of individuals who have first-hand knowledge of a situation, event, or experience. Phenomenology is a philosophy mostly used in qualitative research that emphasizes the cohesion of a lived experience within a certain group. Cook and Campbell (2017:25) note that other types of data such as observations, documents, and art could also be used.

The data is then read and re-read and culled for like themes and phrases that are then convened to form collections of implication (Creswell, 2013:80). Through this philosophy, the researcher can construct the general meaning of the incident, situation, experience, or event and reach a more reflective and philosophical understanding of the phenomenon (Creswell, 2014:7). With its foundation, roots, and origins in philosophy, psychology, and education, phenomenology attempts to abstract the most wholesome, uncorrupted, clean data and in some interpretations of the approach, bracketing is used by the researcher to document personal experiences with the subject to help remove him or herself from the process (Maxwell, 2013:135).

#### **5.3.1.6 Positivism Philosophy**

The positivist philosophy is considered as an objective assessment of an explicit phenomenon centered on factual examination or analysis (Creswell, 2009:10). The paradigm is established on the logical, scientific, and systematic consideration of different associations between constructs (Kivunja & Kuyini, 2017:29). Positivism philosophy is pertinent to studies that involve a quantitative analysis of indirect or direct causative linkages between the recognised and specified constructs (Rehman & Alharthi, 2016:54). According to Clotty (2008:18), this scientific paradigm (positivism) rose to eminence during the enlightenment. Comte made the term 'positivism' popular (Crotty, 2008:19; Creswell, 2009:10) when he sought to apply the scientific paradigm, which patented studying the natural world, to the social world (Cohen *et al.*, 2007:9). The ontological position of positivism is one of realism (Ping, 2010:250). Realism is the assessment that things have an existence away from the researcher (Cohen *et al.*, 2007:7). Accordingly, a discoverable certainty, reality, or veracity exists autonomously of the researcher (Pring, 2010:251). O'Leary (2014: 6) believes that most positivists accept that reality or veracity is not arbitrated by our wits or intellects. Positivistic statements are factual, correlational, and descriptive. Positivism or the scientific paradigm is foundational as scientific proposals are established on facts and data (Creswell, 2014:7).

The positivist philosophy is relevant to this study because it is intuitive, holistic, inductive, and exploratory with quantitative findings (O'Leary, 2014: 6). The philosophy suits the objectives which involve determining by using numerical figures whether any predictive relationships exist between the specified research constructs. Positivism classically supports quantitative approaches and deductive reasoning, which this study embraces. It is preferred as the desired philosophy for

this study, which attempts to construe observations in terms of measurable entities and facts (Mertens, 2015:9). The philosophy, according to Scotland (2012:10), aims to provide explanations and generate predictions and forecasts built on quantifiable outcomes. These measurable outcomes are underscored by four assumptions that Cohen *et al.* (2007:9) propose and include determinism, empiricism, parsimony, and generalisability. Therefore, based on the merits provided in the literature, this study makes use of the positivism paradigm as it appears to be the most suitable paradigm. Furthermore, this is because like positivism, the study is intended to apply statistical methods to determine the causal relationships between the constructs (innovation capabilities, market competitiveness, and business performance).

## **5.4 Research approach**

A research approach is an overall research plan, which outlines how the study should be conducted (Saunders, 2016:30). Petrovic, Koprivica and Bokan (2017:183) reveal that the research approach includes a system of beliefs and philosophical assertions that profile the understanding and consideration of the research objectives and underpin the choice of research methods. A research approach (also known as a research method), characterizes a vital feature that an examination requires to determine, and offers a road map and directions to a study (Greene 2008:17). Rutberg and Bouikidis (2018:210), in support, state that a research approach is a plan and procedure that consists of the stages of comprehensive assumptions to meticulous methods of data collection, analysis, and interpretation. Young and Atkinson (2012:24) claim that a research approach is, therefore, established on the characteristics of the research problem being addressed. Therefore, the next sub-sections discuss the elements of the research approach in detail.

### **5.4.1 Qualitative research approach**

The qualitative method is regarded in most cases as confirmatory (Taguchi & Roever, 2017:31). Loewen and Plonsky (2015:22) suggest that the involvement of the qualitative research approach is centred on the connotations and meanings that life experiences and understandings hold for interviewees. Taguchi (2018:25) confirms that the qualitative research approach is applied when it comes to gathering and examine documented data such as observation, interviews, conversational analysis, focus groups, and surveys. Similarly, Taguchi, Xiao, and Li (2016:789) mention that a qualitative research method is applied when investigating a subject linked to, for example, the job of interviewees by obtaining their perceptions, views, and attitudes. Therefore, a

qualitative method is used to obtain a detailed explanation from interviewees, based on their experiences.

#### **5.4.2 A mixed research approach**

Various academic researchers (Ohta, 2001; Barron, 2003:17; Halenko & Jones, 2011:244; Taguchi, 2012:51; Hassall, 2015:42; Xiao, 2015:570; Diao, 2016:607) assert that the main aim of a mixed-method approach is to achieve an extra comprehensive understanding of a studied model and supplement the weakness of the quantitative approach. A mixed research approach makes use of both qualitative and quantitative methods in a study to collect and analyse data (Brown, 2014:22). Hassall (2015:43) defines a mixed research approach as the technical level with a combination of purposeful and probability sampling, open-ended and closed-ended data collection techniques, narrative, and multivariable analyses in which all these techniques can be used together in a particular study. The goals of the qualitative research approach are generally description and exploration, while the goals of the quantitative research approach are typically explanation and description (Taguchi, 2018:26). Therefore, a mixed research approach combines both qualitative and quantitative principles as well as operational procedures (Saunders, Lewis & Thornhill, 2015:33).

#### **5.4.3 Quantitative research approach**

Quantitative research refers to the use of numerical figures and statistics to explore a particular problem (Rutberg & Bouikidis, 2018:211), Bryman (2001:20) argues that quantitative research emphasizes numbers and figures in the collection and analysis of data. Imperatively, quantitative research approach can be seen as being scientific. The quantitative method normally pronounces aspects such as types of data to be collected, data collection procedures, sample size, data management, analysis plans, sampling, and recruitment techniques (Taguchi, 2018:27). Leedy and Ormrod (2014:154) propose that this method should be used because it does not affect the outcomes of the study since the respondents' responses are coded, classified, and condensed to figures that are manipulated for statistical analysis. Loewen and Plonsky (2015:27) note that reliability is high in the quantitative research approach. The quantitative approach is applied in this study to explore the relationship between innovation capabilities, market competitiveness and business performance. Daniel (2016:93) claims that the quantitative research approach is suitable precisely when the link between determinants is measured.

Various advantages complement the application of quantitative methods in management studies. Daniel (2016:94) argues that pertinent data obtainable in a quantitative arrangement can be encompassed in the management practice and consequently ameliorate and enhance decision-making. Leedy and Ormrod (2014:154) support that this also holds even when not applied in an all-inclusive methodology but somewhat for precise comprehensive objectives in risk management studies. Primarily, the approach signifies a manner to support managerial decision-making (Taguchi, 2018:27). Furthermore, the quantitative analysis approach improves the management making decisions' transparency and delivers objectivity and traceability of policies for those in charge of an organisation. This research approach makes use of statistical data as a means of saving resources and time (Cohen *et al.*, 2011:4). Bryman (2008:22) states that the use of statistical data for the study's explanations, analysis, and description lessens the effort and time that the investigator would have devoted to unfolding his outcome. Hammersley (2012:34) states that replicability is another advantage obtainable from the use of a quantitative research approach. Since the quantitative method depends essentially on hypotheses testing, there is no requirement for the researcher to do intellectual presumptions; he or she ought reasonably to move with the established clear objectives and guidelines, as depicted in the approach (Lichtman, 2013:4). There is full control for alternatives such as descriptions, explanations, interpretations, conclusions, and recommendations when using the quantitative approach (Bryman, 2012:408). The quantitative approach guarantees respondent anonymity (Muijs, 2004:7; Litchman, 2006:8; Creswell, 2009:4; Bryman, 2012:408). Therefore, based on the arguments above, this study incorporates and makes use of the quantitative research approach.

## **5.5 Research designs**

A research design is a plan, structure, and strategy of an investigation so conceived as to obtain answers to research questions or problems (Tobi & Kampen, 2018:1211). Price and Lovell (2018:51) state that a research design is a detailed or blueprint plan outlining ways in which a research study is to be accomplished, functionalising determinants so they can be quantified, choosing a sample of importance and concern to study, gathering data to be used as a foundation for hypotheses testing, and analysing the outcomes. Similarly, Tobi and Kampen (2018:1212) believe that a research design is a procedural strategy that is embraced, adopted, and implemented by the researcher to achieve the objectives, validly, accurately, and objectively. Thus, a research design is a plot for a research study. Zikmund and Babin (2015:107) argue that a research design



is used as a guide in gathering and analysing the collected data in a study. Research design is the arrangement or framework of the research study. Bryman (2012:409) claims that it is the "glue" that embraces all the features in a research study together. Tobi and Kampen (2018:1212) note that an effective research design branch forms a concerted practice that involves the best communication and planning. The above definitions suggest that a research design has two key roles in a research study (Johnson & Christensen, 2012:31). The initial role relates to the formulation and/or development of logistical arrangements and procedures necessary to embark on a study, and the second role emphasizes the significance and prominence of quality in these processes to guarantee and confirm their accuracy, objectivity, and validity. Kerlinger (1986:280) calls these functions the control of variance. According to Leedy and Ormrod (2014:154), before commencing the research process, an effective and applicable research design must be prepared.

### 5.5.1 Quantitative Research Designs

The significance of research design originates from its role as a crucial link between the philosophies and influences that enlighten the research and the empirical data collected (Tuckman & Harper, 2012:33). Similarly, Almalki (2016:291) considers that research design offers a way of gathering and analysing data in a certain study. According to Price and Lovell (2018:44), quantitative research involves the implementation of its five design categories, that is, survey, experimental, correlation, observations, and descriptive. Table 5.1 provides an outline of definitions of the different research design approaches.

**Table 5. 1: Quantitative research designs**

<b>Approaches</b>	<b>Definitions</b>	<b>Sources</b>
<b>Correlational</b>	Entails the assessment of a direct or indirect relationship between more than one research construct. It also involves the analysis of difference or changes between specific groups of participants.	Curtis, Comiskey & Dempsey (2016) Bold (2001)
<b>Descriptive</b>	Concentrates on the overall ascertainment of descriptive characteristics and traits of a particular problem under investigation.	Bellini (2017) De Vaus (2013)
<b>Experimental</b>	Focuses on the establishment of a research outcome or result based on an identified or predefined process	Creswell (2014) Herman, Polivy, Pliner & Vartanian (2019)
<b>Observations</b>	Encompasses the sound observations of individuals or groups with the objective of examining their behaviour.	Herman <i>et al.</i> (2019)

**Source:** Author's compilation

This study follows correlational and descriptive designs since the relationships proposed in the hypotheses have to be tested (Williams & Moser, 2019:47). A correlational design was chosen because it permits researchers to decide the strength and direction of a relationship so that future studies can limit the outcomes and, if possible, determine causation experimentally (Curtis, Comiskey & Dempsey, 2016:22). Additionally, correlational research allows researchers to gather and collect more data than experiments (Creswell, 2014:44). Furthermore, because correlational research usually takes place outside of the laboratory, the results tend to be more pertinent to daily life (Curtis *et al.*, 2016:48). Another merit that comes with the use of correlational research is that it opens up a great deal of further research to other scholars (Kim, Sefcik & Bradway, 2017:25). When researchers begin investigating a phenomenon or relationship for the first time, correlational research provides a good starting position. Descriptive design was also of best choice in this study because it concentrates on the overall ascertainment of descriptive characteristics and traits of a particular problem under investigation (Kim *et al.*, 2017:25). Using the descriptive survey technique, statistical data can be acquired, and analysis of that data can be made to construe anticipated outcomes (Kim *et al.*, 2017:25). Another advantage of using the descriptive design in this study over other research methods is that it is cheap and quick to conduct descriptive research (Rajasekar, Philominaathan & Chinnathambi, 2013:5). Furthermore, descriptive research can be piloted in natural situations. There is no need to have a designated space to conduct research using any of the descriptive research methods.

## **5.6 Research strategies**

The research strategy is an overall plan of how a researcher proposes to achieve the research objectives (Rajasekar *et al.*, 2013:5). A researcher's strategy determines, to a great degree, the selection of data collection approaches (Rajasekar *et al.*, 2013:6; Rovai, Barker & Ponton, 2014:4). Rovai *et al.* (2014:4) refer to a research strategy as an overall approach that assists the researcher to select key data collection techniques or sets of techniques to meet the research objectives. Presenting research strategies, Saunders *et al.* (2016:18) suggest an experiment, survey, archival research, case study, ethnography, action research, grounded theory, and narrative inquiry to be the main strategies for research. Table 5.2 depicts an outline of different types of research strategies' definitions and their applicability.

**Table 5. 2: Forms of research strategies' definitions and applicability**

<b>Research Strategy</b>	<b>Definitions and applicability</b>	<b>Source</b>
Ethnography	A unique qualitative research method. In this study, the researcher will stay in the research location. The researcher stays with the population and get first-hand information from the culture or group	Murchison, (2009).
Experiment	Experiments are a type of causal study in which a researcher investigates changes in one variable while manipulating one or more other variables under controlled conditions. It is usually conducted in natural sciences and social psychology. Its main purpose is to study causal links in variables under given situations	Saunders <i>et al.</i> (2007)
Survey	A survey is a type of method in which the opinions of the sample or population is sought by the researcher, usually with a more objective research instrument, say a structured questionnaire. It is usually associated with a deductive approach and is conducted usually in business and management research to prove or disprove certain assumed propositions and hypothesis. It allows for the collection of large amounts of data from a large population economically	Saunders, Lewis, and Thornhill (2007).
Case study	A case study involves a study of a particular situation and its impact in order to have a more accurate detail and in-depth view of the nature of the phenomenon as it relates to a specific environment. It is mostly used where the purpose is to gain a rich and an in-depth understanding of the context of the research and the processes being enacted	Sharavanavel (2006).

**Source:** author's compilation

This study adopted a survey strategy to achieve the objectives and to enhance accuracy and validity. A survey strategy facilitates the collection of data from many respondents because of the use of a questionnaire. This further facilitates the generalisation of the research results in SOEs in South Africa. This study, therefore, uses the survey strategy because it is commonly related to the deductive approach. It is also a popular and common strategy in business and management research and is most often used to answer who, what, where how many, and how much (Vogt, Gardner & Haeffele, 2012:23). Consequently, it is understood that a cross-sectional 'snapshot' descriptive and correlational survey is the most appropriate option for this study, as it is conducted at a particular time.

### **5.7 Time Horizon**

The time horizon in research studies commonly denotes periods to be studied or chronological horizon of varying breadth (Vogt *et al.*, 2012:24). Sekaran and Bougie (2016:213) indicate that in terms of time horizon, research design can be longitudinal or cross-sectional. A cross-sectional study examines a particular phenomenon at a specific period (Saunders *et al.*, 2007:27). According

to Rovai *et al.* (2014:5), one sample of a population can be taken and studied at a particular time as in a single cross-sectional study or two or more samples of a target population could be studied once as in multiple cross-sectional studies. Conversely, in terms of time horizon, Creswell, and Plano Clark (2014:12) note that a study may be longitudinal where a particular phenomenon is studied at different periods. A longitudinal study can take the form of a single longitudinal study where only one sample is studied at different periods or multi-longitudinal where two or more samples are studied at different periods (Creswell, 2014:4). This study is typically a cross-sectional study in that data were collected from a cross-section of manufacturing SOEs' managers and other professionals. Accordingly, although Saunders *et al.* (2009:115) assert that well-adjusted parity stakes led to the highest possibility of knowledge transfer, their study itself could not explain what mechanisms or processes led to knowledge being transferred. To understand processes happening simultaneously, it is essential to embrace cross-sectional designs. From the positivist side, these include once-off experimental methods and surveys because there are no repeated measurements to be taken over time, and it is more often associated with deductive research reasoning. Given these merits, therefore, this study adopted the cross-sectional time horizon design.

## **5.8 COLLECTION OF SECONDARY DATA**

Secondary data is information which is not collected directly from respondents or subjects (Andrews, Higgins, Andrews & Lalor, 2012:14). Kotler and Keller (2012:15) define secondary data as the relevant information that is collected from the primary sources which can be used in a research study. Johnston (2017:621) maintains that gathering secondary data frequently takes less time than collecting primary data where one would have to collect all the information from scratch. It is thus possible to gather more data this way (Doolan & Froelicher, 2009:206). Johnston (2017:621) asserts that secondary data is often readily accessible. After the expanse of electronic media and the internet, the availability of secondary data has become cheap and easy (Kotler & Keller, 2012:15). Relevant literature was sourced from both hard copies and online revised journals, books, online revised books, business magazines, relevant acts, and other government documents. Databases such as Google Scholar, Wiley, Researchgate, Academia, Emerald, Science Direct, Sabinet, EBSCO host, and J-Stor, amongst others, were used as portals for accessing most of the literature, while some were retrieved straight from other trustworthy and credible internet sources.

## 5.9 LITERATURE REVIEW

The literature review has been termed the “focus” of the research studies, as it is regularly understood as the poor relation to primary research, or the dull but essential prologue to a research proposal or report (Cooper & Schindler, 2014). McGhee, Marland and Atkinson (2007:335) maintain that new concepts and philosophies can be generated from the literature evidence conversed, and new ways for future research can be recommended. Nevertheless, an upright and excellent review can abstract new concepts from others’ work by synthesising and summarising prior literature sources (Jesson, Matheson, & Lacey, 2011:11). According to Colum (2011:219), a literature review is viewed as the gathering and analysing of secondary data to comprehend how it links to the current study, supporting the research question/s, addressing research objectives, and offering a background to the study (Leedy & Ormrod, 2015:32). According to Jesson *et al.* (2011:12), a good review should reflect relevance, comprehensiveness, balance, and full referencing. A literature review can provide a concise examination and discussion of evidence in a particular area (Maier, 2013:4). A literature review refers to a summary of previous research thematics or topics from relevant and reliable scholarly articles, reports, and journals (Cooper & Schindler, 2014:32). The significance of a study’s literature review cannot be underrated. This is because it provides a notional and hypothetical basis upon which the quality of the research study is established.

In this study, a comprehensive review of the literature was conducted and is reported in chapters two, three, and four. Chapter two focused on the developments within SOEs in South Africa. Some of the subjects discussed in this chapter include conceptualisation of manufacturing SOEs, legislation important to the functioning of SOEs, challenges faced by SOEs, and previous literature on SOEs in South Africa. Chapter three reviewed literature on the research theories, innovation capabilities and their four dimensions, namely, innovation culture, market innovation, technological innovation, and innovation strategy. Chapter four reviewed literature on market competitiveness and business performance. In this study, therefore, literature review data came from secondary data sources that include published printed sources, Internet databases, magazines, newspapers, government documents, journals/periodicals, books, unpublished personal records, and census data/population statistics.

## **5.10. EMPIRICAL RESEARCH**

The empirical research part of the study involves the collection of primary data and consists of sampling design, instrumentation, collection data procedures, and data analysis techniques (Taherdoost, 2016:21). Similarly, Johnson and Christensen (2012:31) claim that empirical research pertains to the actual collection of primary data. Therefore, in this study, it comprises sampling design, a structured questionnaire, the data collection approach, and the data analysis approach.

### **5.10.1 Sampling design**

Sampling design refers to the strategies and procedures to be followed in choosing a sample from the target population and the estimation technique formula for computing the sample statistics (Taherdoost, 2016:22). Etikan and Bala (2017:215) claim that a sampling design is a definite proposal used to obtain a sample from a specified population. Kabir (2016:170) defines sampling design as the framework or road map that functions as the foundation for the selection of a study sample and influences various other significant features of a research study as well. In an extensive perspective, researchers are concerned in attaining data through a survey for some population, or universe, of interest (Etikan & Bala, 2017:215). In this regard, according to Kabir (2016:171), one must delineate a sampling structure that embodies the population of interest, from which a sample is to be drawn. The sampling structure can be identical to the population, or it can be only part of it and is, therefore, liable to some under-coverage, or it can have an indirect connection to the population (Charles & Fen, 2007:83). It refers to the procedure or the technique the researcher would assume in choosing elements for the sample. The sampling design for this study, therefore, consists of the population, target population, sample size, and sample approach and technique.

### **5.10.2 Population**

A research population is generally a large collection of individuals or objects, which is the focus of a scientific inquiry (Desu, 2012:19). Rahi (2017:2) defines a population as a total number of groups, inhabitants, citizens, people, employees, or organisations that could be included in a study. A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics (Dalati & Gómez, 2018:17). All individuals or objects within a certain population usually have a common, binding characteristic or trait (Kumar, 2019:33). The

population for this study included all professional staff members and managers at a selected SOE in South Africa.

### **5.10.3 Target Population**

A target population is the complete set of circumstances from which a sample is obtained (Greener & Martelli, 2016:46). The target population can also be defined as a specific group of people or objects for which questions can be asked or observations made to develop required data structures and information (Neil, 2015:3). Other authors (Ott & Rongnecker, 2015:26; Neil, 2015:3) define a target population as a complete collection or set of individuals from which research data is to be collected. The target population includes individuals, groups, organisations, documents, and companies (Greener & Martelli, 2016:46). The target population of this study included professional employees and managers in a selected South African SOE that were based in three provinces, namely, Gauteng, North West and the Free State.

### **5.10.3 Sample size**

A sample is simply a subset of the population (Rahi, 2017:3). According to Resnik (2018:31), the notion of sample arises from the inability of the researchers to test all the individuals or elements in each population. The sample must be representative of the population from which it was drawn, and it must have a good size to warrant statistical analysis (Desu, 2012:22). The key purpose of the sample is to permit the researchers to pilot the study to elements or individuals from the population so that the outcomes of their study can be used to originate deductions that will relate to the whole population (Rahi, 2017:3). According to De Vaus (2014:45), a sample is similar to a concept of the “give-and-take process”. The population “gives” the sample, and then it “takes” deductions, and recommendations from the outcomes attained from the sample (Resnik, 2018:31). Using this calculator for the study’s population (48 375), a 95% confidence interval, a 5% margin of error, and a 50% response distribution, the recommended sample size is 382 respondents.

Thus, as recommended by Forcino, Leighton, Twerdy and Cahill (2015:14), sample sizes for multivariate analysis in quantitative studies should have at least 300 respondents. In addition, according to Zikmund, Babin, Carr, Adhikari and Griffin (2012:253), the sample size above 300 respondents prevent limiting the statistical significance of the results, as would be the case if a small size is used. A proper determination of a study’s sample size should be based on the

combination of three essential criteria, such as precision, level of confidence, and the population ratios or 50% of the variability (Taherdoost, 2016:21). Table 5.3 presents different sample sizes estimations based on the mentioned criteria.

**Table 5. 3: Sample Sizes based on the Level of Accuracy**

Population size	Variance of the population P=50%					
	Confidence level=95% Margin of error			Confidence level=99% Margin of error		
	5	3	1	5	3	1
50	44	48	50	46	49	50
75	63	70	74	67	72	75
100	79	91	99	87	95	99
150	108	132	148	122	139	149
200	132	168	196	154	180	198
250	151	203	244	181	220	246
300	168	234	291	206	258	295
400	196	291	384	249	328	391
500	217	340	475	285	393	485
600	234	384	565	314	452	579
700	248	423	652	340	507	672
800	260	457	738	362	557	763
1000	278	516	906	398	647	943

**Source:** Gill, Johnson, and Clark (2010:45)

This study's sample size was pegged at n=500, which is in line with the previous considerations in terms of the underlined historical sample sizes on the study's constructs which were all approximately restricted between n=150 and n=500. This estimation is in line with those by Gill, Johnson and Clark (2010:44), who presented a breakdown of practicable sample size determinations founded on their confidence levels. In addition, the study further considered the historical sampling approach, where sample sizes applied in previous studies are used as a reference benchmark. The historical evidence of the sample sizes used in other studies is presented in Table 5.4

**Table 5. 4: Historical samples considered in the study**

Construct	Previous study	Research approach	Country	Sample size used
Innovation strategy	Ndubisi, <i>et al.</i> (2015:555)	Quantitative	Pakistan	200
	Jajja, <i>et al.</i> (2017:1062)	Quantitative	India	296
	Mir, Casadesusa & Petnji (2016:32)	Quantitative	Spain	107
Innovation culture	Dobni (2008:549)	Quantitative	Canada	282
	Valencia, <i>et al.</i> (2010:471)	Quantitative	Spain	420
Market innovation	Olughor (2015:93)	Quantitative	Nigeria	200



	Im & Workman (2004:119)	Quantitative	US	206
Technological innovation	Liu & Jiang (2016:890)	Quantitative	China	166
	Al-Ansari, Altalib & Sardoh (2013:5)	Quantitative	Dubai	208
Market competitiveness	Akimova (2000 :1134)	Qualitative	Ukraine	255
	Yeung, Cheng & Lee (2013:578)	Quantitative	Hong Kong	210
Business performance	Yen & Hung (2017:23)	Quantitative	Taiwan	277
	Akimova (2000:137)	Quantitative	Ukraine	221
	Yee, <i>et al.</i> (2013:577)	Quantitative	Hong Kong	420

**Source:** Compiled by author

As indicated in Table 5.4, when all the research constructs are considered, the smallest sample size used is 107 and the largest is 420. Based on this guideline and the need to have equal representation of all disciplines within state enterprises, the sample size was set at n=500. This prevents limiting the statistical significance of the results, as would be the case if a small size was used.

#### **5.10.4 Sampling approach**

The selection of a sample procedure and technique is vital in a researcher's aptitude to conduct a research examination by succinctly choosing respondents of the study (Sekaran & Bougie, 2016:118). According to Uprichard (2013:4), the sampling approach is a practice of choosing individual elements or a subset of the population to make statistical inferences from them and approximate characteristics and behaviours of the whole population. Tobi and Kampen (2018:2014) define sampling as a process of choosing a limited element (a sample) from a larger assembly (the sampling population) to become the foundation for approximating and predicting the prevalence of an unfamiliar and unknown piece of evidence, condition or result concerning the larger group. The sampling approach in research is of two types, that is, probability sampling and non-probability sampling. In these circumstances, sample group elements have to be chosen on the foundation of convenience or the personal judgement of the researcher. Therefore, most non-probability sampling practices contain a component of subjective judgement. Non-probability sampling is the most helpful for exploratory stages of studies, such as a pilot survey (Dutwin & Buskirk, 2017:217). This study, therefore, used non-probability sampling.

### **5.10.5 Sampling techniques**

A sampling technique is a name or other identification of the specific process by which the elements of the sample have been selected (Pasek, 2016:275). Sakshaug, Wiśniowski, Perez Ruiz and Blom (2019:631) view a sampling technique as a method that permits researchers to deduce information about a population based on outcomes from a subgroup of the population without having to investigate every individual or each element in the targeted population. There are two main types of non-probability sampling commonly used in research studies. The following subsections explain in detail the two techniques commonly applied under the auspices of non-probability sampling. This study applied the purposive or judgemental sampling technique. Purposive sampling, also identified as judgemental, selective, or subjective sampling, reflects a group of sampling techniques that depend on the judgement of the researcher when it comes to choosing the elements or subjects (people, case/organisations, events, and pieces of data) that are to be studied (Brace, 2018:44).

According to Ilker *et al.* (2016:3), these purposive sampling techniques include homogeneous sampling and typical case sampling; maximum variation sampling, extreme (deviant) case sampling, expert sampling, and total population sampling. This study, therefore, uses the purposive sampling technique. Concisely, the purposive sampling technique is the deliberate choice of an explicit respondent because of the abilities she or he holds (Ilker *et al.*, 2016:3). It is the sampling technique selected in this study because respondents were expected to have some fundamental knowledge of the subject under examination, as confirmed by their levels of education, as well as appropriate information of the SOEs' industry and their knowledge of innovation, which is filed, on their work experience.

### **5.11 Procedures for Data collection**

The objective for all data collection is to capture quality evidence that then transforms to rich data analysis and develops the construction of substantial, credible, and conclusive answers to research questions that have been proposed (Saunders *et al.*, 2016:275). Data collection is the procedure of gathering, collecting, and measuring information on research constructs of interest in a recognised systematic approach that permits one to respond to specified research questions, test hypotheses, and assess results (Dalati & Gómez, 2018:34). The data collection element of research is collective

to all fields of study including business, humanities, physical and social sciences. Although data collection methods differ by discipline, the importance of confirming accurate and candid collection remains the same (Greener & Martelli, 2016:46). Irrespective of the field of study or inclination for outlining and defining data (quantitative, qualitative, or mixed), precise data collection approaches are essential in upholding the veracity, integrity, and reliability of research (Bryman & Bell, 2014:223). Zikmund *et al.* (2012:254) assert that both the selection of suitable data collection instruments (existing, modified, or newly developed) and vividly outlined guidelines for their correct usage moderate the probability of errors occurring. Therefore, data collection is one of the most important stages in conducting a research study. The following subsection explores all the elements required for gathering and collecting data for this study.

### **5.11.1 Data collection instrument**

In this study, data were collected using a survey questionnaire. According to Patten (2016:71), a questionnaire is a list of carefully structured questions that were chosen after considerable testing to elicit reliable responses from a particular group of people. The questionnaire technique is used for collecting primary data by asking a sample of respondents to answer a list of carefully structured questions chosen after considerable testing, to elicit reliable responses (Kabir, 2016:33). The decision to make use of a questionnaire is influenced by the features and behaviours of the respondents from whom the study intends to collect data; the significance of reaching each targeted respondent; the prominence of respondents' answers not being contaminated or distorted; the size of the sample and the nature and the types of the questions (Brace, 2018:42). In this study, a questionnaire was deemed suitable since a large, predetermined sample size of  $n=500$  was required. A questionnaire may be either open-ended or close-ended. Open-ended questionnaires require respondents to respond to a question using their own words, whereas a close-ended questionnaire limits the respondents to choose from the list provided by the researcher (Kabir, 2016:43). The questionnaires were self-administered, which suggests that respondents were expected to complete them by themselves and without additional assistance. This enabled respondents to be free and objective as they answered the questions without compulsion.

### **5.11.2 Questionnaire Design**

A research questionnaire is a set of questions to be asked to respondents in an interview, with appropriate instructions that indicate which questions are to be asked, and in what order (Sreejesh,

Sanjay & Anusreeh, 2014:143). It enables the data collection from respondents, lends a structure to interviews, and helps process collected data. The effectiveness of a questionnaire is dependent on its design. A well-designed questionnaire is one that is structured in a manner that is easily understandable for both the researcher and the respondent (Sreejesh *et al.*, 2014:143). The questionnaire for this study is divided into four sections. Section A consists of demographic information of the respondents. Sections B to D contain segmented questions on the three constructs under consideration in this study. The questionnaire in this study was developed primarily based on instruments used in other studies; however, not all questions were extrapolated in their original format but were adjusted to fit the context of this study without changing their value or meaning. Since this study used a quantitative approach, all questions were close ended.

A questionnaire containing sixty-one (41) measurement items was designed, based on previous work. The questionnaire contains three constructs, namely: innovation capability in section C (21 measurement items); Section D comprises market competitiveness (four measurement items) and Section E comprises business performance. Under business performance, three dimensions were used, that is, environmental performance (six measurement items); economic performance (seven measurement item) operational performance (six measurement items). Measurement scale items are presented in a questionnaire in Appendix A. The construct items, their sources, and reliability are presented in this section with the use of Tables 5.5 – 5.7.

### **5.11.3.1 Section A: Demographics**

Demographic data permits the researcher to better understand, appreciate and comprehend some contextual or background features and behaviours of a targeted population, whether it is their age, race, ethnicity, income, work situation, marital status, etc. (Van den Broeck, Sandøy & Brestoff, 2013:179). Demographics are characteristics of a population (Majid, 2018:4). Characteristics such as race, ethnicity, gender, age, education, profession, occupation, income level, and marital status, are all typical examples of demographics that are used in research studies. Majid (2018:5) argues that by probing demographic questions, the study can collect demographic data about current staff and professionals at scale, and in turn, assist to design an SOE strategy that can reach the right authorities in South Africa. This section therefore comprises 10 questions eliciting information on the demographic profile of the respondents. The questions elicited information on gender, age

group, race, highest educational qualifications, number of years of experience in the SOE, income level, position in the SOE, type of employment, and the division in which the respondent worked.

### 5.11.3.3 Section B: Construct items on innovation capability dimensions

Section B sought responses on innovation capability dimensions using 21 measurement items, obtained from a previous study conducted by Mir, Casadesús, & Petnji (2016:35). However, the same scale was used and validated in another study conducted by Silva, Styles and Lages, (2017:401). Further details regarding this scale are provided in Table 5.5.

**Table 5. 5: Scale development and reliability for innovation capability dimensions**

<b>Construct</b>	<b>Item code</b>	<b>Item description</b>	<b>Source</b>	<b>Industry and Region where the scale was applied</b>	<b>Reliability (Cronbach's Alpha) (<math>\alpha</math>)</b>
Innovation strategy	IS1	Innovation projects are based on the general company strategy.	Mir, Casadesús, & Petnji, (2016:35)	Retailing	0.864
	IS2	Excellent knowledge on the competitive market environment			
	IS3	Precise definition creation in advance of developing tasks and goals			
	IS4	Communication of information needed for innovation projects is exceptionally frank, transparent, and honest			
	IS5	Mistakes made during innovation projects are viewed as opportunities to systematically learn and improve			
	IS6	The innovation vision is considered during strategic decision-making			
	IS7	Innovation projects follow a documented innovation process that considers all areas of activity			
<i>Scale</i>	<i>1=strongly disagree; 2= disagree; 3= neutral; 4= agree 5 = strongly agree</i>				
<b>Construct</b>	<b>Item code</b>	<b>Item description</b>	<b>Source</b>	<b>Industry and Region where the scale was applied</b>	<b>Reliability (Cronbach's Alpha) (<math>\alpha</math>)</b>

Innovation culture	IC1	Management bodies demonstrate high willingness to engage in new ventures (openness to new markets and technologies, etc.)	Mir, Casadesús, & Petnji, (2016:35)	Retailing	0.911
	IC2	Employees are free to present ideas or suggestions at any time			
	IC3	Capability exists for employees with different backgrounds to work together in innovation project teams			
	IC4	Project team members treat one another with trust and respect			
<i>Scale</i>		<i>1=strongly disagree; 2= disagree; 3= neutral; 4= agree 5 = strongly agree</i>			
<b>Construct</b>	<b>Item code</b>	<b>Item description</b>	<b>Source</b>	<b>Industry and Region where the scale was applied</b>	<b>Reliability (Cronbach's Alpha) (<math>\alpha</math>)</b>
Market innovation	MI1	Relationships with customers, suppliers, etc. are maintained in anticipation of future market needs. To meet future demands, customers are included in the entire process of product/service development.	Mir, Casadesús, & Petnji, (2016:35)	Retailing	0.834
	MI2	Feedback, such as complaints and suggestions, are systematically reviewed and acted upon.			
	MI3	Through innovation, the company has acquired greater market shares than its competitors.			
	MI4	As part of the innovation process, market-oriented distribution channels are identified at an early stage.			
	MI5	By considering various factors throughout the product development process, a diverse range of products is produced.			
<i>Scale</i>		<i>1=strongly disagree; 2= disagree; 3= neutral; 4= agree 5 = strongly agree</i>			

Construct	Item code	Item description	Source	Industry and Region where the scale was applied	Reliability (Cronbach's Alpha) ( $\alpha$ )
Technological innovation	TI1	Our product/service is highly innovative, replacing an inferior alternative.	Silva, Styles, & Lages, (2017:401).	Manufacturing	0.871
	TI2	Our product/service incorporates a radically new technological knowledge.			
	TI3	High-quality technical innovations were introduced during the development of this product/service.			
	TI4	Overall, our product is like our main competitors' products/service.			
	TI5	The application of our product is totally different from that of our main competitors' products/service.			
<i>Scale</i>	<i>1=strongly disagree; 2= disagree; 3= neutral; 4= agree 5 = strongly agree</i>				

Source: Mir, Casadesús and Petnji (2016).

As presented in Table 5.5 the innovation capability dimensions scale used in this study attained a Cronbach alpha value more than 0.7 in the study by Mir, Casadesús, and Petnji, (2016:35). Akgun *et al.* (2014:889) also used the same measurement items and obtained a Cronbach alpha value of 0.94. This confirms that the scale is reliable and suitable for use in this study.

#### **5.11.3.4 Section C: Construct items on market competitiveness measurements**

Section C sought responses on market competitiveness measurements using four measurement items. This study utilised the measurement scale that was adopted and adjusted by Prajogo (2015:245).

**Table 5. 6: Market competitiveness measurement scale**

Construct	Item code	Item description	Source	Industry and Region where the scale was applied	Reliability (Cronbach's Alpha) ( $\alpha$ )
Market competitiveness	MC1	Competition in our market is intense	Prajogo (2015:245)	Manufacturing	0.832
	MC2	Our organisational unit has relatively strong competitors			
	MC3	Competition in our market is extremely high			
	MC4	Price competition is a hallmark of our market			
<i>Scale</i>		<i>1=strongly disagree; 2= disagree; 3= neutral; 4= agree 5 = strongly agree</i>			

**Source:** Prajogo (2015)

Table 5.6 shows that Prajogo, (2015:245) obtained a Cronbach's alpha above the minimum threshold of 0.7, thereby authenticating the reliability of scales used. Other previous sources such as Herrera (2016:1725) and Florio (2014:201) that used the measurement items adopted in this study, also achieved Cronbach's alphas of acceptable proportions.

### 5.11.3.5 SECTION D: Business performance

Section D gathered information on business performance dimensions. Environmental performance has six measurement items adapted from Zhu, Sarkis, and Lai (2008:256). Economic performance uses five measurement items adapted from Zhu, Sarkis, and Lai (2008:256) and finally operational performance which uses six measures adapted from Zhu, Sarkis and Lai (2008:256).

**Table 5. 7: Scale development and reliability for business performance**

Construct	Item code	Item description	Source	Industry where the scale was applied	Reliability (Cronbach's Alpha) ( $\alpha$ )
Environmental performance	EP1	Levels of air emissions	Zhu, Sarkis & Lai (2008:256)	Manufacturing	0.906
	EP2	Volumes of effluent waste			
	EP3	Levels of solid wastes.			
	EP4	Consumption for hazardous/harmful/toxic materials.			
	EP5	Frequency for environmental accidents.			



	EP6	The company's environmental situation			
<i>Scale:</i>	<i>1 = Decreased significantly; 2 = somewhat decreased; 3 = neither decreased nor increased; 4 = somewhat increased; 5 = increased significantly</i>				
<b>Construct</b>	<b>Item code</b>	<b>Item description</b>	<b>Source</b>	<b>Industry where the scale was applied</b>	<b>Reliability (Cronbach's Alpha) (<math>\alpha</math>)</b>
Economic performance	EP1	The cost of materials purchased.	Zhu, Sarkis & Lai (2008:256)	Public sector (services)	0.782
	EP2	The cost for energy consumption			
	EP3	Sales volumes			
	EP4	The fees for waste discharge.			
	EP5	Fines for environmental accidents.			
	EP6	Profit volumes			
	EP7	Return on investment			
<i>Scale:</i>	<i>1 = Decreased significantly; 2 = somewhat decreased; 3 = neither decreased nor increased; 4 = somewhat increased; 5 = increased significantly</i>				
<b>Construct</b>	<b>Item code</b>	<b>Item description</b>	<b>Source</b>	<b>Industry where the scale was applied</b>	<b>Reliability (Cronbach's Alpha) (<math>\alpha</math>)</b>
Operational performance	OP1	The amount of goods delivered on time	Zhu, Sarkis & Lai (2008:256)	Manufacturing	0.871
	OP2	Inventory levels held			
	OP3	Amount of materials/equipment scrapped			
	OP4	Quality of products/services provided			
	OP5	Number of new products/services provided			
	OP6	Level of capacity utilisation.			
<i>Scale</i>	<i>1 = Decreased significantly; 2 = somewhat decreased; 3 = neither decreased nor increased; 4 = somewhat increased; 5 = increased significantly</i>				

**Source:** Zhu, Sarkis, and Lai (2008)

Table 5.7 depicts that Zhu, Sarkis, and Lai (2008:256) obtained a Cronbach's alpha above the minimum threshold of 0.7, which is 0.91, thereby authenticating the reliability of scales used. Other previous sources such as Shin, Lee, Kim and Rhim (2015:182), Mokhtar, Genovese, Brint and Kumar (2018:2) that used the measurement items adopted in this study also achieved Cronbach's alphas of acceptable proportions.

### **5.11.3.6 Response Options**

A Likert-type scale is an interval and psychometric scale designed to measure both positive and negative feedbacks in questionnaires (Shin *et al.*, 2015:184). In this study, response choices in sections C and D of the questionnaire are outlined in a five-point Likert-type scale (extending from 1= “strongly disagree” to 5= “strongly agree”). Those in Section E of the questionnaire extended from 1= ‘Decreased significantly’ to 5= ‘Increased significantly’. The Likert-type scale was applied in this study because it is well suited, compatible with questionnaires, and has the capacity to measure the attitudes and opinions of the respondents accurately (Hartely, 2013:33). Wegner (2012:86) notes that it is indispensable and important because it moderates the advances of response unfairness, prejudice, and bias among the respondents. Furthermore, the scale enables the adjustment, comparability, and standardisation of enquiries between the respondents (Wegner, 2012:87).

Furthermore, Mohler, Dorer, De Jong and Hu (2016:11) reveal that Likert-type questions and enquiries are not difficult to analyse and code directly from the questionnaires. The intermediate ‘3’ position on the scale is considered as ‘neutral’ because it was reflected as more suitable to permit respondents the autonomy and liberty to mention their genuine opinions concerning any question without being intuitively forced to take either the positive or negative stance. A five-point scale was chosen ahead of a four-point scale because it enables and expedites the gathering of an extensive range of feedback (Allaoui *et al.*, 2019:92). There is a space provided at the end of each section, for respondents to provide or add their remarks on the study concepts. This provides them with the prospect to enhance more in-depth perceptions of the study.

### **5.12 Questionnaire Administration**

There are numerous methods of distributing a questionnaire, such as emails, postal, telephone, drop and collect, group-administered and online surveys, and each has its own merits and demerits (Leedy & Ormrod, 2016:17). The first approach is the drop and collect method, which involves the physical and personal delivery and collection of hard copy questionnaires to and from the respondents respectively. The hard copies are distributed to the corresponding workplaces of the respondents. Another method uses email surveys. Emails are appropriate, as many of the selected respondents are in different provinces covered in this study, thus making it challenging to distribute questionnaires physically. Email addresses for those respondents were collected from their

divisions and some from their respective industry database. Respondents were given three weeks to complete the task, and the date of collection was specified on the cover page of each questionnaire (O'Sullivan, Rassel, Berner & Taliaferro, 2016:43). Respondents were not provided with any enticements for their participation in the study.

### **5.13 PROCEDURES FOR DATA ANALYSIS**

Data analysis is considered as the practice of delineation, categorising, inferring, and interpreting the gathered data into suitable and applicable demonstrations that allow the achievement of the objectives of the study (Leedy & Ormrod, 2016:21). Following the data gathering development, the same data was subjected to the data preparation process to certify that it was set for the real data analysis process. The ready data was analysed using descriptive statistics techniques (comprising normality tests), structural equation modelling (SEM), and exploratory factor analysis (EFA). Descriptive statistics and EFA analysis were achieved using the statistical packages for the social sciences (SPSS version 25.0), whereas SEM was achieved by employing the analysis of moment structures (AMOS version 25.0). In all these analyses, evaluations and assessments were conducted amongst the adopted constructs in different divisions of the selected SOE in South Africa.

#### **5.13.1 Preparation of Data**

The primary phase of the preparation of data involves transforming the collected data into an arrangement or presentation that can be assessed to achieve the objectives of the study (Roberts, 2010:36). Data preparation is necessary because it permits the effectiveness and efficiency of the entire data analysis process (O'Sullivan *et al.*, 2016:31). According to Plano Clark and Badiee (2010:275), after the collection of data, it is observed as a standard exercise to arrange the collected data for further assessment, analysis, and evaluation. The preparation of data is an important requirement before the process of data analysis because it certifies the accuracy of data that goes into the analysis arrangement. Furthermore, data preparation enables that corrective and remedial measures are considered to meet any present irregularities in the data before the real analysis process is executed. Readiness of the data consists of several techniques, that is, editing, coding, and cleansing. These techniques were used in this study and are unpacked in the following subsections.

### **5.13.2 Data Editing**

Editing of research data indicates the exercise of scrutinising and assessing the quality of the collected survey data to reduce all the errors that could have sifted through during the data collection stage (Habibzadeh, 2017:1073). Pannekoek and Scholtus (2013:517) view data editing as the quality assurance development in which the data collected is evaluated to discover any present variances. These errors consist of, amongst others, discrepancies in the sequence of answers, missing entries in the section of options, omissions, inconsistencies, incompleteness, illegibility, typological errors, and any other identifiable errors (McDaniel & Gates, 2014:179). All the collected questionnaires in this study were assessed to confirm that they have been filled in correctly and completely. Where discrepancies and inconsistencies were noticed, remedial and corrective processes were executed by matching the respondent's data with that of similar respondents and then making appropriate amendments where required.

### **5.13.3 Data Coding**

Coding of data is considered as a researcher's capability to allocate or allot an explicit arithmetical code or figure to an element of the questionnaire (Williams & Moser, 2019:47). McDaniel and Gates (2014:179) define data coding as a methodological technique used for allocating number codes to responses to a questionnaire. In this study, the questionnaires collected were allocated numbers and processed into an Excel (spreadsheet) package. For example, if 450 questionnaires are collected, each questionnaire is assigned a precise and exclusive numeric code ranging from one to 450. Thus, all responses to questions were assigned an explicit code. For illustration purposes, two demographic responses, that is, 'male' and 'female' are anticipated for the categorical determinant 'gender', Male was assigned a code '1' whereas female was coded '2', This confirmed that only the codes 1 and 2 were entered in the Excel spreadsheet to facilitate data analysis on gender. The procedure of apportioning codes was applied to all questions and responses in the questionnaire.

### **5.13.4 Data Cleansing**

Cleansing of data is the practice of screening and selecting survey questions to ascertain and detect inconsistency or inaccuracy of the selection options (Habibzadeh, 2017:1072). As such, this process comes after the completion of data editing and coding (Pannekoek & Scholtus, 2013:518).

According to Williams and Moser (2019:47), the cleansing of the data includes a double-checking development in which the Excel spreadsheet has to be inspected and examined to confirm and certify that there are no misplaced and missing coded records on the document. Similarly, cleansing of data is viewed as a process of ascertaining and addressing erroneous and shady records from the coded data (Habibzadeh, 2017:1073). It is a significant exercise in that it certifies that the ultimate data established for analysis is satisfactorily reliable and correct to enable and achieve its objective statistical analysis. A common example of such anomalies is misplaced or omitted records that could have been an effect of a typological error encountered during the entering of the data stage in the Excel spreadsheet. An additional discrepancy could be the recording of incorrect numbers or codes, such as, for instance, recording a '7' on a five-point Likert-type scale. To check for and rectify such mistakes, the rows, and columns of the Excel document where data has been recorded and coded were evaluated numerous times. For any mistakes, recognised, corrective measures were implemented by referring to the initial coded questionnaire and eventually re-recording the omitted/incorrect data using the right code. This practice was repeated until no omitted and erroneous recordings were found on the generated data set.

### **5.13.5 Normality testing**

Normality testing of data refers to the assessment and evaluation of effective and efficient displaying of a study's data set (Mishra, Pandey, Singh, Gupta, Sahu & Keshri, 2019:67). Piloting or performing a normality test is imperative because it sanctions research studies to define the spreading of the data, which eventually influences the kind of analysis to be used (Ghasemi & Zahedias, 2012:486). Although it is comprehensively acknowledged that SEM produces dependable approximates of outcomes even though the data being subjected to testing are not normally distributed, it is essential to conduct normality testing to validate and authenticate the performance of parametric tests (Mishra *et al.*, 2019:69). As such, in this study, normality tests were conducted. Several tests can be performed to test for the normality of data. These include the Anscombe-Glynn kurtosis test, the D'Argostino's-Pearson omnibus test, the D'Argostino's K-Squared test, the Jarque-Bera test, and the Lilliefors corrected K-S test (Peat & Barton, 2005:123; Ghasemi & Zahedias, 2012:486). In this study, the normality of data was tested by performing D'Argostino's K-squared test. Ghasemi and Zahedias, (2012:487) define the D'Argostino's K-squared test as a goodness of fit measurement that strives for determining if a sample is obtained from a normally distributed population. In this test, the sample kurtosis and skewness were

computed. According to Mishra *et al.* (2019:68), kurtosis defines if the data collected is either heavily or light-tailed, comparative to a normal distribution, whereas skewness measures the non-existence of symmetry in a data set. Although several rules of thumb are used to measure and ascertain skewness, this study has adopted the -2 to +2 rule proposed by George and Mallery (2010:21) to be the tolerable spectrum in proving the normal distribution of the cleansed data set. The anticipated kurtosis measurement value for all univariate normal distribution is 3 (Ghasemi & Zahediasi, 2012:487); therefore, measurements nearer to this inception or range have been adopted in this study. The D'Argostino's K squared test was performed using the SPSS software package simultaneously with the descriptive statistics analysis.

### **5.13.6 Descriptive Statistics**

Descriptive statistics pronounce the distributions and patterns displayed by the data (Amrhein *et al.*, 2019:264). Descriptive statistics involve the outlining and summarising of quantitatively interrelated data that present a comprehensive synopsis of explicit configurations or representations of the group's population under study (Amrhein, Trafimow & Greenland, 2019:263). According to Maxwell (2013:53), descriptive statistics consider the organisation and summarisation of data to confirm that it can be simply understood. The outcomes of the descriptive statistics are related to the sample under reflection and cannot be anecdotal to the whole population from which the sample is drawn (Holcomb, 2016:43). Thus, descriptive statistics further include the presentation of measures such as mean-scores, standard deviations, frequencies, and percentages. Therefore, this study used the mean, frequencies and standard deviation techniques to conduct its descriptive statistical analysis.

#### **5.13.6.1 Mean Scores**

An arithmetic mean ( $\bar{x}$ ) is a measure of central tendency that computes the average value in a specified data distribution (Maxwell, 2013:54). The research's mean or average score is considered as a general average score resulting from the aggregate representation (Holcomb, 2016:43). It is an aggregation of the scores in a set of a sample divided by the number of these scores (Amrhein *et al.*, 2019:264). In this study, the mean dimension was considered to constitute the most important measure among a set of responses in a particular concept. For a dimension under reflection in this study, for example, the response with the highest average is the most important. Furthermore, the mean measurement was applied to confirm the main concept compared to other constructs

considered in the study. Therefore, the responses that achieved the highest average score were considered as the most significant and leading when matched with other responses.

#### **5.13.6.2 Frequencies**

Frequency analysis can be outlined as the extent of occurrence of a specific determinant inside a determined sample (Khakshooy & Chiappelli, 2018:43). Frequencies are a form of descriptive statistics that show the number of times a particular value occurs in each category of measurement (Oztuna, Elhan, & Tüccar, 2006:172; Lee, Park & Jeong, 2016:1402). For this study, the analysis of frequencies was applied to define the demographic features of the targeted population. Thus, statistical frequencies were used in the analysis of the demographic summary of respondents. For instance, the frequencies specified how many respondents were either female or male. Furthermore, the frequencies were applied in defining the observations of respondents concerning each study construct. For instance, the frequencies exposed how many respondents approved or differed with each of the elements of the study constructs. The frequencies are outlined in a frequency table that summarises the determinants, their classifications, response options, the actual number/score occurring (n), and the percentage (%) of that score compared to the entire sample. Some of the frequencies are depicted using particularly intended displays (for example, histograms) and charts (for example, bar and pie charts).

#### **5.13.6.3 Standard deviation**

Standard deviation (SD) is referred to as the spreading or variance of a study's data related to the mean value (Conner, 2017:52). The lower the SD measurement value, the nearer the data is to the average score value, while a divergent postulation specifies that measures are far more extended over the range of mean value (Conner, 2017:53). Lee *et al.* (2016:1401) define a standard deviation (SD) as a statistic used to measure the extent of dispersion or variance between each score and the data around the mean. In this study, the SD was applied to check if the data collected resembles a normal distribution pattern. Therefore, the analysis of SD scores was expedient in promoting the ascertainment of the distribution of data in this study.

#### **5.13.7 Exploratory Factor Analysis**

The analysis is also utilised to discover and assess the fundamental factor framework of a set of experimental (observed) determinants without forcing a prearranged configuration on the results

(De Winter, Dodou, & Wieringa, 2009:154). Exploratory factor analysis (EFA) is a practice that is engaged to measure the extent to which a particular element affects the study's determinant or variable (Yong & Pearce, 2013:82). Brown (2015:22) defines EFA as a statistical technique applied for assessing the level to which the perceived variables indicated in the conceptual framework symbolise the covert or latent determinants (or constructs). This study has several covert (latent) variables under consideration, that is, innovation capabilities, market competitiveness, and business performance. The suggested factor framework of these determinants is provided through the elements under each construct in the questionnaire, and these elements are the observed variables.

However, it is necessary to establish whether the composed data are constant with the factor framework, as suggested in the conceptual framework, which is accomplished by utilising EFA (De Winter *et al*, 2009:155). For example, as depicted in the conceptual framework, innovation capability is one factor. Nonetheless, after utilising EFA, it may perhaps be that the real factor framework in this study using the data gathered can expose more than one factor for the leadership style variable. Brown (2015:19) proposes that it is important to perform EFA before all other analyses, to decide the factor framework of the data used in the study. Moreover, EFA is essential as the elements utilised in the questionnaire were taken from several prior studies (Brown, 2015:22). Therefore, it makes it compulsory to conduct EFA and determine the soundness, validity, and rationality of the measures being applied in the questionnaire for the present study setting.

In this study, the determination of the factor set-up of the variables was reflected essentially to assess whether the collected data is factorable, as suggested by Field (2013:1). The process of checking for the factorability of the data was done by performing Bartlett's Test of Sphericity and a Kaiser Meyer Olkin (KMO) test of Sampling Adequacy. Bartlett's test determines if the correlation matrix is an identity matrix. Thus, if the determinants are not related, they would be considered inappropriate for the study. An important p score of less than 0.05 shows that the determinants in the correlation matrix are correlated, and therefore factor analysis is regarded as valuable for the collected data. The KMO analysis checks if the sample is sufficient and this is specified by a score larger than 0.5 (Brown, 2015:21). Three criteria were applied in the EFA process; the primary one being that only elements that have factor loadings larger than 0.5 were reserved in the study (Andale, 2017:1). Factor loadings refer to correlation coefficients between



observed variables and latent common factors (Arfken, 2015:230). Kaltofen (2010:892) states that factor loadings can also be regarded as regression weights or standardised regression coefficients. Factor loading is essentially the correlation coefficient for the factor and variable (Field, 2013:1). It shows the variance explained by the variable on that factor. In the SEM approach, as a rule of thumb, 0.7 or higher factor loading represents that the factor extracts sufficient variance from that variable. The additional standard is that only factors with eigenvalues more than 1 must be engaged, as approved through the Guttman-Kaiser rule (Field, 2013:2; Andale, 2017:1). An eigenvalue is also called characteristic roots. Eigenvalues display variance explained by that factor out of the total variance (Arfken, 2015:231). From the commonality column, one can know how much variance is explained by the first factor out of the total variance (Nash, 2015:106). For example, if the first factor explains 68% variance out of the total, this means that 32% variance will be explained by the other factor. It is an exceptional set of scalars linked to a linear system of equations (i.e., a matrix equation) that are at times known as characteristic values, characteristic roots (Hoffman & Kunze 1971:182), latent roots, or proper values (Marcus & Minc, 2008:144). Furthermore, Cartell's Scree Plot criterion has been applied where each factor that is beyond the breaking point is reserved for further analysis (Brown, 2015:21). A scree plot in multivariate statistics is a line plot of the eigenvalues (characteristic roots) of factors or principal components in an analysis (Nash, 2015:106). It is used to determine the number of factors to retain in an exploratory factor analysis (FA) or principal components to keep in a principal component analysis (PCA) (Kaltofen (2010:892).

The EFA process was performed using the latest version of SPSS, making use of the Principal Components Analysis (PCA) technique based on Varimax rotation. There are two or more forms of EFA, namely, Multivariate non-graphical analysis, Univariate graphical analysis, common factor analysis, Q-mode analysis, and Principal Components Analysis (PCA) (Marcus & Minc, 2008:146). PCA (also known as the R-mode analysis tool) is a dimensionality-reduction technique frequently applied to moderate the dimensionality of big data sets by changing a large set of variables into a reduced one that still embraces most of the information in the large set (Arfken, 2015:231). Reducing the number of variables of a data set logically comes at the expense of accuracy, but the trick in dimensionality reduction is to trade a little accuracy for simplicity (Nash, 2015:106). In a nutshell, the notion of PCA is simple and modest- minimise the number of variables of a data set while maintaining as much data as possible (Arfken, 2015:231). In PCA,

the objective is to account for as much of the aggregate variance in the observed variables as possible; linear combinations of observed variables are used to create components (Press, Flannery, Teukolsky & Vetterling, 2012:453). The PCA is best for this study because it checks for missing data and other mistakes and gains maximum insight into the data set and its underlying structure (Nash, 2015:106). It also uncovers a parsimonious model, one that explains the data with a minimum number of predictor variables (Kaltofen, 2010:894).

#### **5.13.8 Structural Equation Modelling**

Structural equation modelling (SEM) is a statistical testing practice that is applied to determine relationships outlined in a research study's model or conceptual framework (Awang, Afthanorhan & Mamat, 2016:15). According to Amrhein, Trafimow and Greenland (2019:262), SEM is a statistical technique that uses several types of models to test associations amongst diverse constructs. The major aim of SEM is to test a theoretical model or the conceptual framework that is postulated in the study. In this study, the theoretical model that was tested using SEM is the conceptual model (Figure 1.1), comprising some suggested associations purportedly befalling amongst the innovation capabilities, market competitiveness and business performance. From the use of SEM, the study thus enabled either approving or disproving these suggested associations through the process of hypotheses testing. Awang *et al.* (2015:16) suggest that the use of SEM includes two stages. The first stage involves the determination of the psychometric elements of the measures employing a technique identified as Confirmatory Factor Analysis (CFA). The following stage consists of the hypotheses testing that applies a practice recognised as path analysis. The latest version of the SPSS software package has been utilised to test for reliability. On the other hand, all the CFA, as well as the path analysis, were performed by applying AMOS' latest version software.

#### **5.13.9 Confirmatory Factor Analysis**

In statistics, confirmatory factor analysis (CFA) is a different form of factor analysis, frequently applied in social and management sciences research (Marsh, Gau, Dicke, Parker & Craven, 2020:102). According to Maydeu-Olivares, Fairchild, and Hall (2017:497), CFA is a procedure that is applied using SEM and designed to measure the level of accuracy of the instrument or measurement scales by determining the direct or indirect causal association that exists between research constructs (observed indicators and latent variables) (Li, 2016:938). According to

Melchers and Beck (2018:294), CFA is that part of SEM that involves establishing the accuracy of the measurement scales by testing the relationships between observed indicators (test items) and covert variables. The analysis is applied to test whether measures of a construct are consistent with the study's understanding of the nature of that construct (or factor). As such, the objective of CFA is to test whether the data fit a hypothesised measurement model (Maydeu-Olivares *et al.*, 2017:498). Marsh *et al.* (2020:102) claim that the determination of the precision of a conceptual framework or the research model is established on three features identified as reliability, validity, and model fit. The application of these three groups of tests is discussed in the following subsections.

### **5.14 Reliability**

Reliability refers to the degree to which data collection methods or analysis procedures and programmes can be repeated and have consistent results. Mohajan (2017:65) defines reliability analysis as the capacity of a research measurement instrument not to be error prone. Melchers and Beck (2018:294) define reliability as the extent or level to which a measure or a test can obtain identical outcomes if it is reiterated under the same settings (Li, 2016:938). Vaske, Beaman and Sponarski (2017:164) concur with the latter definition and state that reliability is the level to which the data measurement instrument is free from measurement inaccuracy or error. Therefore, through reliability analysis, mistakes, bias, and errors are reduced, and reliable outcomes are attained. According to Melchers and Beck (2018:293), several approaches can be applied in reliability testing, consisting of the Cronbach alpha test, the split-half reliability coefficient, the Composite reliability test, the Kuder-Richardson Formula 20 (K-R 20), and item-to-total correlations. The Cronbach alpha test and inter-item correlations testing were performed in this study to determine the reliability of the research instruments.

#### **5.14.1 Cronbach alpha**

The Cronbach alpha coefficient is a measure of internal consistency reliability or how good the elements in a data measurement scale quantify a similar notion (Heo *et al.*, 2015:4). Cronbach's alpha is not a statistical test, but a coefficient of reliability (or consistency) (Vaske *et al.*, 2017:164). According to Herman *et al.* (2019:23), Cronbach's alpha is a measure of internal consistency, that is, how diligently correlated a set of elements are as a group. Heo, Kim, and Faith

(2015:3) assert that Cronbach alpha is reflected to be a measure of scale reliability. Similarly, it is the relationship of the respective element in a data measurement scale with the aggregate of all the other elements of the study. A high Cronbach alpha presents a great degree of relevance through the elements in the measurement scale (Vaske *et al.*, 2017:165). In applying the Cronbach alpha coefficient, this study applied the recommendations depicted in Table 5.8, suggested by Cronbach (1951).

**Table 5. 8: The recommendations for the Cronbach Alpha Cronbach**

Alpha Value	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.8 < \alpha \leq 0.9$	Good
$0.7 < \alpha \leq 0.8$	Acceptable
$0.6 < \alpha \leq 0.7$	Questionable
$0.5 < \alpha \leq 0.6$	Poor
$\alpha < 0.5$	Unacceptable

**Source:** Cronbach (1951)

Table 5.8 presents the level of acceptance and accuracy of Cronbach's alpha values based on their respective threshold values. As can be observed, ( $\alpha$ ) scores that are equal or above 0.7, can be reflected as acceptable, replicating a good internal consistency of the measurement items. However, ( $\alpha$ ) scores below 0.7 are held as disputed, with those dropping far behind the cut-off point indicating internal inconsistency. Thus, Table 5.8 discloses that the least acceptable alpha value is 0.7. It is anticipated, therefore, that the alpha scores for all elements used should be above the 0.7 thresholds and this study follows these rules of thumb in its determination of the reliability of constructs of the study.

#### **5.14.2 Item-total correlations**

The analysis is performed to purify the measure by eliminating 'garbage' items before determining the factors that represent the construct; that is, the meaning of the averaged measure. Item-total correlations refer to the assessment or determination of variables' internal consistency (Howard & Forehand, 1962:732). An item-total correlation test is performed to check if any item in the set of tests is inconsistent with the averaged behaviour of the others, and thus can be discarded. They are used to determine a study's reliability and the consistency of their measurement instruments (Howard & Forehand, 1962:733). According to Taherdoost (2016:30), item-total correlations are

a psychometric measure used to judge the reliability and consistency of measurement scales. The measure is applied to test whether any item in a scale is consistent with the behaviour of the other items on the same scale (Conner, 2017:53). Any inconsistent items are garbage items that have to be discarded. Normally, the discarding of such inconsistent items leads to the improvement of reliability in a process called scale purification (Engellant, Holland & Piper, 2016:42). It is supposed that the result for a particular test on a given individual is initially used to produce a score, where the scores for different tests have a similar range across individuals (Conner, 2017:53). An overall measure for an individual would be constructed as the average of the scores for several different tests. A check on whether a given test behaves similarly to the others is done by evaluating the Pearson correlation (across all individuals) between the scores for that test and the average of the scores of the remaining tests that are still candidates for inclusion in the measure (Taherdoost, 2016:30). In a reliable measure, all items should correlate well with the average of the others. A small item-correlation provides empirical evidence that the item is not measuring the same construct measured by the other included items. A correlation value of less than 0.2 or 0.3 indicates that the corresponding item does not correlate very well with the scale overall and, thus, it may be dropped (Engellant *et al.*, 2016:42). To meet the cut-off level of reliability, the study adopted Nunnally's (1978) recommendation that the item-total correlation of each item should be above 0.3.

### **5.14.3 Composite Reliability**

Composite reliability (occasionally referred to as construct reliability) is a measure of internal consistency level in response scale elements, much like Cronbach's alpha (Netemeyer, Bearden & Sharma, 2003:41, Brunner & Süß, 2005:12). It can be thought of as being equal to the total amount of true score variance relative to the total scale score variance (Brunner & Süß, 2005:13). On the other hand, it is an "indicator of the shared variance among the observed variables used as an indicator of a latent construct" (Fornell & Larcker, 1981:41). Confirmatory Factor Analysis is one way to measure composite reliability, and it is extensively accessible in many diverse statistical software packages. Composite reliability thresholds are up for considerations and debate (a rational range can be somewhere between 0.60 and above), with different scholars proposing varying threshold recommendations. The number of elements available in a response scale influences a lot. Smaller numbers of scale elements lean towards lower reliability levels, while larger numbers of

response scale elements tend to have higher levels. Netemeyer *et al.* (2003:23) state that it is “reasonable” for a narrowly defined construct with five to eight items to meet a minimum threshold of 0.80.

### **5.15 Validity**

Validity is about the accuracy of a measure. The validity of a measure points to the extent to which a particular measure of an instrument is significant and enables the deduction of extrapolations from the sampled elements or population (Heale & Twycross, 2015:66). Validity is defined as the extent to which a concept is accurately measured in a quantitative study (Hopkins, 2017:38). Similarly, it is the degree or level to which the instrument measures the constructs (Csikszentmihalyi & Larson, 2014:40). Furthermore, validity signifies the valuation of whether scales elements measure what they purport to measure in a variable or determinant (Heale & Twycross, 2015:66). It is imperative to determine validity because it constitutes the accuracy and acceptability of measurement instruments (Oluwatayo, 2012:394). Validity can be improved through suitable instrumentation, meticulous sampling, and the appropriate handling of statistical data (Engellant *et al.*, 2016:42). Although there are several measures of validity (Mohajan, 2017:64), this study tested the four main methods, specifically, face validity, content validity, construct validity, and nomological validity.

#### **5.14.1 Face validity**

The analysis denotes the evaluation of the dependability of the study’s questionnaire in terms of its representation from a face value perception (Connell, Carlton, Grundy, Buck, Keetharuth, Ricketts, Barkham, Robotham, Rose & Brazier, 2018:1895). Face validity analysis examines research measurement scales to ascertain their accuracy and effective adaptation (Csikszentmihalyi & Larson, 2014:41). In addition, Heale and Twycross (2015:66) define face validity as a measure of whether a research project appears to be a good project and how representative it is ‘at a facial glance perspective’. The process thus evaluates what the questionnaire seems to measure (Connell *et al.*, 2018:1896). In this study, several members of the faculty of management sciences and three SOEs consultants performed face validity analysis through an assessment of the questionnaire. After reviewing the questionnaire, each of the reviewers presented their responses, which were applied in improving the questionnaire by

effecting some modifications concerning its arrangement and framework, phrasing, and procedural facets.

### **5.15.2 Content validity**

Content validity can be defined as the extent to which the items tested are fair representatives of the complete purview the test seeks to measure (Cooper & Schindler, 2014:103). To measure content validity, a pilot study was conducted after implementing the suggestions from the experts' review of the questionnaire. A pilot study involving a convenient sample of 50 respondents was conducted, its size determined by using the suggestions from other relevant studies (Connelly, 2008:5; Cooper & Schindler, 2014:104; Henseler *et al.*, 2015:119), which should be at least 10 per cent of the study's sample size. Since this study had a prearranged sample size of n=500 respondents, 50-60 cases are considered sufficient for the pilot sample size. Yet again, the questionnaire was enhanced, using the responses obtained from the pilot sample.

### **5.15.3 Construct Validity Analysis**

Construct validity analysis has conventionally been explained as an investigational display that a test is measuring the construct it asserts to be determining (Ahmad & Al-Mutairi, 2017:37). According to Henseler *et al.* (2015:119), construct validity is used to measure what it is supposed to measure (that is, the construct), and no other variables. This measure involves experts in the validation of data. It is also defined as the extent to which a test measures what it claims to measure (Almanasreh, Moles & Chen, 2019:215). It is a necessary process to perform when trying to ascertain the suitability of measurement elements. Moreover, it is most prominent in fields linked to psychology, management, and social sciences (Almanasreh *et al.*, 2019:216). This study tested two forms of construct validity, which are convergent and discriminant validity.

#### **5.15.3.1 Convergent validity**

Convergent validity denotes the degree to which two indicators of a construct that should be related are, in fact, related (Cheah, Sarstedt, Ringle, Ramayah & Ting, 2018:3193). In this study, convergent validity was tested using two techniques. The first applied the item (factor) loadings that are computed as standardised regression weights during the CFA. Convergent validity is considered acceptable if each item loading is at least 0.5 (Cangur & Ilker, 2015:71). All items with loadings less than 0.5 are discarded from the scales because they are deemed a threat to convergent

validity. The other technique is to calculate the average variance extracted (AVE) values for each measurement scale. The AVE is the proportion of accurately explained variance within measured indicators by their latent factor relative to the total variance with error variance inclusive in the total (Cheah *et al.*, 2018:3194). A minimum cut-off value of 0.4 was applied to establish convergent validity in this study.

### **5.15.3.2 Discriminant validity**

Discriminant validity denotes the degree to which measures of different characters are unconnected (Greener & Martelli, 2016:62). Thus, it relates to the point at which constructs that are supposed to be unrelated are distinct from each other. In this study, discriminant validity was ascertained using two methods. The first is the Fornell and Larcker Criterion, which involves checking whether the average variance extracted (AVE) value is larger than the highest shared variance (SV), where the latter is the highest correlation between each construct and others (Neuman, 2016:246). Discriminant validity is considered acceptable if the AVE is higher than the SV for each construct. The second method used error-corrected correlation values computed in the CFA procedure. Positive correlations below 1.0 between the constructs have to be taken as an indicator of adequate discriminant validity (Forcino *et al.*, 2015:15).

### **5.16 Model Fit Analysis**

The analysis offers a precise interpretation of the aptness of the suggested association that exists amongst the constructs of the research study. Model fit analysis is the most important statistical analysis that determines the fitness of a study's suggested research model or conceptual framework concerning the collected data (Maydeu-Olivares *et al.*, 2017:496). Thus, the analysis is the extent to which a suggested hypothesised connected model of a study is buttressed and sustained by collected data (Cheah *et al.* 2018:3194). Model fit analysis was evaluated through several indices, that is, Adjusted Goodness of Fit (AGFI), Chi-square (CMIN/DF), Comparative Fit Index (CFI), Goodness of Fit (GFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), RMSEA and Tucker Lewis Index (TLI). Besides testing for reliability and validity, CFA is as well applied in testing for model fit. Several indexes were applied in testing for model fit, which comprise the adjusted goodness of fit index (AGFI), chi-square/degrees of freedom, comparative fit index (CFI), the goodness of fit index (GFI), the incremental fit index (IFI), normed fit index (NFI), root mean



square error of approximation (RMSEA) and Tucker-Lewis Index (TLI) (Cheah *et al.*, 2018:3194). The tolerable limits that are applicable for each of the model fit parameters are outlined in Table 5.9.

**Table 5. 9: Model Fit Indicator**

<b>Thresholds Model Fit Indicator</b>	<b>Acceptable Threshold</b>
Adjusted Goodness of Fit (AGFI)	>0.9
Chi-square (CMIN/DF)	≤3
Comparative Fit Index (CFI)	>0.9
Goodness of Fit (GFI)	>0.9
Incremental Fit Index (IFI)	>0.9
Normed Fit Index (NFI)	>0.9
RMSEA	<0.08
Tucker Lewis Index (TLI)	>0.9

**Source:** Bagozzi and Yi (2012)

### 5.16.1 Path Analysis

The subsequent step of the SEM procedure is to investigate the hypothesised relations after steering the CFA. The practice implemented is referred to as path analysis. Path analysis is an addition of multiple regression analysis and implies the application of multiple regression equations or models that are at the same time approximated (Yves, 2012:16). Path analysis is a process that is intended to investigate the causal (either direct or indirect) relationship between a research's constructs. Path analysis provides a better effective technique of multidimensional associations amongst predictor and predicted determinants, such as modelling mediators and indirect outcomes (Cangur & Ilker, 2015:72). In general, path analysis outcomes specify the extent and importance of hypothesised causal links between dependent and autonomous variables. The degree of the relationships is shown by path (beta) coefficients while the importance of the association is specified by p-values. A path illustration established in the AMOS programme was produced. The diagram provides a discovered view of the result of the tests. Before hypotheses testing, it is essential to evaluate the classic fit for the structural model, whether the model offers a good fit to the collected data. The similar parameters and indicators as those applicable in the CFA are prompted.

## **5.17 ETHICAL CONSIDERATIONS**

The sensitive outcomes must be reported in such a way that does not hurt the relations amongst the people involved (Sekaran & Bougie, 2016:14). According to Graziano and Raulin (2010:54), every single research study must be carried out in an ethical, moral, and sound manner. In this study, five ethical research values were considered, that is, confidentiality and anonymity, protection from harm and victimisation, informed consent, objective reporting of results as well as authorisation, and approval to conduct the study survey. Hammersley and Traianou (2012:112) suggest that these five are the key ethical apprehensions applicable to a quantitative study such as this study.

### **5.17.1 Protection from victimisation**

Victimisation is the process of being victimised or becoming a victim. The guideline is viewed as a principle that sought to avoid and reduce all the available and anticipated harm to the research participants (Myers & Venable, 2014:803). Myers and Venable (2014:802) point out that in any research study, it is important to safeguard and protect respondents from any kind of victimisation or harm. The researcher must avoid and minimise such harm. To confirm that this ethical procedure is attained, finalised questionnaires were stored and locked in a safe place at VUT. The participating respondents were informed and guaranteed that the study is being piloted for academic intentions only. Information of respondents was not revealed or stored together with the completed questionnaires, which were conscientiously kept.

### **5.17.2 Ensuring confidentiality and anonymity**

Confidentiality and anonymity are ethical antecedents intended to keep the privacy of human subjects while collecting, analysing, and reporting data. Nora, Zoboli, and Vieira (2017:309) describe confidentiality in terms of separating or modifying any personal, identifying information provided by participants from the data. Sekaran and Bougie (2016:14) defined confidentiality as a condition in which the researcher knows the identity of a research subject but takes steps to protect that identity from being discovered by others. By contrast, anonymity refers to collecting data without obtaining any personal, identifying information (Nora *et al.*, 2017:308). Zikmund *et al.* (2012:252) state that anonymity is the practice followed in quantitative studies and confidentiality is maintained in qualitative studies. In both cases, the researcher collects data from respondents,

and it is the data that has to be analysed (Saunders *et al.*, 2016:497). Numerous such research studies require the collection of a signed consent agreement from respondents, and the collection of other personally identifiable data, and thus researchers are aware of the identity of their subjects. In such circumstances, upholding confidentiality is a key measure to confirm the protection of private information. In this study, the identities of respondents, such as their names and other personal details were treated with strict confidentiality. Respondents were requested to avoid writing their names anywhere on the questionnaires, to ensure that these names remain anonymous. In this way, the study encouraged the respondents' right to privacy. Efforts were made to avoid invading the privacy of respondents.

### **5.17.3 Informed consent and voluntary participation**

Informed consent includes the establishment of essential information to the directed respondents, which permits them to make immutable decisions to contribute to the study, or to refute the appeal to participate (Prakobtham, Limpattarachoen, Suetrakul, Vutikes, Khusmith, Wilairatana, Adams & Kaewkungwal, 2017:4). Survey respondents are required to understand and comprehend the objectives of the study and the way the study is conducted (Adams *et al.*, 2017:4). This permits them to sign consent forms and contribute to the study willingly (Adam *et al.*, 2017:6). In this study, necessary determinations were made to offer all the essential information needed by respondents to empower them in making well-versed decisions to take part. Furthermore, a covering letter clarifying and enlightening the objectives and purposes of the study was attached to the questionnaire. Every respondent was entreated and encouraged to sign the consent form to indicate that they are participating in the study with all the information and knowledge, and that their participation is intended. Respondents were made aware that they are free to pull out of the study at any time with no confrontational concerns.

### **5.17.4 Ensuring permission is obtained**

Permission to collect data was sought from the relevant authorities at different SOEs before the data was collected. A copy of the permission letter is provided in Appendix 2.

### **5.17.5 Objective reporting of results**

The standard of impartiality in the reporting of the study outcomes acquired in the analysis of the gathered information was maintained. To realise the impartial recording of outcomes, the

disreputable and unethical handling of the findings was circumvented and avoided during the study, and all explanations and analyses of data were executed with precision. In addition, exertions and efforts were considered in minimising academic fraud (plagiarism) to uphold the philosophies of objectivity and validity. Academic fraud was vetoed by submitting the content of the study through a plagiarism check software (Turnitin software package) to ascertain the extent of the resemblance of the text of the whole thesis regarding the outside academic and scholarly articles offered by the public literature field. Furthermore, it was ensured that information obtained from outside scholarly and academic articles was transformed and rephrased.

## **5.18 CHAPTER SUMMARY**

The main aim of this chapter has been to explore in detail the research methodology elements that are included in this study. The chapter began by discussing the research reasoning approaches and paradigms ascertained in the study. It was established that the study is based on deductive reasoning and the positivist paradigm. Furthermore, other methodological considerations, such as the research approach, time horizon, design, and strategy were discussed. The study used the quantitative approach, a cross-sectional time horizon, and a survey strategy that was employed as the data collection technique. The chapter also discussed the sampling design. The selection of the respondents was motivated by the non-probability-based purposive sampling technique. In addition, the discussion provided an outline and insight into the design and structure of the measurement instrument of the survey questionnaire and its dissemination procedures through emails, the drop-and-collect techniques, and an online survey. In terms of data analysis, the chapter indicated that the primary data analysis procedures would include descriptive statistics, EFA, and the SEM procedure. It concluded by highlighting several ethical considerations that were followed in the study to maintain a high level of integrity. The next chapter discusses the findings derived from the analysis of the gathered data of the study.

## CHAPTER 6

### DATA ANALYSIS AND INTERPRETATION OF RESULTS

#### 6.1 CHAPTER OVERVIEW

Data analysis applies statistical techniques to illustrate, describe, recapitulate, condense, and evaluate data. According to Nora *et al.* (2017:308), several systematic or logical procedures "provide a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data". An essential part of certifying data integrity is the appropriate and accurate analysis of research results. Inappropriate statistical analyses misrepresent scientific outcomes, misinform casual readers (Zikmund *et al.* 2012:252), and may undesirably influence the public perception of research. Reliability and veracity matters are just as pertinent to the analysis of non-statistical data as well. Therefore, the primary purpose of this chapter is to present the results from the collected data and provide the discussions, analyses, evaluations, elucidations and interpretation of the research outcomes or results. All data were analysed using the SPSS (version 25.0) and AMOS. The analysis of the data is in two phases: descriptive statistics analysis and inferential statistical analysis. Descriptive statistics were applied first to analyse the data provided in Section A of the questionnaire that sought to establish the demographic patterns of the respondents and the profile of their SOEs in South Africa. This is followed by the descriptive analysis of the results where the mean scores and the standard deviations in each measurement item/scale were established to determine the respondents' perceptions towards each conceptual framework construct of the study. This chapter also presents an analysis of the psychometric properties of measurement scales utilised in the study, using the correlation and regression analysis procedure. It further presents the results of the correlation and regression analyses performed to check the study's hypotheses. In conclusion, the link between the results and the research theory is discussed. The chapter begins with the pilot study results, response rate of the survey, and descriptive statistical analyses.

#### 6.2 RESULTS OF THE PILOT STUDY

A panel of academics in SCM from the Vaal University of Technology (VUT) reviewed the questionnaire. Each review revealed indistinct issues through an incremental improvement

approach since suggestions from earlier reviews were implemented before the following review. The constructs' terms were explained to improve understanding. The demographics section has two sections, with one section focusing on the respondents' data and the other section on the firm profile, thereby enhancing the survey demographic data (see Appendix 1 for the copy of the final questionnaire). The sample questionnaire was then pre-tested using a predetermined sample of 14 (n=14) respondents selected. The pre-testing results confirmed the accuracy of the questionnaire with no meaningful adjustments except one change, which required the inclusion of respondent consent to participate in the survey. This change was implemented, and the questionnaire was considered ready for a pilot study. A sample of 52 (n=52) respondents were selected conveniently and used to carry out a pilot study and test for content validity and reliability of the questionnaire. Measures such as explaining the questions and simplifying the constructs questions were adopted, improving the reliability and validity of the primary survey data. Table 6.1 shows the results of the pilot study.

**Table 6. 1: Results of the Pilot Test**

Scale	Sample Size.	Mean	Variance	Average item-total correlation	Number of items	Number of items deleted	Cronbach Alpha
IC	52	3.276	0.470	0.554	6	0	0.798
IS	52	4.251	0.063	0.385	5	0	0.663
MI	52	4.687	0.036	0.534	6	0	0.917
TI	52	4.337	0.024	0.442	5	0	0.743
MC	52	4.473	0.170	0.231	6	0	0.867
EP	52	2,274	0.022	0.321	6	0	0.900
FP	52	3.844	0.703	0.578	7	0	0.685
OP	52	4.158	0.171	0.530	6	0	0.753

IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance

**Source:** Compiled by Author

As indicated in Table 6.1, all scales obtained average item-total correlations above the recommended cut-off value of 0.3 (Greener & Martelli, 2016:46). In addition, some scales (i. e., IC=0.798; MI=0.917; TI=0.743; MC=0.867; EP=0.900 and OP=0.753) obtained Cronbach alpha

values above the 0.7 minimum threshold recommended by various authors (Neuman, 2016:232; Cook & Campbell, 2017:24). The Cronbach alpha values of some constructs (i.e., IS=0.663 and FP=0.685) were slightly below the Cronbach's alpha threshold of 0.7). The reviewing panel advised that the pilot data should be discarded. Therefore, the pilot data were not included in the main survey. The next section presents an analysis of the results of the main survey.

### 6.3 RESPONSE RATE

Though comparable in description to completion rates, response rates enable understanding the accuracy of the collected data. Concisely, a response rate refers to the number of people who fully completed the survey questionnaires divided by the number of people who make up the total sample group (Greener & Martelli, 2016:46). Similarly, Neuman (2016:232) states that response rate relates to the number of people participating in a survey divided by the number of people who responded, expressed as a percentage (Saunders *et al.*, 2016:275). Cook and Campbell (2017:24) define the response rate as the number of completed interviews or distributed questionnaires divided by the total number of respondents. Sekaran and Bougie (2014:146) present it as the total number of returned questionnaires divided by the total sample who completed the survey initially. This study utilised the definition given by Cook and Campbell (2017:24) to calculate the response rate of this study. Table 6.2 present the response rate.

**Table 6. 2: Response Rate**

<b>Description</b>	<b>Frequency</b>
Total number of questionnaires distributed	400
Total number of questionnaires returned	323
Total number of questionnaires not returned	77
Unusable responses discarded	45
Valid questionnaires retained	278
Response rate percentage	69.5

**Source:** Compiled by Author

Table 6.2 outlines the total number of questionnaires distributed, returned, discarded, and retained during the survey and data capturing process. Four hundred (400) questionnaires were distributed to professionals and managers employed by the selected SOE from depots and offices in Gauteng, the Free State and North West provinces. From the questionnaires distributed, 323 were returned, and 77 were not returned. From the returned total, 45 questionnaires were discarded because they were unusable as several items had ambiguous responses (for example, double ticking), and some

sections were unmarked. In total, 278 questionnaires were retained after establishing that they were valid to be used in the study depicting a response rate of 69.5 per cent. Therefore, the usable total number of responses available for analysis is 278 questionnaires.

There is no consensus regarding the minimum response rate as various researchers and academics suggest different values. A quick review of survey literature reveals a lack of consistency and benchmark set regarding the minimum and highest response rates. Some studies (Creswell, 2014:7; O'Leary, 2014:6; Mertens, 2015:8; Saunders *et al.*, 2016:275; Cook & Campbell, 2017:24) mention that there is no absolute threshold for a minimum response rate for sampling items as no rate is revealing of greater or lesser precision utility. Mertens (2015:8) suggests that a response rate of at least 50 per cent is appropriate, acceptable for analysis and reporting. O'Leary (2014:6) proposes that a minimum response rate of 60 per cent is both desirable and adequate, while Johnston (2017:621) recommends that 70 per cent is the most appropriate and desirable. However, the proposed thresholds for response rates may provide a guide that has no statistical basis such that a demonstrated lack of response bias is far more important than a high response rate (Setia, 2016:263). The 69.5 per cent response rate achieved in this study satisfies the various recommendations cited above. The following section presents the descriptive analysis.

### **6.3.1 Descriptive analysis**

This section presents the results drawn from the descriptive statistics in the first part of the data analysis. The discussion revolves around the data received in Section A of the questionnaire, which sought to establish the demographic details of respondents. The descriptive analysis is premised on determining the gender, age, race, highest qualification, number of years employed, type of contract, occupational area, and position.

### **6.3.2 Demographic profile of respondents**

Demographic data refers to statistical socio-economic information, including employment, education, income, gender, and many more. The data about the demographic profiles of respondents were analysed using descriptive statistics, which focused on categories such as gender, age, race, highest qualification, employment period, and type of contract, occupational area, and occupational position of the respondents. The statistical information in section A of the



questionnaire was divided into two categories, namely, the demographic details of respondents and the profile of participating manufacturing SMEs.

**Table 6. 3: Descriptive Statistics Results**

Variable	Category	Frequency (n)	Percentage (%)
<b>(A1) Gender</b>	Male	174	62.6
	Female	104	37.4
<b>Total</b>		<b>n= 278</b>	<b>100</b>
<b>(A2) Age</b>	25 years and below	4	1.4
	26-33 years	42	15.1
	34-41 years	129	46.4
	42-49 years	95	34.2
	50 years and above	8	2.9
<b>Total</b>		<b>n= 278</b>	<b>100</b>
<b>(A3) Race</b>	Black	225	80.9
	White	18	6.5
	Indian	24	8.6
	Mixed Race	9	3.2
<b>Total</b>		<b>n= 278</b>	<b>100</b>
<b>(A4) Highest qualification</b>	Matric	2	0.7
	Certificate	14	5.1
	Diploma	59	21.2
	Degree	183	65.8
	Postgraduate	20	7.2
<b>Total</b>		<b>n=278</b>	<b>100</b>

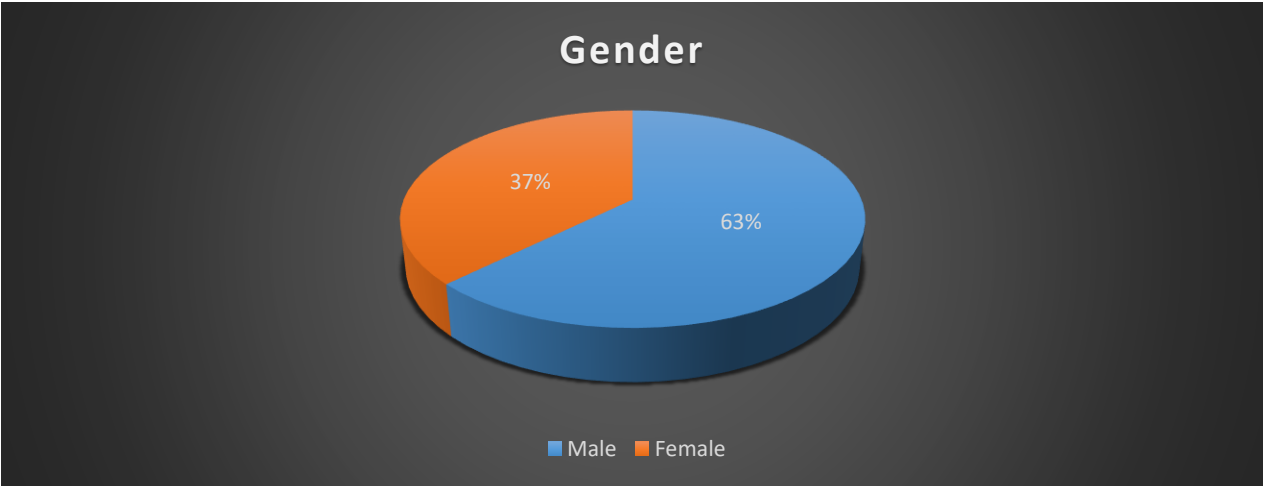
Variable	Category	Frequency (n)	Percentage (%)
<b>(A5) Employment period in organisation</b>	Less than 1 year	1	.4
	1-2 years	19	6.8
	3-5 years	90	32.4
	6-9 years	135	48.6
	10 years and above	33	11.9
<b>Total</b>		<b>n=278</b>	<b>100</b>
<b>(A6) Experience in the Industry</b>	1-2 years	21	7.6
	3-5 years	95	34.2
	6-9 years	132	47.5
	10 years and above	30	10.8
<b>Total</b>		<b>n=278</b>	<b>100</b>
<b>(A7) Net monthly income</b>	Less than 20000	28	10.1
	20001- 40000	196	70.5
	40001- 60000	46	16.5
	60001- 80000	6	2.2
	Above 80001	2	0.7
<b>Total</b>		<b>n=278</b>	<b>100</b>
<b>(A8) Division</b>	Corporate Office	37	13.3
	Engineering	64	23.0
	Freight Rail	67	24.1

	Port Terminals	54	19.4
	National Ports	54	19.4
	Others	2	0.7
<b>Total</b>		<b>n=278</b>	<b>100</b>
<b>(A9) Position in the organisation</b>	Executive Manager	6	2.2
	Senior Manager	47	16.9
	Middle Manager	49	17.6
	Lower/ Line Manager	161	57.9
	Specialist	1	.4
	Administrative/ Operator	14	5.0
<b>A (10)</b>	Permanent	232	83.5
	Contract	46	16.5
<b>Total</b>		<b>n=278</b>	<b>100</b>

Source: Compiled by Author

Table 6.3 presents information on the respondents’ gender, age, highest qualification, and race. Also included is information on the employment status of the respondents.

**6.3.2.1 Gender distribution of respondents**



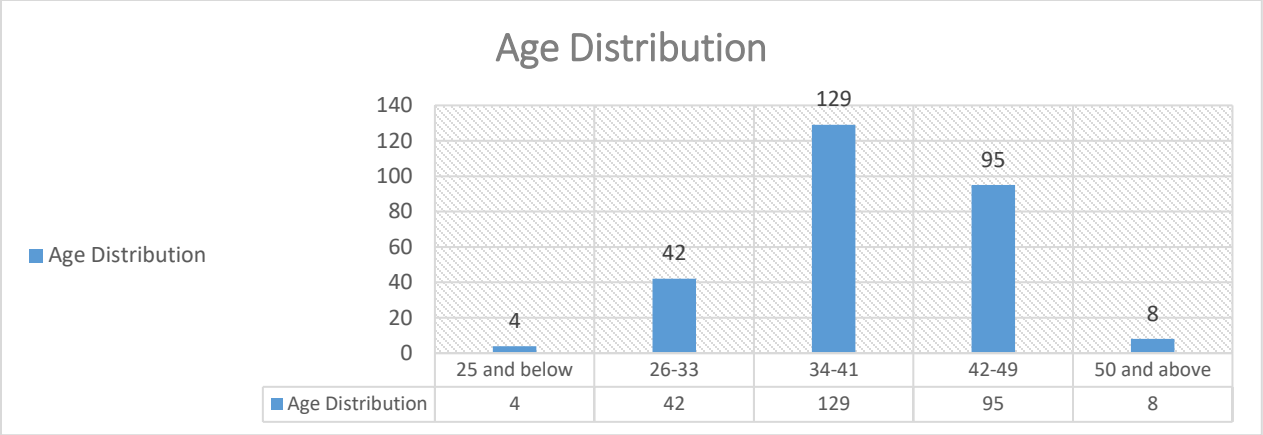
**Figure 6. 1: Gender Distribution of respondents**

Source: Compiled by Author

Figure 6.1 is a graphical diagram of the gender structure of the surveyed respondents. It shows that there were more male respondents represented in the sample than females. The male gender registered 63% (n=174) of the respondents, whereas the female gender registered 37% (n=104).

**6.3.2.2 Age distribution of the respondents**

Figure 6.2 presents the age distribution of respondents



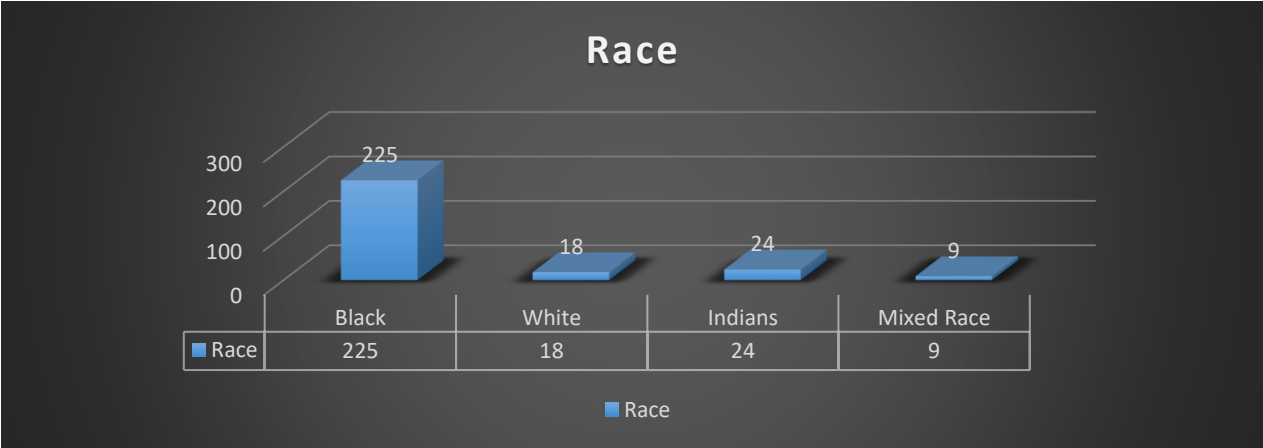
**Figure 6. 2: Age Distribution of Respondents**

**Source:** Compiled by Author

In terms of the age distribution, the results show that most respondents were aged between 33-41 years (46.4%; n=129). This is followed by those aged between 42 and 49 (34.2%; n=95). A 15.1% of respondents (n=42) from the total retained sample data were aged between 26-32 years. The study also reveals that a total 10.9% respondents (n=4) of the sample were aged 25 years and below, while 2.9% of respondents (n=8) were aged 50 years and above. The data reveals that between 33-41 years has the highest number of respondents in this study.

**6.3.2.3 Race distribution**

The discussed results regarding the racial distribution among respondents are reported in Figure 6.3.



**Figure 6. 3: Racial Distribution of the Respondents**

**Source:** Compiled by Author

Regarding the race distribution of the respondents, interesting results emerged. The highest percentage of respondents in the study belonged to the Black race which constituted 80.9 per cent (n=225) of the total sample. This is followed by the Indian race which accounts for 8.6 per cent (n=24) of the 278 retained respondents. The White race constitutes 6.5 per cent (n=18) of the respondents. The mixed-race (coloured) comes last in terms of dominance with 3.2 per cent (n=9). There were no other races that were identified in the study other than the ones identified above. Therefore, the data shows that the black race responded more than any other race in this study.

#### 6.3.2.4 Highest qualification distribution of respondents

Figure 6.4 presents information regarding the highest qualification distribution



**Figure 6. 4: Highest qualification distribution.**

**Source:** Compiled by Author.

Concerning the qualifications of the respondents, the results display that out of n=278 respondents, 0.7 per cent (n=2) were matriculates whilst 5.1 percent (n=14) were certificate holders. The results also revealed that most of the respondents were degree holders as they constituted 65.8 per cent (n=183) of the surveyed population. Close to degree holders are respondents who have a diploma as their highest qualifications as they constituted 21.2 per cent (n=59) of the total sample. Only 7.2 per cent (n=20) of the total sample were holders of postgraduate qualifications. Thus, most of

the respondents in this study are degree holders followed by those with degrees and respondents with postgraduate qualifications are third. Respondents with certificates are fourth and respondents with matriculation are the least in terms of representation.

### 6.3.2.5 The employment period of respondents

From the results presented in Table 6.5, 0.4 per cent (n=1) of the surveyed respondents were employed in their organisations for less than one year. It is revealed that 6.8 per cent (n=19) of the surveyed individuals were employed in their organisations for a period of 1-2 years. The results further show that the largest number of sampled individuals of 48.6 per cent (n=135) were employed in the organisation for a period of between 6-9 years, whereas 32.4 per cent (n=90) were employed for a period of between 3-5 years. Only 11.9 per cent per cent (n=33) were employed for a period of 10 years and above in their organisations. The results regarding employment period are shown in Figure 6.5.



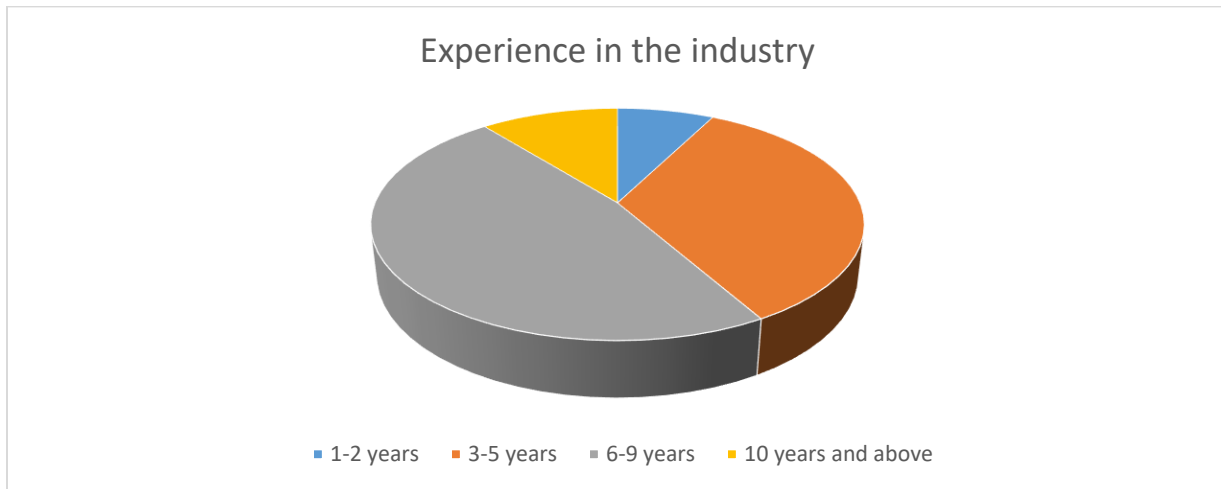
**Figure 6. 5: Employment period in the Organisation**

**Source:** Compiled by Author

From the statistical results in Table 6.3, most of the respondents were employed in their respective organisations for a period of less than 10 years.

### 6.3.2.6 Experience in the industry

Relating to the experience of the respondents, the results revealed that 7.6 per cent (n=12) were employed in their positions for a period of between one and two years. From the results, it was also established that most respondents possessed 6-9 years of experience and they constituted 47.5 per cent (n=132) of the respondents. Close to that are those who possessed 3-5 years of experience as they accounted for 34.2 per cent (n=95). Only 10.8 per cent (n=30) of the professionals had experience of more than 10 years. This information is presented in Figure 6.6.

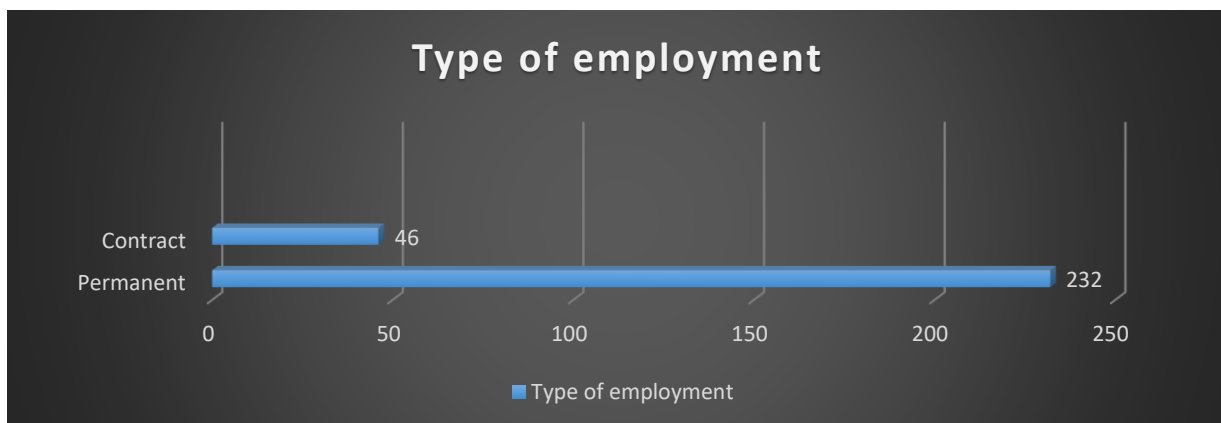


**Figure 6. 6: Experience as an SCM professional**

Source: Compiled by Author

### 6.3.2.7 Type of employment

Figure 6.7 presents the results regarding the type of employment



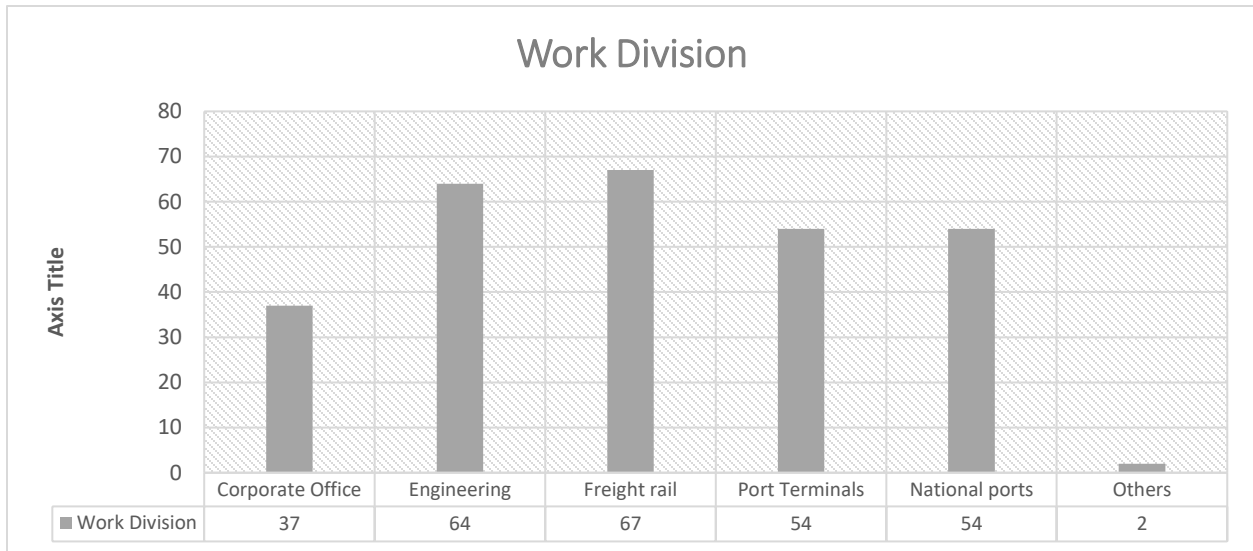
**Figure 6. 7: Type of Employment**

Source: Compiled by Author

The results presented in Figure 6.7 confirm that out of 278 respondents, 83.5 per cent (n=232) were employed in their respective organisations on a permanent basis. The results also reveal that 16.5 per cent (n=46) were employed on a contract basis.

### 6.3.2.8 Division

Figure 6.8 depicts division information.



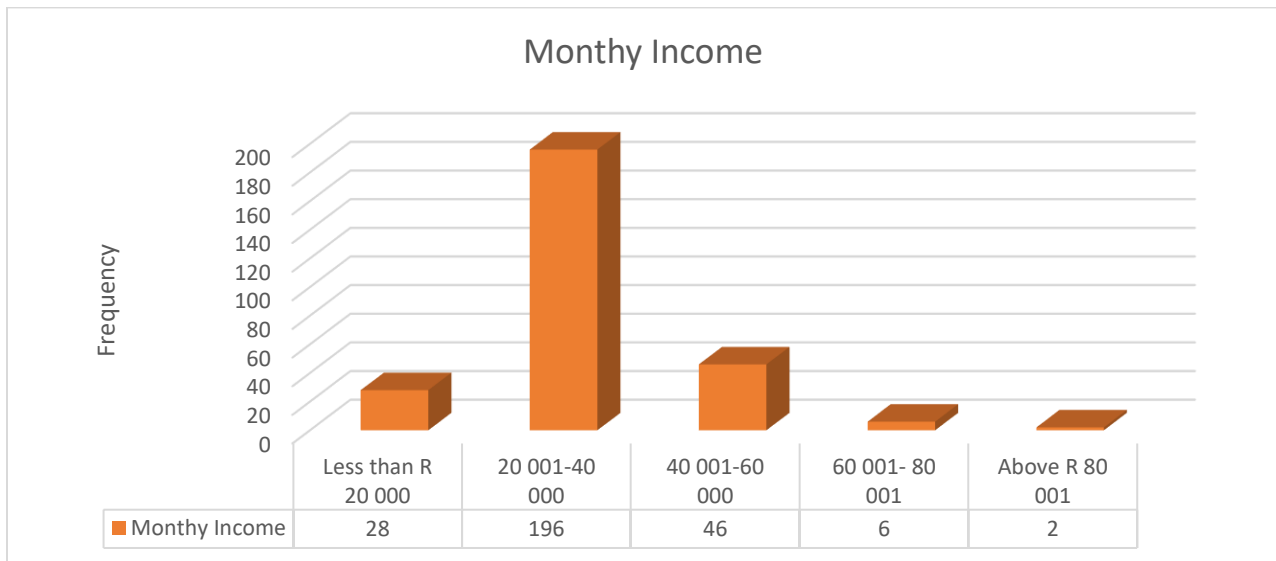
**Figure 6. 8: Work Division**

**Source:** Compiled by Author

The results presented in Figure 6.8 confirm that out of 278 surveyed respondents, 13.3 per cent (n=37) operated from the corporate office. The results also reveal that 23.0 per cent (n=64) were from the Engineering division. The Freight rail division had 24.1% (n=67) of the respondents. Both the Port terminals and the National ports had 19.4 percent (n=54) of the respondents. Other divisions had the least respondents, that is only 0.7 per cent (n=2) out of 278 respondents.

### 6.3.2.9 Monthly income

Figure 6.9 presents information on monthly income of the respondents.



**Figure 6. 9: Position held in Organisation**

**Source:** Compiled by Author

The results presented in Figure 6.9 confirm that out of 278 surveyed respondents, 10.1 per cent (n=28) earn a monthly income that is R 20 000 and less. The results also reveal that most of the respondents earn monthly income between R20 001- R40 000 (70.5 per cent; n=196). The bracket R40 001- R60 000 had 16.5 percent (n=46) of the total respondents and 2.2 percent (n=6) earned monthly income between R60 001 and R80 000. The bracket above R80 001 had the least respondents, that is only 0.7 per cent (n=2) out of 278 respondents.

## 6.4 EXPLORATORY FACTOR ANALYSIS

In this study, the EFA procedure was applied to evaluate the factor structure of the collected data. This implies that the EFA was applied to test if the data loaded as arranged in the constructs as proposed initially in this study. In performing the EFA procedure, four criteria were applied. These involve the use of factor loadings (which should be higher than 0.5), checking the commonalities (which should be higher than 0.3), the eigenvalue criterion (selection of factors with eigenvalues higher than 1) and the scree plot criteria. (Refer to Section 5.12). As mentioned in Section 5.13, before performing the EFA, it is necessary to compute the KMO and the Bartlett's Test, to check



the factorability of the data. The results for the KMO and Bartlett's test for all constructs considered in the study are presented in Table 6.4.

**Table 6. 4: The KMO measure and the Bartlett's Test results.**

CONSTRUCTS	KMO MEASURE	BARTLETT'S TEST		
		Approximate Chi-Square	Degrees of freedom	Significance level
IC	.802	729.902	6	0.000
IS	.637	288.293	3	0.000
MI	.876	1226.635	15	0.000
TI	.713	447.770	6	0.000
MC	.785	841.920	15	0.000
EP	.858	1287.033	15	0.000
FP	.727	583.329	10	0.000
OP	.776	603.300	10	0.000

IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance

**Source:** Compiled by Author.

Table 6.4 indicates that the KMO values for all scales used in the study were higher than the minimum cut off value of 0.5, as they ranged from 0.602 to 0.911. In the same way, the Bartlett's test for all scales produced significant levels of 0.000. These results confirm that the data collected in this study were suitable for the EFA analysis procedure. The next sections outline the outcomes of the EFA performance on IC, IS, MI, TI, MC, EP, FP, OP.

#### 6.4.1 Factor analysis for the innovation culture

In subjecting the IC data to the exploratory factor analysis procedure, one factor was extracted. From the IC scale, two items (IC5 and IC6) were discarded for attaining factor loadings lower than the recommended 0.5 minimum value. The final factor structure is presented in Table 6.5.

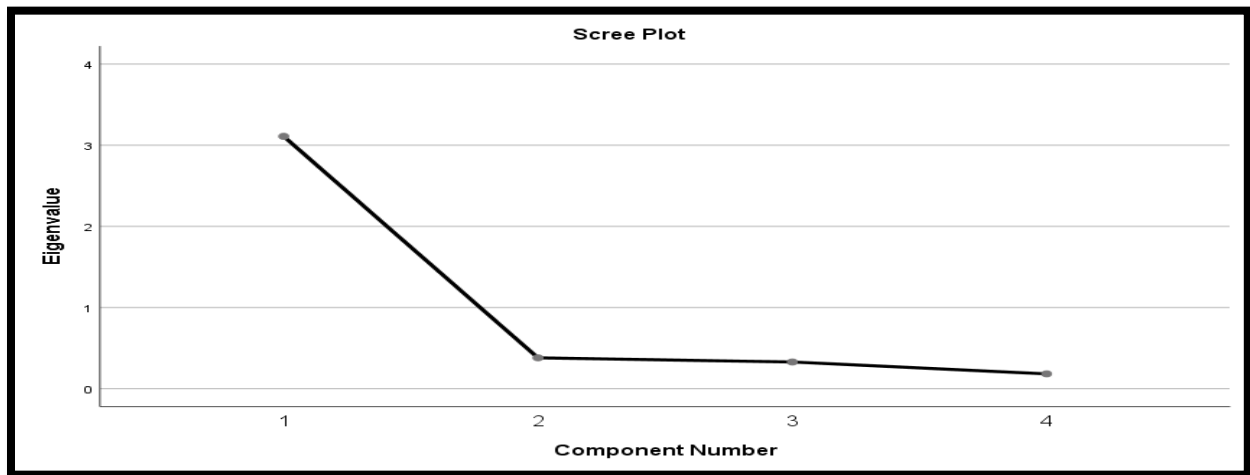
**Table 6. 5: Uni-Dimensional Factor Structure for the innovation culture scale.**

ITEM CODE	Description	Factor 1
IC1	Management bodies demonstrate high willingness to engage in new ventures (openness to new markets and technologies, etc.)	0.900
IC2	Employees are free to present ideas or suggestions at any time	0.894
IC3	Capability exists for employees with different backgrounds to work together in innovation project teams	0.864
IC4	Project team members treat one another with trust and respect	0.868
<b>Eigenvalue</b>		<b>3.109</b>

<b>Total variance explained</b>	<b>77.729</b>
<b>Cumulative variance explained</b>	<b>77.729</b>

**Source:** Compiled by Author.

As depicted in Table 6.5, one factor was extracted in the exploratory factor analysis procedure in the IC scale. This factor explained 77.729 per cent of the variance in IC. The loadings for the factor were acceptable and ranged from 0.864 to 0.900, which is greater than the minimum recommended cut-off value of 0.5. The scree plot which further supports that only one factor was extracted since it had eigenvalues higher than 1, is presented in Figure 6.10.



**Figure 6. 10: Scree plot for innovation culture values**

**Source:** Exported from SPSS (Version 25.0)

Figure 6.10 represents the scree plot for the IC scale. It shows that the scale for IC has a unidimensional factor structure as it extracted only one factor with an eigenvalue of higher than 1. The IC scale had an eigenvalue of 3.109.

#### **6.4.2 Factor analysis for the innovation strategy**

The FFA technique was applied for the innovation strategy scale. Two items (IS1 and IS2) were discarded for cross loadings. Only one factor was extracted, as shown in Table 6.6.

**Table 6. 6: Uni-Dimensional factor structure for the innovation strategy scale**

<b>ITEM CODE</b>	<b>Description</b>	<b>Factor</b>
		<b>1</b>
IS3	Precise definition creation in advance of developing tasks and goals	0.719

IS4	Communication of information needed for innovation projects is exceptionally frank, transparent and honest	0.897
IS5	Mistakes made during innovation projects are viewed as opportunities to systematically learn and improve	0.881
<b>Eigenvalue</b>		<b>2.097</b>
<b>Total variance explained</b>		<b>69.898</b>
<b>Cumulative variance explained</b>		<b>69.898</b>

**Source:** Compiled by Author

Table 6.6 shows that only one factor was extracted on the IS scale, consisting of three items, which contributed to 69.898 per cent of the variance in IS. Factor loadings were acceptable and ranged from 0.719 to 0.897, which is greater than the least cut-off value of 0.5. The scree plot is presented in Figure 6.11.



**Figure 6. 11: Scree plot for innovation culture values**

**Source:** Exported from SPSS (Version 25.0)

Figure 6.11 represents the scree plot for the IS scale. It shows that the scale for IS has a unidimensional factor structure as it extracted only one factor with an eigenvalue of greater than one. The IS factor had an eigenvalue of 2.097.

### **6.4.3 Factor analysis for the market innovation**

The EFA was conducted for the MI scale. Only one factor was extracted, as shown in Table 6.7. The resultant factor structure is presented in Table 6.7.

**Table 6. 7: Uni-Dimensional Factor Structure for the market innovation scale**

ITEM CODE	Description	Factor
		1
<i>MI1</i>	Relationships with customers, suppliers, etc. are maintained in anticipation of future market needs. To meet future demands, customers are included in the entire process of product/service development.	0.701
<i>MI2</i>	Feedback such as complaints and suggestions are systematically reviewed and acted upon.	0.874
<i>MI3</i>	Through innovation, the company has acquired greater market shares than its competitors.	0.893
<i>MI4</i>	As part of the innovation process, market-oriented distribution channels are identified at an early stage.	0.856
<i>MI5</i>	By considering various factors throughout the product development process, a diverse range of products is produced.	0.886
<i>MI6</i>	By considering various factors throughout the product/service development process, a diverse range of products/service is created	0.832
<b>Eigenvalue</b>		<b>4.262</b>
<b>Total variance explained</b>		<b>71.031</b>
<b>Cumulative variance explained</b>		<b>71.031</b>

**Source:** Compiled by Author

As indicated in Table 6.7, only one factor extracted from the EFA procedure explained 71.031 per cent of the variance in the SCR scale. The remaining 28.969 per cent is explained by other extraneous factors that were not considered in this current study. Factor loadings were acceptable and ranged from 0.701 to 0.893, which is greater than the least cut-off value of 0.5. The scree plot is displayed in Figure 6.12.



**Figure 6. 12: Scree plot for Supply Chain Reliability values**

**Source:** Exported from SPSS (Version 25.0)

As indicated in Figure 6.12, the scree plot represents the MI scale. It demonstrates that the scale for MI has a unidimensional factor structure as it extracted only one factor with an eigenvalue of greater than 1. The MI factor had an eigenvalue of 4.262.

#### 6.4.4 Factor analysis for the scale on technological innovation

In subjecting TI data to the EFA procedure, Item TI4 (Overall, our product is similar to our main competitors' products/service) was deleted because of low commonality value lower than the recommended 0.3. Only one factor was extracted in the process. The result of the factor structure is presented in Table 6.8.

**Table 6. 8: Uni-Dimensional Factor Structure for the technological innovation scale**

ITEM CODE	Description	Factor
		1
<i>TI1</i>	Our product/service is highly innovative, replacing an inferior alternative.	0.818
<i>TI2</i>	Our product/service incorporates a radically new technological knowledge.	0.880
<i>TI3</i>	High-quality technical innovations were introduced during the development of this product/service.	0.854
<i>TI5</i>	The application of our product is very different from that of our main competitors' products/service.	0.651
<b>Eigenvalue</b>		<b>2.596</b>
<b>Total variance explained</b>		<b>64.912</b>
<b>Cumulative variance explained</b>		<b>64.912</b>

Source: Compiled by Author

Table 6.8 depicts that the one factor that was extracted from the EFA procedure explained 64.912 per cent of the variance in TI. Factor loadings were acceptable and ranged from 0.651 to 0.880, which is greater than the minimum cut-off value of 0.5. The scree plot for the TI scale is shown in Figure 6.13.



**Figure 6. 13: Scree plot for Supply Chain Costs values**

**Source:** Exported from SPSS (Version 25.0)

Figure 6.13 depicts the total eigenvalue for the TI scale. It shows the single dimensionality of the TI scale as only one factor was extracted in the EFA procedure. The TI factor attained an eigenvalue of 2.596.

#### **6.4.5 Factor analysis for the scale on market competitiveness**

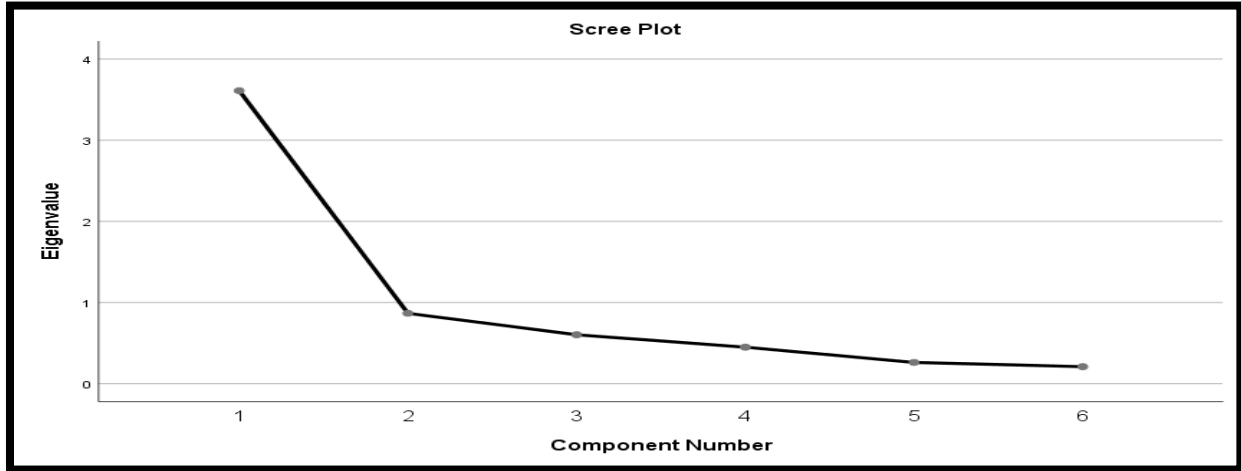
Application of the EFA procedure to the MC scale resulted in the extraction of one factor. The resultant factor structure is presented in Table 6.9.

**Table 6. 9: Uni-dimensional factor structure for the market competitiveness scale**

<b>ITEM CODE</b>	<b>Description</b>	<b>Factor</b>
		<b>1</b>
<i>MC1</i>	Competition in our market is intense	0.695
<i>MC2</i>	Our organisational unit has relatively strong competitors	0.803
<i>MC3</i>	Competition in our market is extremely high	0.794
<i>MC4</i>	Price competition is a hallmark of our market	0.828
<i>MC5</i>	Product competition is high	0.816
<i>MC6</i>	Our organisation reacts swiftly to competition	0.709
<b>Eigenvalue</b>		<b>3.610</b>
<b>Total variance explained</b>		<b>60.171</b>
<b>Cumulative variance explained</b>		<b>60.171</b>

**Source:** Compiled by Author

Table 6.9 depicts that the one factor that was extracted from the exploratory factor analysis procedure explained 60.171 per cent of the variance in MC. Factor loadings ranged from 0.695 to 0.828. The scree plot for the MC factor is presented in Figure 6.13.



**Figure 6. 14: Scree plot for market competitiveness values**

**Source:** Exported from SPSS (Version 25.0)

Figure 6.14 represents the scree plot for MC, further supporting the eigenvalues shown in Table 6.9. The scree plot curve indicates that one factor was extracted, and it had an eigenvalue of 3.610.

#### 6.4.6 Factor analysis for the scale on environmental performance

The resultant unidimensional factor structure for the EP scale is presented in Table 6.10.

**Table 6. 10: Uni-dimensional factor structure for the environmental performance scale**

ITEM CODE	Description	Factor
		1
<i>EP1</i>	Reduction of air emissions	0.773
<i>EP2</i>	Reduction of effluent waste	0.904
<i>EP3</i>	Reduction of solid wastes.	0.929
<i>EP4</i>	Decrease in consumption for hazardous/harmful/toxic materials.	0.929
<i>EP5</i>	Decrease in frequency for environmental accidents.	0.832
<i>EP6</i>	Improvement in an enterprise's environmental situation	0.510
<b>Eigenvalue</b>		<b>4.094</b>
<b>Total variance explained</b>		<b>68.236</b>
<b>Cumulative variance explained</b>		<b>68.236</b>

**Source:** Compiled by Author

Table 6.10 reveals that the one factor extracted from the EFA explained 68.236 per cent of the variance in EP. Factor loadings were acceptable and ranged from 0.695 to 0.828. The scree plot for the EP scale is presented in Figure 6.15.



**Figure 6. 15: Scree plot for market competitiveness values**

**Source:** Exported from SPSS (Version 27.0)

Figure 6.15 represents the scree plot for EP, providing further support for the eigenvalues in Table 6.10. The scree plot curve indicates that one factor was extracted, and it had an eigenvalue of 4.094.

#### **6.4.7 Factor analysis for the scale on financial performance**

From the EP scale, two items, EP4 and EP 5, were discarded for cross loadings during the EFA. The final factor structure after applying the EFA to the FP scale is presented in Table 6.11.

**Table 6. 11: Uni-Dimensional factor structure for the financial performance scale**

ITEM CODE	Description	Factor
		1
<i>FP1</i>	Decrease in cost of materials purchasing.	.833
<i>FP2</i>	Decrease in cost for energy consumption	.837
<i>FP3</i>	Decrease in fee for waste treatment.	.689
<i>FP6</i>	Decrease in operational costs	.753
<i>FP7</i>	Decrease in maintenance costs	.679
<b>Eigenvalue</b>		<b>2.897</b>
<b>Total variance explained</b>		<b>57.935</b>
<b>Cumulative variance explained</b>		<b>57.935</b>

**Source:** Compiled by Author



One factor explaining 57.935 per cent of the variance in FP was extracted in the EFA. Factor loadings ranged from 0.679 to 0.837. The scree plot for the FP scale is presented in Figure 6.16.



**Figure 6. 16: Scree plot for market competitiveness values**

Source: Exported from SPSS (Version 27.0)

Figure 6.16 represents the scree plot for FP, revealing the eigenvalues shown in Table 6.11. The scree plot curve shows that one factor was extracted, and it had an eigenvalue of 2.897. Hence, the FP factor is unidimensional, as shown in Figure 6.16, as there is only one eigenvalue, which is higher than 1.

#### 6.4.8 Factor analysis for the scale on operational performance

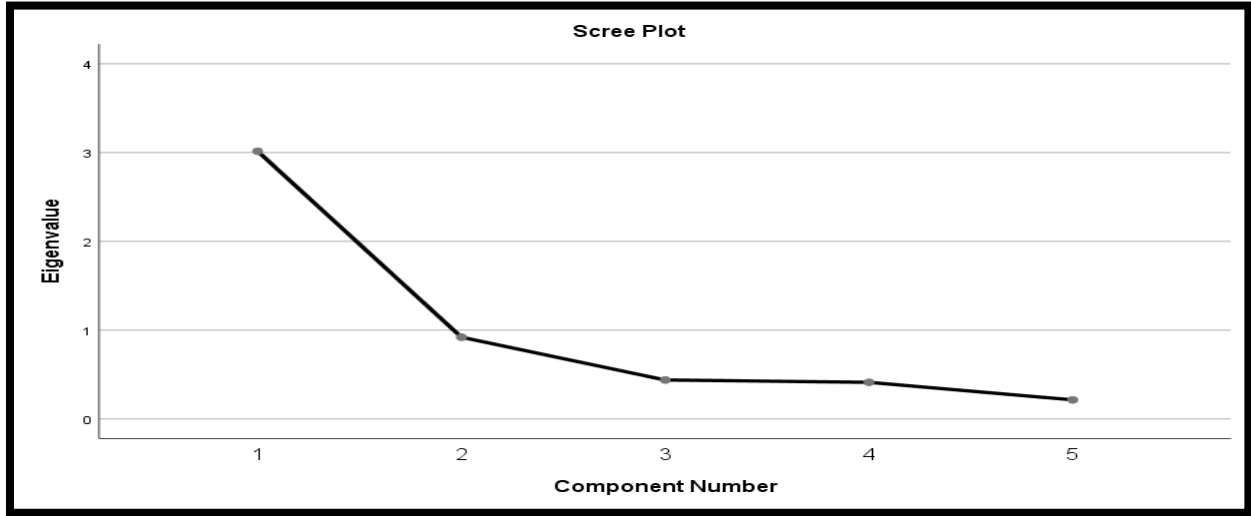
In subjecting TI data to the EFA procedure, Item OP3 (Decrease in scrap rate) was deleted because of a low commonality value lower than the minimum cut off value of 0.3, and one factor was extracted. The factor structure is presented in Table 6.12.

**Table 6. 12: Uni-Dimensional factor structure for the operational performance scale**

ITEM CODE	Description	Factor
		1
<i>OP1</i>	Increase in the amount of goods delivered on time	.650
<i>OP2</i>	Decrease in inventory levels	.728
<i>OP4</i>	Increase in product quality.	.747
<i>OP5</i>	Increase in product line.	.861
<i>OP6</i>	Improved capacity utilisation.	.873
<b>Eigenvalue</b>		<b>3.015</b>
<b>Total variance explained</b>		<b>60.299</b>
<b>Cumulative variance explained</b>		<b>60.299</b>

Source: Compiled by Author

As shown in Table 6.12, one factor explaining 60.299 per cent of the variance in OP was extracted from the EFA. Factor loadings ranged from 0.650 to 0.873. The scree plot for the OP scale is shown in Figure 6.17.



**Figure 6. 17: Scree plot for market competitiveness values**

**Source:** Exported from SPSS (Version 27.0)

Figure 6.17 represents the scree plot for OP, which indicates that one factor was extracted, and it had an eigenvalue of 3.015. Hence, the OP factor is unidimensional, as shown in Figure 6.17, as there is only one eigenvalue which is higher than 1.

#### 6.4.9 Summary of the Results of the exploratory factor analysis

Table 6.13 shows the results after data purification process performed through the EFA.

**Table 6. 13: Data purification process (exploratory factor analysis)**

SCALE	ITEMS DISCARDED	RELIABILITY AFTER ITEM REMOVAL	SCALE IN FACTOR ANALYSIS
INNOVATION CULTURE	IC5 & IC6	0.904	Unidimensional
INNOVATION STRATEGY	IS1 & IS2	0.777	Unidimensional
MARKET INNOVATION	None	0.917	Unidimensional
TECHNOLOGICAL INNOVATION	TI4	0.811	Unidimensional
MARKET COMPETITIVENESS	None	0.867	Unidimensional

<b>ENVIRONMENTAL PERFORMANCE</b>	None	0.900	Unidimensional
<b>ECONOMIC PERFORMANCE</b>	EP4 & EP5	0.806	Unidimensional
<b>OPERATIONAL PERFORMANCE</b>	OP3	0.823	Unidimensional

**Source:** Compiled by Author

As shown in Table 6.13, all measurement scales were unidimensional and had acceptable reliabilities, as shown by the Cronbach alpha values higher than the recommended lower limit of 0.7. The next section discusses the descriptive statistics of the constructs.

## 6.5 DESCRIPTIVE STATISTICS OF THE CONSTRUCTS

In this section, the descriptive statistics about the constructs are presented. The descriptive statistics presented, including the means, standard deviations of the constructs in the study, are provided in Table 6.14.

**Table 6. 14: Mean scores and standard deviations of research variables**

Study Constructs	Sample size (N)	No of items	Means	Minimum	Maximum	Standard Deviation	$\bar{x}$ rank
<b>IC</b>	278	3	2.8435	1	5	0.84827	7
<b>IS</b>	278	7	4.4257	1	5	0.52060	3
<b>MI</b>	278	5	4.6900	1	5	0.43920	1
<b>TI</b>	278	7	4.4245	1	5	0.50508	4
Scale: 1= Strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=Strongly agree							
<b>Mediating Variable</b>							
<b>MC</b>	278	9	4.4730	1	5	0.48418	2
Scale: 1= Strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=Strongly agree							
<b>Outcome Variable</b>							
<b>EP</b>	278	6	2.2740	1	5	0.74923	8
<b>FP</b>	278	5	4.3282	1	5	0.56923	6
<b>OP</b>	278	6	4.3306	1	5	0.54611	5
Scale: 1= Decreased significantly, 2=somewhat decreased, 3=neither decreased nor increased, 4=somewhat increased, 5=Increased significantly							
IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance							

**Source:** Researcher's own compilation

### **6.5.1 Innovation culture**

The mean value for innovation culture was ( $\bar{x}=2.8435$ ;  $SD \pm 0.84827$ ), which indicates a 'neutral' response and demonstrates a proclivity towards the 'neutral' position on the Likert-scale. This result suggests that respondents in this study are indifferent as to whether SOEs have an innovation culture or not. The indifference can be as a result that the respondents are not aware of the existence of the innovation projects that are based on the company strategy in the organisations. The neutral response can be also that there is no proper communication of information needed for innovation projects. Employees may not be free to present ideas or suggestions at any time to management. This situation can lead to a mediocre market competitiveness, as mentioned by Brem *et al.* (2016:135). It is necessary then that measures be developed and implemented to improve the innovation culture in SOEs in South Africa. These measures may include effective communication, sensitising employees to innovation and its opportunities, motivating and inspiring employees to engage in innovation alongside their day-to-day business. Therefore, this result implies that top management in SOEs may not be communicating their innovation vision during strategic decision-making and their innovation projects might not be following a documented innovation process that considers all areas of the innovation culture in the company.

### **6.5.2 Innovation Strategy**

An analysis of the results in Table 6.14 reveals an overall mean score of ( $\bar{x}=4.4257$ ;  $SD \pm 0.52060$ ) on IS. The results demonstrate an inclination towards the 'agree' position on the Likert-scale. This result implies that respondents in this study perceive and agree that innovation strategies are being implemented resoundingly in the selected SOE. Implementation of strategy innovation brings efficiency in the running of railway operations by SOEs. Stronger collaboration between government and the private sector are needed in the railway industry. The relationship can be achieved if strategy innovations are implemented in SOEs. A data-driven contextual approach, particularly railway transport modelling, should be used in prioritising and ranking key innovations and interventions, considering the effects of global developments and innovations in logistics systems on the structure of rail freight transport. The strategy innovation can result in the improvement of innovation and market competitiveness of the surveyed organisation (Alexe & Alexe, 2016:1001; Prajogo, 2016:242).

### **6.5.3 Market strategy**

The mean value for market innovation was ( $\bar{x}=4.6900$ ;  $SD \pm 0.43920$ ), which demonstrates an inclination towards the 'strongly agree' position on the Likert-scale. This result suggests that respondents in this study are satisfied that their SOE is involved in market innovation. This means that relationships with customers, suppliers and other relevant stakeholders are maintained in anticipation of future market needs. To meet future demands, customers are included in the entire process of product/service development. Feedback, such as complaints and suggestions, are systematically reviewed and acted upon. The result asserts that programmes towards market innovation are either formulated or implemented in the selected SOE. Such programmes include e-procurement, use of social media in marketing, architectural innovation, and radical innovations. These programmes improve the efficiency operation of SOEs activities as the programmes necessitate the introduction and implementation of new railway technology. It is necessary therefore, that market innovations are continuously applied in the SOEs to gain competitive advantage in the railway markets across South Africa and beyond (Ziggers & Henseler, 2017:796).

### **6.5.4 Technological innovation**

Table 6.14 shows that TI had a mean value of 4.4245. This result is close to the 'agree' position on the Likert scale. This means that the TI is satisfactory in the selected SOE. This suggests that the selected SOE is adopting new technologies that improve its operations. It also implies that the SOE is involved in technological forecasting activities, in which it invests some of its resources to tracking the technological changes occurring worldwide, and their impact on the railway sector. The result can lead to the fact that their SOE is doing enough in terms of innovation in technologies. TI can lead to a comprehensive market competitiveness, as asserted by Clow (2018:141). New technologies such as high bandwidth systems and IP based networks are being implemented for strengthening safety and security features in their SOE. Voice data and train control messages are critical for strong security. The advancement of ICT has developed the overall operations within railway management. Therefore, it is essential that the selected SOE should channel more resources towards innovation in technologies to enhance its performance within the railway sector.

### **6.5.5 Market competitiveness**

The results in Table 6.14 reveal an overall mean score of ( $\bar{x}=4.4730$ : SD  $\pm 0.48418$ ) on MC. The results establish a leaning towards the 'agree' position on the Likert-scale, suggesting that respondents in this study agree that competition in freight market is intense. The respondents agree that their SOE has relatively strong competitors and competition in the railway market is extremely high. The result also suggests that respondents agree that the price competition is a hallmark of the market in the selected SOE. This situation can result in the improvement of operational and financial performance (Prajogo, 2016:242). A competitive market implies many firms and a freedom of entry and exit and many firms seeking to attract customers. On the one hand, competitive markets will create an incentive for firms to develop new and better products. However, the lack of supernormal profit may make investment in research and development difficult. The SOE can improve its market competitiveness by finding out how others in the rail industry are innovating; upgrading its customer relationship systems; investing in employee training, product development and reducing delivery lead-time by improving processes. These strategies improve the operations of SOEs activities. Thus, it remains important that organisations should invest in those activities, such as product development, product differentiation, and quality to strengthen the competitive advantage in the markets.

### **6.5.6 Environmental performance**

Environmental performance scored an overall mean score of ( $\bar{x}=2.2740$ : SD  $\pm 0.74923$ ) which indicates a 'somewhat decreased' response. This result indicates that respondents felt that environmental performance in the selected SOE has improved, and the environmental commitment programmes could be implemented. The results suggest that levels of air emissions, volumes of effluent waste, levels of solid wastes, consumption for hazardous/harmful/toxic materials, and frequency for environmental accidents have decreased, indicating an improvement in environmental performance in the selected SOE. The company's environmental situation has improved. The improvement could be associated with the examination and implementation of the Environmental Policy by the SOE, bolstering employee involvement and migrating to 'green' and pollution free new technologies. Better environmental performance is also associated with better quality of human capital in the selected SOE, which may help it to improve its financial performance. Thus, the SOE's profitability will improve. Environmental performance plays an

overwhelming part in controlling the organisations' environmental activities, compelling organisations to act upon the policies (Yao & Yang, 2017:445). Therefore, the selected SOE should invest in environmental performance for the betterment of the economy. A clean and safe environment promotes good health care in an economy (Nguyen *et al.*, 2020:271).

### **6.5.7 Financial performance**

Table 6.14 shows that FP had a mean value of 4.3282. This result is next to the 'somewhat increased' position on the Likert scale. This means that some FP items such as the cost of materials purchased, the cost for energy consumption, the fees for waste discharge and fines for environmental accidents have increased in the selected SOE. However, the respondents noted an increase in sales volumes, profit volumes and return on investment. The result can lead to the fact that the selected SOE is performing well in some aspects of its financial performance and performing badly in others, especially in cost management aspects. This implies that the selected SOE is not improving its overall cost management, thus lacking cost effective programmes, such as resource planning, risk management, reduction of fixed costs and budgeting. Implementation of well-informed purchasing practices, improvement in SCM and price increases by the SOE, can attribute the improvement in sales volumes, profits and return on investment. Therefore, FP can lead to a comprehensive market competitiveness, as asserted by Clow (2018:141). Consequently, it is essential that the selected SOE (Transnet) should channel more resources towards financial performance.

### **6.5.8 Operational performance**

The mean value for operational performance was ( $\bar{x}=4.3306$ ;  $SD \pm 0.54611$ ), which demonstrates an inclination towards the 'somewhat increased' position on the Likert-scale. This result suggests that respondents in this study are contented that their organisation is performing well on the operational activities. The results also implies that activities such as the number of goods delivered on time, quality of products/services provided, number of new products/services provided, and level of capacity utilisation have improved in the SOE. A better allocation of resources through these principal processes allows the organisation to eradicate waste, decrease costs, adjust more to proper technological innovation and, perform better than competitors, thereby improving the operational performance (Gopang *et al.*, 2017:128). These principal processes include supply chain execution, supply chain integration, e-procurement and lean SCM. To compete worldwide,

an organisation must embrace all performance measures and refine its functionality and processes (Abu *et al.*, 2019:661). Therefore, the main objective of the selected SOE in this case should be to improve its operational performance (Buer *et al.*, 2020:3).

## 6.6 TESTS FOR THE NORMALITY OF DATA

This test uses two statistics; namely, skewness and kurtosis to assess the distribution of data (refer to Section 5.12.5). According to Setia (2016:266), to assume that data are satisfactory to demonstrate normal univariate distribution, its skewness must be in the range of -2 to +2 and its kurtosis must be in the range of -3 to +3.

**Table 6. 15: Skewness and Kurtosis values of Constructs.**

	Valid cases	Missing cases	Skewness			Kurtosis		
			Sig.	Statistic	Std. Error of Skewness	Sig.	Statistic	Std. Error of Kurtosis
IC	278	0.000	0.000	-.032	.146	0.000	-.368	.291
IS	278	0.000	0.000	-.989	.146	0.000	.693	.291
MI	278	0.000	0.000	-1.319	.146	0.000	.856	.291
TI	278	0.000	0.000	-1.204	.146	0.000	2.528	.291
MC	278	0.000	0.000	-1.129	.146	0.000	1.810	.291
EP	278	0.000	0.000	1.181	.146	0.000	1.979	.291
FP	278	0.000	0.000	-1.740	.146	0.000	2.925	.291
OP	278	0.000	0.000	-.452	.146	0.000	-.526	.291

IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance

**Source:** Compiled by Author.

Table 6.15 shows that the skewness statistics for all scales ranged from -1.740 to -0.032 and values of kurtosis fall between -0.526 to 2.925. These values fall within the prescribed ranges of -2 to +2 for skewness and -3 to +3 for kurtosis, which suggests that the data for this study were normally distributed. The average values for skewness and kurtosis were between -1.740 and -0.032 and, between -0.526 and 2.925 respectively. The results indicate a distribution close to normality as the values fall between -2 to +2 and -3 to +3 (recommended by Graham *et al.* (2013:92). The next section discusses the results of the analysis of the inferential statistics.

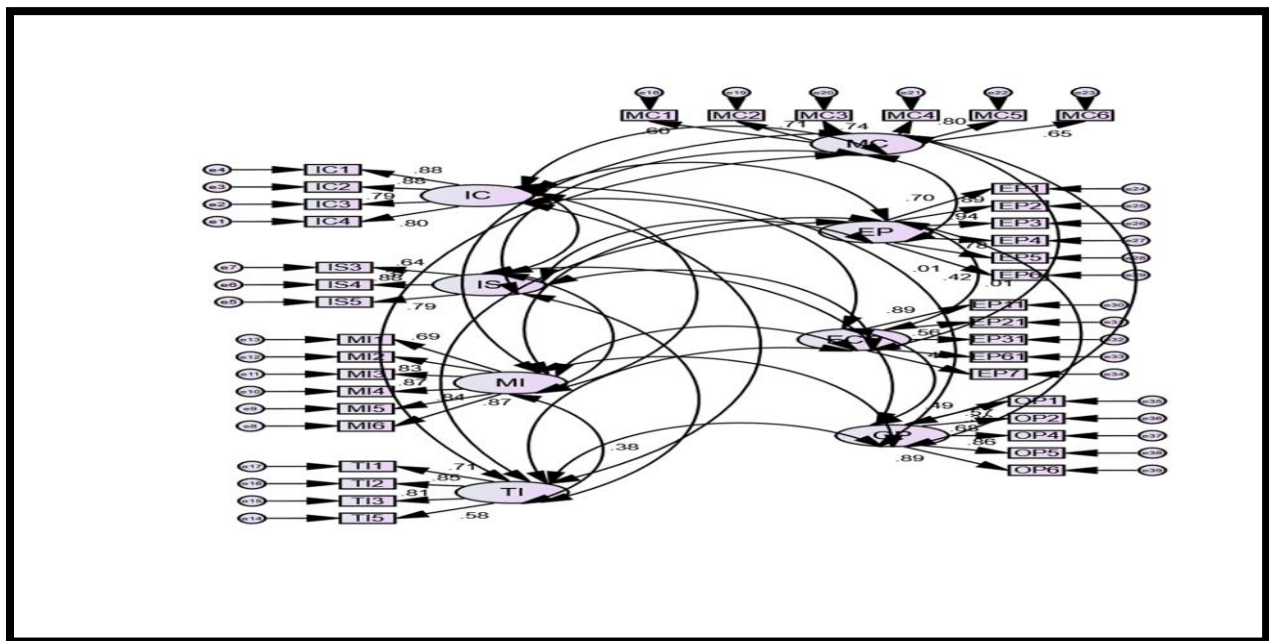


## 6.7 INFERENCE STATISTICS

The section presents the inferential statistics, which are the results related to the testing of the hypotheses suggested for this study.

### 6.7.1 Confirmatory factor analysis

The CFA is a statistical technique that focuses on modelling the relationship between manifest indicators and underlying variables (Gallagher & Brown, 2013:289). It aids in the testing of hypotheses between variables. This section presents the results of the CFA, the latter of which was designed to assess the psychometric properties of the measurement scales used in this study. These properties consist of the reliability, validity and model fit. This section also presents the CFA model (Figure 6.18), which indicates the relationship that each latent construct has with the observed constructs.



**Figure 6. 18: Confirmatory factor analysis model**

**Source:** Extracted from AMOS Graphics (Version 25.0)

Figure 6.18 presents the CFA path diagram, extracted from the AMOS graphics software. It specifies the paths that make up the diagram. These paths are the standardized regression weights between the different latent (unobserved) constructs.

**Table 6. 16: Accuracy analysis statistics**

Research constructs		Cronbach's test		CR	AVE	HSV	Factor loading
		Item-total	$\alpha$ Value				
<b>IC</b>	<i>IC1</i>	0.812	0.904	0.85	0.95	0.57	0.900
	<i>IC2</i>	0.801					0.894
	<i>IC3</i>	0.760					0.864
	<i>IC4</i>	0.765					0.868
<b>IS</b>	<i>IS3</i>	0.672	0.777	0.73	0.91	0.67	0.719
	<i>IS4</i>	0.590					0.897
	<i>IS5</i>	0.445					0.881
<b>MI</b>	<i>MI1</i>	0.596	0.917	0.87	0.91	0.74	0.701
	<i>MI2</i>	0.812					0.874
	<i>MI3</i>	0.835					0.893
	<i>MI4</i>	0.780					0.856
	<i>MI5</i>	0.823					0.886
	<i>MI6</i>	0.753					0.832
<b>TI</b>	<i>TI1</i>	0.644	0.811	0.74	0.76	0.72	0.818
	<i>TI2</i>	0.729					0.880
	<i>TI3</i>	0.699					0.854
	<i>TI5</i>	0.470					0.651
<b>MC</b>	<i>MC1</i>	0.569	0.867	0.81	0.77	0.77	0.695
	<i>MC2</i>	0.699					0.803
	<i>MC3</i>	0.681					0.794
	<i>MC4</i>	0.729					0.828
	<i>MC5</i>	0.715					0.816
	<i>MC6</i>	0.589					0.709
<b>EP</b>	<i>EP1</i>	0.668	0.900	0.83	0.74	0.66	0.773
	<i>EP2</i>	0.838					0.904
	<i>EP3</i>	0.871					0.929
	<i>EP4</i>	0.875					0.929
	<i>EP5</i>	0.740					0.832
	<i>EP6</i>	0.407					0.510
<b>FP</b>	<i>FP1</i>	0.670	0.806	0.78	0.81	0.68	0.833
	<i>FP2</i>	0.674					0.837
	<i>FP3</i>	0.519					0.689
	<i>FP6</i>	0.612					0.753
	<i>FP7</i>	0.532					0.679
<b>OP</b>	<i>OP1</i>	0.501	0.823	0.82	0.79	0.84	0.650
	<i>OP2</i>	0.582					0.728
	<i>OP4</i>	0.581					0.747
	<i>OP5</i>	0.731					0.861
	<i>OP6</i>	0.759					0.873

IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance

**Source:** Author's compilation

To establish the relationship between latent constructs and their respective observed constructs, measurement items should be above 0.4 (Schreiber *et al.*, 2006:325). In this study, it was noted that all scales had factor loadings above 0.4, which then indicates consistency with the nature of the latent constructs.

### **6.7.1.1 Reliability analysis**

Reliability has been defined as the degree to which a test measures something consistently (Salkind, 2017:62; Middleton, 2019:1). Babbie (2016:149) described reliability as a matter of whether a particular technique, applied repeatedly to the same object, yields the same result each time. Several scholars (Fornell & Larker, 1981:39; Fraering & Minor, 2006:284; Taber, 2018:1273) suggest that the checking of reliabilities is performed using indicators such as a Cronbach's alpha test, Composite Reliability (CR) test, and item-total correlations. This study adopted these three suggested indicators.

#### **6.7.1.1.1 Cronbach's alpha test**

Cronbach's alpha refers to a measure of internal consistency of a test or scale (Tavakol & Dennick, 2011:53; Bonett & Wright, 2014:1). The degree of reliability of a variable should be confined between 0 and 1 to meet the sufficient reliability threshold (Cronbach, 1951:297; Tavakol & Dennick, 2011:53). Consistently, other scholars (Bagozzi & Yi, 1988:74; Padilla, Divers & Newton, 2012:331) state that a construct is deemed reliable when the Cronbach alpha result is equal to or greater than 0.7. The results in Table 6.17 illustrate that all the constructs of this study (IC, IS, MI, TI, MC, EP, FP, and OP) were reliable. They yielded Cronbach values above the 0.7 minimum threshold (IC= 0.904; IS=0.77; MI=0.917; TI=0.811; MC=0.867; EP=0.900; FP=0.806; OP=0.823). These results, therefore, confirm the satisfaction of the criteria of reliability as emphasised by Ursachi, Horonic and Zait (2015:681).

#### **6.7.1.1.2 Composite reliability test results**

Computation of CR values was performed using the following formulae provided by Fornel and Lacker (1981:39).

$$\text{(CR): } CR_{\eta} = (\sum \lambda y_i)^2 / [(\sum \lambda y_i)^2 + (\sum \epsilon_i)]$$

Composite reliability = (Square of the summation of the factor loadings) / [(square of the summation of factor loadings) + (summation of error variances)].

The results presented in Tables 6.17 reveal that the CR values of all constructs (IC=0.85; IS = 0.73; MI = 0.87; TI = 0.74; MC = 0.81; EP = 0.83; FP = 0.78; OP= 0.82) were above the recommended minimum cut-off value of 0.7, which was suggested by Hulland (1999:195) and Borsboom (2006:425).

#### **6.7.1.1.3 Item-to-total correlation**

Item-to-total correlations were also used to determine reliability. Item-to-total correlation represents the degree to which differences among individual responses to the item are consistent. Scholars (Cristobal, Flavian & Guinaliu, 2007:317; Streiner, Norman & Cairney, 2015:84) submit that acceptable item-to-total correlation scores should be equal to or above 0.3. The loadings of all items met the minimum threshold of 0.3 as shown in table 6.17. The results demonstrates that all measurement scales were internally consistent.

#### **6.7.1.2 Computation of the highest shared variance**

Highest shared variance is the maximum amount of variation that a construct is able to explain in another variable (Farrell & Rudd, 2009:4). Newsom (2008:1) defines it as the maximum amount that variations of the two variables tend to overlap. It is used in assessing the discriminant validity of the constructs and is represented by the square of the correlation between any two variables (constructs) (Farrell & Rudd, 2009:4; Essmuis *et al.*, 2014:182). The results of the highest shared variance (HSV) are presented in Table 6.17. The results demonstrate that OP had the highest shared variance of all constructs with a score of 0.84, followed by MC (HSV=0.77), followed by MI (HSV= 0.74), followed by TI (HSV= 0.72), FP (HSV= 0.68), IS (HSV= 0.67), EP (HSV= 0.67) and IC (HSV= 0.57).

#### **6.7.1.3 Validity analysis**

Validity refers to the point at which scale items measure what they intend to measure in a construct (Taherdoost, 2016:28). Babbie (2010:153) refers to validity as the extent to which the measure reflects the real meaning of the concept under consideration. Its prime purpose is to explain how well the collected data covers the actual area of investigation (Ghauri & Gronhaug, 2005:267).

Validity tests are mainly divided into four types, namely, content validity, face validity, construct validity, and criterion-related validity (Creswell, 2005:256). To measure validity, this study used three types of indicators, namely, content, convergent and face validity.

#### **6.7.1.3.1 Face validity**

Face validity refers to whether a test appears to respondents to be measuring what it is supposed to measure (Labbe, 2011:76). Face validity ensures that there are no errors in the measurement and that the questions posed are clear to avoid interviewer bias (Ibid). In this study, face validity was established through consultation with a panel of academics from a selected university of technology. Additionally, the questionnaire was reviewed by the study promoters to ensure that the questions measure what they intend to measure. The reviewers made recommendations in areas such as the wording and grammar of questions, the length of the instrument and its technical layout. These recommendations were implemented prior to the pilot study.

#### **6.7.1.3.2 Content validity**

Content validity is a type of validity that requires that a measure represents all aspects of the conceptual definition of a construct (Neuman, 2014:216). Ruel *et al.* (2015:90) present content validity as the comprehensiveness, relevance, and representativeness of the measurement. In this study, the validity of the content of the constructs of the study was ascertained through a pilot study of the questionnaire. The questionnaire was piloted using a conveniently selected sample of 52 respondents drawn from various public sector organisations in Gauteng, the Free State and North West Provinces. The questionnaires collected from the pilot sample were analysed to check whether respondents had faced challenges in answering the questions. It appeared that respondents were comfortable with the questions and had managed to complete the response within the required time of 15 minutes. Data collected from the pilot sample were then subjected to a reliability test, using the SPSS statistical package. All measurement scales attained Cronbach alphas above 0.7 and item-total correlations above 0.3. As such, no items were removed from the questionnaire, as it showed that its content was valid and reliable. Respondents who participated in the pilot study were excluded from the main survey.

#### **6.7.1.3.3 Construct validity**

Construct validity refers to how well a research instrument measures what it is supposed to measure (Brown, 2010:9). Construct validity is measured using two components, namely, convergent, which seeks to establish how well the indicators of one construct converge, and discriminant validity, which determines how well the indicators of different constructs diverge (Neuman, 2014:217). Therefore, the two components seek to establish if the measures fit the appropriate and expected patterns of relationships with other constructs.

#### **6.7.1.3.4 Convergent validity**

Convergent validity has been defined as the degree to which items converge or share a high proportion of variance (Hair, 2011:96). To measure convergent validity, this study utilised the factor loadings derived from the CFA (refer to Table 6.16) as well as the Average Variance Extracted (AVE) (refer to Table 6.16). The results indicate that all factor loadings related to the items used in measuring each construct were higher than 0,4 as suggested by Marnburg and Luo (2014:39). All the items with factor loadings of less than 0.4 were discarded during scale purification, as suggested by Hair (2011:97). All items used in the data analysis in this study had factor loadings of above 0.4, which suggests that every accepted item met the criteria for convergent validity and measured at least 40 per cent of what they intended to measure.

#### **6.7.1.3.5 Discriminant validity**

Discriminant validity refers to the extent to which a construct is truly distinct from other constructs (Madhankumar & Sathyanarayan, 2014:22). Its purpose is to provide evidence that a construct is unique and captures some phenomenon other measures do not. As suggested by several scholars (Bagozzi & Yi, 1988:74; Zait & Berteau, 2011:217), discriminant validity can be measured using the Q-sorting chi-square difference test, the AVE test and the use of correlations computed during the CFA. Fornell and Larcker (1981:39) further suggest that discriminant validity is ascertained by determining whether the value score of AVE is higher than the threshold of 0.4 and subsequently above the HSV score. In assessing discriminant validity, this study adopted two approaches, namely, the AVE test and correlation analysis. The results of the correlation analysis are presented in Table 6.17.

**Table 6. 17: Inter-construct correlations**

Research construct	IC	IS	MI	TI	MC	EP	FP	OP
IC	1.00							
IS	0.683	1.00						
MI	0.680	0.599	1.00					
TI	0.625	0.771	0.708	1.00				
MC	0.644	0.675	0.733	0.847	1.00			
EP	0.578	0.725	0.601	0.844	0.819	1.00		
FP	0.536	0.506	0.586	0.631	0.703	0.657	1.00	
OP	0.532	0.326	0.572	0.388	0.504	0.409	0.678	1.00

IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation; MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance.

**Source:** Author’s compilation

Table 6.17 presents the correlation matrix of the constructs considered in this study. It shows that there were positive correlations across the individual paired constructs, which were found to be below the cut-off value of 1.0 ( $r=0.683$ ;  $p<0.01$  to  $r=0.325$ ;  $p<0.01$ ), which confirms the adequacy of discriminant validity of the scale items, as recommended by Bagozzi and Yi (1988:74).

#### 6.7.1.4 Model fit analysis

Model fit analysis is a statistical model that describes how well a set of observations fit a theoretical observation (Lui *et al.*, 2016:276). Hair, Anderson, Tatham and Black (2006:11) assert that assessing the fitness of a research model requires a relationship with several indicators (indices) of fitness. To determine the fitness of a research model, indicators such as Chi-square value over degrees of freedom ( $\chi^2/df$ ); Goodness-of-fit Index (GFI); Comparative Fit Index (CFI); Incremental Fit Index; Tucker-Lewis Index (TLI); the Normed Fit Index (NFI); Relative Fit Index (RIF); Root mean square residual (RMR); and Root Mean Square Error of Approximation (RMSEA) are used (Adeyemi, 2009:49). Table 6.18 presents the results of the model fit assessment.

**Table 6. 18: Model fit results for confirmatory factor analysis**

Model fit indices	Accepted threshold values	Sources	Results obtained
$\chi^2/df$	Between 1 to 3 [ $\leq 3.0$ ]	Schreiber, Stage, King, Nora, and Barlow (2006:330)	1.8
RMSEA	Equal to or below 0.08 [ $\leq 0.08$ ]	Browne and Cudeck (1993:137)	0.058

CFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.924
IFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	1.000
TLI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.921
NFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.934
RFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.903

**Source:** Author's own compilation

The model fit was established by the chi-square value over the degree of freedom, which according to Schreiber, Stage, King, Nora, and Barlow (2006:330), should be between 1 and not more than 3. The study also used the values of the Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), the Normed Fit Index (NFI), and the Relative Fit Index (RFI), which all should be equal to or above 0.9 and Root Mean Square Error of Approximation (RMSEA), which should be equal to or below 0.08 (Fan *et al.*, 2016:6). The results in Table 6.19 shows that the chi-square value over degrees of freedom ( $\chi^2/df$ ) was 1.8, which falls within the required threshold of 3 as suggested by Schreiber *et al.* (2006:330). Furthermore, the RMSEA value was 0.058, which is within the recommended bracket of less than 0.08 (Browne & Cudeck, 1993:137). Other indices attained the following scores: CFI = 0.924; IFI = 1.000; TLI = 0.921; NFI = 0.934 and RFI = 0.903. While the values of the CFI and IFI were satisfactory, some of the outcomes fall short on the required threshold of equal to or greater than 0.9, as suggested by several scholars (Bollen, 1990:256; Bagozzi & Yi, 2012:28; Fan *et al.*, 2016:6). All the indices (CFI, IFI, TLI, NFI, and RFI) met the required thresholds, indicating that the model fit was absolute. Various authoritative scholars (Forza & Pilippini, 1998:17; Greenspoon & Saklofske, 1998:965; Hair *et al.*, 2010:96) posit that the threshold of equal to or greater than 0.9 means a satisfactory fit while values greater than 0.8 are acceptable and suggest a good fit. In addition, the data fit the model theoretically since the measurement instruments adopted from several sources managed to meet the thresholds of all other measures such as the reliability, validity, and correlations.

In addition to the above, in literature, there is considerable controversy about fit indices as several scholars suggest different perspectives. Barret (2007:821) suggests that some researchers do not believe that fit indices add anything to the analysis and only the chi-square should be interpreted. They instead believe that the chi-square exact-fit test is the only substantive test of fit for SEM.



However, Barret (2007:821) further submits that the chi-square’s sensitivity to discrepancies from expected values at increasing sample sizes can be problematic if those discrepancies are considered trivial from an explanatory-theory perspective. Hayduk, Cummings, Boadu, Pazderka-Robinson, and Boulianne (2007:841) argue that cut-off values for a fit index can be misleading and subject to misuse. This resonates with the view submitted by Kenny (2015:2) that most analysts believe in the value of fit indices but caution against strict reliance on cut-offs. Given all the insights above, the model fit indices in this study were retained as they met the suggested thresholds. The next section discusses the path analysis results.

## 6.8 PATH ANALYSIS RESULTS

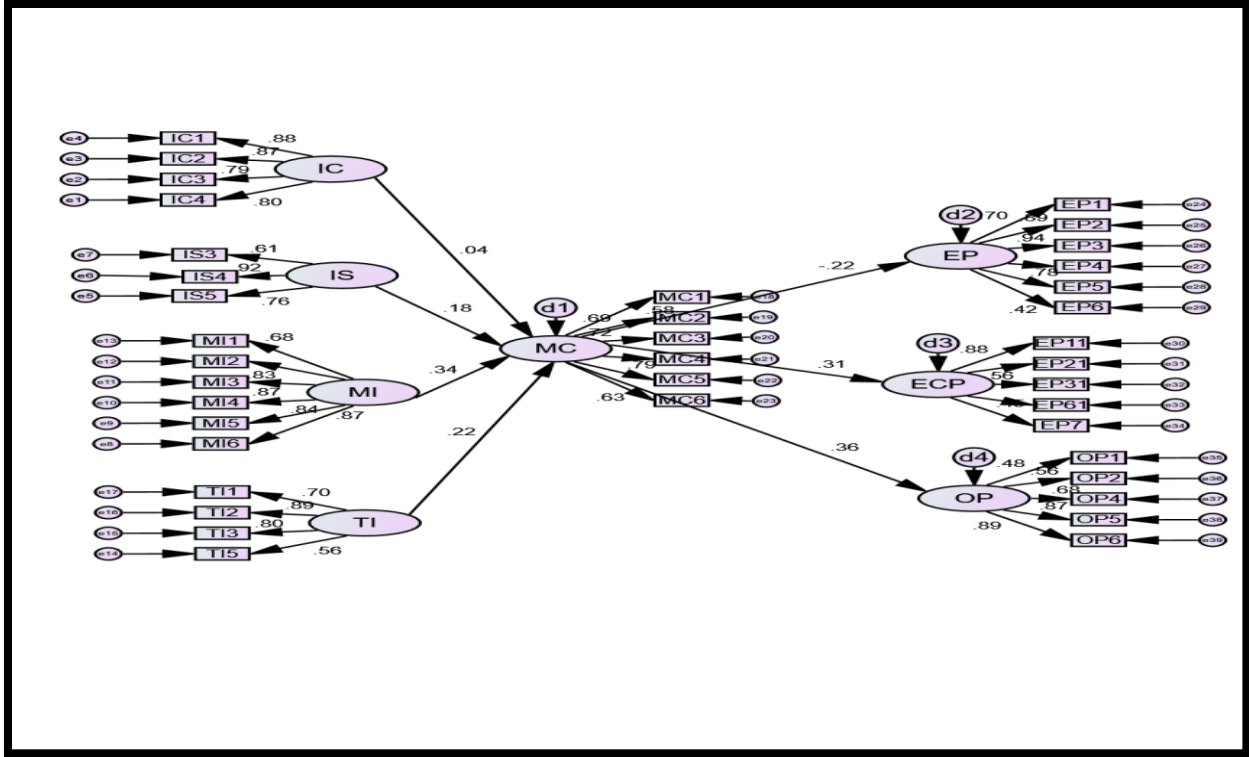
Path analysis refers to a form of multiple regression statistics that are used to evaluate causal models by examining the relationships between a dependent variable and two or more independent variables (Crossman, 2019:1). In this study, path analysis was used to test the hypotheses and establish their validation or non-validation based on the results obtained from SEM. Model fit was also tested in the path analysis using the same indicators used in the CFA. The results are reported in Table 6.19.

**Table 6. 19: Model fit results for path analysis**

Model fit indices	Accepted threshold values	Sources	Results obtained
$\chi^2/df$	Between 2.0 and 5.0 [ $\leq 5.0$ ]	Wheaton, Muthen, Alwin and Summers (1997:84); Hooper, Coughlan, and Mullen (2008:53)	3.872
RMSEA	Equal to or below 0.08 [ $\leq 0.08$ ]	Browne and Cudeck (1993:137)	0.073
CFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.905
IFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.907
TLI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.982
NFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.914
RFI	Equal to or greater than 0.90 [ $\geq 0.9$ ]	Bollen (1990:256)	0.903

**Source:** Author’s own compilation

In Table 6.19, the SEM model fit of this study was ascertained by combining several indices, namely: Chi-square value over degree of freedom ( $\chi^2/df$ ), Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), the Normed Fit Index (NFI), Relative Fit Index (RIF) and Root Mean Square Error of Approximation (RMSEA) (Hooper *et al.*, 2008:53). As indicated in Table 6.20, the Chi-square value over degree of freedom ( $\chi^2/df$ ) was 3.872, which is below the upper threshold of 5.0 suggested by scholars, such as, Wheaton *et al.* (1997:84) and Hooper *et al.* (2008:53). In addition, the RMSEA value was 0.073, which is below the recommended cut-off value of 0.08 suggested by Browne and Cudeck (1993:137). Indices such as CFI, IFI, TLI, NFI and RIF had values of 0.905, 0.907, 0.609, 0.982, and 0.903, respectively. These values fall within the acceptable thresholds of above 0.9, as recommended by Bollen (1990:256). As demonstrated in the discussion above, the results of the indices were acceptable. Therefore, the model was retained since all the indices values were satisfactory. The Chi-square, which is the substantive test of the SEM model fit falls within the cut-off value (Barret, 2007:821). In support of this view, Hu and Bentler (1999:2) suggest that the Chi-square is the traditional measure for evaluating overall model fit and assesses the magnitude of discrepancy between the sample and fitted covariance matrices. Other scholars (Mulaik *et al.*, 1989:430; Kline, 2005:448; Barret, 2007:815) highlight that the Chi-square is the one that is used to determine the lack of fit. In addition, SEM results were supported by an additional set of results obtained through regression analysis. These results complement the SEM results and show similar outcomes, which confirms that both sets of results are useful. The results for the path analysis are presented in the structural model in Figure 6.18.



**Figure 6. 19: Structural path model**

**Source:** Imported from AMOS graphics

The structural path model in Figure 6.18 shows the latent variables (IC, IS, MI, TI, MC, EP, FP, OP), their associated observed variables and error terms. The unidirectional arrows between the latent constructs are the structural paths that were tested in this study and the figures attached are the path coefficients. For example, the path coefficient between IC and MC is 0.04. The highest path coefficient is between MC and OP ( $\beta = 0.36$ ). The factor loadings are the figures slotted in the arrows between the latent and observed variables.

**6.8.1 Regression analysis**

Regression analysis is a test for predictive relationships between independent and dependent variables (Sarstedt & Mooi, 2014:194). In this study, regression analysis was performed to check the relationships between the constructs. Regression models were run since there are two types of relationships to be tested. In Regression Model 1, four innovation capability practices (IC, IS, MI and TI) were entered as independent variables, while MC was entered as the dependent variable. In Regression Model 2, MC was entered as the independent variable while EP was entered as the

dependent variable. In Regression Model 3, MC was entered as the independent variable while FP was entered as the dependent variable. In Regression Model 4, MC was entered as the independent variable while OP was entered as the dependent variable. Each regression model is presented in an Ordinary Least Squares (OLS) regression equation, presented in Table 6.20.

**Table 6. 20: Regression equations for all models**

Regression model	Dependent variable	Independent variables	Equation
1	MC	IC, IS, MI, IT	$MC = \beta_0 + \beta_1(IC) + \beta_2(IS) + \beta_3(MI) + \beta_4(IT)$
2	EP	MC	$EP = \beta_0 + \beta_1(MC)$
3	FP	MC	$FP = \beta_0 + \beta_1(MC)$
4	OP	MC	$OP = \beta_0 + \beta_1(MC)$

$\beta_0$  is the constant or intercept, and  $\beta_1$ -4 are the coefficients of the independent variables  
 IC= innovation culture; IS= innovation strategy; MI= market innovation; TI= technological innovation;  
 MC= market competitiveness; EP= environmental performance; FP= financial performance; OP = operational performance.

**Source:** Author's own compilation

An assessment was made regarding the fulfilment of the assumptions of the regression analysis in this study. First, the sample size applied in this study (n=278) was considered adequate, based on the recommendation by Field (2005:620) and Hair *et al.* (2010:98). Second, the data used in this study were notably distributed, as indicated through closely aligned standard deviations (refer to Table 6.21). Third, computations performed regarding the Variance Inflation Factor (VFI) and Tolerance values indicated a limited threat of multicollinearity among the independent variables. If the VFI is greater than 10, then the collinearity of the independent variables is undesirable. On that score concerning the current study, the VFI value for the independent variables was above 2, which is in the acceptable range within the 10.0 upper cut-off point. Moreover, regression tolerance levels above 0.1 are desirable as they indicate that fewer challenges were encountered in multicollinearity. In the present study, the tolerance levels in both models ranged from 0.1 to nearly 0.5, suggesting that the multicollinearity did not indicate a severe threat amongst the independent variables in the study. Therefore, the assumptions of the regression analysis were not violated in this study.

### 6.8.1.1 Regression Model 1

The results regarding Regression Model 1 are presented in Table 6.21.

**Table 6. 21: Regression Model 1: Innovation capability practices and market competitiveness**

Independent variables: Innovation capability practices		Dependent variable: Market competitiveness						
		Unstandardised coefficients		Standardised coefficients	Sig.		Collinearity statistics	
		$\beta$	Std. error	Beta	t	p	Tolerance	VFI
Regression Model 1	(Constant)	1.569	.343		4.577	.000		
	IC	.026	.031	.046	.849	.397	.961	1.040
	IS	.121	.057	.130	2.111	.036	.746	1.341
	MI	.295	.065	.268	4.515	.000	.807	1.239
	TI	.206	.061	.214	3.387	.001	.708	1.413

R= 0.475; Adjusted R<sup>2</sup> = 0.214; F = 19.899 p<0.05\*

Source: Extracted from SPSS (Version 26.0)

Analysis of Regression Model 1 (Table 6.21) indicates that the influence of innovation capability practices approximates to 47.5 per cent (Adjusted R<sup>2</sup> = 0.475) of the variance of MC in South African State enterprises. The remaining 62.5 per cent of the variance is explained through factors that were not considered in this study. The regression matrix indicates that IC ( $\beta = 0.046$ ;  $p = 0.397$ ), IS ( $\beta = 0.130$ ;  $p = 0.036$ ), MI ( $\beta = 0.268$ ;  $p = 0.000$ ) and TI ( $\beta = 0.214$ ;  $p = 0.001$ ) contributes positively towards MC. The results, therefore, validate that effective formulation and implementation of innovation capacity practices (IC, IS, MI, and TI) leads to MC in South African state enterprises.

### 6.8.1.2 Regression Model 2

The results regarding Regression Model 2 are presented in Table 6.22.

**Table 6. 22: Regression Model 2 Market competitiveness and environmental performance**

Independent variable: Market competitiveness	Dependent variable: Environmental performance						
	Unstandardised coefficients		Standardised coefficients	Sig.		Collinearity statistics	
	$\beta$	Std. error	Beta	t	p	Tolerance	VFI
Construct	3.543	.412		8.599	.000		
MC	-.284	.092	.183	-3.097	.002	1.000	1.000

R= 0.183; Adjusted R<sup>2</sup>= 0.030; F= 9.594; p< 0.05\*

Source: Extracted from SPSS (Version 25.0)

Analysis of Regression Model 2 (Table 6.22) revealed that MC (Adjusted R<sup>2</sup> = 0.030) explained approximately 3 per cent of the variance in EP in South African state enterprises. MC ( $\beta = 0.183$ ;

p= 0.002) further contributed positively towards the EP of South African state enterprises. This indicates that improved and better MC enhances the EP in the South African State enterprises.

### Regression Model 3: Supply chain execution and supply chain reliability

The results regarding Regression Model 3 are presented in Table 6.23.

**Table 6. 23: Regression Model 3: Market competitiveness and financial performance.**

Independent variable: Market competitiveness	Dependent variable: Financial performance						
	Unstandardised coefficients		Standardised coefficients	Sig.		Collinearity statistics	
	$\beta$	Std. error	Beta	T	p	Tolerance	VFI
Construct	2.643	.302		8.762	.000		
MC	.377	.067	.321	5.622	.000	1.000	1.000
R= 0.321; Adjusted R <sup>2</sup> = 0.099; F= 31.602; p< 0.05*							

**Source:** Extracted from SPSS (Version 27.0).

The results of Regression Model 3 analysis (as shown in Table 6.23) specifies that MC (Adjusted R<sup>2</sup> = 0.099) explained approximately 10 per cent of the variance in FP in South African State enterprises. The outstanding 90.0 per cent of the variance is therefore explained through factors that were not considered or included in this study. The F-value (F=31.602) in Table 6.23 indicates that the value is more than one. This result highlights that there is a significant relationship between the MC and FP. The results, therefore, conclude that the implementation of MC practices has a significant influence on FP in the surveyed South African State enterprises.

### Regression Model 4: Market competitiveness and operational performance

The results regarding Regression Model 4 are presented in Table 6.24

**Table 6. 24: Regression Model 4: Market competitiveness and operational performance**

Independent variable: Market competitiveness	Dependent variable: operational performance						
	Unstandardised coefficients		Standardised coefficients	Sig.		Collinearity statistics	
	$\beta$	Std. error	Beta	t	p	Tolerance	VFI
Construct	2.829	.292		9.702	.000		
MC	.336	.065	.298	5.179	.000	1.000	1.000
R= 0.298; Adjusted R <sup>2</sup> = 0.085; F= 26.817; p< 0.05*							

**Source:** Extracted from SPSS (Version 27.0)

Table 6.24 highlights the results of Regression Model 4 analysis. The results reveal that MC (Adjusted  $R^2 = 0.085$ ) explained approximately 8.5 per cent of the variance in OP in South African State enterprises. The residual 91.5 per cent of the variance is explained through factors that were excluded in this study. The F-value ( $F=26.817$ ) in Table 6.24 indicate that the value is far from one, explaining that there is a significant relationship between the MC and OP. The results therefore validate that MC practices can influence OP in the surveyed South African State enterprise. The results of the regression analysis are generally consistent with those computed through the SEM approach. The differences, in which the regression results are slightly lower than the SEM results, are quite modest and can be disregarded. These differences are because SEM is a more robust and complex form of analysis that relies on a good model fit between the data and the theoretical and structural model, providing results that are more valid. In view of this, the SEM results remain as the primary estimates of the proposed relationships between the latent variables in this study.

### **6.8.2 HYPOTHESES TEST RESULTS**

A scientific hypothesis (also known as a research hypothesis) is a statement about the expected result of a methodical study (for example, a thesis or dissertation) (Neuman, 2016:248). Sekaran and Bougie (2016:14) assert that a hypothesis is a perception that is tested through experiments and research. It is an inference tested by research (Saunders *et al.*, 2016:497). Nora *et al.* (2017:308) argue that for a hypothesis statement to be valid, it should include three attributes, that is – specificity, testability, and falsifiability. Therefore, hypothesis testing is an act in research whereby a researcher tests an assumption regarding a population parameter (Neuman, 2016:248). Cangur and Ilker (2015:72) held that a hypothesis testing evaluates the credibility, plausibility and acceptability of a hypothesis by using sample data. Such data may come from a data-generating process or from a larger population. The results of the hypotheses tests, based on SEM, are reported in Table 6.25.

**Table 6. 25: Results of structural equation model analysis**

Path	Hypothesis	Path coefficient	Significance	Outcome
Innovation culture → market competitiveness	H <sub>1</sub>	0.046	0.397	Not supported and insignificant
Innovative strategy → market competitiveness	H <sub>2</sub>	0.130	0.036	Supported and significant
Market innovation → market competitiveness	H <sub>3</sub>	0.268	***	Supported and significant
Technological innovation → market competitiveness	H <sub>4</sub>	0.214	***	Supported and insignificant
Market competitiveness → environmental performance	H <sub>5</sub>	0.183	0.002	Supported and significant
Market competitiveness → Financial performance	H <sub>6</sub>	0.321	***	Supported and significant
Market competitiveness → Operational performance	H <sub>7</sub>	0.298	***	Supported and significant
Structural model fits: $\chi^2/df=3.872$ ; RFI=0.903; IFI=0.907; CFI=0.905; NFI=0.914; TLI=0.982; RMSEA=0.073				
significance level <0.001 ***				

**Source:** Author's own computation

As depicted in Table 6.25, seven hypotheses were tested in this study. Table 6.25 shows that six hypotheses (H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub>, H<sub>5</sub>, H<sub>6</sub>, and H<sub>7</sub>) were accepted whilst one hypothesis (H<sub>1</sub>) was rejected. The discussion of the results is presented in the next section.

### 6.8.2.1 Discussion of results

This section discusses the results of the hypotheses tests performed to address the empirical objectives. The study utilised the two main criteria under SEM to validate and confirm each hypothesis. The first criterion included checking the path coefficients, which are represented by a beta ( $\beta$ ). For a hypothesis to be supported and significant, the path coefficient must be positive or negative (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014:106). The second criterion constitutes the significant influence of the constructs. The significant influence constitutes three levels, which are represented by stars also known as p-values. The levels of influence include values with at least three stars (\*\*\*), which represent p-values less than 0.001, two stars (\*\*) represent p-values less than 0.05, and one star (\*) denotes a p-value less than 0.1.



**Hypothesis H1: Innovation culture has a significant positive influence on MC in South African State enterprises.**

The results from Table 6.26 show that IC has an insignificant influence on MC ( $\beta = 0.046$ ;  $p = 0.387$ ). The p-value for individual consideration is higher than the common alpha level of 0.05, which indicates that the impact of IC as a predictor of MC is not statistically significant. Thus, the hypothesis is not supported, is insignificant and rejected. As indicated in Table 6.26, if the implementation of innovation culture practice increases, MC, on the other hand, increases by a small margin of 4.6 per cent, which is a very insignificant margin to be considered in influencing a meaningful hypothesis relationship. Thus, hypothesis H1 indicates an insignificant relationship between the two variables. The result indicates that there is no relationship between the two variables. This result is in contrast with previous studies (Darvish & Nazari, 2016:2; Lee & Xuan, 2019; Ropret *et al*, 2019:68), which showed a significant relationship between IC and MC practices in business organisations. Other empirical research results have also suggested that MC can be influenced positively using IC practice (Azar & Ciabuschi, 2017:324; Lee & Xuan, 2019). This result may be because IC as an innovation capability practice might be a new concept in South African State enterprises. Lekhanya (2015) states that most State enterprises in South Africa lack innovational cultures, and hence they are unaware on how to implement the capability in their enterprises.

Furthermore, this could be because IC in most South African State enterprises is still at its inception stage. Hence, the management and owners of these firms are still finding a balance in terms of which innovation culture to apply for their MC. Sattayaraksa and Boonitt (2017:731) pronounce that IC has been a critical concern for State enterprises in South Africa, and its implementation is still at its foundation stage. In addition, Edsand (2017:4) state that State enterprises in developing countries (e.g., South Africa) lack the systems and technology to implement IC and MC initiatives. Finally, the available leadership practices may be generally unfavourable to IC practices, leading to an insignificant relationship between the variables. These issues and several others within the South African State enterprises point to entrenched IC problems and MC improvements. It could be that top management of these enterprises fails

to apply the perfect IC practices to attain MC. Therefore, the State enterprises in South Africa is responding to this lack of IC, hence the view that (IC as an innovation capability practice) does not necessarily influence MC.

**Hypothesis H2: Innovation strategy has a significant positive influence on market competitiveness in South African State enterprises.**

The results of the analysis show that IS has a significant influence on MC. This was shown by a strong positive path coefficient of ( $\beta = 0.130$ ;  $\rho < 0.05$ ), which exhibits that a relationship exists between IS and MC. Therefore, H2 was supported and significant. This result illustrates that if IS increases, MC, on the other hand, increases by a margin of 37 per cent. This indicates that there is a relationship between IS and MC. The results of the study also reveal that where there are innovation strategies, State enterprises' ability to be competitive in the marketplace is improved. Therefore, it can be concluded that IS improves the MC of SOEs in South Africa. The results of this study suggest that innovation strategies, as an innovation capability, positively influences MC in State enterprises in South Africa. This result confirms the view of Baker *et al.* (2019:303), who submit that innovation capability in the form of implementing strategies influences positively the market competitiveness of business organisations. Svahn *et al.* (2017:240) assert that market competitiveness depends highly on the implementation of innovation strategies. Several other scholars, such as Zeithaml *et al.* (2020:34), noted that the success of state-owned enterprises revolves around a sound and effective formulation and implementation of IS. Ekman *et al.* (2020:4) share the same sentiments as they report that market competitiveness is because of innovation strategies, supported by the top management in an organisation. Therefore, SOEs in South Africa must formulate and implement the proper IS for the achievement of a robust market competitiveness

**Hypothesis H3: Market innovation has a significant positive influence on market competitiveness in South African State enterprises.**

The results of the study, through the path analysis, reveal that MI exerts a positive and significant influence on MC. Hypothesis 3 was therefore accepted due to the strong and positive relationship ( $\beta = 0.268$ ;  $\rho < 0.01$ ) that was found between the two constructs. The results, as shown in Table 6.24, demonstrate that if MI increases, MC, in turn, increases by almost 27 per cent. This shows that a significant relationship exists between the two variables. The result also reveals that where there is MI in State enterprises, the performance of suppliers is enhanced. The result of this study

indicates that MI is the leading driver of MC in the State enterprises in South Africa. Therefore, MI predicts MC. The results suggest that MI improves MC in State enterprises. The results presented above confirm the assertion by Ekman *et al.* (2020:1) who establish that MI influences MC. The results of this study also infer that SCI enables public sector organisations and their supply chain partners to commit to each other and increase efforts of co-operation. Elliot *et al.* (2018:620) posit that MI leads organisations into gaining MC. Moreover, the results of this study reveal that MI increases visibility, flexibility, and agility causing organisations to attain MC. In addition, Storbacka (2019:4) found that innovation capabilities have a significant positive effect on MC.

**Hypothesis H4: Technological innovation has a significant positive influence on market competitiveness in South African State enterprises.**

The results from the hypothesis tests presented in Table 6.26, show that TI has a significant predictive influence on MC ( $\beta = 0.214$ ;  $p = 0.000$ ). The p-value is less than 0.05, indicating that hypothesis H4 is supported, significant and thus, is accepted. Table 6.26 shows that if the implementation of TI practice increases, MC, on the other hand, increases by 21.4 per cent, which is a significant margin to be considered in determining a meaningful hypothesis relationship. Empirical evidence on innovation capabilities has also supported the results obtained in this study (Lopes *et al.*, 2017:477; Utterback, 2017:77; García-Sánchez *et al.*, 2018:771). The result of this hypothesis (H4) is therefore discussed under the following suggestions. First, this positive and significant result on the influence of MC by TI capability can have substantial implications for SOEs in South Africa. The MC processes in the SOEs need technological research and development. Thus, technological innovation policies may need to be guided by the desire to inspire, motivate and improved MC practices in SOEs in South Africa. Second, the positive outcome of this relationship confirms that if SOEs in South Africa direct their efforts towards the TI practice, there is a greater possibility that the MC can be improved. These practices include a positive creative environment, R& D and ITC programmes, training, and development. It is therefore, concluded that the practice of TI in SOEs has a positive influence on the MC.

**Hypothesis H5: Market competitiveness has a significant positive influence on environment performance in South African State enterprises.**

The results of the hypothesis test revealed that MC has a significant influence on EP. This was shown by a positive coefficient of beta ( $\beta = 0.183$ ;  $p = .0001$ ), and the p-value is less than 0.05,

indicating that hypothesis H5 is supported, significant, and thus it is accepted. Furthermore, Table 6.26 shows that if the MC practice increases, EP, on the other hand, increases by 18.3 per cent, which is a significant margin to be considered in determining a meaningful hypothesis relationship. These results agree with the results obtained from studies by Nguyen *et al.* (2020:271), whose studies reveal a positive and significant relationship between MC and EP in manufacturing industries. The result of this hypothesis (H5) is therefore discussed under the following suggestions. The above finding has practical implications in understanding how MC can influence the EP in SOEs in South Africa. In addition, these outcomes, which show a positive and significant relationship, provide a critical piece of empirical evidence for supply chain research. Investigating the MC practices, influencing EP in SOEs, particularly in South Africa, is crucial to realise the strategic value and competitive advantage (Zhang, 2017:539). Therefore, the results from this relationship can practically mean that the expedition towards EP hinges somewhat on SOEs' ability to apply MC practices in their organisational processes. This study shows that MC influences the EP in the SOEs in South Africa.

**Hypothesis H6: Market competitiveness has a significant positive influence on financial performance in South African State enterprises.**

The results of the hypothesis test revealed that MC has a significant influence on FP. This was shown by a positive coefficient of ( $\beta = 0.321$ ;  $p = 0.000$ ), which exhibits that a relationship exists between MC and FP. Therefore, hypothesis H6 was supported and significant. This result illustrates that if MC initiatives are increased in manufacturing SMEs' supply chains, FP, on the other hand, increases by a margin of 32.1 per cent. This indicates that there is a significant positive relationship between MC and FP. Therefore, MC improves the FP in SOEs in South Africa. The hypothesis H6 was accepted. The results of this hypothesis test strongly support the finding that the MC does affect the organisational performance. This result, through empirical observations, confirms the assertions of Ellis (2018:22), who pointed out that the implementation of MC programmes, have a significant effect on the FP in SOEs in South Africa. These results seem to agree with studies such as Lee (2018:3), who establish a significant positive relationship between MC and FP.

From a practical perspective, two leading suggestions can be drawn from the empirical evidence obtained from this result. First, this hypothesis test result is vital, given the existing South African and global volatile market environment where recession is increasing. Markets are becoming

increasingly complex and dynamic (Matar & Eneizan, 2018:3). Therefore, the need to improve on MC has become more apparent in the pursuit of achieving FP excellence (Coetzee & Kleynhans, 2019:3). Pilcher (2017:451) suggests that the understanding of MC leads to the development of FP strategies that reduce costs, make procurement predictable, clarify supplier partnership decisions and provide control over suppliers in negotiations. Thus, South African SOEs are more perceptive and incisive to exhibit MC explorative behaviours compared to those that are exploitative. Lastly, exploiting their MC models and tactics with the intention and hope of embracing maximum value for their businesses is no longer sufficient. Hadi *et al.* (2018:75) note that SOEs have to embrace new practices in their structures to meet the prospects of a flexible global market. These new practices include relationship agility, measurement integration, and technology, planning execution, material and service supplier integration, internal operations and customer integration. Therefore, SOEs in South Africa have to dig deep and explore further than normal and diversify their MC dimension within their respective industries and at the global level. This makes it essential for SOEs in South Africa to focus on enhancing factors linked to MC to appreciate the FP benefits.

**Hypothesis H7: Market competitiveness has a significant positive influence on operational performance in South African State enterprises.**

The results of the path analysis indicate that MC influences OP in South African SOEs. The results support and accept the stated hypothesis (H7) as indicated in Table 6.26 with a path coefficient of ( $\beta = 0.298$ ;  $\rho < 0.01$ ). The result demonstrates that there is a relationship between MC and OP. This implies that when MC is increased in SOEs, there is also an increase in OP with a margin of 29.8 per cent, which shows that there is a significant relationship between these variables. The results also indicate that where there is MC, the FP increases. The results of this study suggest that MC in SOEs enables public procurement systems flexibility in terms of sourcing, reduction in costs, and increased return on investment, thereby providing them an edge to reach their full competences. This result is in congruency with a study by Hudson *et al.* (2018:1097), which establishes that SOEs that are markets aligned and innovation-oriented perform better in terms of operations and finances. The results suggest that SOEs that pursue all types of operations such as product innovation, process innovation, and technological innovations increase strategic partnerships with both internal and external stakeholders and enable sturdy OP. Reliably, Kwaku

and Satyendra (2018:386) coined that MC in developing products, markets, knowledge, and new technologies improves OP within SOEs. Hence, MC is an essential factor in increasing OP.

## **6.9 THE LINK BETWEEN THE RESULTS OF THE STUDY TO THE RESEARCH THEORIES**

This section discusses the link of the results of this study to the research theories, which are the resource dependency theory and resource agency theory.

### **6.9.1 Resource dependency theory**

Resource dependency theory is centred on the principle that an organisation, such as an SOE, must engage in transactions with other organisations in its environment in order to acquire resources (Kwaku & Satyendra, 2018:386). Although such transactions may be advantageous, they may also create dependencies that are not. Resources that the organisation needs may be scarce, not always readily obtainable, or under the control of unco-operative organisations. The resulting unequal exchanges generate differences in authority, power, and access to further resources. To avoid such dependencies, organisations develop strategies (as well as internal structures) designed to enhance their bargaining position in resource-related transactions. Such strategies include increasing the organisation's scale of production, taking political action, diversifying, and developing links to other organisations. Strategies such as diversifying product lines may lessen a firm's dependence on other businesses and improve its power and advantage.

Thus, this study used RDT to explain the internal mechanism between innovation capabilities and MC, which provides a new theoretical explanation for MC. This study shows that inbound innovation capabilities are conducive to reducing the SOEs' dependency on several specific resources of external organisations, whereas outbound TI is beneficial for improving more external organisations' dependency on SOEs' resources. Therefore, the SOEs' in South Africa can improve MC by capturing a variety of resources needed for product innovation. Previous innovation capability studies that focused on RDT considered that the inbound and outbound TI could help promote information flow, MC, mutual benefits, and mutual trust, thereby improving the SOEs' competitive edge and performance (Zhu *et al.*, 2017). Guided by RDT's perspective, this study suggested that innovation capabilities influence the resource dependency relationship among partners through different channels and further influence MC. The RDT contributes to explaining the difference between innovation capabilities. In addition, this study indicated that the MI affects

MC by influencing the resource dependency relationship. Results verified the opinion that innovation capability conditions can influence the resource dependency relationship among organisations. Congruous with the study's theoretical model, the results show that three innovation capability factors, including IS, MI, and TI, are positively correlated with MC in South African SOEs. The findings also suggested that innovation capabilities enhanced by the ability of creativity that perform and maintain expected market improvements fosters the development of common goals and joint planning for MC. This result highlights that a high level of innovation facilitates MC to maintain responsive and responsible operations to better deal with uncertainty in the markets.

### **6.9.2 Resource-based view theory**

The Resource Based View theory is centred on the premise that an organisation must acquire core and critical resources, which are difficult for a competitor to imitate. The theory also aims to ensure that organisations maximise their performance and develop a sustainable competitive advantage by exploiting the resources at their disposal. The Resource Based View theory assumes that organisations determine their success or failure by providing an allowance for them to check and review their disposable resources and decide how best to bundle them to outplay their industry competitors. Thus, it facilitates organisations to consider the resources at their disposal to unlock the capabilities that are within the organisation to gain a competitive advantage.

In this study, the three performance systems (EP, FP, and OP) are considered as resources dependent. The results of the study indicate that all three-business performance, that is, EP ( $\beta = 0.183$ ;  $\rho < 0.001$ ), FP ( $\beta = 0.321$ ;  $\rho < 0.001$ ) and OP ( $\beta = 0.298$ ;  $\rho < 0.001$ ) have significant relationships with MC. These results are in line with the resource-based view theory because business performance outcomes are tangible and vital resources to South African SOEs' market innovation and competitiveness. In this study, the RBV also deals with the competitive business environment faced by SOEs in South Africa but takes an inside out approach that is, it starts with an analysis of the firm's internal environment. As such, RBV is often considered as an alternate to Porter's five-forces model. The RBV emphasizes internal resources and capabilities of firms in formulating strategy to achieve sustainable competitive advantages in the marketplace. Internal resources and capabilities determine strategic choices made by firms while competing in the external business environment. The organisation's abilities also allow some businesses to add value in the market value chain, develop new products or expand in new marketplace. When

organisations' capabilities are considered as paramount in the creation of competitive advantages, it will focus on reconfiguration of value chain activities. This is necessary as it provides opportunity to identify the capabilities within value chain activities, which provide it with competitive advantages. The RBV draws upon the resources and capabilities that reside within the organisations to develop sustainable competitive advantages. Resources (innovation capabilities) may be considered as inputs that enable firms to carry out their activities and enhance business performance.

## **6.10 CHAPTER SUMMARY**

Chapter Six provided understandings and perceptions into all the activities linked to data collection and its analysis as presented in Chapter Five. The study substances addressed in this chapter include the response rate, descriptive analysis of the results, and inferential statistics of the collected data where the path, SEM, hypotheses testing, and regression analyses were performed to establish the relationship between the variables. First, descriptive analysis was performed on the demographic profile data of the respondents and their organisations. The analysis also provided the mean scores and standard deviations of the constructs. The descriptive analysis also showed the skewness and kurtosis to determine the distribution of data. The results of the mean scores indicated that most of the responses leaned towards the 'agree' side of the Likert scale applied. After the descriptive statistics, the collected data were subjected to the EFA procedure to test the factor structure. Lastly, the path and regression analyses procedures were performed to assess the psychometric properties of the constructs and to examine the hypotheses dependencies, where six hypotheses were supported and accepted whilst one was unsupported. The next chapter focuses on the conclusions and recommendations of the study.



## **CHAPTER 7**

### **CONCLUSIONS, RECOMMENDATIONS, LIMITATIONS, AND IMPLICATIONS FOR FUTURE RESEARCH**

#### **7.0 CHAPTER OVERVIEW**

The main aim of this chapter is to provide a concluding analysis of the study. It first provides an overview of the whole study, presenting conclusions to each theoretical objective set for the study. The chapter then provides conclusions established on the empirical objectives. It also presents recommendations that could be adopted by SOEs in South Africa to increase the influence of innovation capabilities on MC and business performance. Moreover, the chapter explores both theoretical and practical contributions to the study. Finally, it outlines the limitations, suggestions for further studies, and the study's overall conclusion.

#### **7.1 REVIEW OF THE STUDY**

The key aim of this study was to examine the relationship between innovation capabilities, MC, and business performance in the South African SOEs supply chains. The thesis developed from the study is divided into seven chapters. The first chapter was divided into 18 sections that discussed the introduction, background to the study, outlined the problem statement, research aim, objectives, conceptual framework, a summary of research hypotheses, significance of the study, research theories, a preliminary literature review, a brief research methodology, statistical analysis, ethical considerations, definition of terms, chapter outline and chapter summary.

The second chapter on the literature review on SOEs was divided into eight sections. The first section discussed the chapter's overview. The second section reviewed the conceptualisation of SOEs. The third section reviewed the literature on the growth of SOEs in South Africa. The fourth section reviewed the literature on the challenges faced SOEs in general. Section five reviewed the literature on the challenges faced by SOEs in South Africa. Section six reviewed the literature on SCM in SOEs in South Africa. Section seven discussed the legislation framework on SOEs in South Africa, while Section Eight discussed the chapter's overview.

Chapter Three, which reviewed the literature on the research theories and innovation capabilities, was divided into nine sections. Section one covered the chapter overview and discussed literature

on innovation capabilities. Section two discussed literature on research theories. The theories explained in this section include the RDT and the RBV. Section three discussed literature on innovation capabilities in SOEs. Section four reviewed previous studies on innovation capabilities. Section Five discussed innovation culture and Section six discussed the innovation strategy dimension, section seven reviewed literature on MI. Section 8 discussed TI and section 9 was the chapter summary.

Chapter Four, which discussed the literature review on MC, business performance and hypothesis formulation, was divided into eight sections. Section one discussed the introduction of the chapter, and Section two reviewed the literature on MC. Section three discussed literature on business performance in SOEs. Sections four, five and six discussed business performance and its dimensions used in this study, while Section seven focused on the conceptual model and hypothesis development, and Section eight was the conclusion.

In Chapter Five, the methodology applied in this study was discussed in detail. The chapter was divided into 18 sections, in which the first section discussed the chapter overview, while the second section discussed the forms of reasoning that influence research studies. The second section also highlighted the reasoning model that was applied. The third section discussed research paradigms or philosophies that influence research on the methodology used in collecting research data. The fourth section focused on the research approach, whereas the fifth section discussed the research designs. The sixth section discussed the research strategies of the study. Section seven outlined and discussed time horizons (dimension) that were adopted for the study. Section eight discussed how secondary data was collected. Section nine focused on the appraisal of the previous literature review chapters. Section ten of the chapter discussed the empirical part of the methodology that constitutes the sampling design, sampling techniques, research population, sample size, and sampling frame. The eleventh section discussed the procedures for data collection and research instruments, whereas section 12 focused on Questionnaire administration. Section 13 focused on data analysis and statistical approaches.

In addition, Section 14 discussed the reliability methods, and Section 15 discussed the validity forms used in the study. Section 16 explained the model fit analysis results. Ethical considerations were discussed in Section 17. Lastly, section 18 presented the chapter's summary.

Chapter Six of the study, which focused on data analysis and interpretation, was divided into ten sections. The first section discussed the study's introduction, whilst the second section focused on the pilot study results. The third section was on calculating the response rate of the study. The fourth section divulged the explanatory factor analysis results. The fifth section focused on descriptive statistics. The testing was realised through the exploratory factor analysis and the skewness and kurtosis test. Section 6 discussed the normality testing of data, and Section 7 focused on inferential statistics of the research constructs. Section eight focused on discussing the path analysis results, and hypothesis test results. Section 9 discussed the link between the research theory and the study's results, while Section 10 focused on the summary and conclusion of the chapter.

Chapter Seven discusses the conclusion and recommendations. The chapter is divided into fourteen sections. The first section provides the introduction of the chapter. The second section presents the review of the study, whereas the third section focuses on presenting conclusions based on the theoretical objectives of the study. The fourth section presents conclusions based on empirical objectives, whilst the fifth section presents the recommendations. Section six of the chapter presents the study's contributions, and lastly, section seven presents the limitations of the study.

## **7.2 CONCLUSIONS BASED ON THE THEORETICAL OBJECTIVES**

This section discusses the conclusions based on the theoretical objectives of the study. As indicated in Chapter 1 (refer to subsection 1.3.3), the following theoretical objectives were set for the study:

- v. to analyse literature on SOEs.
- vi. to explore literature on innovation capabilities that include innovation strategy, innovation culture, market innovation and technological innovation.
- vii. to conduct a literature review on market competitiveness; and
- viii. to conduct a literature review on business performance.

### **7.2.1 Conclusions based on the literature review of SOEs**

The first theoretical objective focused on conducting a literature review on the South African SOEs. This objective was achieved in the second chapter of this study. The review acknowledged the importance of SOEs in South Africa. The literature review on SOEs revealed that South Africa has a long-standing history of using SOEs as a mechanism for socio-economic advancement. The

review on SOEs in South Africa confirm that in post-apartheid South Africa, SOEs continued to operate in all spheres of production and the new government advocated for the nationalisation of key sectors. The literature review noted that most SOEs are created to play critical roles in the countries in terms of economic, social, political contributions. Obadan (2008:8) postulates that the creation and proliferation of SOEs, particularly in developing countries, were motivated by the need to achieve economic and social objectives.

In summary, the review on SOEs in South Africa play a critical role in the economy as they promote the role of state welfare, social inclusion, universal coverage and addressing regional disparities as well as being instrumental to national industrial policy, investment in research and innovation. Most SOEs are now important stakeholders and contributors towards supporting and promoting urban growth and development. Some SOEs also provide highly significant structuring elements, which may influence development patterns within the city, such as transportation networks, bulk infrastructure, energy, and ICT infrastructure. Therefore, according to the reviewed literature, SOEs contribute to rural development and poverty eradication through skills development and ultimately, employment. In South Africa, the then National Party-led government used SOEs to “contribute to the process of industrialisation and economic growth by direct intervention in the economy” (Ibid).

### **7.2.2 Conclusions based on the literature review of innovation capabilities**

The second theoretical objective of this study focused on reviewing the literature on innovation capabilities. This objective was addressed in the third chapter. The literature review has revealed that an organisation’s innovation capability is regarded as a central way of attaining the organisation’s competitive advantage and sustainable success. The literature on innovation capability outlines that innovation leads to transformation in business and non-profit organisations and supports them in establishing market competitiveness. Conceição *et al.* (2018:412) argue that innovation capabilities influence performance improvement. Organisational performance can be enhanced and advanced through innovation, buoyed by numerous influences, such as environment, organisational culture, top management support, technology, social and economic aspects. The literature reviewed affirms that innovation capability is associated with institutional support, and it influences the organisational performance in the context of exports. Cui and Wu (2016:517) suggest that practitioners and decision makers must consider factors related to innovation to

increase their operational performance. The reviewed literature asserts that organisations who have an innovation culture will surpass in their performance although they still rely on a comparatively steady environment. The literature explains that innovation culture is a commonly shared collection of inventive ideas, values, behaviours, beliefs, characteristics, information, and shared assumptions of organisational members, which can enable and support the organisational innovation process.

The literature affirms that an innovation strategy leads the organisation in making suitable and immutable decisions on which work, and activities should be made in the future market. Through an innovation strategy organisations attain, and change a given knowledge or information to suit an explicit managerial and functional initiative that permits the organisation to innovate (Alexe & Alexe, 2016:1001; Prajogo, 2016:242). Through an innovation strategy, organisations such as South African SOEs, expedite and accelerate the course and process of agility, flexibility and responsiveness to the market challenges and sustain competitive advantage in the process.

Market innovation is “changes in the way business is done,” covering a broad range of functions on multiple levels, both within the organisation and throughout the extensive business network. The literature revealed that market innovation is the process of introducing significant and continuous changes in the marketplace with the view of improving product and service awareness to customers. Market innovation involves the incremental transformations that are presented in a particular given market, and the positive influence such variations have on market performance and competitiveness. According to Weill *et al.* (2019:42), there exists a positive significant relationship between market innovation and organisations’ competitive advantage.

The reviewed literature revealed that technological innovation is considered as an important driver of human progress and economic growth. Clow (2018:141) refers technological innovation as “the process of implementation of an idea for a new product or a new service or the introduction of new elements in an organization’s production process or service operation”. Furthermore, the literature review confirms that technological innovation plays an important part as it can yield greater productivity from the same resources to spur sturdy sustainability and growth which in turn, improves organisational performance. Walker *et al.* (2015:407) established that technological innovation presents one of the most significant sources of competitive advantage and sustainable

performance in the business world. Similarly, the literature revealed that technological innovation is an essential tool for a sustainable position in the present time of globalisation.

### **7.2.3 Conclusions based on literature review of market competitiveness**

The third theoretical objective of this study focused on reviewing the literature on market competitiveness. This objective was addressed in the fourth chapter of this study. The review pointed out that market competitiveness is an intricate economic classification that is precisely correlated to the organisation's sustainability and performance. The literature review mentions that innovation capabilities and business performance (financial performance) become the cornerstone of market competitiveness, based on productivity and other operational principles. This study uses sustainable market competitiveness as an outcome of the collaboration between competitiveness and market sustainable development, which shows how an organisation can use its resources proficiently, be competitive, but not limit its use to future generations. Such an evaluation is aimed to structure and complement the factors influencing market competitiveness (as well as sustainability), therefore resulting in sustainable market competitiveness.

### **7.2.4 Conclusions based on the literature on the business performance**

The fourth theoretical objective intended to review the literature on the influence of leadership on SCE, cascading to performance. This objective was addressed in Chapter 4 of the study.

## **7.3 CONCLUSIONS BASED ON EMPIRICAL OBJECTIVES**

This section discusses the conclusions based on the empirical objectives of the current study. As indicated in Chapter One (refer to Section 1.3.4), the following empirical objectives were set for the study:

- v. to establish the influence of innovation capabilities on market competitiveness in South African state enterprises.
- vi. to determine the influence of market competitiveness on environmental business performance in a South African state enterprise.
- vii. to determine the influence of market competitiveness on business performance in a South African state enterprise; and
- viii. to develop a model for improving the business performance of state enterprises using innovation capabilities and market competitiveness.

### **7.3.1 Conclusions regarding the influence of innovation capability practices on market competitiveness in the South African SOEs.**

The first empirical objective focused on determining the influence of innovation capability practices on MC in the South African SOEs. This objective was achieved by analysing the hypothesis testing results between the four innovation capability practices under consideration that is, IC, IS, MI, TI, respectively, and MC.

### **7.3.2 Conclusions regarding the influence of innovation culture on market competitiveness**

The hypothesis test results on hypothesis H1 reveal that IC has an insignificant influence on MC. The result implies that if IC activities increase, MC decreases, and vice versa ( $\beta = 0.046$ ). Fascinatingly, these outcomes are not congruent with the knowledge examined in the literature review in Chapter 4, where IC is presented as one of the practices that is important in adding value to the MC interventions and leads to superior MC in the SOEs business processes. Because of this result, it is settled that IC practice in the South African SOEs has no significant influence on MC.

### **7. 3.3 Conclusions regarding the influence of innovation strategy on market competitiveness**

The hypothesis test results on hypothesis H2 establish that IS has a significant positive influence on MC. The result suggests that if IS activities increase, MC increases, and vice versa ( $\beta = 0.130$ ). Interestingly, these results agree with the information revealed in the literature review in Chapter four, where IS presented as one of the practices important in adding value to the MC and leads to improved business performance. Given this result, it is concluded that IS functions in the South African SOEs are directly proportional to the MC.

#### **7.3.4 Conclusions regarding the influence of market innovation on market competitiveness**

The hypothesis test results on hypothesis H3 reveals that MI has a significant positive influence on MC. The result indicates that if MI activities increase, MC increases, and vice versa ( $\beta = 0.268$ ). Remarkably, these results agree with the information in the literature review in Chapter four, where MI is presented as one of the practices important in adding value to the MC and leads to improved business performance in organisations. Therefore, from this result, it is determined that MI activities in the South African SOEs are directly proportional to the MC.

#### **7.3.5 Conclusions regarding the influence of technological innovation on market competitiveness**

Regarding the hypothesis (H4), which stipulates the relationship between TI and MC, the hypothesis test results demonstrate a significant relationship between the two factors. The result was depicted by a significant beta margin that measured the strength and predictive power of the relationship ( $\beta = 0.214$ ). The result leads to the conclusion that TI initiatives have a positive influence on MC. Therefore, the TI in SOEs either predicts or influences the MC.

#### **7.3.6 Conclusions regarding the influence of market competitiveness on business performance of South Africa**

The second and third empirical objective focused on determining the influence of MC on business performance dimensions in the South African SOEs. These objectives were achieved by analysing the hypothesis testing results of the three business performance measurements under consideration, that is, EP, FP, OP and MC.

#### **7.3.7 Conclusions regarding the influence of market competitiveness on environmental performance**

Regarding hypothesis H5, the results indicate that there is a significant positive relationship between the two constructs. The results establish that MC does significantly predict EP in the South African SOEs ( $\beta = 0.298$ ). Remarkably, this result is congruent to the insights expanded from the literature review where it was discovered that well-structured MC interventions have a positive influence on EP in business organisations. This study, therefore, concludes that MC is of great significance in improving the EP in the South African SOEs.



### **7.3.8 Conclusions regarding the influence of market competitiveness on financial performance**

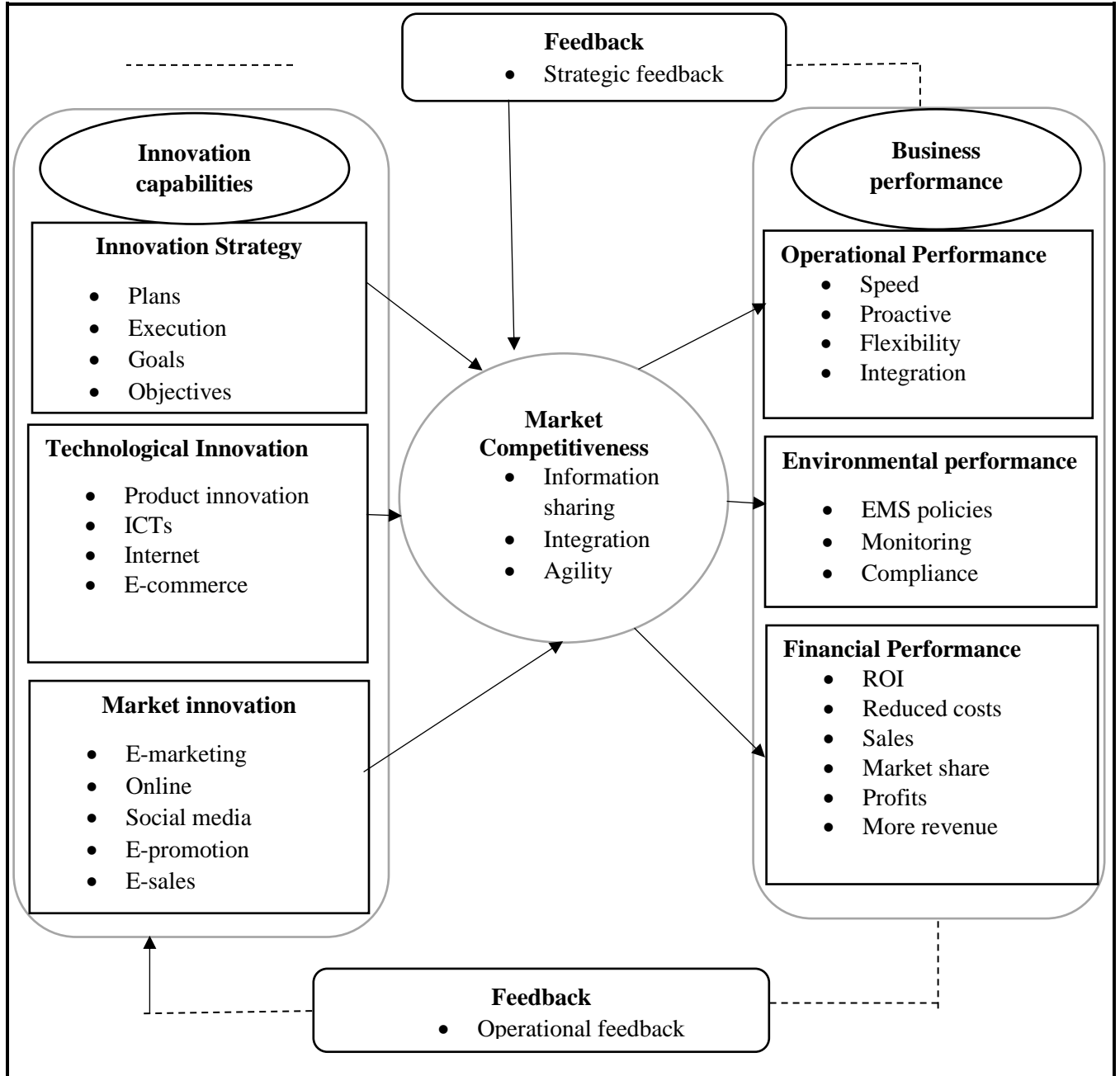
The results on the tested hypothesis (H6), showing the relationship between MC and FP, and indicate that MC does have an influence on FP. The results point toward that MC is one of the principal predictors of FP ( $\beta = 0.321$ ). Given this result, it is concluded that MC is a significant determinant that influences and improves FP in the South African SOEs.

### **7.3.9 Conclusions regarding the influence of market competitiveness on operational performance**

Concerning hypothesis (H7), the results of the study revealed that MC influences OP, that is, the hypothesis test establishes that there is a positive relationship between MC and OP ( $\beta = 0.183$ ). These results align with the observations drawn from the literature review, which indicated that the implementation of MC interventions is important as they comprehend and improve the FP of many organisations worldwide. In line with this result, the study concludes that MC has a significant relationship with FP in the South African SOEs.

## 7.4 THE MODEL DEVELOPED

Based on the results of the study, a model is developed that shows how SOEs may harness and apply innovation capabilities to boost their market competitiveness and business performance. This model is presented in Figure 7.1.



**Figure 7. 1: The model for innovation capabilities, market competitiveness and business performance in the South African SOEs.**

**Source:** Compiled by author.

The model developed in the study (Figure 7.1) illustrates that innovation strategy, market innovation and technological innovation and management by exception are the three innovation capability practices necessary for the improvement of market competitiveness in the South African SOEs. This view is supported by the significant positive relationships between these three factors and MC. In addition, all the chosen business performance dimensions (that is, EP, FP and OP) are the factors that can be influenced by MC. Therefore, the study's model depicts that to improve market competitiveness, they should re-engineer their innovation strategies, remodel their market innovation and upscale their technological innovation. The model also links market competitiveness to business performance. It then allows feedback from the business performance constructs back to the MC and innovation capability practices. The type of feedback includes strategical feedback, such as quality levels; lead time against industry norm; and supplier pricing against market. Operational feedback may include order intake, external turnover, value of open purchase orders, inbound delivery performance, number of orders overdue and outbound delivery performance.

## **7.5 RECOMMENDATIONS**

Recommendations follow conclusions and are views, sentiments, suggestions, submissions, or proposals supported by the research's findings. Yahaya and Ebrahim (2016:191) define recommendations as submissions written to propose or commend the options available to fill a need or solve a problem. The goal of the recommendations is to compare options, recommend some options, and support those suggestions. The principal objective of this study was to determine the influence of innovation capability practices on MC and business performance in South African SOEs. In determining these relationships, the study suggests several recommendations that can improve the performance of SOEs in South Africa. These recommendations intend to benefit all SOEs and other relevant organisations in South Africa and can be applied to other companies in developing countries and beyond.

### **7.5.1 Recommendations regarding innovation culture on market competitiveness**

The study's results suggest that innovation culture insignificantly influence the MC in South African SOEs. It is essential and important to suggest some recommendations that they and other organisations might adopt and implement in their various business processes. Therefore, it is vital

to explore strategic ways to understand how the relationship between these two variables can be improved. These strategic recommendations include the following, among others,

#### **7.5.1.1 Embracing a multi-faceted approach to innovation, starting at the bottom**

It is recommended that SOEs should embrace a multi-faceted approach to innovation, starting at the bottom. People often think of innovation as something that happens in brainstorming sessions about irresistible new products, where someone develops clever marketing campaigns to launch and sell the products and services out of them. However, organisations should take the product out of the equation for a moment and consider a multifaceted approach to innovation across the entire organisation. Forbes, for example, suggests starting with the “4 P’s: profit models, processes, products, and policies.” Breaking innovation down into these functions and tackling them as individual challenges will allow SOEs in South Africa to move faster and with more operational agility.

#### **7.5.1.2 Empowering the employees and they will provide value in new ways**

The study recommends that SOEs should empower the employees and they will provide value in new ways. Innovation as a corporate value means creating a culture where every employee feels he or she has some level of autonomy with expectations, of course, to think independently and find new ways to solve problems. Great leaders make smart decisions, but they also know they cannot and should not do it all alone. Leading is as much about listening, mentoring, trusting and empowering the innovative teams as it is about anything else. The freedom of expression can be achieved by creating a conducive environment whereby leaders promote creativity. Therefore, it is suggested that leaders in SOEs should provide challenges and support to their employees of the desire to explore creative ways, which would solve their MC problems in the entire SOE systems.

#### **7.5.1.3 Set aside an ample budget for innovation**

It is recommended that SOEs should set aside budgets for innovation to promote an innovation culture that will cascade into robust MC. Many people in different organisations fear taking up innovation as they see it as an extra cost. Innovations do come with big overheads but at the end, the rewards are in the same way, big. An estimate of 35% of the I.T. budget was assigned to innovation and business opportunity as stated by a past CEB survey. This movement is anticipated

to rise, as many companies are aware of the need to innovate in order to stay competitive. Allocating a clear-cut budget and a firm support system for innovations will in turn, develop more innovators in the organisations.

#### **7.5.1.4 Utilise the power of millennials and innovation champions within the company**

The study recommends that SOEs should utilise the power of millennials and innovation champions within the organisations. Presently, millennials are taking over the workplace while post-millennials will join the workforce soon. Regarding the addition of this new probability, business leaders should adjust to the emerging dynamics to train the innovation culture of the younger generation. Millennials have a powerful urge regarding action. The leadership team can profit from the younger generation who could turn out to be the organisations' innovation champions. The face of the organisation should be an influential brand ambassador. Adding the human factor is a very effective way of enhancing customer relations. In addition to rewarding staff members who are innovative, the SOEs should make them the organisation's innovative champion. The idea can be attainable and less terrifying by simply putting a face on the innovation campaigns to promote an innovation culture in SOEs.

#### **7.5.1.5 Offer incentives and collaborate for innovation**

The study recommends that the top management of SOEs in South Africa should offer incentives and collaborate for innovation. Aside from developing a platform where staff members can propose their innovative ideas, SOEs should give rewards and incentives for promoting innovation. Some organisations offer paid vacations and cash gifts. Others have a points system where the accumulated points can be used as cash. Furthermore, some organisations even host parties and events to bring light to their new innovators. Every now and then, members of another team can provide new solutions. Top management can encourage their team players to find new innovative ways by developing a culture of collaboration. Employees tend to feel more empowered when they can contribute to other groups. In addition, collaboration with external bodies such as universities, research organisations and even government agencies, can lead to innovations that can only be attainable when SOEs' leaders get ideas from outsiders.

#### **7.5.2 Recommendations regarding innovation strategy on market competitiveness**

An innovation strategy is a collection of business initiatives that seek the creation of new sources of earnings to maximise the value of an organisation within a given period. Innovation is very

important when it comes to strategy. It can create superior business growth, reduce costs, eliminate competition, and even create entirely new markets, but the term ‘innovation’ has been so overused that it has lost its meaning. The study revealed that innovation strategies have a positive influence on MC in the South African SOEs. Several strategies could be utilised to improve this situation and ensure that the influence of IS on MC remains positive. Such strategies, among others, include:

#### **7.5.2.1 Explore both the consumers and the non-consumers of the market**

The study recommends that SOEs in South Africa should explore both the consumers and the non-consumers of the market. Sometimes organisations can find innovative ideas for product improvements or for new products and services by exploring the reasons why the consumers of an industry select one product over another and why the “non-consumers” of the industry are not buying the incumbent products. The exploration can be achieved by carrying out research and surveys on consumers and non-consumers. The feedback is always important information for decision-making and for market competitiveness achievement. Linking with their customers to gather feedback is also another vital benefit to SOEs, particularly in South Africa. The connection through feedback makes customers feel that the organisation values them and is willing to resolve their issues. This would establish trust and may even prevent customers from sharing their concerns or pessimistic comments on social media. For example, a web hosting service provider (Site Ground) invites its customers to present their feedback constantly through three different feedback channels: phone, live chats, and tickets. Therefore, SOEs in South Africa could use the same feedback platform to improve the relationship between their innovation capabilities and MC.

#### **7.5.2.2 Improve existing products through digital business models**

The study recommends that SOEs in South Africa should improve existing products through digital business models. Nowadays, more and more business organisations find success from implementing new business models leveraging the power of digital technologies, such as Multisided Platforms, Online Communities and Gamification, concepts whose implications for an innovation strategy are essential for market competitiveness. When there is potential for one- or two-way value exchange, especially of information, a Multisided Platform model may come in handy as part of the SOEs’ product innovation strategy. Businesses where a direct conversation between customers and their brands could improve revenues and retention, might find Online Communities to be a great complementary MC resource. Finally, if the offer could benefit from

customer engagement and loyalty, then a Gamification effort may be a good choice for SOEs in South Africa. These digital models are here to stay and are becoming more common over time, so they should become part of SOEs' innovation book of tricks to improve their products and services.

### **7.5.3 Recommendations regarding market innovation on market competitiveness**

This study showed that market innovation has an influence on MC in SOEs in South Africa. However, several strategies could be employed, including the following:

#### **7.5.3.1 Consider the risk-reward trade-off**

The study recommends that SOEs in South Africa should consider the risk reward tradeoff. Every innovation involves risk, some more than others. In most cases, the time, cost and effort required to bring a game-changing idea to fruition will be substantially more than that required to spin off a product for which an organisation already has suppliers, systems and distributors in place. The risk reward trade-off can be achieved by enhancing management control, avoiding potential risks engaging reliable transportation services and sourcing necessary capabilities. Providing the right risk strategies at the right time and place is essential in implementing an operative market innovation since this improves productivity and cuts costs. It also permits inventory to be delivered to customers on time. On time, reliable performance is often credited to the shipper/carrier relationship. Profiling customers, creating different service lines, and prioritising allocation logic lets the business organisations privilege those customers who bring the business the most benefits for turnover, punctual payments or margin. Therefore, the SOEs should weigh the cost of developing the innovation against the potential reward. The SOEs then have to focus on a mix of innovations so they are neither thinking too small nor overtaxing their resources.

#### **7.5.3.2 Dedicate adequate resources**

The study recommends that SOEs should provide adequate resources for market innovation to be a success in their operational processes. Adequate resources are all the inputs that an organisation needs for the successful implementation of market innovation processes. This can be achieved by mobilising financial resources, human capital resources, and physical resources from different sources, combining them and enhancing market competitiveness through sturdy market innovation. There is a lot of evidence in the literature that small companies are inherently more innovative, and that may be true in some ways. Nevertheless, SOEs can also be hamstrung by a

lack of resources (human, time, financial) to make things happen. SOEs must not develop an innovation unless they have the resources to put behind it. Otherwise, they will be dooming the project to failure.

### **7.5.3.3 Provide leadership and involving top management**

The study proposes that SOEs in South Africa should involve their top management in their MI functions. It is, therefore, proposed that they should engage with their top management and involve them in activities that have to do with improving MI and MC. Thus, the will and zeal to innovate must be shared with top management in different market functions. Thus, everyone can bring value. However, supposed product innovation, production, logistics, the sales force and marketing, top management do not necessarily share this engagement philosophy. In that case, the market innovation will never be fluid, and an organisation in question would find it difficult to progress, sometimes losing imp advantages of competitiveness within the operating system. Leadership needs to come from the top down, and it is crucial that they support the innovation. The SOEs should choose someone to take ownership of the innovation within the business-someone who has the energy and focus to make sure the team follows through even when the going gets tough.

### **7.5.3.4 Balance innovation with day-to-day operations**

It is recommended that SOEs should balance innovation with day-to-day operations. Innovation always sounds exciting at first, but when reality sets in and the demands of running the business start to compete with the demands of making innovation happen, all too often the market innovative project ends up on the back burner; until the flame eventually dies out altogether. The leader's passion is crucial in keeping the innovation flame burning, but it is also important to be realistic about how much time and resources can be devoted to market innovation. Is 15 per cent or 25 per cent a realistic goal? The SOEs should assess the project's potential ROI to help weighing the time commitment.

### **7.5.3.5 Integrate with other business partners**

The study recommends that SOEs should work with partners with resources to consolidate their market innovation in return. What it means is that if SOEs do not have the resources in-house to bring innovation to life, they can find a strategic partner who could help. Distributors, manufacturers, and small business owners in complementary, but not competing, industries can all



be potential partners here. The SOE in question should collaborate with other businesses where trust is present and have skills, assets, connections, or capital the SOEs lack.

#### **7.5.4 Recommendations regarding technological innovation on market competitiveness**

From the study, it was revealed that TI has an influence on MC. To improve its influence, several strategies could be used, including the following:

##### **7.5.4.1 Adopt advanced technological innovations**

The study recommends that SOEs should adopt and implement new information and technological innovations such as e-logistics and e-procurement to stay involved and on par with global competition and development in general. Technological innovation is a new or enhanced process or product whose technical characteristics are suggestively different from before. This can be achieved by having SOEs' employees involved in the innovation process, such as solving problems during meetings, providing a suggestion box, rewarding them for their ideas that become implemented and providing creativity or innovation workshops. In addition, new technology permits them to institutionalise various initiatives that facilitate the effective sharing of information with their suppliers and customers, thereby improving the supply chain execution processes. The adoption of advanced technological innovations can also be achieved if the leadership in these SOEs can display and implement individualised consideration traits of leadership. Adopting innovations also cascades into solid relationships with suppliers as organisations may be obliged to provide capacity-building sessions to train and develop each other on the new technology and how they can best apply it in their markets. Moreover, by adopting new technologies presents SOEs with better ways to engage with their suppliers and provide opportunities to be innovative. However, the leadership that promotes innovation in the entire SOEs process can only achieve new technology adoption.

##### **7.5.4.2 Reward individual innovative ingenuities**

It is recommended that SOEs allow, protect, appreciate, and value new ideas that benefit the organisation from their employees. Innovative ingenuity refers to an individual/team's capacity to apply their maximum cognitive abilities (in terms of strategic/creative thinking and logical reasoning, fundamental principles) to deliver structured, original, insightful and impactful creative solutions to pertinent supply chain problems. In SOEs, innovative ingenuities can be achieved by

considering everyone's ideas, specifying intended goals, encouraging innovation sessions, encouraging customer feedback, and leaders should never indiscriminately dismiss a suggestion. Employees who could have initiated unsuccessful ideas and innovations should not be punished, and the failure of a programme must be treated as part of the learning process. Presenting and providing protection and rewarding innovation conserves the intellectual property of the innovators, which helps reduce the fear of being punished, improves trust, commitment, and performance, and enhances MC. Innovations and ideas must be appreciated to encourage others to be inventive. In addition, valuing in-house innovations in the organisation creates the desire and dedication to innovate. All this can be attained if the SOEs leadership practice individualised consideration behaviours. Innovation is one of the most important concerns of each SOE, and its role in the development and co-ordination of the market competitiveness. Rewarding innovative ingenuities increases the chance to react to changes and discover new market opportunities. It can also help foster competitive advantage as it permits SOEs to build better MC processes, services, and products for the markets.

#### **7.5.4.3 Ensuring every service provided is online**

The study recommends that the SOEs should ensure that every service they provide is online. This sounds intuitive to individuals, but while many organisations have begun their digital transformation, the progress is patchy. Of all respondents along the Digital Transformation Index, businesses in the top group are delivering new customer experiences by writing software to make their products smart or take their services online. However, more than 45 per cent of respondents of that study said they do not know what their industry will look like in three years and are in a wait and see mode before they put more money into software. SOEs in South Africa should make an early investment into software and fly past their competitors while they are waiting. The SOEs should ensure that they are thinking of how to get their products in the hands of customers as fast as possible.

#### **7.5.4.4 State-owned enterprises in South Africa should now think of themselves as a technology company**

It is recommended that SOEs in South Africa should now think of themselves as technology companies. These days, successful organisations think code is as important as their products and services. However, many large companies are still thinking of technology as a tool instead of a

product. They bring in a technology leader after the business plans are built, versus having them at the table at the beginning. A technology executive should be in every strategy meeting of the business, not an afterthought. Because of digital transformation, the barriers to entry that used to protect established companies are significantly lower. There are many tools to engage in this transformation, like Salesforce Essentials, Shopify, and GoDaddy. This is a huge opportunity for MI and MC in South African SOEs. South African SOEs should take advantage of these innovations and race past their biggest competitors.

#### **7.5.4.5 Make social media and digital marketing a top priority**

The study recommends the use of social media and digital marketing platforms. Social media and digital marketing (multi-channel servicing) is about giving customers support over more than two different servicing channels. These channels include phone support, email and chat support, social media support, and text support. Most modern customers in the world prefer to buy from companies that offer consistent customer service across multiple channels, which is why this study recommends that these SOEs in South Africa need to provide omni-channel communication options. They should empower customers to shift between multiple channels yet relish a consistent and reliable quality of service. In addition, customer empowerment can help boost the reputation and credibility of the SOE in question. Most organisations leverage digital from day one. Many historic companies are still trying to figure out basic social media channels. Digital marketing, and social media should be an overlapping strategy for customer acquisition. Even physical organisations must think about how to use these techniques to bring market competitiveness through the front door.

#### **7.5.5 Recommendations regarding market competitiveness on environmental performance**

The study results revealed that there is a significant relationship between MC and supplier EP. However, numerous interferences and recommendations could be utilised. These may include the following:

##### **7.5.5.1 Examining the organisation's environmental policy**

The study recommends that the SOEs in South Africa should always examine their environmental policies to improve their environmental performance. The first step in improving the SOE environmental performance is to understand their current environmental policies. Environmental performance begins with an environmental policy that clearly communicates standards of success

and expectations of performance. If the environmental performance is not meeting the organisational goals, the policy may be the culprit. It is suggested that SOEs should start by looking at the strategies and goals outlined in the environmental policy. If they do not align with the broader goals, that is a quick way to account for lackluster environmental performance. The study suggests that the SOEs should also assess the language of the policy itself. If it does not clearly state performance standards, it can easily create confusion.

#### **7.5.5.2 Assess the distribution of responsibility**

It is recommended that South African SOEs should assess the distribution of environmental responsibility. While the organisation is inspecting its environmental, health and safety (EHS) policy, it should also look at how responsibility is distributed throughout the organisation, alongside observations made in the everyday work environment. It can be noted that if responsibility lies solely with the EHS team, the organisation will be approaching environmental performance with the wrong mindset. Responsibility lies with the entire organisation, and if the policy and day-to-day practices do not reflect this, the organisation will see the results in its overall environmental performance. The suggestion can be achieved by spending some time with employees. The management should observe their work. The organisational management should continuously ask how the employees think about environmental responsibility and how that plays into their daily tasks. This will open the door for further dialogue about environmental performance across the organisation.

#### **7.5.5.2 Encourage employee involvement**

The study recommends that SOEs should always encourage employee involvement in the environmental initiatives. As a safety professional, one already knows that engaged employees are safe employees. These employees are aware of their surroundings. They are always willing to pay attention to the small details and speak up when they see a problem. In addition, the reality is that employees make up the bulk of the organisation's resources. If they do not see environmental performance as part of their responsibilities, most of the organisation is checked out. The best place to start reinforcing employee involvement is through in-person dialogue and safety training. Safety talks on environmental performance are a great option for SOEs in South Africa.

### **7.5.5.3 Secure top management commitment**

The study recommends that SOEs should engage top management in environmental issues to enhance MC. One of the most critical steps in the planning process is gaining top management's commitment to support EMS development and implementation. Management must first understand the benefits of an EMS, and what it will take to put an EMS in place. To develop this understanding, SOEs should explain the strengths and limitations of their current approach and how those limitations can affect the organisation's financial and environmental performance. Management also has a role in ensuring that the goals for the EMS are clear and consistent with other organisational goals. Management's commitment should be communicated across the organisations.

### **7.5.5.4 Build an implementation team**

The study recommends that South African SOEs should build an implementation team to achieve EP. A team with representatives from key management functions (such as finance, engineering, production, human resources, and/or services) can identify and evaluate issues, opportunities, and existing processes. The SOEs should include contractors, suppliers, or other external parties as part of the environmental project team, where appropriate. The team will need to meet regularly, especially in the early stages of the environmental project. A cross-functional team can help to ensure that procedures are practical and effective, and can build commitment to, and "ownership" of, the EMS and EP.

## **7.5.6 Recommendations regarding market competitiveness on financial performance**

The study discovered that MC has a significant positive influence on the FP of SOEs in South Africa. However, various strategies can be used to further strengthen the relationship of these two variables. These strategies, among others, can include the following:

### **7.5.6.1 Monitoring of financial position and recover outstanding debt**

The study recommends that SOEs in South Africa should monitor their financial positions and recover outstanding debt. The suggestion can be achieved by regularly monitoring the progress of the entire business. Daily, the organisation should know how much money it has in the bank, how many sales it is making and its stock levels. SOEs should also review their financial positions against the targets set in the business plan monthly. Furthermore, the SOEs should continuously chase up as many outstanding payments as they can. If SOEs do not have the time, they should

consider using a reputable debt collection agency. SOEs should always have a condition of sale agreement before they make a sale. This gives the buyer the terms and conditions, including:

- Any percentages that will apply to overdue payments
- how long they must pay the debt

#### **7.5.6.2 Become more efficient, control overheads and reduce or rearrange expenses**

It is recommended that SOEs in South Africa should become more efficient, control overheads and reduce or rearrange expenses. Is the business operating at its most efficient? Saving energy and therefore money, can happen by implementing changes in behaviour and using existing equipment more efficiently. It is one of the easiest ways to cut costs. Areas to look at in an average office include heating, lighting, office equipment and air conditioning. SOEs should work out which of their expenses could be reduced or rearranged. South African SOEs might be able to:

- switch insurance companies, banks or suppliers to get a better deal
- switch to cheaper options for consumables like energy
- arrange a deferred or periodic payment plan for larger expenses
- change how much stock is bought and buy when there is a higher cash flow

#### **7.5.6.3 Get the right funding and sell assets**

The study recommends that South African SOEs should get the right funding and always consider selling unused assets. It is essential that SOEs should choose the right type of finance for the business. Each type of finance is designed to meet different needs. Smaller businesses usually rely more on business overdrafts and personal funding, but this might not be the best kind of funding for an SOE. Selling unwanted assets can be a good way to get some cash and reduce the storage costs. The SOEs should consider leasing their main assets. This helps to spread the cost over a longer period. Furthermore, the organisation should consider registering a security interest-external site on the Personal Property Securities Register (PPSR) if it is:

- leasing out valuable goods
- selling on terms, such as retention of title

Registering a security interest can help the SOE to recover the debt if a buyer does not pay or becomes insolvent.

#### **7.5.6.4 Ensure customers pay on time and offer additional payment options**

The study recommends SOEs in South Africa should ensure that their customers pay on time and offer additional payment option. Businesses can run into major problems because of late customer payments. To reduce the risk of late or non-payment, SOEs should make their credit terms and conditions obvious from the outset. The enterprises should also quickly issue invoices that are accurate and clear. Using a computerized credit management system will help SOEs to keep track of customers' accounts. Offering additional payment options can open up different markets and improve the organisations' bottom line. SOEs should consider:

- e-commerce
- credit
- payment systems like BPAY, BillPay or PayPal.

#### **7.5.7 Recommendations regarding market competitiveness on operational performance**

The study results revealed that there is a significant relationship between MC and OP. However, numerous interferences and recommendations could be utilised to further strengthen the relationship. These may include the following:

##### **7.5.7.1 Provide access to information**

The study recommends that SOEs departments and processes should have access to relevant information to improve OP. Ensuring that each employee has consistent, secure access to crucial information plays an essential role in MC and operational efficiency. A reliable and secure network keeps the SOE business agile. It allows the organisation to react to market changes faster than its competitors do by providing employees with accurate information that is easy to access. This secure and reliable network infrastructure also provides the foundation for technologies that can enhance operational efficiency, like IP communications.

##### **7.5.7.2 Regular training**

It is recommended that SOEs in South Africa should provide regular training to those employees who are pushing for MC processes and innovation. It is hard to maintain operational efficiency if

the employees do not have access to best practice methods. The recommendation can be achieved by having workers trained on the different processes and systems that they use, or may use, in the future. Training helps ensure operational efficiency and performance. Regular training is beneficial for employees of every level, whether they have an entry-level position or have a role in the company's corporate side. Establishing a coaching or mentoring programme is a great way to keep everyone up to date on best practices for MC and operational efficiency. Therefore, SOEs should have publicly posted documentation of all the methods used which is another way to make sure every employee is on the same page.

#### **7.5.7.3 Streamline communications**

The study suggests that SOEs in South Africa should streamline communication channels. Being efficient and knowledgeable in the way the organisation interacts with customers is one of the most important things the SOEs in South Africa can do, not only for operational efficiency but also for the organisation's health, as a whole. Customers are the mainstay of any business and having phenomenal customer service plays an important role in the SOE's success. The streamlined communication can be achieved by using a customer service management system, like Starting Point, makes it easy to streamline communications for the business's clients and customers in an easy to access, all-in-one interface where the employees can assist them swiftly and efficiently.

#### **7.5.7.4 Review and refine processes**

The study recommends that SOEs in South Africa should constantly review and refine operational processes. Enhancing operational efficiency by refining the processes of the day-to-day operations is critical to operational performance improvement. One of the best ways to do this is by automating repeatable work. Most administrative duties that take up a large amount of time each day can be automated from invoices, quotes, proposal development, and project planning to financial reporting. By reviewing which processes take up most of the employees' time and evaluating if it is possible to automate those tasks, they will have more time to spend on other aspects of the business. Even if the SOE does not plan to incorporate automation into the workplace, it is essential to document, review, and update all the processes to stay on the road to continuous improvement.



## **7.6 CONTRIBUTIONS OF THE STUDY**

The contributions of this study are both theoretical and practical. Theoretical contributions concern the applicability and benefits of the cited literature, while practical contributions are aligned with the benefits of the study's results to managers and professionals with innovation knowledge. The following sections discuss in detail both its theoretical and practical contributions.

### **7.6.1 Theoretical contributions**

This study provides a theoretical contribution to innovative scientific development by equally testing the concepts of innovation capabilities, MC, and business performance. Thus, it contributes to the existing body of knowledge since it is an addition to the available literature on innovation capabilities, MC, and business performance in the South African SOEs.

The study also contributes to the existing literature on the conceptualisation, drivers, and importance of innovation capability practices (that is, IC, IS, MI, TI, MC, and business performance measurements – EP, FP, and OP).

Furthermore, the study provides a specific hypothesis test on the relationship between innovation capability practices, MC, and business performance, which provides a platform for the theory's applicability to the South African SOEs where no such study had previously been conducted.

This study supports the appropriateness of methodical critical literature reviews to determine theory building. It proposes that such a philosophical and profound study is predominantly practical when innovation capability practices, MC initiatives and business performance measurements in SOEs are strategic and complex. It also contributes to clarifying the concepts of innovation capabilities, MC, business performance and an enhanced understanding of these relationships' constructs by providing a "state-of-the-art" of empirical evidence.

The multi-dimensional conceptual framework proposes a platform for identifying divergences, convergences and themes that have been in focus as well as ones that have been missing. In addition, the study provides the determination of the relationship between constructs in the conceptual framework. It reveals that a significant relationship exists between innovation capability practices, MC, and business performance measures (that is, EP, FP and OP). The relationship was also supported by various examples of previous results drawn from other studies. Thus, this study contributes to the understanding of the relationships between the applied

constructs. It is significant for future studies as it can be a source of information and practical applications in business management. It also provides a fundamental starting point for posing new research questions and improved operationalisation of innovation capabilities, MC concepts, and business performance measurements in SOEs in South Africa.

### **7.6.2 Practical contributions**

One of the practical contributions of this study is the comprehensive intuition and insight provided by the three constructs, that is, innovation capabilities (IC, IS, MI and TI), MC and business performance dimensions. The results reveal that most of the innovation capability practices are linked to the MC activities of SOEs in South Africa. This entails that for operational implementation of MC initiatives, emphasis should be placed on understanding and considering the appropriate innovation capabilities. MC initiatives could help managers and innovation professionals view and implement the best capability available in integrating, implementing, and executing MC practices and, eventually, its institutionalisation.

The study revealed the importance of MC practices in improving the business performance of SOEs in South Africa. As a result, managers and professionals should take note and ensure that MC practices are implemented in their business systems to improve their performance. One practical contribution is that the study provides a specific context for analysing the process of adoption and use of innovation capabilities to understand the interaction between MC and performance of SOEs in South Africa. The contribution of this research is to understand, based on theoretical assumptions, how innovation capability initiatives can be institutionalised and how they contribute to the general market competitiveness and business performance. To this end, the innovation capabilities (that is, IC, IS, MI and TI), MC, and performance models could provide practical tools.

It is generally accepted in business management that both innovation capabilities and MC are required for enhanced business performance. This infers that the achievement of superior business performance includes the simultaneous integration of innovation capability practices and MC processes, neither of which is a stand-alone initiative. Furthermore, this specifies that superior business performance is related to a synchronised integration of internal and external MC processes. In other words, the higher the level of integrated downstream and upstream MC and innovation capability synchronisations, the greater the benefits. Thus, the study's results provide

practical contributions for SOEs in South Africa to improve the innovation skills of managers, professionals, and top executives to implement MC practices and manage the entire business performance processes in their enterprises. It can also be specified that it is necessary for innovation professionals in the South African SOEs to continuously evaluate the performance of their strategies and on a timely basis develop systems that help them reach their optimum operating level to improve the performance of the entire business network.

## **7.7 LIMITATIONS OF THE STUDY**

This study provided valuable insights into the hypothesised relationships between innovation capabilities, MC, and performance of SOEs in South Africa. However, despite the valued contributions made, various limitations should be highlighted for future reference. The first limitation is that the study did not test the moderating effect of factors such as the salary of respondents or gender of the respondents, among others. Measurement of the impact of demographic factors such as gender, position, and salary on the proposed relationships could have further cemented the results by showing how such factors moderate the proposed relationships. Another limitation is that of the setting of the study. It limited its scope to three provinces in South Africa, namely, Gauteng, the Free State and North West provinces. This could be a drawback, given that the SOEs' domain is broad and calls for a more extensive geographic scope. An expansion to two or three more provinces, such as the Western Cape and KwaZulu Natal provinces, given their economic contributions and size, could have yielded results that are more informative. The other limitation is that the study was restricted to a sample size of 278 respondents based in three geographical locations: Gauteng, the Free State and North West provinces, and their participation was based on the approval of their organisations. As a result, even though applications seeking permission to conduct research were sent, some organisations did not respond while others declined, reducing the number of respondents. In addition, the sample size was reduced by an increased difficulty in identifying eligible respondents since no universal list exists for managers and professionals in the South African SOEs sector. The challenge prompted the researcher to use convenience and judgemental sampling techniques, which also increased the susceptibility of the research sample to sampling bias. Hence, caution should be exercised when simplifying the results of the study.

In addition, the study's primary respondents ended up being managers and innovation professionals in SOEs. On further research, stakeholders such as the government, suppliers, financial institutions, customers, and low-level employees should take part and contribute to widening the views from the primary investigation. The study was only limited to a quantitative approach, and it is advisable to undertake one using either a qualitative approach or a mixed methodology to establish an in-depth analysis of the study. Another limitation is that the accuracy of the responses could not be ascertained because respondents had to complete the questionnaires in their own time in the absence of the researcher, which made the study susceptible to response bias. In addition, the researcher did not sit with each respondent to monitor the completion of the questionnaires. Another limitation is that the study did not test the relationship between innovation capability practices and business performance, which is the response variable of the study.

## **7.8 SUGGESTIONS FOR FURTHER RESEARCH**

Several implications for further research are suggested. Firstly, since this study included various SOEs from different industries, future studies should consider SOEs in specific industries, such as automotive, electronics, petrochemical, and aviation. As mentioned in the previous section, one of the unexplored areas for future studies would be to test the direct relationship between innovation capabilities and business performance. Such an investigation might produce exciting results regarding the influence of innovation capacity practices. It might also be worthwhile to test the relationship between business performance practices themselves, as this might reveal how these activities influence each other.

Moreover, since this study utilised the quantitative methodology, a different view would be to perform similar research using a mixed-methods approach, which involves the qualitative approach where interviews are included. The results of such a study would prove to be informative since respondents' views could be included and compared on variables. Where relationships were not found, future studies could be conducted to check if the pattern is still consistent with the results of this study. Different samples and data collection techniques may be used for these purposes. Furthermore, scholars might include other business performance practices excluded in this study. Examples of such practices include supply chain performance, risk management, total quality management, supplier development, green SCM and lean SCM, among others. It would be interesting to measure how such factors influence MC in South African SOEs. Future studies

should also include testing moderation influences where studies test the moderating influence of demographic factors of respondents such as gender, salary, or race, among others. Mean differences based on these demographic factors could also be analysed using t-tests and analysis of variance techniques. Finally, as emphasized previously, this study paid attention to SOEs in Gauteng, the Free State and North West provinces only. An expansion on the scope of the study to different provinces could have provided another view. For instance, conducting the same research in other provinces of South Africa could provide different results, which would provide a basis for comparison.

## **7.9 CHAPTER SUMMARY**

This chapter served as the final chapter of the study. It provided an overview and the conclusions based on the study's theoretical and empirical objectives. The study showed that SOEs in South Africa face numerous operating and economic challenges that could be resolved by implementing effective innovation practices and robust MC initiatives. Its results provided statistical evidence that there is a significant relationship between innovation capability dimensions, MC and business performance constructs in the surveyed SOEs in South Africa. The study's results showed that MC plays an essential role in steering business performance in South African SOEs. This chapter also presented various recommendations for improving business performance through the implementation of MC programmes. Numerous relevant innovation capabilities were recommended to stimulate the MC endeavours in South African SOEs. It revealed that the study makes several significant contributions to the practical part of business management and the body of knowledge. The chapter specified that although the study is limited in various ways, several suggestions for further research could be drawn, paving the way for more focused research attempts in the future.

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**APPENDIX A: LETTER FOR THE COLLECTION OF DATA**



28 February 2017  
Mr Sefako Marweshe  
2 Alida Street  
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1914

isaiahm@vut.ac.za

Dear Mr Sefako Marweshe

**Re: Request for permission to conduct research at Transnet SOC Ltd.**

Your letter of request for permission to conduct research at Transnet on "Innovation Strategies; Environmental Practices and Business Performance in a State Enterprise" is acknowledged.

We duly note the conditions of the study for strict academic purposes, the results of the study will be submitted to Transnet, and the research will be confidential and that anonymity for both respondents and the organisations is guaranteed. Should you or Vaal University of Technology want to publish the study in any other manner than the final assignment, Transnet will be approached for permission to do so.

Based on the above conditions, your request to conduct the research study in Transnet is granted. We are looking forward to the outcomes and recommendations of your study and the positive contributions towards the marketing strategy of Transnet.

Yours sincerely,

*for*  
  
**Ms. Nonkululeko Sishi**  
Chief Human resources Officer  
Date:

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