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Business networks and the moderating impact of innovation on business performance

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Business networks and the moderating impact of innovation on business performance

A research report submitted to the Faculty of Commerce, Law and Management at the University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation

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ABSTRACT

South Africa faces frighteningly high levels of unemployment, inequality and poverty. Like many other emerging economies, the South African government has recognised the importance of entrepreneurial activity. It widely views SME's (Small or Medium-sized Enterprises) as the lynchpin to realising growth and expansion.

However, a common challenge to the performance and growth of many SME's is the lack of access to resources. Additionally, as advancements in innovation have so rapidly evolved in recent years, a business's innovative capabilities have become just as crucial to its performance capabilities and sustaining a competitive advantage.

This study mainly focused on investigating the extent to which networks, particularly supplier, consumer and competitor networks, moderated by innovation, impacted the financial performance of SME's in South Africa. Data collection from SME owners and managers throughout South Africa using self-administered surveys, distributed via Qualtrics.

The results show that two supplier networks and consumer networks moderated by innovation significantly impact business performance. Consequently, no factors from the consumer networks construct were extracted in the EFA analysis to determine consumer networks' impact on business performance. As such, no conclusions could be determined in considering the consumer network's impact on firm performance.

Findings suggest that the study be replicated with a significantly larger sample. It is also recommended that further research explores the extent to which network activities and network resources, when moderated by innovation, impacts business performance, with a view on measuring alternate performance metrics such as growth, market share and consumer and employee satisfaction and growth.

Keywords: business networks, innovation, business performance, SMEs, consumers, suppliers, competitors engagement and collaboration

DECLARATION

I, Brigitta Jordaan, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the Field of Entrepreneurship at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Brigitta Nerina Jordaan

(Type your name in full here, and sign in the space above)

Signed at : Pretoria

On the 30th day of April 2021.

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1. CHAPTER 1: INTRODUCTION

1.1 Background

South Africa faces acute unemployment, inequality, and poverty, accompanied by significant structural economic, technological, and social changes (Patel, Graham, & Chowa, 2020). Low levels of investment and growth have strained the South African economy in recent years. The outbreak of the Covid 19 pandemic has compounded the effects of these; thus, South Africa finds itself in a deepening economic crisis (South African Government, 2020). South Africa recognises that entrepreneurial activity is vital to combating socio-economic challenges, as in many developing economies. It is widely viewed by scholars and experts alike that SMEs are crucial to harnessing future growth and innovation opportunities.

Illustrated in the findings of various institutions' studies into the Covid 19 pandemic's effects on SMEs is the economic challenges faced in South Africa. One such study was conducted in March 2020 by "22 on Sloane", a start-up campus in Johannesburg, who surveyed 120 SMEs to understand the impact of the Covid 19 pandemic on SME and start-up businesses. Their findings suggested that over fifty-five thousand (55 000) SMEs would fail, which would correspond to the loss of about forty-two thousand three-hundred and fifty (42 350) jobs (Jackson, 2020). The findings extrapolated to accommodate approximately two-hundred and fifty thousand (250 000) operative SMEs in South Africa. More recent surveys by Nedbank, Visa, SME finance association (SASFA) and the consumer credit organisation have also echoed these concerns (Planting, 2020).

As outlined in the South African Economic Reconstruction and Recovery Plan, one of the centrepieces of South Africa's 'post-pandemic economic development plan' is the support for SME development (South African Government, 2020).

As such, SMEs are seen as significant contributors towards fostering economic development.

One of the critical challenges SMEs in South Africa face in their pursuit of performance is the lack of internal resources. Businesses do not control all the necessary resources required to maintain a competitive advantage (Andrevski, 2009). According to Lechner, Dowling & Welpe (2006), a common characteristic of entrepreneurial endeavours is a lack of internal resources. Referring to Stinchcombe (1969) and Baum (1996) theoretical works, Lechner et al. (2006) characterise this handicap as the inherent liability of both newness and smallness. The strategic use of external resources, accessed via networks, is considered critical to growth and survival. A crucial ingredient to achieving performance goals and competitive advantage is a business's ability to network and engage with suppliers, consumers and competitors (Mlotshwa, 2019). According to Koka & Prescott (2008), networks are reservoirs through which information, knowledge and resources are diffused.

Economic development within a society is a good indicator of entrepreneurial activity and development (Urban, 2018). Simultaneously, the extant literature on networks suggests that the underlying assumption of network theory is that businesses derive critical access to embedded resources exchanged through network members' active engagement. According to Meyer (2002), networks are a crucial enabler, as they enable the flow of information and transaction between resource-rich and resource-constrained actors. According to Werthner and Klein (1999), networks play a substantial role in stimulating growth – and by extension - performance. Thus, networks are the socio-economic activity by which firms and entrepreneurs come together to scan the environment for opportunities (Abbas, 2019).

Networks are characterised by the patterns of interaction amongst nodes within them. These nodes represent the flow of communication, engagement and exchange between people, organisations or actors of any kind within a network (Oh & Monge, 2016). By their very nature, networks capture the essence of relational patterns and characteristics of unique attributes that define them. Networks, requiring the interplay of interactions among actors, have been

beneficial to actors in various ways, such as sourcing new business, advice, growing entrepreneurial and company profiles, and building trust (Pratono, 2014).

This chapter sets out the framework for the study. Social Capital and Network Theory form the theoretical grounding for the study, while SMEs operating in South Africa sets the study's contextual parameters. Determining the extent to which supplier, consumer and competitor networks impact performance while moderated by innovation is the study's critical research problem, which serves as the basis for identifying the research questions. The chapter then rounds off with conceptual definitions for key terms pertinent to the study and discussions on its contribution, delimitations, and assumptions.

1.2 Theoretical Foundation: Social Capital and Network Theory

In today's competitive and dynamic market environment, the benefits derived from social capital resources becomes the fertile ground upon which entrepreneurs and business build a sustainable competitive advantage (Pratono, 2014). The social capital theory has a long history, and the importance of its ability to explain social phenomena has gained significance in academic literature (Bhandari & Yasunobu, 2009). According to Lin (2005), capital is both a concept and a theory, a complex and multidimensional concept. Stemming from Marx's work, capital is understood to be surplus value resulting from the circulation of commodities and monies (Lin, 1999).

While capital as a concept represents an investment made into value resources (Lin, 2005), social capital can be defined as a subsequent refinement of classical capital theory - as illustrated in Table 2 below. Retaining the sense of capital, in a social sense, represents an investment in social relations with social return expectations (Lin, 1999 & 2005).

Table 1: Summary of Capital Theories.

	Classical Theory	**Neo - Classical Capital Theory**			
		Human Capital	**Cultural Capital**	**Social Capital**	
Theorists	Marx	Schultz, Becker	Bourdieu	Lin, Burt, Flap, Coleman	Bourdieu, Coleman, Putman
Explanation	The exploitation of the workingclass by capitalists	The accumulated surplus-value of the labourer	Values, Symbols and meaning	Accessibility of embedded resources within a social network	Solidarity among groups
Capital	Surplus use of value and exchange of value in the production and circulation of commodities	Investment in knowledge (education), skills development	The internalisation of dominant values/ meanings	An investment made into social networks	Investment in mutual interests
Level of analysis	Classes	Individual	Individual / classes	Individual	Group/ Individual

(Lin,1999, p. 30)

Bhandari & Yasunobu (2009) argue that social capital is framed as a collection of assets gained from shared norms, values, beliefs, trust, social relations, networks and collective actions.

According to Venter & Urban (2008), these social resources' grant network actors privileged access to tangible and intangible resources when mobilised into action. This view embraces social capital, as defined by Lin (2005). It is consistent with various scholars' interpretations thereof, such as Bourdieu, Burt, Coleman, Erikson, Flap, Putman and Portes, who have all contributed to the study of social capital. Lin (2005) defines social capital as the resources embedded in one's social networks, which can be assessed and mobilised through ties in a network.

Maima et al. (2016) posit that the greatest obstacle to any business operation is that of one operating in isolation. According to Lin (2005), it is all but impossible to access resources entrenched therein without access to the network. The homophily and heterophily attributes of the networks also influence the type of resources made accessible. Huang et al. (2012), as cited in Mitchel's (1969), defines networks as the relationships which exist among "groups of people, affairs and things". With a specific view of networks built among SMEs, Aarakit & Kimbugwe (2015) describes networks as an activity in which SMEs develop and manage relationships (Mlotshwa & Msimango-Galawe, 2020).

This research project, therefore, analyses and synthesises network theories to facilitate the interpretation and understanding thereof. Network theory consists of two domains, according to Borgatti & Halgin (2011), "network theory" and "theory of networks".

Network theory evaluates network variables' consequences, such as engaging with ties or the impact of an actor's "location/ proximity" within a network. While on the other hand, the theory of networks investigates the processes that determine why networks have particular structures – its antecedents or properties (Brass, 2002). While the study focuses on network theory, it refers to the theory of networks to illustrate the nature and distinctive characteristics.

As such, the frame utilised to analyse networks, guided by Borgatti et al. (2011), an interpretation of Laumann et al. (1983) boundary specification of network ties, is to evaluate the extent to which supplier, consumer and competitor networks impact business performance when moderated by innovation (Borgatti et al., 2011)

Clusters of strong and weak connections characterise networks. Burt (1992) and Granovetter (1973) remain key thought leaders influencing the theorising of networks. Walker et al. (1997) hypothesise that the premise of Burt's approach assumes that choosing partners goes a long way in determining the cooperation's success. Burt (1992) refers to the connection of these non-redundant networks clusters as structural holes (Oh et al., 2016), thus

emphasising the value of open instead of closed networks. The more distance or disconnectedness among actors within a network, the more actors are exposed to divergent thinking, ideas and practices. As such, actors within the network are more likely to discover new information, recognise the value of alternative separated sources of information (Burt, 2015). The bridging of these structural holes is crucial to the realisation and combination of information. According to Lin (2001), these social relations are developed to understand strategic and social behaviours within networks.

Granovetter (1973) took a somewhat alternate view to theorise networks. Based on the breakdown of Granovetter and Burt's theories in the table below, it is evident that the two, while approaching the theorising of networks from alternate viewpoints, stress a similar point - that access to novel information comes as a result of heterophily (diverse), non-redundant, networks (Borgatti, 2011).

Table 2: Network Theorising

Theoretical principle	Scholar
Strength of weak ties (SWT) – This theory aims to determine the strength of a tie – the transitivity (cause of tie formation) of the tie and the usefulness of a bridge within a network. The premise is that the bridging ties (unlikely to be strong ties) link someone to novel information/ideas – you will hear that you would usually not be privy to in your circle. Based on this, Granovetter's argues that strong ties are not sources of novel information (Borgatti, 2011).	**Granovetter's (1973) - SWT**
Structural Holes – This theory is concerned with ego-networks. The nodes adjacent to a given node and the ties that bind them. Embracing a more strategic and instrumental view to networks compared to Granovetter. Burt's work illustrates that locating a node (its location with a network) makes it possible to determine proximity to a network's strategic location. Thereby determining the extent of competitive advantage one can derive from access to embedded resources. Competitive advantage is thus achieved through diverse (heterophily) and valued networks (Borgatti, 2011).	**Burt (1992) – Structural holes**

(Lin, 2005)

Based on Borgatti's (2011) analysis, it is evident that different types of networks, whether influenced by structure or position, play a crucial role in influencing the advantage gained from embedded resources. As such, this study aims to understand the extent to which the heterogeneous networks of

suppliers, consumers, and competitors impact businesses' performance when moderated by innovation.

It is important to note that the purpose of this study is not aimed at defining what is and not a network or network theory. However, to utilise the existing theory to build upon and elaborate on the foundation for evaluating this study's research objectives.

1.3 Context of the Study

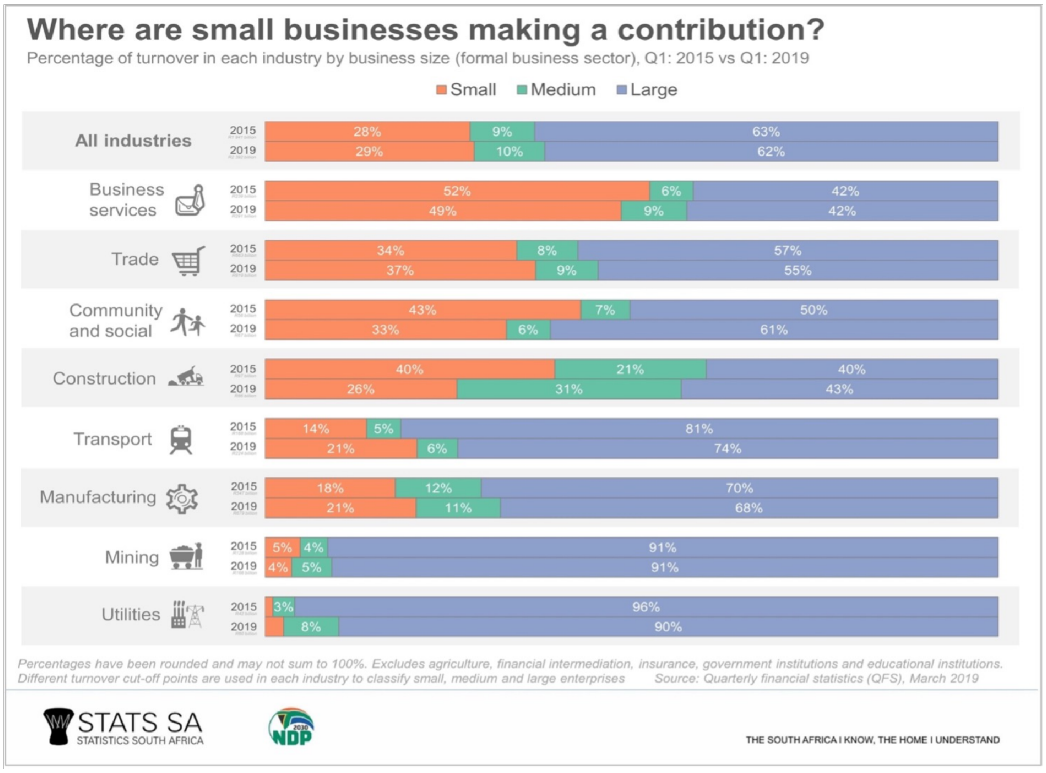
A broadly accepted view is that if countries wish to transition from poor to wealthy nations, support for SMEs, among other interventions, is paramount (Mahadea et al., 2008). An analysis of SMEs done by the World Bank (2011) found that growth was closely linked to SME development, emphasising a positive relationship between the sector's relative size and economic growth. In developing economies, like South Africa, SMEs have become the linchpin upon which hope for economic development and growth hinges. According to Mlotshwa and Msimango-Galawe (2020), SMEs are crucial to employment creation, poverty reduction, the facilitation of economic growth, and income distribution stimulation. As such, SMEs are considered to be the growth engines of entrepreneurship. The South African Government has taken steps to reduce barriers to entrepreneurship through various programmes. The small business and innovation funds are just two programmes initiated by the South African government to support entrepreneurs from the idea phase to the implementation and growth phase (OECD, 2019; Mboweni, 2020).

While entrepreneurship is signalled as a crucial means to meeting socioeconomic challenges (Machirori & Fatoki, 2013), such as high unemployment, attracting investment (local and foreign) and boosting economic activity – it is merely a microcosm of a country's broader economic condition and environment.

According to the International Finance Corporation (IFC), South Africa's SMEs employs approximately 60% of the country's workforce (International finance corporation, 2019). In the first quarter of 2019, the formal SME sector contributed to 39% of its annual turnover (Stats SA, 2019). SMEs' turnover was

broken down as follows: small businesses accounting for 29% and medium-sized businesses 10%.

The figure below shows that significant SME activity is evidenced in business services, social services, trade and construction industries (Stats SA, 2019). Except for the social services industry, the medium-sized business has managed to increase its participation and contribution. In contrast, small companies have managed to increase their trade, transport, and utility industries. However, there has been a slight decrease in small businesses contribution across the following sectors: Business Services, Social Services, Construction, and mining.



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Figure 1: Comparative look at SMEs contribution to turnover in South Africa: 2015 vs 2019 (Stats SA, 2019).

Though the above figure depicts an increase in SME activity in some industries in South Africa, entrepreneurship is extremely low compared to other African countries. A low rate of entrepreneurship, coupled with a low survival rate, according to the IFC (2019), indicates a scant pipeline of businesses with the potential to scale their operations. Many SMEs suffer from weak performances and high failure rates (Machirori & Fatoki, 2013). For most businesses, firm performance is mainly tied to making a profit. Apart from this, the concept of firm performance is also dynamic. Its definition has changed over the decades, aligned with the firm shifting focus, making the concept difficult to define concretely (Aifuwa, 2020).

One of the contributing factors to such a high failure rate in South Africa is SMEs lack of access to resources required to advantage of market opportunities. According to the IFC (2019), the lack of access to markets, finance, and skills development are critical barriers to growth. Many SMEs look to external collaborators such as suppliers, consumers and competitors to sustain a competitive advantage. Mochirori and Fatoki (2013) cite Pfeffer and Salanvik's (1978) remarks on firms' interdependency. They reiterate Pfeffer and Salanvik's (1978) viewpoint that interdependence is necessary and inherent to entrepreneurial activity (Mochirori and Fatoki, 2013). However, no firm entirely controls market conditions impacting business. Mlotshwa and Msimango-Galawe (2020) find a significant relationship between the maintenance of networks and SME performance.

Therefore, by leveraging embedded resources such as know-how, technology and the identification of market opportunities, the SMEs can improve performance outcomes and maintain competitive advantages. Based on this view, all business outcomes are dependent on the interdependent interactions external to the business, which can also lead to a degree of uncertainty (Mochirori and Fatoki, 2013).

1.4 Research Problem

Extant literature has set the foundation from which the theory and concepts for social capital and networks have stemmed. Based on the theoretical foundations discussed in section 1.2, it is understood that social capital is the subsequent refinement of the classical capital theory, which stems from works of theorists such as Marx, Schultz, Becker, Bordieu, Kin Burt, Coleman and Putman, to name a few.

Literature has extensively investigated the concept of social capital at both an individual and group level and the impact that structure and position, such as the natures of ties, location, and proximity, have on the cultivation of networks. Extant literature shows that that networks enable privileged access to social resources and management of relationships. The study builds on this foundation, exploring how SME suppliers, consumer and competitor networks impact business performance when innovation moderates. The lack of internal resources, long-term sustainability, and a growth path is crucial financial and operational problems faced by SME's and remains amongst the critical barriers to exploiting market opportunities.

This problem is emphasised by the findings of the global entrepreneurship monitor report (GEM), which explored the state of entrepreneurship in South Africa for the period 2017/18, highlighted a significant sustainability problem faced by businesses, with the rate of established firms consistently remaining at only 2.2% for a couple of years. In 2017, firms were five times more likely to fail (Herrington & Kew, 2018). According to Leboea (2017), many entrepreneurs fail to turn their businesses into sustainable operations. This view is asserted by Fatoki and Garwe (2010), who stated that SMEs often do not follow a sequential growth path – moving from the first stage of growth to maturity. Most SMME's fail to survive beyond the first five years (SME South Africa, 2019).

As such, SMEs in South Africa are currently operating in a challenging and competitive environment, and given the current state of the economy, this is likely to continue (SME South Africa, 2019). South Africa is described by GEM

(2017/18) as one of the least supportive countries in terms of its support and assistance provided to entrepreneurs.

Qiao et al. (2014) postulate that networks help resource-deprived businesses compete in today's competitive environment, extending their capabilities and know-how. Networks have become critical to acquiring the necessary capabilities and resources to sustain business growth and performance (Huang, Lai and Lo, 2012). This sentiment gleaned from networks and social capital scholars such as Burt & Granovetter and Marx.

Since SMEs are likely to succumb to market pressures at a significantly higher rate than larger firms, business networks' management is crucial to their sustainability. According to Venter & Urban (2008), network relationships are advantageous for securing a competitive advantage. Furthermore, capitalising on these embedded resources helps businesses adapt to changing market conditions while enabling innovation (Qiao, 2014).

Scholars such as Walker et al. (1997) and Huang et al. (2012) point out that businesses consider their current networks when identifying potential network engagements. In other words, these can be defined as those ties they have previously or currently work with (Huang et al., 2012).

As SMEs tend to have insufficient internal resources, they tend to take advantage of their networks resources to improve performance and consider paths to innovation.

With this in mind, this study aims to investigate the extent to which supplier, consumer and competitor networks influence business performance when moderated by innovation.

1.5 Research Questions and Aims of the Study

Based on the above section, it can be inferred that networks and innovation improve firm performance. The purpose of the study is to determine the extent to which business networks moderated by innovation impact firms' firm performance in South Africa.

1.5.1 Research Questions

The decision to explore network impact on innovation and performance was guided by the quest to answer the main research question : to what extent does networking impact firm performance when moderated by innovation, and this research question was subdivided into the following sub research questions:

1. To what extent does supplier networks as a dimension of business networks impact firm performance?
2. To what extent does consumer networks as a dimension of business networks impact firm performance?
3. To what extent does competitor networks as a dimension of business networks impact firm performance?
4. To what extent does innovation moderate the relationship between business networks (supplier, consumer and competitor networks) and performance?
    a. To what extent does innovation impact supplier networks and firm performance?
    b. To what extent does innovation impact consumer networks and firm performance?
    c. To what extent does innovation impact competitor networks and firm performance?

1.5.2 Research Aims and Objectives

This study's fundamental aim is to investigate the extent to which innovation moderates the relationship between business networks (interactions with consumer, supplier and competitor) and firm performance.

1. Investigate the impact of Supplier networks on business performance

2. Investigate the impact of consumer networks on firm performance
3. Investigate the impact of Competitor networks on firm performance
4. a. To determine the extent to which innovation moderates the relationship between supplier networks and firm performance

4 b. To determine the extent to which innovation moderates the relationship between consumer networks and firm performance

4 c. To determine the extent to which innovation moderates the relationship between competitor networks and firm performance

1.6 Conceptual Definitions of Terms

- **Social Capital:** Lin (2005) defines social capital as 'the resources embedded in one's social networks, which can be assessed and mobilised through ties in a network'.
- **Networks:** Mitchel (1969) defines network relationships among groups of people, affairs, and things. A more recent definition for networks, by Aarakit & Kimbugwe (2015), describes networks as an activity in which SMEs build and manage relationships (Mlotshwa & Msimango-Galawe,2020).
- **Open innovation (OI):** 'The pursuance of activities where firms commercialise external, as well as internal, ideas by employing both inhouse and outside pathways to marketing strategies.' (Chesbrough, 2003).
- **Inbound innovation:** "Outside-in" – Authors Enkel, Gassman and Chesborough defines this as a process that aims to enrich a firm's knowledge capital by internalising externally developed technologies (Morettia & Biancardi, 2018).
- **Firm performance:** According to authors Lesbans and Euske, as cited by Taouab (2019), refers to a set of financial and non-financial indicators that offer information on the level of results achieved. Further, performance is dynamic, requiring judgement and interpretation.

1.7 Contribution of the Study

A fundamental attribution toward SME failure in South Africa identified by GEM (2017/18) is access to support (SME South Africa, 2019; International finance corporation, 2019). Additionally, Qiao et al. (2014) posit that networks help resource-deprived businesses compete, extending their capabilities and know-how. As a result, this study aims to contribute to the literature on network theory, with specific contextual reference to SME network impacts on performance when moderated by innovation.

While the topic of network theory has no shortage of extant literature (Abbas, 2019; Borgatti, 2011; Lyu et al., 2019; Morettia, 2018; Qiao et al., 2014; Taouab, 2019), this study will provide a unique view on the impacts of supplier, consumer and competitor network interactions (Huang et al., 2012) within the South African context. Most of the literature perused and referenced (Abbas, 2019; Borgatti, 2011; Lyu et al., 2019;

Moretti, 2018; Qiao et al., 2014; Taouab, 2019) in this study has been conducted in the European, Asian and North American regions.

Furthermore, the study aims to identify the extent to which innovation moderates the relationship between business networks, primarily focusing on interactions and firm performance (Huang et al., 2012).

Therefore, the research findings aim to provide insight into which network interactions – supplier, consumer or competitor – are leaned upon (influential) within a South African SME context. Study findings will help guide entrepreneurs and industry to the benefits of networks and their role in the diffusion of innovation and its impact on performance.

1.8 Delimitations of study

As explained by Simon & Goes (2013), the delimitations of a study are those characteristics that limit and define the exact scope of the study. These include factors used to guide a researcher's choice of study objectives, variables of interest, incorporation of relevant theoretical perspectives, and determining the study's population chosen to be investigated (Simon & Goes, 2013).

This study focuses on the moderating impact of innovation on the relationship between business network interactions of suppliers, consumers and competitors and the performance of SMEs operating in South Africa.

Personal social capital and resources embedded in personal networks are considered outside of this study's scope. Only the interactions of firms with their suppliers, consumers, and competitors are taken into account for the survey.

Their resultant impact is moderated by innovation on a firm's performance outcome.

1.9 Assumptions

As defined by Simon & Goes (2013), a study's assumptions are the set of factors out of the researcher's control. However, they have a direct impact on the study outcomes.

The assumptions for this study are as follows: Firstly, participants were sincere in their willingness to participate and, as such, were candid in their feedback when answering the survey. Secondly, the study respondents are entrepreneurs and business owners, top tier managers of SMEs in South Africa. Thirdly, the respondents are engaged in network activities aimed at improving their performance outcomes.

1.10 Report Structure

This study is set out as follows: The frameworks, theoretical grounding and context of the study is discussed in chapter one, followed by chapter two, which details the literature review for business performance, networks, in particular supplier, consumer and competitor networks and innovation. The study's conceptual frameworks are also discussed in chapter two. Chapter three discusses the research methodology approach undertaken, discussing in further detail: the study's population, sampling, instrumentation, and data collection used,

including the inquiry on validity and reliability. The study's results are presented in chapter four and are discussed in further detail in chapter five. Lastly, in chapter six, the study's conclusions are discussed along with the proposed implications of the findings.

2. CHAPTER 2: LITERATURE REVIEW

This chapter delineates the literature review of networking and further explores supplier, consumer, and competitor networking. Additionally, the literature review also looks at firm performance and innovation. Academic articles and research studies set the basis for this review; it assists in exploring relevant theories for developing and identifying this study's hypothesis.

The chapter is laid out as follows: The Introduction briefly explores SMEs' topics and entrepreneurship within the South African context. Next, firm performance is discussed. Following this, the networks and the underpinning thereof within the context of social capital theory is explored. Further, innovation is then discussed and its impact on the relationship between networks and firm performance. Lastly, the study's conceptual frameworks are highlighted and discussed.

2.1 Background Discussion

South Africa's economy is in a grim position (SEDA, 2019), and it is believed that SMEs are crucial to driving economic growth and development (IFC, 2019). Since the white paper's promulgation on SME development, the prioritisation of entrepreneurship and the SME sector's growth has remained a vital aim of the South African government (Seda, 2019; Mboweni 2020; Makwara, 2019). The country's prevailing socio-economic challenges see SMEs' promotion as essential to economic progress, viewed as potential growth engines, significant to positively contributing to economic upliftment (Abbas, 2019).

According to Mitchell (2013), as cited by Makwara (2019), SMEs are crucial to sustainable development. Entrepreneurs generate employment opportunities and contribute to their economic performance (Kritikos, 2015). Empirical research by Murphy (1996), Longenecker et al. (2000), Smallbone and Welter (2001), Dzani (2004), to name a few, were in agreement that SMEs are a critical economic development mechanism. This view has only strengthened over the years. SMEs can generate employment, act as resource redistribution agents, and enhance the country's competitive climate (Dzani, 2004).

Increased digitisation levels also create opportunities for SMEs to transform their business models and operational practices, leveraging emerging technology to boost productivity and a mechanism to stimulate inclusive growth (OECD, 2019).

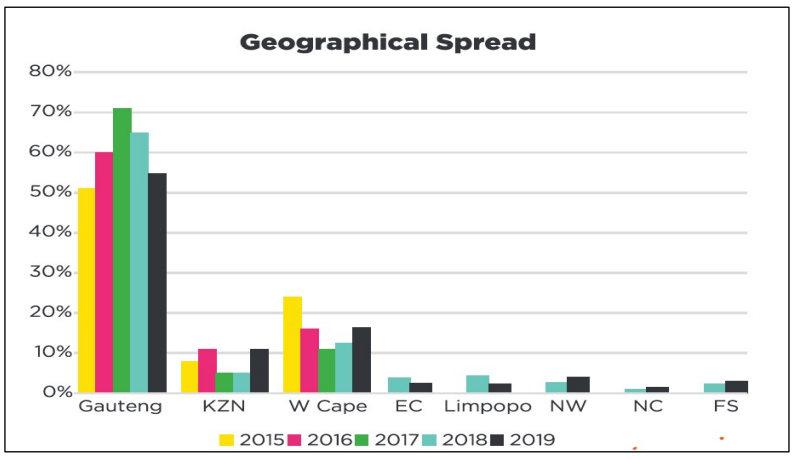
Digital innovations have reduced structural market disadvantages and barriers. They have enabled access to markets and helped access resources through networks while decreasing cost barriers (OECD, 2019). Digital innovations provide a pivotal leveraging point for SME's to better position themselves within future production and supply chain ecosystems. Digital innovations allow businesses to reach economies of scale, product differentiation and customisation, enabling shorter distance and time to market – improving business responsiveness (OECD, 2019).

Various entrepreneurial activity measures, such as the entrepreneurship monitor (GEM), point to a relatively low level of entrepreneurship in South Africa (Lewis & Gasealahwe, 2017). GEM's most recent study on entrepreneurial activity in South Africa indicated that total early-stage entrepreneurship sat at just eight per cent (8%). The study also found that compared to emerging market economies, early-stage entrepreneurship activity is significantly lower. Control characteristics such as biological sex, age, and education level are critical determinants of entrepreneurship (Lewis & Gasealahwe, 2017). With so much uncertainty at hand in South Africa's economy, Urban (2018), discussing the entrepreneurial climate in South Africa, leans on the work of Shane & Venkataraman (2000), believes that where there is a void of opportunities and enterprising individuals' drive is low, very little renewal can be expected to occur.

In support of driving economic activity, the South African government aimed to capitalise a one point three billion Rands (R1.3bn) innovation fund over three years for 2020-2023. Additionally, industrial incentives of one point five billion rands (1.5bn) were earmarked for creating fifty-six thousand jobs (Mboweni, 2020 a). Provisions for refurbishing industrial parks, small business incentives and enterprise development were also tabled (Mboweni, 2020 a). In circumstances such as we find ourselves in this post-pandemic era, that

reinforces Urban's (2018) view that entrepreneurship lives at the nexus of uncertainty and opportunity. South Africa's socio-economic environment may benefit from enterprising individuals who are cognizant of the environmental obstacles and market realities, forge ahead and intentionally make things happen (Urban, 2018).

Seed Academy's the Real State of Entrepreneurship Survey (2019) provides a broad overview of SME activity in the country. A location-based analysis of its findings indicates that almost ninety per cent (90%) of entrepreneurial activity occurs in urban areas, with nearly sixty per cent (60%) of respondents from Gauteng, South Africa's key economic hub. The Western Cape and Kwa ZuluNatal account for almost thirty per cent (30%) of the countries' entrepreneurial activity. In comparison, the remaining provinces make up the remaining activity – approximately ten per cent (10%) (see figure 2). As depicted in figure 2, the geographic spread indicates a greater degree of entrepreneurial activity in parts of the country where a high degree of economic activity exists – Gauteng, Kwa Zulu-Natal, and Western Cape key areas driving economic activity in South Africa.



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Figure 2: Geographical Spread (Seed Academy, 2019)

2.2 Firm performance

Firm performance is complex and draws relation to a variety of business factors, such as financial statements (balance sheet, income and cash flow statements), research and development, technological competencies as well as a few intangible assets such as brand image, goodwill and human capital (Herciu & Șerban, 2018). The crux of the concept and the traditional theoretical view of firm performance maximise wealth creation for shareholders (Belghitar, Clark, & Kassimatis, 2019). On the other hand, Richard, Devinney, Yip and Johnson (2009) provide a more comprehensive view of performance measurement. According to Richard et al. (2009), performance is determined by three outcomes, namely: financial performance (i.e., profits, return on investments, return on assets), product market performance (i.e., sales and market share) and shareholder return.

Currently, "a firm's performance is determined by how effectively and efficiently harnesses its resources (land, labour and capital) to create value, achieve sufficient profit and meet stakeholder expectations" (Aifuwa, 2020, p.10). According to Taouab (2019), a firm's ability to manage its resources is crucial to its survival.

Klassen and McLaughlin, as cited by Herciu & Șerban (2018), believe that environmental management factors play a pivotal role in influencing the performance of a business. Research suggests that merely trying to frame performance as a concept can be a subjective exercise influenced by many factors. However, accounting measures have become the most commonly used method in determining performance (Richard et al., 2009). This is validated in numerous academic articles exploring the topic.

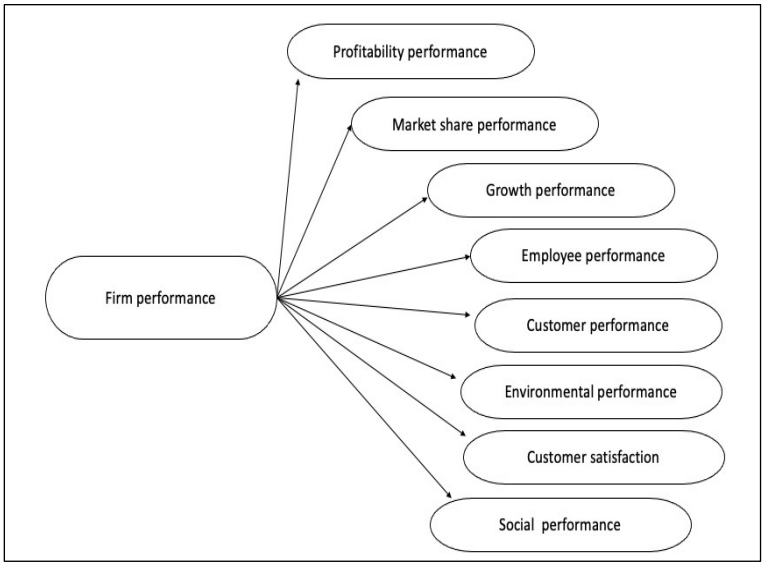
According to Taouab (2019), successful firms are pivotal to developing markets as they are vital in evolving economic, social and political change. Therefore, firm performance's relevance has become a key concept in strategic management research and is frequently used in studies seeking to determine how it is influenced (Taouab, 2019).

Theoretically, "firm performance is tied to an economic view of profit maximisation" (Aifuwa, 2020, p.13). According to Lebans and Euske (2006), firm performance can be defined as a set of financial and non-financial indicators. These indicators assist in determining performance outcomes and are dynamic (Taouab, 2019). Its definition has evolved over the decades, evolving in alignment with the changing focus relatives to the time. Taouab (2019) states that in the '50s, firm performance was closely associated with a business's organisational efficiency, viewed in relation to how well an organisation met its goals compared to the effort and resources required to utilise its workers and available resources. Later, in the '60s and '70s, according to Taouab (2019), a firm's performance was measured against its ability to exploit its limited resources. In the '80s, the definition shifted to include a firm's ability to create value for its clients.

In the twenty-first century, the definition evolved again, this time defined as a firms ability to efficiently utilise resources, achieve goals while at the same time adding value to its shareholders (Aifuwa, 2020).

2.2.1 Measurement of Firm Performance

Determining a business's performance allows for comparison over different periods. The literature on firm performance illustrates that performance can be unidimensional or multidimensional, the determinants of which are as depicted in the figure below (Selvam et al., 2016). As depicted below, firms' performance can be broken down into various subsets of financial and non-financial performance measures.



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Figure 3: : List of identified Determinants for Firm performance (Selvam et al, 2016 p93).

Profitability: All firms' objectives are to generate profit, as this is a necessary means of satisfying shareholders and investor expectations while enabling growth and market value. Thus, profitability performance enables the measurement of a business's ability to generate a profit over an identified period, as Selvam et al. (2016) argued.

The financial performance of a firm can be further divided into various subsets, namely: return on investment (ROI), return on assets (ROA), economic value added (EVA), net profit, sales growth, and earnings per share (EPS) to name just a few (Aifuwa, 2020).

Market Value: Complimentary to profitability is the measurement of market value. Market value is defined as the external assessment of a firm's future potential and an essential determinant considered in the decision-making considerations of investors and stakeholders (Selvam et al., 2016).

Growth: According to Whetten (1987), growth is complementary to the above determinants, as it predicts a firms ability to increase in size (Selvam et al.

2016). Growth in size influences economies of scale, market power and enhances the potential for future profitability.

Employee and Customer satisfaction and growth: Lastly, employee and customer satisfaction and growth levels are paramount to a business's performance. While employee satisfaction and growth are directly influenced by a business's stance on human capital investment, it manifests in a business's ability to retain and attract talent (Harter et al., (2002) cited by Selvam et al. (2016). On the other hand, customer satisfaction and growth indicate a business's ability to meet or surpass the needs of consumers through its offering in the market. Both are considered equally crucial performance indicators (Selvam et al., 2016).

For the study, firm performance was measured against financial measures. The below-listed measures were used:

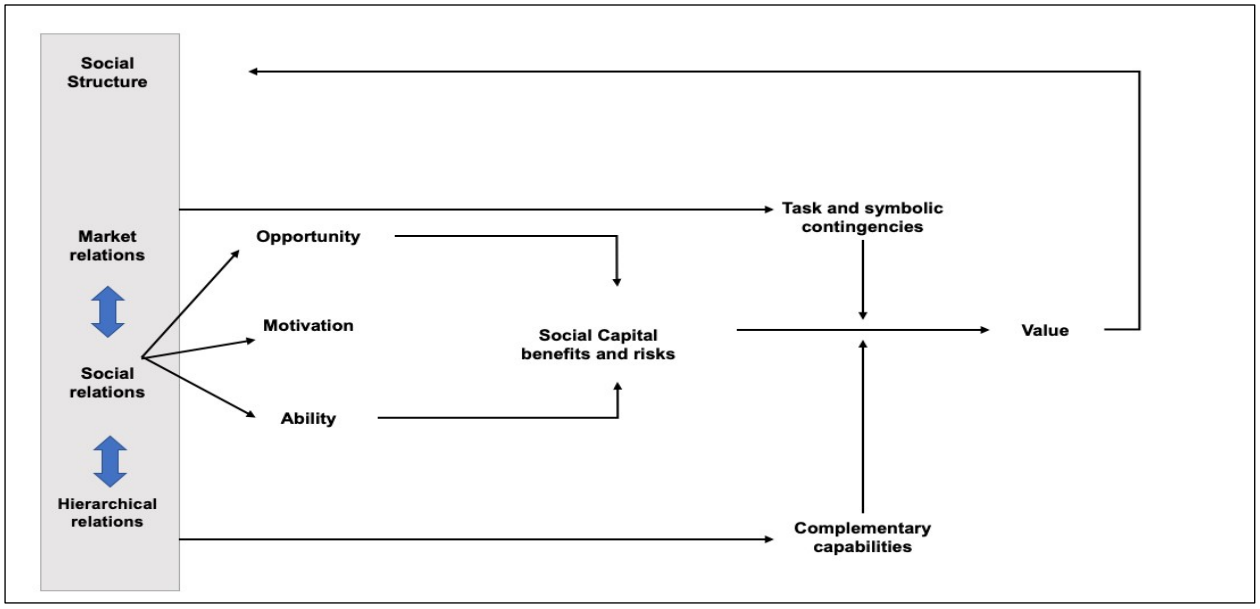
1. Return on investment (ROI)
2. Return on Assets (ROA)
3. Return on equity (ROE)
4. Net profit goals achieved
5. Sales growth

2.3 Social Capital in Entrepreneurship

The contemporary notion of Social Capital has been evoked across a wide range of disciplines, just as it has in entrepreneurial studies (Barreira, 2016). Stemming from the accumulation of goodwill, entrepreneurial social capital can be called upon when required to facilitate action and gain access to influence, resources and sponsorship (Adler & Kwon, 2002; Carolis et al., 2009). While a wide range of benefits from the pivotal role played by social capital in the entrepreneurial domain, authors Adler & Kwon (2002) highlight that it can be crucial in fortifying supplier relations, production networks, inter-firm exchanges and learning as well as facilitation of innovation (Barreira, 2016). They define entrepreneurial social capital as goodwill available to entrepreneurs and their

teams, flowing from their social relations (Adler & Kwon,2002), encompassing internal and external ties (Barreira, 2016).

Figure 4 depicts the entrepreneurial social capital concept as defined by authors Adler & Kwon (2002). The figure illustrates the value derived from the sources, influences, benefits and risks associated with entrepreneurial social capital.



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Figure 4: Conceptual framework of entrepreneurial social capital (Adler & Kwon, 2002).

2.3.1 Internal and external ties

Various social scholars have put forward definitions for social capital, tabled below in table 3, while they may appear to be similar at root level, there are identifiable distinctions.

Table 3: Definitions put forward by social scholars

Internal vs External	Authors	Definition
Internal	Coleman	"Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure" (1990: 302).
	Brehm & Rahn	"the web of cooperative relationships between citizens that facilitate the resolution of collective action problems" (1997: 999).
	Fukuyama	"Social capital can be defined simply as the existence of a certain set of informal values or norms shared among members of a group that permit cooperation among them" (1997).
		"a culture of trust and tolerance, in which extensive networks of voluntary associations emerge" (1997: 188).
	Portes & Sensenbrenner	"those expectations for action within a collectivity that affect the economic goals and goal-seeking behaviour of its members, even if these expectations are not oriented toward the economic sphere" (1993: 1323).
	Putnam	"features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (1995: 67).
	Thomas	"those voluntary means and processes developed within civil society promote development for the collective whole" (1996: 11).
	Baker	"a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors" (1990: 619).
	Belliveau, O'Reilly,&Wade	"an individual's network and elite institutional affiliations" (1996: 1572).
External	Bourdieu	"the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition" (1985: 248).
	Bourdieu & Wacquant	"the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (1992: 119).
	Boxman, De Graaf, &Flap	"The number of people who can be expected to provide support and the resources those people have at their disposal" (1991: 52).
	Burt	"Friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital" (1992: 9).
	Knoke	"the process by which social actors create and mobilize their network connections within and between organizations to gain access to other social actors' resources" (1999: 18).
	Portes	"the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (1998: 6).
Both	Lour	"naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace... an asset which may be as significant as financial bequests in accounting for the maintenance of inequality in our society" (1992: 100).

Nahapiet & Ghoshal	"the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Thus, social capital comprises both the network and the assets that may be mobilized through that network" (1998: 243).
Pennar	"the web of social relationships that influences individual behaviour and thereby affects economic growth" (1997: 154).
Schiff	"the set of elements of the social structure that affects relations among people and are inputs or arguments of the production and/or utility function" (1992: 160).
Woolcock	the information, trust, and norms of reciprocity inhering in one's social networks" (1998: 153).

(Adler & Kwon (2002)

Based on the definitions put forth by authors such as Burt (1992); Knoke (1998); Portes (1998), whose works specifically emphasise the benefits of bridging amongst external ties and relations, it appreciates social capital as an asset that is imbued from links and associations developed with others. In many instances, based on this view, social capital can explain businesses' competitive stance and actions in the market (Adler & Kwon, 2002).

To some extent, Authors Nahapiet &Ghoshal (1998), Schiff (1992) and Woolcock (1998) share similar views, who, through their definitions, point to the strength of internal and external ties, illustrates that interactions amongst a collective – is more neutral on emphasising internal versus external benefits. However, they view social capital benefits imbued from the goodwill function from both sides.

Researchers have tended to take either an internal or external stance to analyse the benefits of network and social capital theory.

Discussed below, this research explores the linkages of external business networks in greater detail and also their impact on performance interactions between SME, its supplier, consumer and competitor networks – which could, when mobilised correctly as Urban posits, facilitate the achievement realisation of mutual pursuits and performance goals.

2.4 Business and Firm Performance

Environmental uncertainty is among the critical drivers influencing the need to keep abreast of inter-organisational and consumer exchanges (Eisingerich & Belle, 2008). Business networks assist firms in identifying resources faster and are a firm source of opportunity discovery. Eisingerich and Belle (2008) quote Gulati et al. (2000) in defining what an organisations network represents. According to Gulati et al. (2000), it can be defined as the accumulation of firms vertical and horizontal relations that are of strategic relevance. Many SMEs rely on their networks' strength to exploit profitable opportunities as they become key to unlocking access to information, resources, markets, and technology. Many firms tend to lack the full scope of desired resources while externally facing environmental challenges (Pratono, 2014). In other words, networks are representative of all linkages and interactions between a business and its stakeholders where the use and benefit of embedded resources can result in complimentary exchanges and integrated solutions (Eisingerich & Belle, 2008). Long-standing business relationships are derived from interactions among key network participants such as suppliers, distributors, competitors, and governments, to name a few (Venter & Urban, 2008).

Typically, networks are adopted based on their functionality and role within the broader entrepreneurial ecosystem (Abbas et al., 2019). The access to information, technology and know-how derived through networks help entrepreneurs, executives, and employees be more dynamic, innovative and competitive. Authors Lin (1999, 2005) and Reagans & Zuckerman (2001) state that heterogeneity within a network improves productivity and mediates barriers to collaboration.

Authors Birley, Cromie & Myers, as cited by Das (2019), perceive entrepreneurial activity as a way to discover ideas and information. According to Huang et al. (2012), cooperation among firms that can be described as the aggregation of organisations significantly impacts adopting innovation and firm performance. To illustrate this point, Huang et al. (2012) reference a study done in Canada. Its results indicate that a firm can raise its performance and lower

costs associated with acquiring new information and technology through collaboration and participation in alliance networks. This example aligns with Lin's notion of mobilised capital, as it reflects the use of a resource (strategic alliances) in a marketplace extended through networks. This ultimately positively impacting firm performance.

According to Abbas et al. (2019), firms across the globe gain competitive advantages because of network interactions, tapping into growth opportunities due to external resources they can access. According to Abbas et al. (2019), rather than incorporating rigid, all-encompassing internal structures, networks' fluidity affords firms the ability to leverage resources when needed. Within a network alliance, each firm focuses on its unique set of expertise, skill, and offering, relying on its partners' trust and cooperation to meet their resource gaps (Abbas et al., 2019). Within these network structures, the flow of capabilities among participating members and resources is determined (Maina, 2016). Consistent with Abbas et al. (2019), the flow of resources is one of the motives driving firms to strengthen resource-based networks as a means to boost their competitive advantage.

Thus, networks play a vital and central role in an ever-changing market environment. Networks help firms reduce transactional costs, provide access to strategic resources, assets, facilitate dynamic learning, acquire and leverage innovation. In short, networks provide backing to firms at all development and growth stages (Huang et al., 2012). This study focuses on three types of business networks: supplier, customer, and competitor interaction, all discussed below.

2.4.1 Supplier Networks

Literature suggests that supplier integration and interaction lead to potential benefits leveraged by firms (Zhang et al., 2018). Empirical research has argued that suppliers' interactions and integration improve efficiencies and the effectiveness of information flow among firms. Zhang et al. (2018) argue that

supply networks' seamless cohesion is a characteristic hard matched by competitors.

Researchers argue that the integration and interaction among suppliers, whether strategic or operational, may influence firm performance in various ways (Flynn et al., 2013). Conforming to Flynn et al. (2013), suppliers' integration occurs when firms partner on inter-organisational strategies and are considered a critical source for producing and sustaining competitive advantage. These efforts aim to improve operations among forms and their suppliers. Working with suppliers can be summed up as the unity of efforts within a network to meet consumer needs better, argues Zhao et al. (2013).

These efforts help firms acquire various embedded benefits and resources such as insights, technology, process integrations, and the acquisition of external capabilities to overcome market constraints (Yeng et al., 2012). Ultimately, this results in better planning, forecasting, product design and development, and reduced transaction costs.

It is, therefore, expected that business network supplier networks positively impact firm performance. It is this that informs the following hypotheses:

H1: A high degree of supplier networks positively impacts firm performance

2.4.2 Consumer Networks

In a profound, direct and meaningful way, the actions taken by others can influence consumers' choices. These actions can stem from recommendations from a friend or passive observation (Godes, D., Mayzlin, Chen, Das, Dellarocas, Pfeiffer, Libai, Sen, Shi & Verlegh, 2005).

According to Heinonen et al. (2013), early studies investigated the impact of consumer interaction. Consumers' participation points to an economic value captured by firms, should they leverage insights gained from understanding the changing dynamic of consumer behaviours. The topic of consumer interaction

stems from the exploration of service management studies (Zaborek & Mazur, 2019). Interactions between firms and their consumers are dyadic. More recently, through the adoption and usage of digital innovations, interactions help firms maintain, develop, and expand network relationships with consumers (Ho et al., 2020). Studies suggest that firms benefit from consumer engagement and interaction, ultimately resulting in value co-creation (Zaborek & Mazur, 2019).

Consumer networks can manifest various outcomes beneficial to performance, such as strengthening the brand, increasing customer loyalty, attracting new customers, and lowering the cost of offering differentiated products, according to Piligrimiene et al. (2015). Additionally, customer interactions can also foster innovation due to sharing ideas and combining knowledge, according to Zaborek & Mazur (2019).

Park and Lee (2008) confirm that consumer interaction creates value beyond direct transactions. For example, e-word-of-mouth (eWOM) and the volume of traction gained can directly influence product popularity and enhance brand awareness in the digital age. In comparison, other studies have pointed to increased consumer trust and certainty expressed towards a firm (Ho et al., 2020).

Gronroos (2015) posited that consumer involvement results in the customer being the receiver of services and a participant in the process, "a production resource," as the feedback sourced from the consumer can be utilised to influence aspects of the product creation.

Though literature directly signals that a positive link between consumer interaction and firm performance is limited, studies provide circumstantial evidence.

It is, therefore expected that business network (consumer networks) positively impacts firm performance. It is this that informs the following hypotheses:

H2: A high degree of consumer networks positively impacts firm performance

2.4.3 Competitor Networks

Research investigating collaboration among competing firms has gained significant interest among researchers (Ritala et al., 2008). Competitive advantage and firm performance have been fundamental areas of enquiry, as the competitive advantage is linked to benefits derived from resources, capabilities and knowledge.

Literature supports the opinion that cooperation among competitors can be a low-cost way for new entrants to gain technology and market access (Harvard Business Review, 1989). Businesses that participate in strategic alliances, who benefit from competitor collaboration, often adhere to a set of strategic objectives that delineate engagement terms—this resulting in the competition of a different form.

Firms are intertwined in a complex network of interactions with other firms. They have realised that these networks can be a tremendous resource for greater efficiency and effectiveness when leveraged. As such, Harbison & Pekar (1998) argue that firms have increasingly been collaborating, not only with complementary partners such as suppliers and customers but increasingly cooperating with competitors (Ritala et al., 2008). According to Bengtsson & Kock (2000), “coopetition” has the potential to bring about more advantages than competition pursued separately.

It is, therefore, expected that business network competitor networks positively impact form performance. It is this that informs the following hypotheses:

H3: A high degree of competitor networks positively impacts firm performance

2.4.4 Innovation

Integrating and harnessing innovation equips firms in meeting market challenges and changing business conditions (Prajogo,2014) – especially in

turbulent times, such as the world finds itself today – impacted by the Covid 19 pandemic. Innovation provides a firm with new ideas, strategies and products which can be leveraged to sustain a competitive advantage (García-Vidales et al., 2019).

Most studies exploring innovation have focused on understanding how internal factors, such as management, knowledge/ know-how, organisational culture and technical capabilities, impact a firm's ability to innovate (Prajogo,2014). This is probably because innovation is, more likely than not, viewed as an internal capability guided by a firm's leadership team (Oskarsson, 2003). As such, little is known about the influence and the extent to which external networks have on a firm's innovative capability and the moderating effect on performance.

According to Barney (1991), as referenced by Oskarsson (2003), an innovative capability is defined as the ability to quickly introduce new products and adapt processes to sustain a business's competitive advantage. Authors Romijn and Albaladejo (2002) further highlight dimensions, both internal and external, that influence business innovative capability depicted in Table 3 below:

Table 4: Internal and external dimensions influencing firm innovativeness

Firm Innovative Capability	
Internal dimensions	**External dimensions**
• Background of founder/manager(s)	• Intensity of networking
• Skills of the workforce	• Proximity advantage of networking
• Efforts internally focused on improving technology	• Accessibility of institutional support

(Romijn & Albaladejo, 2002).

Scholars have noted that innovative potential can be driven through partnerships established amongst various stakeholders (Bach, Dalazen, da Silva, Ferraresi, & da Veiga, 2019). While Roach, Rayman and Makani (2016) point out that businesses should seek to act collaboratively through their

network of partners. This interaction between networks significantly impacts the kind of innovation adopted across services, performance, and products (Bach et al., 2019), as found by a study conducted by Ali, Kan, and Sarstedt (2016), cited by Bach et al. (2019), who found that innovation in products, processes and management assisted SME's in achieving better performance outcomes. According to Prajogo (2014), innovation is an effective means of achieving a competitive advantage.

Theories such as the resource-based view, knowledge-based view, organisational learning theory and market orientation theory contribute to understanding how innovative internal capabilities are developed and their impact on performance(Ozkaya, 2011). According to Mazzalo et al. (2012), innovation improves a business's likelihood of enhancing the quantity, quality, and diversity of ideas within a firm per the resource-based view. Besides enhancing performance, collaborations also affect the efficiency of financial performance.

However, Ozkaya (2011) asserts that resources by themselves do not equate to a competitive advantage. A competitive advantage rises from the "effective and efficient" usage thereof and is sustained when competitors are not readily able to integrate and reconfigure internal and external competencies (Ozkaya, 2011). This view emphasises the relationship between firms capabilities, innovation and performance.

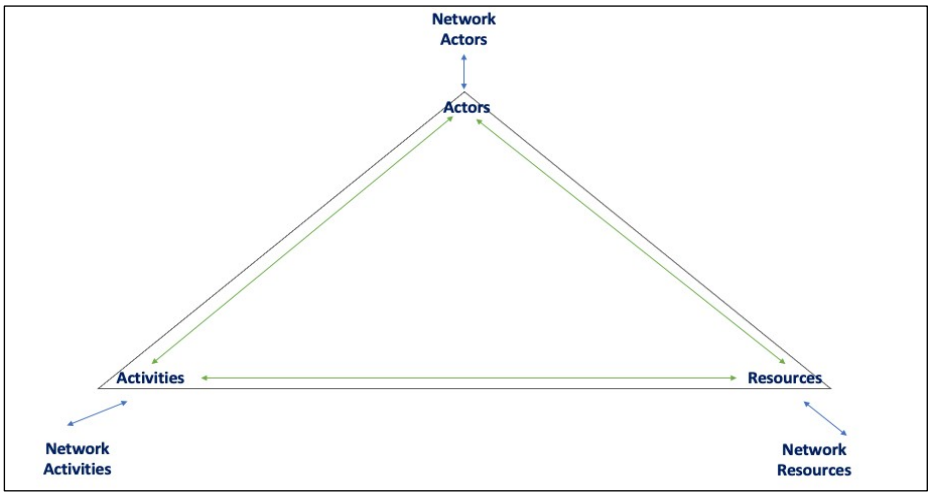
To harness new capabilities in today's environment, firms frequently leverage external sources of knowledge and technology. Chesbrough (2003), as cited by Enkel et al. (2009), posits that not all intelligent people work within a firm; there is a need to work with people both inside and outside a company. According to Bach et al. (2019), suppliers and customers are excellent sources of innovation. Today's business reality benefits from a good balance of both open and closed innovative activities. According to Dayasindhu (2002), as cited by Oskarsson (2003), a firm's embeddedness and knowledge transfer are key determinants that encourage competitiveness. This is because networks provide access to knowledge and resources often not readily available through

market exchange. As such, we see firms leveraging unique sets of resources fit to meet their distinctive needs (Huang et al., 2012).

Innovation consists of the purposeful use of external ideas, knowledge, skills sourced from competitors, suppliers, research institutions, and competitors to boost internal processes and ultimately firm performance (Bagherzadeh, 2019; Mazzola et al., 2012). Firms utilise various measures to leverage external partners' embedded resources, such as alliances, intermediaries licensing, or crowd-sourcing, argues Bagherzadeh et al. (2019).

The literature on the link between innovation and business networks suggests that new ideas, more often than not, emerge through business networks and tend to be incremental (Öberga, 2017) primarily. Author Chesbrough et al. (2006) argues that external business networks are consistently linked to innovation, a process of harnessing social capital to overcome the limitations of internal resources (Qiao et al., 2014). Cooperation and network interactions allow firms to scan and improve their capabilities and present opportunities to build ties with consumers, intermediaries/ suppliers, competitors and research organisations. They are suggesting that innovation benefits from a highly competitive environment. According to Qiao et al. (2014), innovation relies on a successful interaction process and the exchange of knowledge. This view would align with the findings of authors Bergeron, Lallich et al. (1998), which emphasises that technical progress and innovation result from numerous interactions between industries and technologies. While authors Hakansson, Walusewski et al. (2002) posit that interactions facilitate the harnessing of resources, when developed, can lead to innovation.

Interactions are crucial to firm innovativeness. Based on empirical research, the developments in innovation depend on the combination and mobilisation of resources.



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Figure 5: Interaction according to IMP approach based on the works of Hakansson (Oskarsson, 2003).

Oskarsson (2003), therefore, emphasises how interaction is affected by three key network components: network actors, network resources and network activities. Chesbrough (2014) verbalises it as "the use of purposive inflows of knowledge to accelerate internal innovation." Mazzola et al. (2012) argue that the so-called "in-licensing" has become one of the foremost means for today's external technology acquisition firms. The advantage of leveraging existing and reliable technology allows firms to simultaneously meet two goals – advancing their technological capacity and achieving financial performance goals.

While literature illustrates various advantages of integrating external innovation, the critical advantage is that it decreases the time spent on product development while also improving businesses competitive advantages within a market, affording it a pre-emptive advantage. Thus, inhibiting a business's competitors first-mover advantage (Mazzola et al., 2012).

Just as too strong a tie hinders performance, it also impedes the degree of innovation achieved. According to Oberg (2017), strong ties do not foster conditions supportive of radical innovation goals. Firms are collaborating with networks outside of their direct networks (Oberg, 2017).

This view Illustrates the importance of diversity within a network, as higher diversity influences the degree of firm innovativeness achieved (Pittaway, 2004). According to Pittaway (2014), literature suggests that in cases of incremental innovation, firms tend to seek feedback from their consumers Whereas, in cases where a firm seeks to implement disruptive innovation, they tend to look to the expertise of academic and research institutions as collaborators (Pittaway, 2004).

Prajogo's (2014) study underscored the importance of alignment between a business's strategic objective, environment, and innovation context. His research reveals that environmental competitiveness positively moderates the relationship between innovation and performance (Prajogo, 2014).

Following these considerations, it can be deduced that innovation would positively affect the relationship between business networks (supplier, customer and competitor networks) and firm performance. Furthermore, this formulates the following moderating hypotheses:

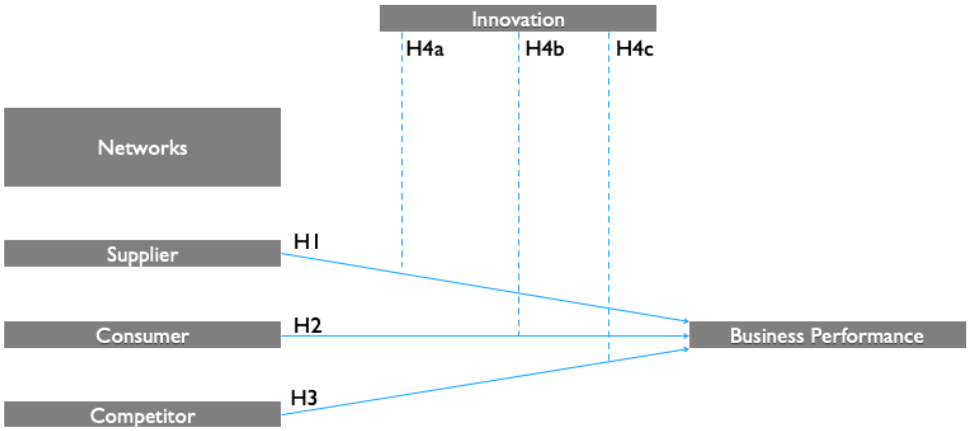
H4: Innovation positively moderates the relationship between business networks and firms performance

2.5 Conceptual Framework

As posited by Camp (2001), a conceptual framework, cited by Adom et al. (2018), is a depiction used to explain the phenomenon to be studied. Linked by concepts, theories and empirical research, the conceptual framework synthesises and systematises the information adopted by the researcher. In layman's terms, it explains the research problem to be studied (Adom et al., 2018).

Works from the following authors guide the conceptual frameworks depicted below:

- Social Capital and Network theory chiefly guided by the works of Granovetter's theory of the strength of weak ties, Burt's theory of structural holes as well as other researchers who studied the concept of networks (Lin, 1999; Lin, 2005; Borgatti, 2011; Huang, 2012).
- Innovation: Chiefly guided by Chesbrough's conceptualisation of Inbound open innovation and researchers who have studied the concept (Mazzola, 2012; West, 2014; Adams, 2008; Chesbrough, 2014; Enkel, 2009).
- Firm performance: guided by Taouab's (2019) exploration of the definition and metrics of firm performance and Selvam et al.'s (2016) explanation of the determinant of firm performance measurements.



Source: Author's own

Figure 6: Study Conceptual Model

The articles listed in the table below have served as a basis for the study. They have helped to frame and build the literature review within the defined topic. These articles have helped define the critical study concepts, evaluate relevant theoretical frameworks, and understand how they relate.

Table 5: Summary of key literature used as a basis for the study.

Author(s)	Focal Entrepreneurial phenomenon	Locus of Entrepreneurship	Relationship between Entrepreneurship and Firm performance
(Abbas et al., 2019)	Entrepreneurial business networks	What impact EBN has on performance	Strategic relevance of networks and the ability to leverage networks to impact firm performance positively
(Huang et al., 2012)	Entrepreneurial business networks	What impact EBN has on performance and innovation	Strategic relevance of networks and the ability to leverage networks to impact firm performance positively
(Venter & Urban, 2008)	Social capital and networks	Examining the link between SC and Networks	Determining networks as an asset derived from SC
(Das et al., 2019)	Entrepreneurial business networks	Examining literature on SC and Networks	Determining networks as an asset derived from SC
(Taouab et al., 2019)	Firm performance	Definition and measurement of firm performance	How the measurement of firm performance can be leveraged as an indicator in evaluating the benefit of networks, and innovation
(Chesbrough, 2014)	Entrepreneurship	Relationship between economic development and entrepreneurship	entrepreneurship leverage to positively impact an economy.
(Shane, S., & Venkataraman, S. 2000)	Social Capital and Network Theory	Identifying networks as a form and asset of Social capital	Discussing the link between SC, Networks theory
(Lin, 1999) (Lin, 2005)	Merging theory of SC and networks	Social capital and networks	Discussing the link between SC, Networks theory

2.6 Conclusion

Authors Lin (1999) and Gabbay & Leenders (1999) advance the significance of resources derived from networks – arguing that the importance depends on associative resources made available at other linkage points within a network. Interactions, associative ability and exchange within the collaborative networks allow SMEs to derive benefits (Barreira, 2016).

Networks are crucial to entrepreneurial performance and success. Not only do they limit propensity for and the associated liability of failure, but it also provides access to resources, knowledge and support. In the South Africa context, as elsewhere, networks have proven beneficial to establishing, growing and initiating a stabilising presence for SMEs in the market. This will allow businesses to overcome barriers to entry and market engagement while also enabling the advancement of innovation – at various levels.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Paradigm

A literature review on the meaning of the term 'research paradigm' leads to a deep understanding of meaning; American philosopher Thomas Kuhn first uses the term 'paradigm' to describe a philosophical way of thinking (Kivunja & Kuyini, 2017). Routed in Greek where it means pattern, in research, the term paradigm is used to describe a researchers worldview – their perspective, thinking, set of beliefs or school of thought that influences and informs how research findings and data are interpreted (Kivunja & Kuyini, 2017). The epistemology is closely related to ontology and methodology – how we come to know, and the particular practices used to attain this knowledge (Krauss,2005).

Many researchers operate from the ontological understanding that each ones perceptions are unique. Since we each experience the world from our unique point of view, each experience is different (Krauss,2005). In general, qualitative studies is based on a relativistic, constructivist ontology (Krauss,2005). Simply put, many individuals experience many realities. Together these constructed meaning by individuals imposes order and meaning to an experience (Krauss,2005).

Positivism assumes that independent facts can be quantitively measured and that the data and its analysis does not change because it is being observed. As such, positivists separate themselves from the world being studied (Krauss,2005). A positivist approach was adopted for this study. This approach's philosophy emphasises experience and reason as a core means to understand a research problem (Rafeedalie, 2020). The advantage of this approach lies in its emphasis on objectivity in analysis and reasoning.

3.2 Research Approach

Authors Cooper et al. (2014) state that good research follows a standard scientific method that is systematic, following an empirically based procedure aimed at generating replicable research. In this chapter, a quantitative approach is operationalised by distributing a self-administered survey to address the research questions raised in chapter one. The result of which depends on the answers provided by respondents.

According to Field (2009), surveys have proved to be the most used method of collecting data for quantitative studies and allow researchers to collect primary data in short periods. Another benefit is that this approach is cost-efficient, allowing the study to reach its sample audience (Msimang-Galawe, 2017). Ethical considerations relating to how respondents were approached and data collected from them were acknowledged. In the process of collecting data, informed consent was acquired from each participating respondent. Participants were further informed that their participation was not obligatory and that their identities would be kept confidential.

Lastly, before any data collection could be started, ethical clearance approval was obtained.

3.3 Research Design

A cross-sectional research design coupled with a quantitative survey distribution as the means for data collection via an online self-administered questionnaire will be utilised to address the research questions detailed in chapter one (Cooper, 2014).

A quantitative study is characterised as a structured approach with predetermined variables, hypotheses, and research design, emphasising figures to be collected, collated, and analysed (Daniel, 2016). The use of statistical data derived from this study and the analysis thereof via the IBM

Statistical Package for Social Sciences (SPSS) enabled the researcher to interpret findings, based on the data collected, on the impact of business networks on firm performance, in the South African context.

This approach is also beneficial from a time, cost, and resource perspective. A further benefit of a quantitative approach is "research detachment'. As such, researcher bias is significantly reduced when not directly contacting respondents (Daniel, 2016). The distribution of an online self-administered questionnaire will support respondent's anonymity as well as support researcher objectivity. This approach also enables the researcher to access the desired sample, which is not accessible through face-to-face interviews.

"Researcher detachment", however, can also be a disadvantage. This kind of researcher/respondent relationship can make it hard to gain an in-depth and robust view of the natural setting (Daniel, 2016). Data gathered aims to support or reject the research questions posed, highlighting the approach's effectiveness to support what is already known rather than identifying unknowns (Daniel, 2016).

3.4 Population and Sample

Taherdoost (2016) describes a population as the number of people within an area. An accessible population from which a representative subset or sample is chosen is a group of people or objects a researcher wishes to study. In determining the sample design, questions highlighted by Cooper and Schindler (2013) were used to narrow the researcher's focus. These questions were: "What is the target population?"; "What are the parameters of interest?"; "What is the sampling frame?"; "What is the appropriate sampling method?" and "what size of sample is needed?" (Cooper & Schindler, 2013, p. 244).

Based on the key objective of the study, the targeted population of interest was determined. For this study, the population of interest comprised SME's spanning the country's breadth; SMEs operating in South Africa.

It is stated that sampling allows for a more thorough investigation and for better testing (Cooper & Schindler, 2013). Several factors influence a researcher's decision when finetuning the sample. According to Cooper and Schindler (2013), sampling decisions flow from two key criteria: the research question and the specific investigative questions about the research question. The study's overall objective influences these considerations, associated ethical considerations and risks, resources and time required.

Based on sample considerations raised by the questions highlighted by Cooper and Schindler (2013), when it came to considering and identifying the best possible sample, size, and appropriate method to be used - the researcher considered the following clarifying questions to assist in defining the sample. These were within an SME in South Africa…

- Who are the individuals best positioned to provide adequate information on how the SME interacts with suppliers, consumers and competitors?
- Similarly, who would be best positioned to provide adequate information on how the SME adopts or develops innovation within the business?
- Who would be best suited to provide feedback on the financial performance of the business?

Taherdoost (2016) further describes sampling as being representative and a subset of the population. The sampling strategy to be adopted is simple random sampling. Each respondent is equally chosen, and everyone within South Africa has the same chance of being selected to participate in the survey.

Thus, the sample was narrowed to entrepreneurs or business owners and business managers in South Africa based on the above. According to the Small Business Institute (SBI,2018), there are approximately two hundred and fifty thousand formal (250 000) SME's in the country. Due to the practical implications and resources required to contact such a vast number of SME owners and managers, under restrictions imposed by Covid-19 restrictions, was not feasible.

Understanding that the entire SME population in South Africa was quite huge, the following strategies were adopted to ensure an adequate sample could be

contacted for the study. The sample was significantly narrowed to include only those entrepreneurs/ business owners and managers contactable via LinkedIn InMail. These participants were identified based on a categorical search of participants who identified themselves via their profiles and the roles they fulfilled within their companies. It is important to note that the participants were contacted via LinkedIn but not part of the researcher's profile before the study. Participants were sought out based on a categorical search via LinkedIn based on their profile title descriptions and job descriptions. To further ensure the participants were actively running operative SME's, an analysis of the business digital footprint was to via Google to ensure the businesses of participants identified were operative in South Africa.

A further narrowing of the sample was conducted by only include such identified owners and managers within South Africa.

In summary, the sample for this study was SME entrepreneurs/business owners and managers from various industries across South Africa and reachable via LinkedIn InMail. The sample participants were chosen based on their titles used on their profiles on LinkedIn. Table 6 below provides the breakdown of the respondents.

Table 6: Sampling of respondents

	Description
Geographical footprint	South Africa
Targeted population	Small and Medium Enterprises (SMEs)
Targeted Sample	Entrepreneurs/ Business Owners and Managers
No of respondents	110
Data sourced from	LinkedIn mail

Source: Authors Own

3.5 The Research instrument

A self-administered questionnaire was operationalised for this study. Based on previous research, suitable measures were recognised based on the empirical evidence for each construct. The Independent variable (Business networks) and dependent variable (Firm performance) are operationalised based on their distinct dimensions. Each variable consisted of multidimensional indicators. All items were measured on a seven-point Likert scales ranging from strongly agree (7) to strongly disagree (1).

- IV - Business networks: is to be operationalised using the author's Das et al. scale, initially conceptualised in 2019 for their study (Das, 2019)
- MV - Innovation is to be operationalised using Wang (2015) & Adams (2009) scale for Innovation
- DV - Firm performance: is to be operationalised using the author's Das et al. scale, initially conceptualised in 2019 for their study (Das, 2019)

The Likert scale and dichotomous questions will be used to gain feedback from respondents. The questions posed relate to the study's purpose: to determine whether the hypotheses stated are confirmed or falsified. The table below illustrates against which measurements items the study is to be measured.

Table 7: Measurement instrument

Construct	Literature sources	Dimensions	Comment on Instrument
Business networks- Supplier networks	(Abbas, 2019) (Huang,2012)	1. Partnerships with suppliers to share ideas 2. Interactions with suppliers to stimulate product development ideas 3. Interaction for product development 4. Interaction with suppliers to test product	1 to 7, one being 'I strongly disagree', 4 being 'neutral' and 7 being 'I strongly agree'
Business networks- Consumer networks	(Abbas, 2019) (Huang,2012)	1. Partnership with consumers 2. Interaction with consumers 3. Interaction with consumers to develop new products 4. Interaction with consumers to test new products	1 to 7, one being 'I strongly disagree', 4 being 'neutral' and 7 being 'I strongly agree'
Business networks- Competitor networks	(Abbas, 2019) (Huang,2012)	1. Partnerships with competitors to share ideas 2. Interactions with competitors to stimulate product development ideas 3. Interaction for product development 4. Interaction with suppliers to test product	1 to 7, one being 'I strongly disagree', 4 being 'neutral' and 7 being 'I strongly agree'
Firm performance	(Abbas, 2019) (Huang,2012)	1. ROI 2. ROA 3. ROE 4. Net profit goals achieved 5. Sales growth Market share	1 to 7, one being 'I strongly disagree', 4 being 'neutral' and 7 being 'I strongly agree'
Innovation	(Wang, 2015) & Adams, 2008)	1. Technology scouting 2. Horizontal technology collaboration 3. Vertical technology collaboration	1 to 7, one being 'I strongly disagree', 4 being 'neutral' and 7 being 'I strongly agree'

Source: Authors Own

3.6 Procedure for Data Collection

The data collection procedure describes steps adopted by the researcher in gathering the data required for their study (Cooper & Schindler, 2013).In brief, this process entails knowing when the data is to be collected and how much time is being allocated, therefore, who was tasked with collecting the data and how they did so in this study (Cooper & Schindler, 2013).

For this study, secondary research was utilised, as a reference, to build chapters one through three. The literature was thus relevant in framing the study's objective and developing the literature review. Secondary research was also used to support, as a reference, the researcher's thinking and argumentation throughout the study.

Primary data used for empirical analysis was collected via a self-administered survey developed and distributed by the researcher during December 2020 and January 2021. A link to the survey was sent via LinkedIn mail to entrepreneurs/ business owners and managers, identified by their title used on the platform during this period. Respondents were able to access and complete the survey, at their leisure and convenience, via their laptops, PCs or mobile devices. Using electronic data collection software, Qualtrics enabled the questionnaire's digital distribution to respondents, eliminating geographical constraints pertaining to potential lockdown restrictions and travel bans.

Respondents were reminded, via LinkedIn mail, to complete the survey after three weeks as an attempt by the researcher to encourage higher completion rates. This approach was also adopted to ensure the timeous completion of the questionnaire.

3.7 Data Analysis

The process followed in the data analysis process for this study is discussed below, highlighting the considerations and steps taken when making statistical decisions.

Data analysis involves handling data and the theoretical basis guiding the techniques chosen to interpret it (Cooper & Schindler, 2013). The process involves dwindling large volumes of accumulated data into summaries, identifying patterns, and applying specialised techniques to determine the relationship between variables (Cooper & Schindler, 2013).

Data from the self-administered surveys distributed via the Qualtrics platform was downloaded into Microsoft Excel for the preliminary cleaning process. This exercise was aimed at ensuring to verify the integrity of the data. Once this process was completed in Microsoft Excel, the data was uploaded for a more comprehensive cleaning and analysis to IBM's statistical package for social sciences (SPSS). The steps taken in checking the quality of the data included: screening for data errors, missing values, coding, checking for the completeness of responses and the reverse coding of reverse questions. The statistical package for social sciences (SPSS v27) was utilised for the study's statistical analysis.

The research instrument allowed respondents to complete the survey in more than one sitting, which meant they could complete it mid-way, accessing the survey via the same link later to complete it. The aim of this was to encourage as many completed submissions as possible. However, the consequence of this approach also meant that missing data in its entirety and partially completed surveys. Described below are the steps taken to clean as well as to search for, delete or replace some missing values from the one hundred and thirty-two (133) responses collected:

3.7.1 Data Screening

The screening and validation of the data are essential. This preliminary step includes cleaning, editing, and coding the data to ensure that the data's accuracy is analysed. At this stage, potential data entry errors and gaps are identified and corrected (Field, 2014).

- **Clearing of columns:** In SPSS, columns not required for analysis were removed. This included Longitudinal data, date started and finished, duration, recipient name and email, external references and user language.
- **Variable count, coding:** A manual check of the variable count was conducted, and this was checked against all the variable and data view in SPSS. As well as checking to see that the variable values are positively coded. The frequencies test was conducted to check scale ranges; this was done to ensure all measures were defined appropriately, as per the measurement instrument (7-point Linkert scale). In compiling the research instrument reverse phrased question was added to each set of variable questions. The aim of this was to ensure respondents were actively engaged and not answering the survey haphazardly as well as a guard against bias. Described below are the steps taken to reverse code these questions. Sub question 5 for the supplier, consumer and competitor (Q. 5.1.5, 6.1.5 and 7.1.5) variables were reverse coded in SPSS as they were negatively phrased in the measurement instrument. For these questions the scale was reversed i.e.: (1=7, 2=6, 3=5 and 4=4, 5=3, 6=2, & 7=1). The consequence of this meant that a low score in these questions indicated disagreement while a high score indicated agreement.

- **Inspection for consent:** The research instrument was programmed so that when a respondent opted to enter the “I do not consent to the survey” option, the survey would then proceed to the end of the survey window.

- **Deleting disqualifying cases:** Five cases where the business size was identified as 'large' were also deleted as large businesses were not part of the defined sample.

- **Missing Data:** It is usual to come across missing data in a survey-based study. There are many contributing factors resulting in the occurrence of missing data. This may occur due to the respondents either mistakenly overlooking a question, respondents losing interest in completing a lengthy questionnaire or opting not to answer sensitive questions. This is often a manner of excising their right not to provide answers to questions they perceive as sensitive questions (Cooper & Schindler, 2013; Msimang-Galawe, 2017). However, missing data may also result from researcher error; this may result from the corruption of data files or deliberate changes made to the research instrument – e.g., eliminating variables (Cooper & Schindler, 2013). In this study, missing data was attributed to incomplete cases detailed below:

    - Listwise deletion of 37 cases was done on cases that were wholly or more than 10% partially incomplete. This subsequently left 91 responses. However, there were still cases with missing values.

    - A missing values analysis was run via SPSS. The results indicated that all missing values were under 5% for all items. Items from the innovation variable, Q 8.11 and 8.12, had the highest percentage of missing values recorded at 4.4%.

    - To understand whether these missing values were random or not, Little's missing at complete random (MACR) test was conducted via SPSS. The test resulted in a p-value of 0,148. As the p-value was above 0.05, this meant that there was no statistical significance and the null hypothesis rejected. Thus, missing values were completely missing at random.

The missing values were replaced by utilising the series mean for each variable in SPSS. Each variable and its subscales were run separately to ensure greater internal correlation between the subscales. In this manner increasing the

efficiencies of the data. Once all variables were run, they were merged and saved, ready for analysis.

Statistical Techniques

After data screening which included checking of missing values, several statistical techniques were used to analyse the data to test the study's hypothesis. This included descriptive statistics, correlational and regression analysis.

3.7.2 Descriptive Statistics

A descriptive statistics analysis assists in summarising the data in an organised, meaningful and manageable manner. The key aims of descriptive statistics are to summarise the sample and its measures (Sharma, 2019). According to Kaur, Stoltzfus & Yellapu (2018), descriptive statistics describe the data and are the crucial first steps taken when interpreting research. Volumes of data are summarised into statistical tables detailing the datasets means, minimum and maximum value, range, counts (n), standard deviation (s) and variation (!!) and so on, allowing for the analysis of data in a more manageable form (Cooper, 2014; Field, 2014). These data summaries are depicted using tables, graphs and statistical commentary, providing a general description of the cases.

In this study, a descriptive statistics analysis was used to analyse the respondents' demographic profile characteristics. The following indicators were measured to provide meaning to the samples' demographic profile: biological sex, age, and level of education. At the same time, business profile indicators, which helped understand the type of businesses each respondent was represented, included: business size, location, duration of business operations, and the number of employees.

3.7.3 Correlation Analysis

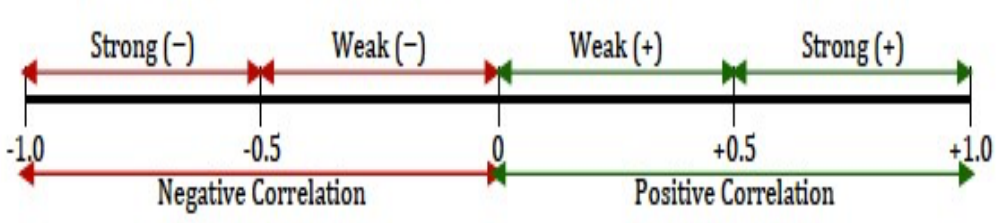
Describing the “mutual relationship between 2 or more things” (Australian Council of Research, 2015), a correlation can be positive (+), negative (-) or non-existent (0) as the value indicates the ‘magnitude of closeness’ amongst variables. Thus, providing insight as to the relationship between variables.

There are three main ways to measure the correlation between variables:

- Pearson’s coefficient (r): Which measures the strength of linear relationships between variables. Important assumptions when using the Pearson’s correlation coefficient is that data is normally distributed, variables are linearly related and measured on an interval or ratio scale (Hauke & Kossowski, 2011).
- Spearman’s rho coefficient (rs): Spearman’s rank coefficient measures the strength of the association between variables, evaluating how well monotonic relationships move between variables. Unlike Pearson’s, this does not require variables to be linearly related, normally distributed or measured on interval or ratio scales. It can be used on data measured on an ordinal scale- rank ordered variables are linearly related and measured on an interval or ratio scale (Hauke & Kossowski, 2011).
- Kendall’s tau coefficient (t) (Hauke & Kossowski, 2011): An Alternative to Spearman’s rho (rs) for ranked data, a measure of the concordance or “agreement” amongst variables, variables are linearly related and measured on an interval or ratio scale (Hauke & Kossowski, 2011).

More commonly used in studies is the Pearson coefficient. Often referred to as the Pearson coefficient, the r value ranges from -1 to +1. A correlation or r value of zero (0) indicates that no relationship exists between variables, while correlations closer to -1 or +1 suggests an association between variables(Taylor, 1990).

A positive correlation illustrates a corresponding positive impact, indicative of the direct relationship amongst variables. In contrast, the inverse is true for negative correlations (Taylor, 1990).



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Figure 7: Basic spectrum of interpreting correlation coefficient (Source: Senthilnathan, 2019 p4).

In this study, a correlation coefficient will be tested to indicate the strength and direction of the relationship between the variables, i.e., Networks (supplier, consumer and competitor networks - IV), Innovation (MV) and Business Performance (DV).

A positive r would indicate a corresponding positive relationship between the variables, meaning that as network interactions and innovation increase, so does business performance. The inverse would be true should a negative r value be recorded.

3.7.4 Regression

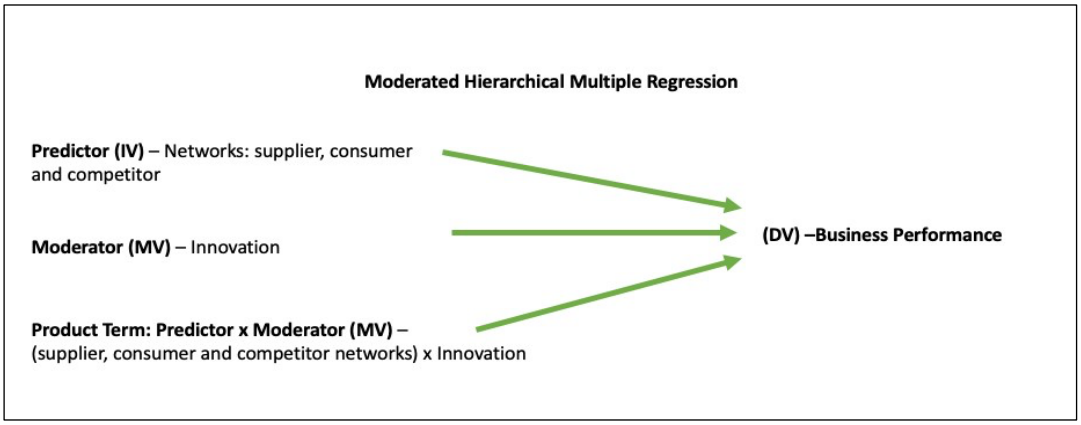
Regression is a statistical technique that helps the researcher draw inferences about the relationship amongst variables, providing responsive insight as to the relationship between the dependent variable (DV) and the predictor variables (IV) (E. A. G. S. & SERIES, 2006). Regression analysis enables a researcher to identify whether there is a significant relationship between independent variables and dependent variables and the strength of these different independent variables on a dependent variable (Sarstedt & Mooi, 2014; Field, 2014).

Regression differs from correlation in that it is focused on determining how variables respond to each other. Thus, a researcher can draw inferences about whether or not the predictor variables impact the dependent variable in any way.

This study explains the variance in the relationship between the Independent (supplier, consumer and competitor network interactions) and dependent (firm performance) variables when moderated by innovation. Predictor variables change the strength and, in some cases, the direction of the causal relationship between the independent (IV) and dependent variable (DV).

As such, the study tested for two-way interactions, illustrated in figure 15. In this process, the dependent variable (business performance) was regressed to the interaction term (IV - networks: supplier, consumer and competitor networks x MV- Innovation) and the main effects of networks(supplier, consumer and competitor networks) and Innovation.

To ensure this analysis could be run via SPSS, new centred variables and a product term (i.e., IV - networks: supplier, consumer and competitor networks x MV- Innovation) was calculated before starting the regression analysis.



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Figure 8: Depiction of the Regression Model for this study (Source: Andy Field, 2013).

3.8 Validity and Reliability of Research

According to Murimbika (2019), two measures are commonly used to determine the quality of research: Validity and reliability. This view is asserted by Cooper & Schindler (2013), Cunic (2020) Taherdoost, (2016).

According to Mohajan (2017), a prerequisite to determining a measurement scale's quality and integrity is evidenced in its validity and reliability. Joppe (2000) describes reliability as the "extent to which results are consistent over time and an accurate representation of the total population in the study" (Golafshani, 2003 p 598). Where results can be reproduced under similar conditions, the instrument's reliability is considered reliable. Embodied in this definition is the notion of replicability and stability of the measurement instrument over time.

On the other hand, validity aims to explain how well the data collected can be measured by what is intended to measure. Joppe (2000) defines validity as "whether the research truly measures that which it was intended to measure" (Golafshani, 2003 p 598). The validity, therefore, is used to check the accuracy or 'truthfulness' of the research, confirming that the operationalisation thereof is adequate for its chosen intention.

3.8.1 Validity

Validity is concerned with the interpretation and meaning of a measurement scale. There are many approaches to determine validity. According to Gould (1994), validity does not take one form, as multiple forms may be applicable.

Internal Validity - Internal validity pertains to the extent to which the instrument adequately measures what is supposed to be measured. Internal validity enhances accuracy (Cooper & Schindler, 2013; Cunic, 2020). Internal validity further reflects the propensity of a study to eliminate alternative findings (Cunic, 2020). This includes:

- **face and content validity:** Closely related, content and face validity are the minimum requirements of validity. Demsey and Demsey (1992)

affirm that face validity is the quickest way to determine validity as the judgement thereof is based on the assumption of whether a measurement scale looks reasonable. Not tested using statistical measurement, but on the researcher's consideration as to whether a scale is relevant.

On the other hand, content validity is concerned with the inclusion of relevant considerations and the exclusion of irrelevant considerations related to the scales content. Therefore, determining the extent to which the scale adequately measures that which it is supposed to.

This is done to ensure all concepts relevant to the construct identified is included in the scale, which closely relates to construct validity.

- **Criterion validity:** There are two parts to criterion validity: concurrent validity and predictive validity.

  Concurrent validity is concerned with whether or not a scale correlates to or is similar to an existing scale. Predictive validity considers the correlation of the results from the scale developed and the 'current gold standard' and determines the scales ability to predict future outcomes (Bannigan & Watson, 2009).

  Together concurrent and predictive validity is used to determine the accuracy of the measurement scale.

- **Construct validity:** According to Polit & Hungler (1995), construct validity is concerned with assessing the extent to which a measurement instrument correlates to the construct being studied. Construct validity is crucial in instances where no previous instrument exists, and the development of a measure has been based on theory (Bannigan & Watson, 2009).
- **Factorial validity:** Based on a statistical procedure, Polit & Hungler (1995) explain that factor analysis is concerned with consolidating a

large number into a smaller set of variables with common underlying dimensions. Factor analysis is thus used to identify an instrument's 'underlying conceptual structure' (Bannigan & Watson, 2009).

There are two approaches to factor analysis, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA enables a researcher to identify factors not easily identified in a large set of variables, while CFA allows a researcher to test hypothetical models and their fit (Bannigan & Watson, 2009).

To improve internal validity, the following measures were taken:

- A sample of respondents, identified as SME owners and managers, was targeted. It is expected that these individuals are responsible for managing relationships with suppliers, consumers, and competitors and making judgements on innovation to be adopted by the business.

- The variables measured in the study (networks, innovation and performance) are concepts previously studied and well covered in the research. Measurement scales were adopted from previous studies undertaken in 2012 and 2019 (Haung, 2012; Abbas, 2019), while innovation scale was adopted from Adams (2008).

- Questions were asked as succinctly as possible to reduce ambiguity

- An EFA analysis was conducted to identify factors for hypothesis testing

- **External validity -** Addresses the question of generalisability (Cooper, 2014) and utility. It evaluates whether a research result can be extrapolated for a whole population, similar situations/ contexts outside of that where the research has currently taken place (Ursachi, Horodnic & Zait, 2015). It can also indicate how well a study can be expected to be applied elsewhere. In other words, external validity refers to how

generalisable the findings are – their application to different sets of people, settings, situations and periods (Cunic, 2020).

Situational factors, such as the current Covid 19 restrictions, have been considered, and steps are taken to ensure minimal impact on the study

3.8.2 Reliability

Key to the research process is the reliability of the data collected. Reliability refers to the consistency and replicability of the results obtained (Zohrabi, 2013). A reliable instrument would not produce random or unstable errors in measurement. MacDowell and Newell (1996) emphasise that the purpose of reliability testing is, therefore, to test the extent to which a measurement scale is free of random error (Bannigan & Watson, 2009). According to Field (2006), reliability is based on the idea that individual items should produce consistent results – Cronbach Alpha, the most commonly used method to test reliability, computes the correlation coefficient for each split test (field, 2006). Thus, the less variation in an instrument, the more reliable it is.

Described as one of the statistical methods used in research to test for, Cronbach Alpha is commonly used by researchers to demonstrate that the identified measurement scale is 'fit for use' (Taber, 2018). Today, Cronbach Alpha's use in research is considered routine, especially where multi-item measurement scales are used (Taber, 2018).

Where the test achieves a score of 0.7 or greater, it is inferred that reliability is very good. A score of 0.6 – 0.7 is regarded as satisfactory or acceptable reliability. Kline (1999) notes that when dealing with psychological constructs, values below 0.7 can be expected due to the diversity of the measured constructs. Alpha is also affected by reverse phrased items – essential for reducing response bias - hence reverse coding is crucial. If not done, it can lead to a negative Cronbach alpha score (Field, 2006). In a reliable scale, all items will correlate. Items with low correlations may need to be deleted.

Reliability concerns itself with the extent to which the measurement used can provide a consistent and stable result (Taherdoost, 2016). Reliability is further concerned with repeatability, meaning that, if utilised under similar conditions, it can provide similar, stable, and consistent results (Taherdoost, 2016). Thus, indicating the consistency and reliability of the identified measurement instrument.

3.9 Study Limitations

According to authors Cooper and Schindler (2013), all studies, irrespective of its size or topic, has its limitations. As stated by the authors, limitations are essential as they assist the reader in making a judgment as to the validity of the study (Cooper and Schindler, 2013).

The limitations of this study are identified as follows:

- Respondents may have been biased in their answering.
- As a self-administered survey was used with a limited number of questions, further probing or clarifying questions were not asked.
- Respondents were asked to mark the answer that best represented their answers, based on their subjective opinion. Responses on performance were not measured against concrete financial records.
- Cold emails sent via LinkedIn meant that a few potential respondents, owing no prior reference or acquittance with the researcher, chose to ignore their invitation to participate in the study.
- The collection of data over the festive break, December 2020 leading into January 2021, was not ideal as many identified participants were not active on the LinkedIn platform during this time as December marks South Africa's summer holiday/break.
- In the South African context, the study's focus being on SMEs could mean that results identified are not necessarily transferable or experienced by larger firms. Irrespective of their geographic positioning.

- Similarly, the SME experience in South Africa may not be identical to that of other countries. Be it on the African continent or across the globe, socioeconomic conditions, which may be unique to the country, plays a crucial role in this sense.

3.10 Ethical Considerations

Ethical behaviour refers to moral choices that guide and affect an individual's behaviour. Cooper and Schindler (2013) describe ethics as the norms and standards of behaviour that guide individuals' choices, behaviours, and relationships with others. Thus, ethics ensures that no harm is imposed due to the research activities undertaken (Cooper and Schindler, 2013). According to Cooper and Schindler (2013), respondents have the right to several confidentialities: nondisclosure, purpose nondisclosure, and findings nondisclosure. This is attributed to the potentially sensitive nature of research questions or because external researchers have either been brought in to conduct a study or participants have been approached by an external party to participate in a study (Cooper & Schindler, 2013). To achieve this, it is essential to ensure that participants' rights are not infringed upon in the research and data collection process. It is the researcher's responsibility to respect the participant's wishes on nondisclosure and safeguard their identity.

The following steps were taken to ensure that ethical guidelines were adhered to for this study:

- All attempt at gaining respondent feedback was set aside, pending university clearance. The researcher received a clearance certificate from the university's ethical committee, who approved the study unconditionally.
- Clearance was subject to fulfilling all ethical requirements set out for consideration by the WITS Business School. The following criterion was considered for ethical clearance approval: Study's risk level, allocation of a supervisor, aims and objectives of the study, how and from whom formal permission would be obtained for an identified sample group,

identification of the period over which data would be collected and how the data would be collected.

- The researcher further awaited feedback and signoff on the measurement instrument. Once this was received, attempts to facilitate feedback from respondents was then undertaken.
- Respondents' voluntary participation should be respected. As such, efforts were made to ensure they were informed about the purpose, scope, and reasoning behind the study being conducted (Cooper and Schindler,2013). Based on this, respondents could choose to consent to participation.

See attached ethical clearance certificate, Appendix B.

3.11 Conclusion

This chapter presented the research methodology, design and explained the research process adopted for this study. Therefore, the hypothesis developed in chapter two was tested within the research context set out in this chapter. The research design was developed to collect data required for testing the relationships between business networks, innovation and performance.

Twenty-one (21) Likert-scale items were used in the research instrument, covering all variables. A self-administered survey was distributed to a sample of SME entrepreneurs/ business owners and managers for data collection purposes.

An overview of the statistical techniques utilised in the data analysis, validity and a reliability process. Lastly, this chapter closes off with the limitations criteria and ethical considerations defined for the study.

The results from the analysis of the data are presented in the next chapter.

4 Chapter 4: PRESENTATION OF RESULTS

4.1 Introduction

Presented in this chapter are the results of the data collection and the inferential statistical analysis. The analysis presented is done in line with the study's research methodology described in chapter three. The chapter starts with the presentation of the respondents' demographic characteristics, followed by descriptive statistics. The data is also subjected to exploratory factor analysis (EFA) and validity and reliability testing of the measurement scales. The chapter concludes with the results from the hypotheses test findings.

The interest of this study was to investigate the extent to which networks moderated by innovation impacted business performance. The study hypothesised that networks (supplier, consumer and competitor networks) positively impacts business performance and that innovation positively moderate the relationship between networks and business performance.

4.2 Demographic Profile of Respondents

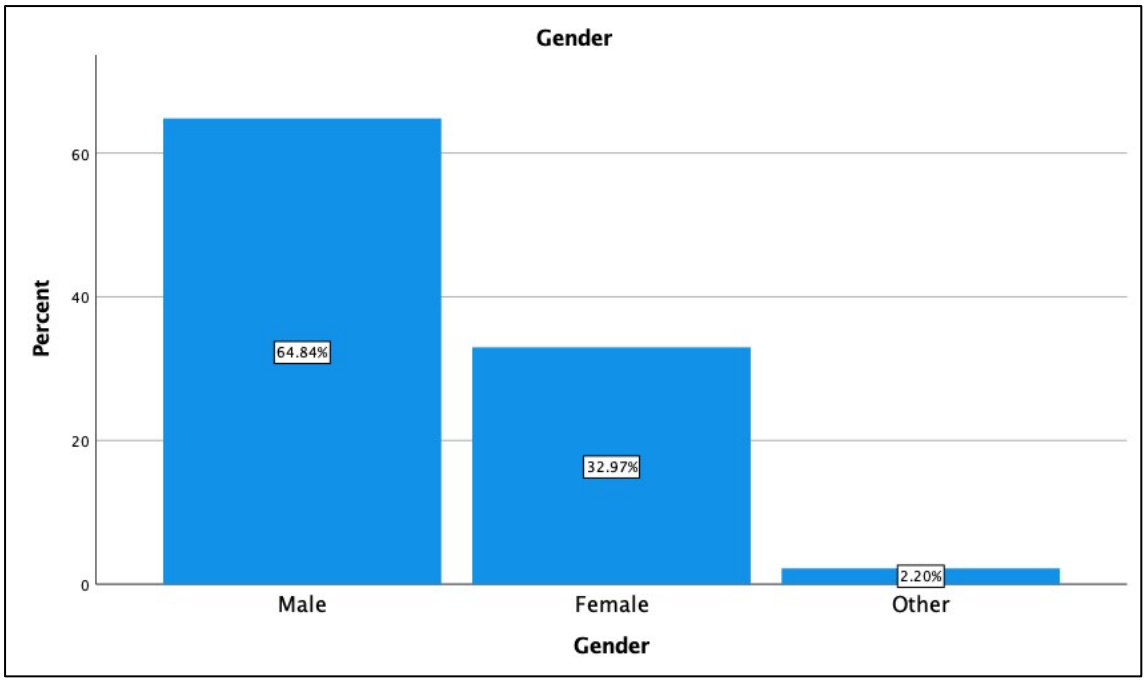
This section presents the demographic profile of the study's respondents. First, the respondents' characteristics are presented; in this study, the respondents were entrepreneurs or managers of SMME's in South Africa. To measure this, the following information was collected via the self-administered survey: respondents Age, Biological Sex and Level of education.

In line with this, the characteristics of the SMME's they represent are presented. To measure this, the following information was collected via the self-administered survey: Geographic location, business size, how long the business had been operative, the number of full-time employees, Whether or not new capabilities were being considered as a result of Covid 19, and lastly, the industry the businesses were operative in.

4.2.1 Biological Sex

The sample's Biological Sex characteristic results reveal that just under two-thirds of the respondents were male (64.84 %), while female (32.97 %) respondents represented just below one-third of the responses. Two per cent (2.20 %) of the respondents identified as other.

Thus, double the number of males were sampled in the study.



Source : Primary Data

Figure 9: Respondents Biological Sex Results. Source : Primary Data

4.2.2 Age

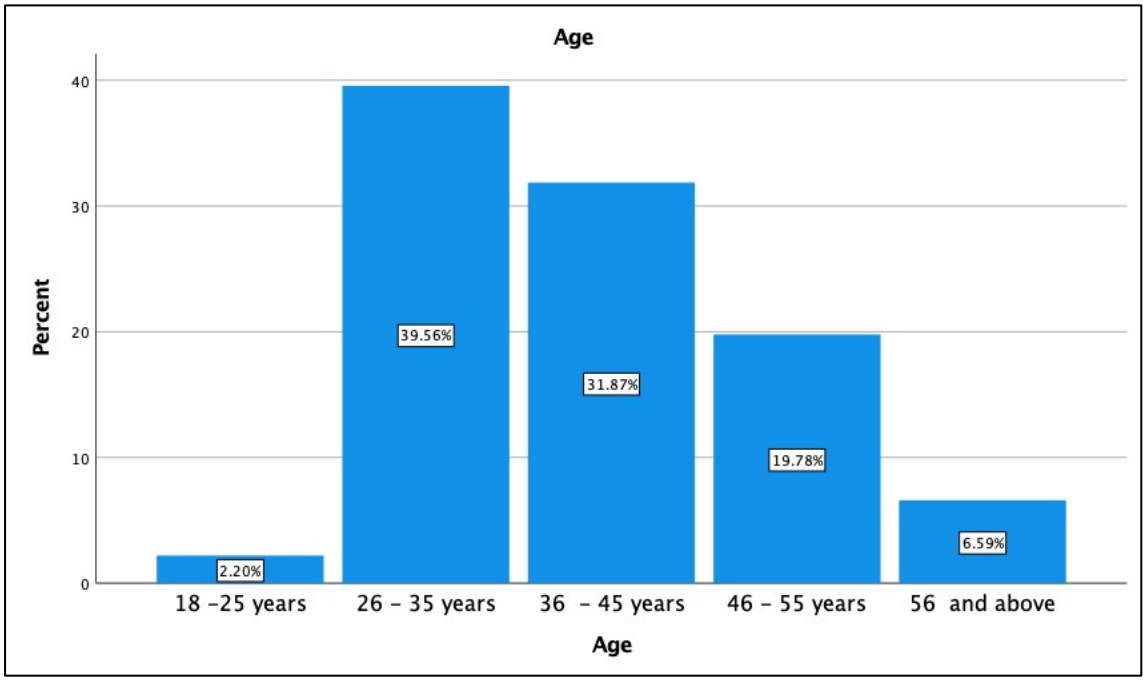
Figure 10 shows that most of the respondents were aged between 25 – 34 years, making up 39.56% of the study's respondents. South Africa's youth demographic, taged18 - 34, collectively accounts for 41.76% of all respondents.

Those aged between 36 - 44 years who represented 31.87 %

Furthermore, those aged 45 - 54 accounted for 19.78% of the study's respondents. Collectively made up

51.65% of all respondents.

Those aged 56 and above made up 6.59% of all respondents.



Source : Primary Data

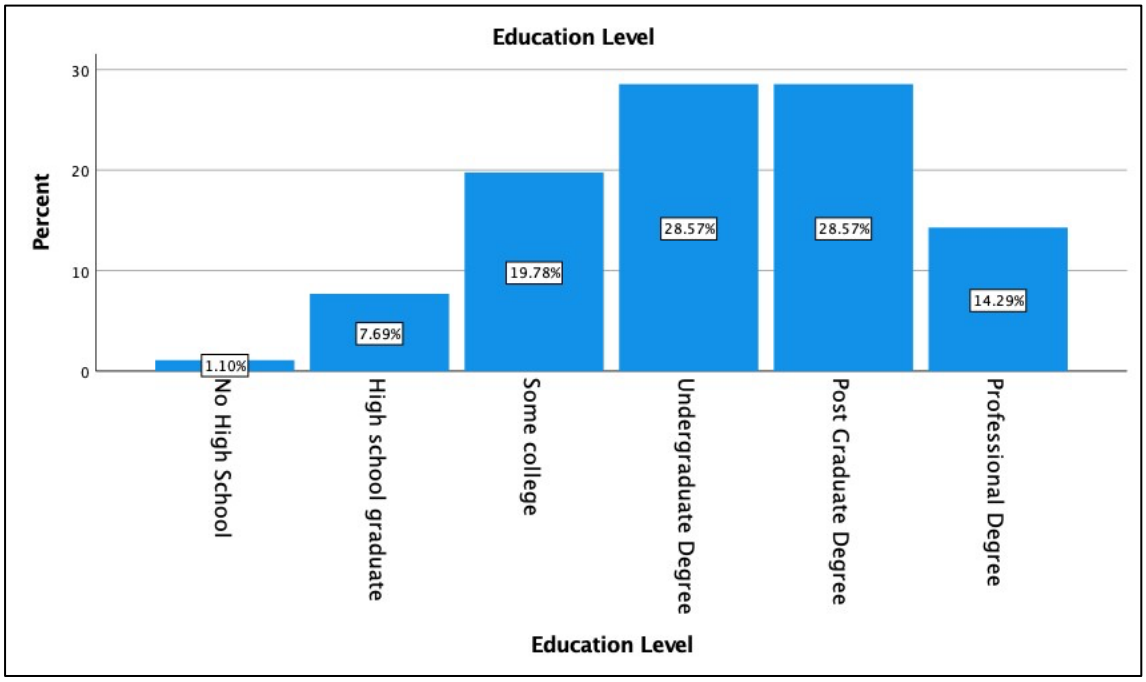
Figure 10: Sample Age Group Results.

4.2.3 Level of Education

An analysis of the respondents level of education, as depicted in figure 11, shows that an equal proportion of the sample has obtained their undergraduate and post-graduate degrees. A further 14.29% of respondents have obtained professional degrees. The three groups with tertiary education at varying levels account for 71.43% of the sample.

Nineteen-point seventy-eight per cent (19.78%) of the sample had received some college education, while 7.69% had graduated high school. Only 1.1% of the sample had not finished high school.

The apparent bias towards respondents with university qualifications could be due to the data collection method, which relied on LinkedIn, a professional networking platform to contact and share the survey with respondents.



Source : Primary Data

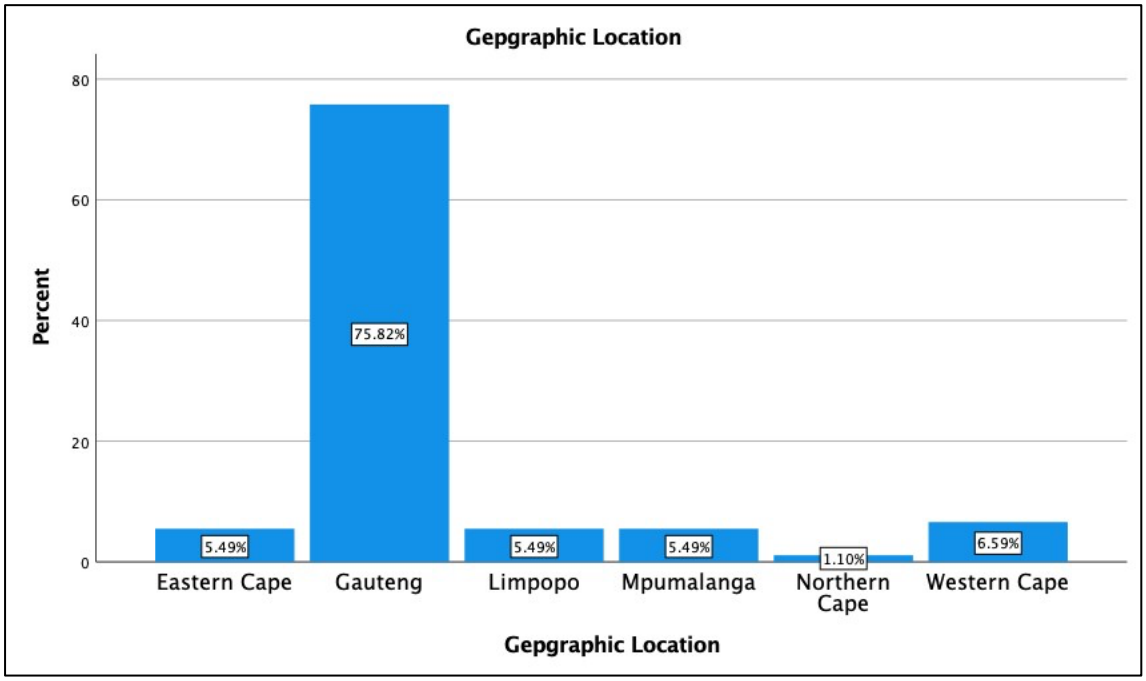
Figure 11: Level of Education Results. Source : Primary Data

4.2.4 Geographic Location

An analysis of figure 12 depicts the geographic footprint of respondents. Most respondents (75.82%) were SMEs located in Gauteng, while 6.59% were based in the Western Cape.

Five-point fifty-nine per cent 5.59% of businesses were located in Limpopo and Mpumalanga and the Eastern Cape, respectively.

The Northern Cape represented 1.10% of respondents.



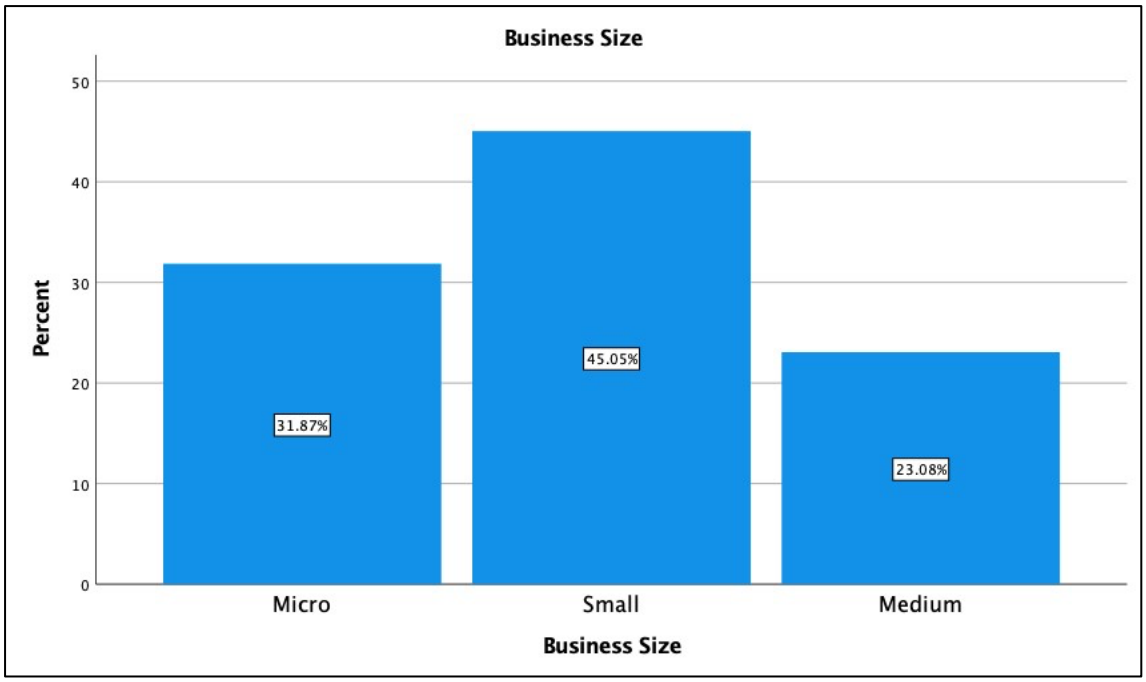
Source : Primary Data

Figure 12: Geographic Location Results. Source : Primary Data

4.2.5 Business Size

Figure 13 depicts the size of the business each respondent represented. Based on the bar chart, most of the businesses represented by respondents in the survey were small (45.05%), followed by micro-businesses (31.87%). Medium-sized businesses made up (23.08%) of the sample.

Collectively small and micro-businesses made up 76.92% of the samples' business sizes.



Source : Primary Data

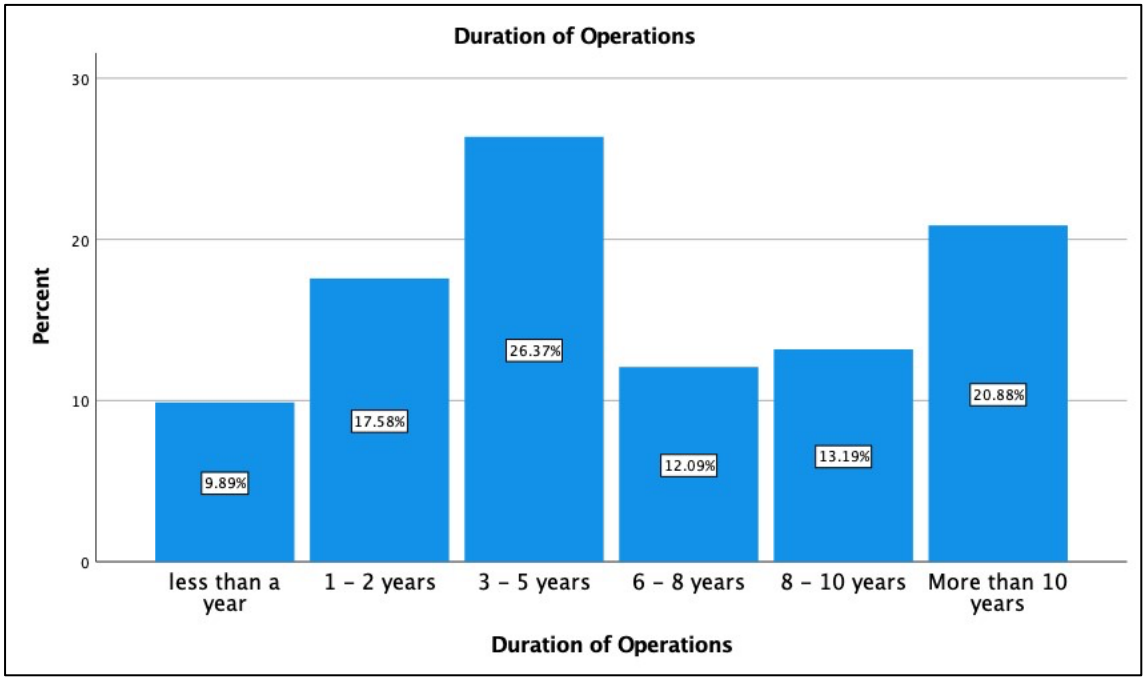
Figure 13: Business Size Results. Source : Primary Data

4.2.6 Duration of Operation

Based on the analysis of figure 14, 26.37% of the businesses had been in business for 3 – 5 years, while 20.88% had been in business for over ten years.

Collectively, 27.47% of businesses had been in business for 2-years or less. 12.09% had been in business for 6 – 8 years, while 13.19% had been in business for 8 – 10 years.

A slim majority of businesses had been in business for 5-years or less (53.84%), while the minority of businesses had been in business for more than 5-years (46.16%).



Source : Primary Data

Figure 14: Duration of Operations Results. Source : Primary Data

4.2.7 Industry

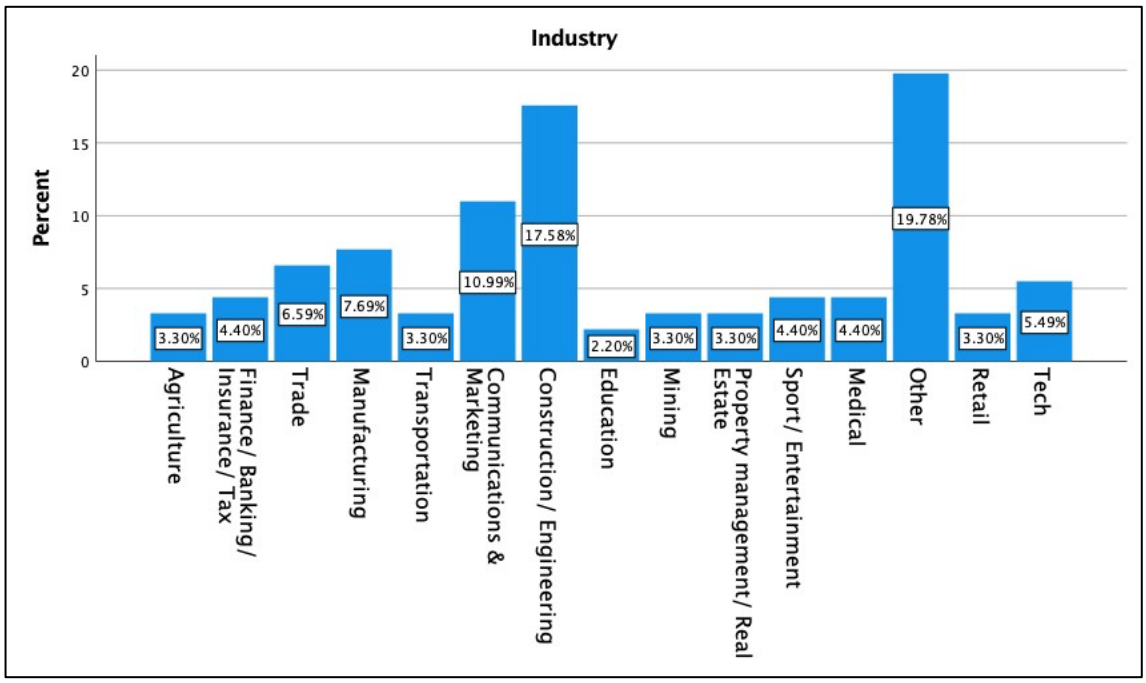
Collectively, respondents from the marketing and communications and the construction and engineering made up 28.57% of the industry profile. In comparison, nineteen 19.78% made up the 'other' category. Manufacturing made up 7.69% of industries represented in the survey, while Trade represented 6.59% of the sample.

Five-point forty-nine per cent (5.49%) of respondents worked at technology-based businesses. Medical, sports and entertainment, and financial industry-based businesses represented 4.40% of all respondents in the survey, respectively. Collectively accounting for 13.20%.

Agriculture, transportation, mining, property management and retail industries made up 3.30% of the sample, respectively. Collectively accounting for 16.50%. The education industry was represented at just 2.20%.

Overall, the results illustrate which industries lend themselves to explore entrepreneurial endeavours and opportunities in the South African Landscape.

Trade, in this instance, refers to businesses who perform and provide their clientele with a particular skilled based service and offering, in particular manual skilled labour. While retail refers to the selling of goods and services direct to the consumer.



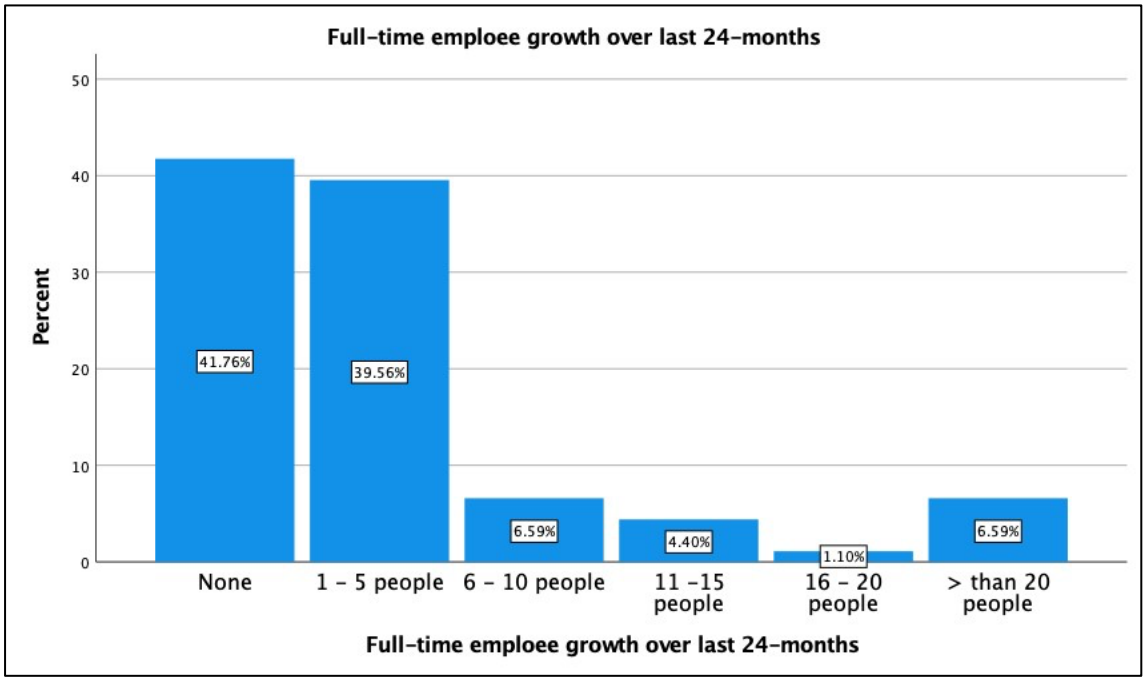
Source : Primary Data

Figure 15: Industry Results. Source : Primary Data

4.2.8 Growth in the Number of Permanent Employees

Most of the businesses represented in the survey have not grown in the number of permanent employees, with forty-one (41.76%) having not employed a permanent employee as yet. In comparison, 39.56% have increased their number of permanent employees employed by between one to five people.

Collectively, 10.99% of businesses have permanently employed between 6 and fifteen people, while a further collective 6.74% have permanently employed more than 16 people.

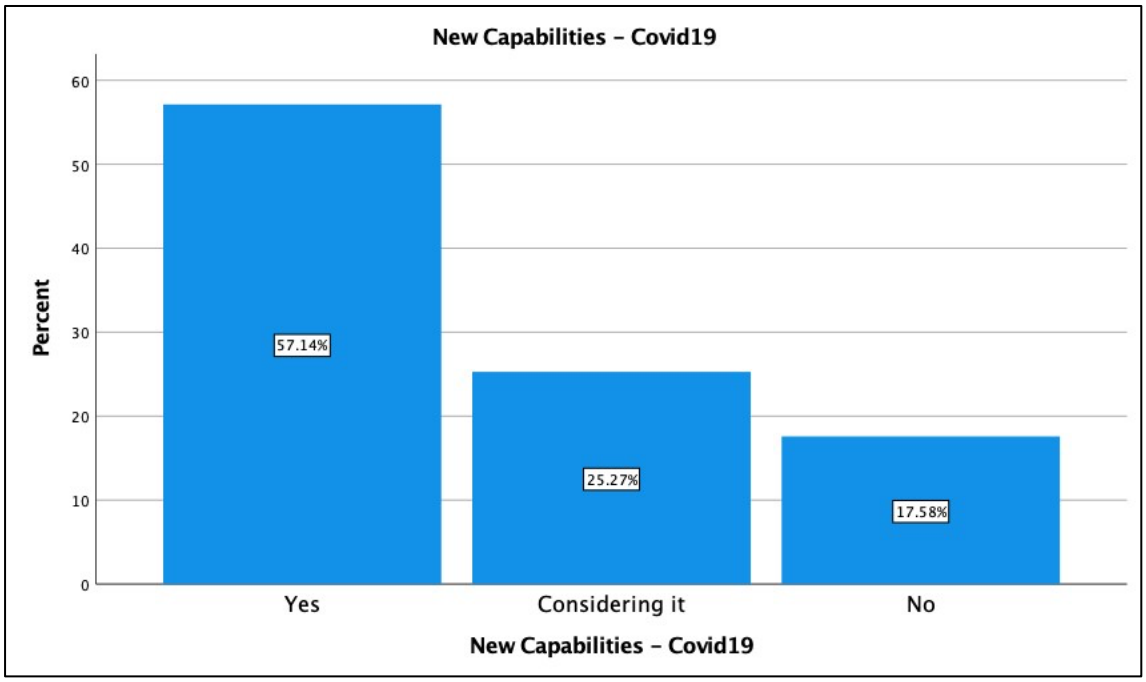


Source : Primary Data

Figure 16: Growth in the number of permanent employees. Source : Primary Data

4.2.9 Covid-19

An analysis of figure 17 shows that most respondents (57.14%) are looking to integrate new capabilities into their businesses due to the Covid 19 pandemic, while a further 25.27% are considering it. Only 17.58% of respondents have decided not to incorporate new capabilities into their businesses.



Source : Primary Data

Figure 17: Businesses seeking to integrate new capabilities as a result of Covid-19. Source: Primary Data

4.2.10 Summary of Demographic Analysis

Table 8: Summary of Demographic Analysis.

Variable	Category	Percentage (%)
Gender	Male	64.84
	Female	32.97
	Other	2.02
Age	18 -24	2.02
	25 - 34	39.56
	35 - 44	31.87
	45 -54	19.78
	>56	6.59
Education	No High School	1
	High School Graduate	7.69
	Some College	19.87
	Undergraduate, Postgraduate	28.57
	Professional Graduate	14.29
Geographic Location	Gauteng	75.82
	Western Cape	6.59
	Eastern Cape, Limpopo, Mpumalanga	5.49
	Northern Cape	1.1
Business Size	Micro	31.87
	Small	45.05
	Medium	23.08
Duration of operations	<1 year	9.89
	1 – 2 years	17.58
	3 – 5 years	26.37
	6 – 8 years	12.09
	8 – 10 years	13.19
	>10 years	20.88
Industry	Other	19
	Construction	17.58
	Marketing & communications	10.99
	Manufacturing	7.69
	Trade, Finance, Medical, Sports & entertainment	6.59
	Technology	5.40
	Retail, Property management, Mining, Agriculture, Transportation	3.30
	Education	2.20
	None	41.76
Growth of fulltime employees	1 – 5	39.56
	6 - 10	6.59
	11 -15	4.40
	16 - 20	1
	>20	6.59
Incorporation of new capabilities as a result of Covid19	Yes	57.14
	Considering it	25.27
	No	17.58

Source : Primary Data

4.3 Descriptive Statistics

In quantitative studies, descriptive statistics is utilised to describe and summarise the dataset and its measures. The following section quantitatively describes the characteristics of the data collected, summarising the dataset. The results of Networks (supplier, consumer and competitor), innovation and business performance are presented in tables.

4.3.1 Business Performance

Six questions were asked to measure the respondents view on their businesses performance.

Table 9: Scale Items Business Performance

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor ...	Somewhat agree	Agree	Strongly Agree	Mean	Standard Deviation
Return on investment (ROI) goals have been achieved	3.3	15.4	7.7	13.2	24.2	30.8	5.5	4.53	1.641
Return on asset goals (ROA) goals have been achieved	3.3	14.3	11	17.6	16.5	30.8	6.6	4.49	1.661
Return on equity (ROE) goals have been achieved	5.5	12.1	12.1	19.8	16.5	28.6	5.5	4.38	1.670
Net profit goals have been achieved	5.5	14.3	12.1	17.6	17.6	26.4	6.6	4.34	1.712
The business has achieved sales growth compared to competitors	3.3	14.3	6.6	20.9	20.8	22	21.1	4.56	1.681
The business has gained market share compared to competitors	2.2	13.2	8.8	18.7	26.4	20.9	9.9	4.55	1.584

Source : Primary Data

At a glance of the results table on business performance, most responses leaned towards the positive end of the scale, with a mean for all questions ranging from 4.38 to 4.56. Respondents were most satisfied with their businesses growth performance compared to their competitors as 62.9% indicated that they either somewhat agree, agree or strongly agree that they have achieved growth compared to their competitors. This measurement

achieved a central tendency, or mean, of 4.56 and a standard deviation of 1.681.

Further, 59.4% of respondents believed they had achieved their return-on-investment goals. However, only 40.6% of respondents had achieved their net profit goals with a standard deviation of 1.712; as such, there was greater dispersion in respondents feedback to this item of the business performance scale.

4.3.2 Supplier Networks

Table 10: Scale Items Supplier networks.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor	Somewhat agree	Agree	Strongly Agree	Mean	Standard Deviation
Our business strives to create close business ties with supply partners	1.1	2.2	2.2	5.5	7.7	50.5	30.8	5.91	1.199
Our business discusses our offering with existing and potential suppliers	1.1	3.3	1.1	11.0	12.1	49.5	22	5.66	1.258
Our business actively seeks out feedback from supply partners	3.3	6.6	2.2	11.0	17.6	42.9	16.5	5.27	1.535
Supply partners have assisted in solving a problem for our business	4.4	7.7	4.4	13.2	28.6	30.8	11.0	4.90	1.571
Our business promotes successful cooperation with supply partners	3.3	8.8	0	9.9	5.5	47.3	25.3	5.48	1.642
Our business customises and tailors cooperation with supply partners	3.3	1.1	3.3	14.3	23.1	45.1	9.9	5.28	1.299

Source : Primary Data

Responses for the supplier networks table indicates that respondents tended to answer toward the positive end of the scale, with means for all answers ranging from 4.90 to 5.91. A majority of respondents (89%) sought to build close ties with their supply partners, with a mean of 5.91. While 78.1% of respondents seek to tailor cooperation with suppliers.

4.3.3 Consumer Networks

Table 11: Scale item Consumer networks.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor	Somewhat agree	Agree	Strongly Agree	Mean	Standard Deviation
Our business strives to create close business ties with consumers	1.1			3.3	4.4	40.7	50.5	6.34	0.922
Our business discusses our offering with existing and potential consumers	1.1	2.2		1.1	4.4	52.7	38.5	6.18	1.039
Our business actively seeks out feedback from consumers	1.1	1.1	2.2	3.3	16.5	47.3	28.6	5.89	1.110
Our consumers have assisted in solving a problem for our business	4.4	3.3	4.4	14.3	18.7	45.1	9.9	5.14	1.472
Our business does promote successful cooperation with consumers	2.2	8.8	2.2	6.6	4.4	41.8	34.1	5.63	1.643
Our business customises and tailors cooperation with consumers	1.1	1.1	3.3	3.3	14.3	52.7	24.2	5.84	1.118

Source : Primary Data

Based on the scale means for each question and the spread of respondents answers, we can see that respondents tended to answer toward the positive end of the scale. The majority of respondents, around 95%, strived to create close ties with their consumers, with a mean of 6.340 and a standard deviation of 0.922. Indicating that feedback for this item is clustered relatively close to the mean with the lowest dispersion compared to other scale items.

SME's are also keen to discuss their offering with current and potential consumers. With means of 6.18, respectively and a standard deviation of 1.039.

Quite a high percentage of SME's (73.6 %) engaged consumers when looking to solve a problem.

4.3.4 Competitor Networks

Table 12: Scale Item Competitor Interaction.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor	Somewhat agree	Agree	Strongly Agree	Mean	Standard Deviation
Our business strives to create close business ties with competitors	8.8	16.5	9.9	19.8	23.1	20.9	1.1	3.99	1.657
Our business discusses our offering with existing and potential competitors	18.7	27.5	15.4	12.1	12.1	13.2	1.1	3.16	1.731
Our business actively seeks out feedback from competitors	16.5	37.4	13.2	8.8	11.0	12.1	1.1	3.01	1.690
Our competitors have assisted in solving a problem for our business	22.0	31.9	5.5	9.9	15.4	13.2	2.2	3.13	1.863
Our business does promote successful cooperation with competitors	6.6	18.7	15.4	23.1	6.6	20.9	8.8	4.022	1.794
Our business customises and tailors cooperation with competitors	18.7	22.0	13.2	18.7	14.3	9.9	3.3	3.31	1.755

Source : Primary Data

Based on an analysis of the feedback received on competitor networks, respondents tended to answer toward the mid-range of the scale with a slant to the lower end of the scale. This is further confirmed by the means for each question which ranged from 3.13 to 4.022.

Surprisingly, 45.1 % of respondents sought to create close business ties with competitors. With a mean of 3.99. At the same time, 61.6% of businesses do not discuss their offerings with competitors.

36.3% of SME's are not opposed to promoting successful cooperation with competitors, while 40.7% are opposed to that. This question also had the highest mean of 4.022 and a standard deviation of 1.794 within this subset of questions. This indicates greater dispersion in the feedback for the promotion of cooperation with competitors than the other feedback received for this subset of questions.

4.3.5 Innovation

Table 13: Scale Item Innovation.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor	Somewhat agree	Agree	Strongly Agree	Mean	Standard Deviation
Our business actively keeps track of new technology breakthroughs	1.1		1.1	2.2	15.4	45.1	35.2	6.07	0.987
External sources of knowledge and ideas are important to our business				1.1	5.5	52.7	40.7	6.33	0.633
Our company has sourced and bought new technology from other firms and institutions	3.3	7.7	8.8	5.5	6.6	47.3	20.9	5.30	1.696
Our company sources information on trends and developments from the industry	1.1	1.1	4.4	2.2	17.6	46.2	27.5	5.82	1.170
Our business continuously strives to introduce new products and services to market.	1.1	2.2	1.1	6.6	16.5	36.3	36.3	5.89	1.233
The number of new products and services our business has introduced to market over the last two years has increased steadily	1.1	6.6	7.7	8.8	33.0	25.3	17.6	5.12	1.459
Our business has collaborated with suppliers when considering incremental product/ service innovation goals and the acquisition of new technologies	3.3	4.4	9.9	12.1	17.6	36.3	16.5	5.11	1.574
Our business has collaborated with suppliers when considering radical product/ service innovation goals and the acquisition of new technologies	4.4	5.5	6.6	11.0	22	35.2	15.4	5.08	1.600
Our business has collaborated with competitors when considering incremental product/ service innovation goals and the acquisition of new technologies	18.7	22.0	11.0	10.0	15.4	15.4	6.6	3.54	1.967
Our business has collaborated with competitors when considering radical product/ service innovation goals and the acquisition of new technologies	19.8	27.5	15.4	13.2	8.8	11.0	4.4	3.15	1.804
Our business seeks feedback from consumers when considering incremental product/ service innovation goals	2.2	3.3	1.1	9.9	23.1	47.3	13.2	5.45	1.272
Our business seeks feedback from consumers when considering radical product/ service innovation goals	2.2	2.2	5.5	11.0	22.0	37.4	19.8	5.41	1.379

Source : Primary Data

Based on the results shown in table 13, most respondents tended to answer toward the upper, positive end of the scale. For 98.9% of SME's external sources of knowledge and ideas were essential to their business. While 95.7% of SME's actively keep track of technological breakthroughs.

When it comes to scouting for information and sourcing technology from external sources, 74.8% of SME's had bought technology from other firms. In comparison, 91.2% of all respondents sourced information on trends and developments from their broader industry.

89% of all SME's seek to bring new offerings to the market continuously. At the same time, 73.7% confirmed that they had brought new products and services to market in the last two years.

When it came to collaborating on incremental and radical innovation, respondents engaged with suppliers equally as much. Similarly, 83.6% of respondents sought feedback from consumers when developing incremental innovation, while 61% sought consumer feedback when considering radical innovation.

When engaging with competitors, 60% of respondents choose not to engage competitors when considering radical innovation. However, 37.4% of respondents would engage competitors when considering incremental innovation.

4.4Validity and Reliability Test

4.4.1 Validity of Measurement Scales

4.4.1.1KMO-Bralettes

The Kaiser-Meier-Olkin's (KMO), a diagnostic measure for sampling adequacy, indicates whether or not a sample is adequate for further analysis (Field, 2013). The Bartlettes test value of a dataset assesses the extent to which items belong together. A higher Bartlettes' test value means the correlation amongst

variables can be explained by latent variables and suitability for factor analysis. The converse is true for smaller Barllettes test values (Nkansah, 2011).

Based on this study's dataset's dimensionality, a Kaiser-Meyer-Olkin measure of sampling indicated a value of 0.746 (Nkansah, 2011), indicating that the study achieved middling sampling adequacy. According to Andy Field (2013), a sampling measure of 0.746 is above Kaiser's recommendation of 0.5. Bartlett's test of sphericity was statistically significant at (p<.0001). As such, the results show that the sample size is adequate and should yield distinct and reliable factors (Field, 2013).

Table 14: KMO Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of sampling		0.746
Bartlett's Test of Sphericity	Approx. Chi-Square	851.317
	df	171
	Sig.	0.000

Source : Primary Data

Based on the results for the Bartlett's test for sphericity, Approx. Chi-square = 851.317, DF = 171, p <0.05, the correlation between items is significant and sufficient for factor analysis.

Based on these results, factor analysis proceeded as follows:

Exploratory Factor analysis (EFA) is traditionally used when a researcher seeks to identify factors that influence variables and group variables that go together, according to McDonald (1985), the primary tenant of which is to identify latent variables within a dataset and identify the smallest number of factors that account for the greatest degree of correlations (Yong & Pearce, 2013).

According to Young and Pearce (2013), having cited key scholars in their study of EFA, explain that in performing an EFA analysis, there are a few assumptions and requirements to keep in mind, these are: that the data has univariate and multivariate normality (Child, 2006) absence of outliers (Field, 2009), a linear relationship between variables exists (Gorsuch, 1983), factors have at least three variables (Tabachnick & Fidell, 2007), the larger the sample size, the better, as this decreases the error in the data, variable loadings is an indicative measure of how much each variable contributes towards the factor. Correlations should be greater than 0.3, as anything lower than this is indicative of a weak relationship between variables and that factors with missing values are not included to prevent overestimation (Tabachnick & Fidell, 2007). Lastly, EFA is usually conducted on continuous or ordinal variables.

Few key decision points influence an EFA analysis: choosing an extraction method, deciding the loadings cut-off, deciding on the number of factors, and the chosen rotation method.

- Factor extraction is based on a "common factor model, (Young and Pearce, 2013)." Which postulates that the measures within the dataset are common underlying factors. There are several extraction methods available in SPSS, namely: Maximum Likelihood, Principal Components Analysis, and Principal Axis Factoring.
- Rotation assists with ambiguity. Rotated factors enable better interpretation, ultimately defining a distinct number of clustered interrelated variables (Young & Pearce, 2013). There are two forms of rotation, namely: orthogonal and oblique rotation. For the purposes of this study oblique rotation was used, from which a pattern matrix was derived. The pattern matrix identifies factors with loaded items as well as the correlations between factors. The Oblique rotation with the Promax technique was used to ensure greater correlations among factors were identified in the factor structure (Young & Pearce, 2013).
- Factor loadings assist in interpreting factors as the loadings indicate the direction of the correlations (strength) of the relationship amongst variables. The deletion of no-loadings, cross-loadings (split loadings)

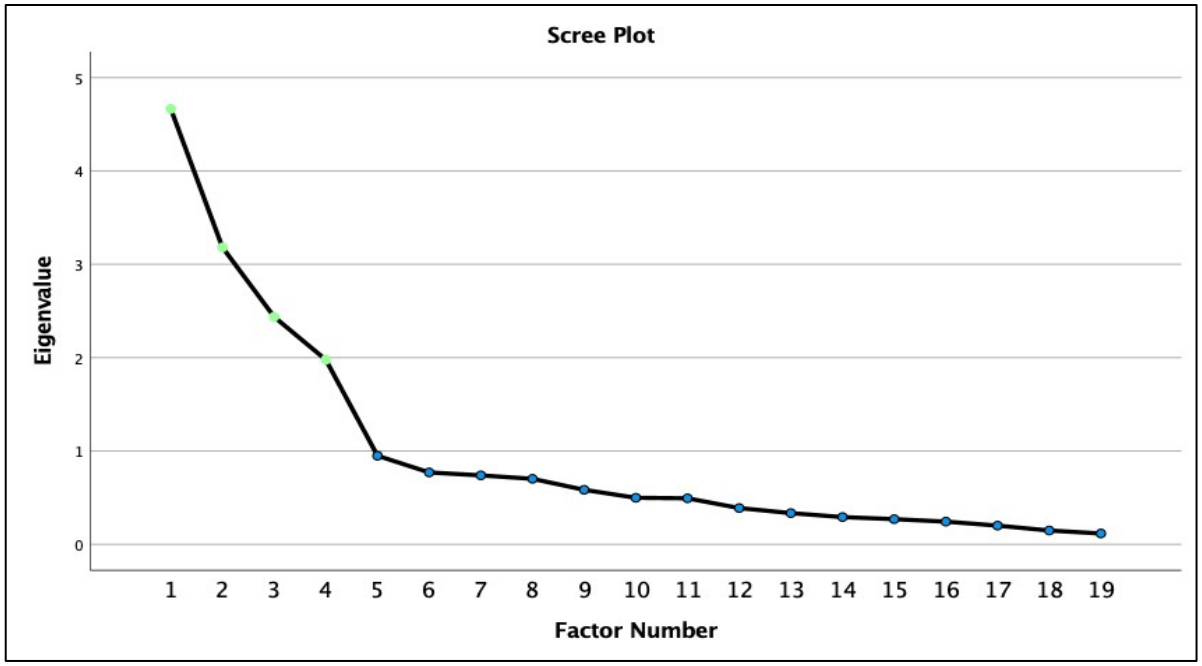
and negative- loadings are methods utilised in determining which loadings to retain within a factor. Another option in determining which factor loadings to retain is factor loading cut-off's (Young & Pearce, 2013). The general rule of thumb is to retain items with a loading of 0.32 or higher (Tabachnick & Fidell, 2007).

- Eigenvalues and Scree-plot assist in determining the number of factors to retain. A common criterion used in research is to retain factors with an eigenvalue of 1 or higher (Young & Pearce, 2013). A Scree-plot, a graphical representation of factors extracted, further helps in identifying factors with an eigenvalue above 1.

Though the measures used in this study were drawn from previous extant literature, EFA was applied to evaluate the convergent and divergent validity. EFA was performed in SPSS for all the scale items, the number factors, and their structure. The principal-axis factoring extraction method was used with Promax rotation. Coefficients smaller than 0.40 were suppressed.

To assist in deciding on the number of factors, using the principal axis factoring method and the Kaiser rule (Young & Pearce, 2013),

a Scree-plot was generated to assist in identifying factors with eigenvalues greater than one. Based on the Scree-plot, it is evident that the first four factors account for the greatest variance.



Source : Primary Data

Figure 18: Scree Plot

The Principal axis factoring method of extraction coupled with an oblique rotation method (Promax) helped determine the factor loadings based on the assumption that the factors were correlated.

Based on the screen plot analysis, as depicted in figure 18, four factors (1 – 4) extracted had an eigenvalue of above or equal to two. While the remaining three factors (factors 5 - 19) had an eigenvalue below 1, as such, they were not extracted by SPSS.

4.4.1.2 Total Variance Explained

Table 15: Total Variance Explained.

Factor	Initial Eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
1	4.665	24.555	24.555	4.281	22.529	22.529	3.633
2	3.182	16.747	41.302	2.819	14.837	37.367	3.177
3	2.438	12.830	54.133	2.032	10.696	48.063	2.504
4	1.978	10.410	64.543	1.508	7.937	55.999	2.713
5	0.950	4.998	69.541				
6	0.771	4.057	73.598				
7	0.739	3.891	77.488				
8	0.702	3.697	81.186				
9	0.585	3.076	84.262				
10	0.499	2.627	86.889				
11	0.389	2.049	86.889				
12	0.389	2.049	91.536				
13	0.335	1.763	93.299				
14	0.292	1.539	94.838				
15	0.270	1.423	96.261				
16	0.244	1.284	97.545				
17	0.201	1.058	98.603				
18	0.149	0.782	99.385				
19	0.117	0.615	100.000				

Source : Primary Data

Extraction method: Principal Axis Factoring

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

4.4.1.3 Pattern Matrix

Table 16 shows that four factors were extracted through Principal Axis Factoring. These factors relate to the Independent variable (Networks - Supplier, consumer and competitor networks, moderating variable (Innovation) and the dependent variable (business performance).

- **Dependent Variable** - Business Performance (BP): Business performance was measured across with 6 subscales, BP_6 cross-loaded and as such was deleted. One factor was identified and extracted by SPSS. The factor loading for this scale varies from 0.839 to 0.924.
- **Independent Variable** - Networks: Networks was measured across 3 subscales (supplier interaction, consumer interaction and competitor interaction), each with 6 items. Supplier networks (SI)_5, Consumer

networks (CI)_1 – 6 and competitor networks (COMPI)_1 & 5 were deleted for cross-loading. Two factors were identified and extracted by SPSS. The factor loadings across all 2 factors vary from 0.403 to 0.859

- **Moderating Variable** - Innovation: Innovation was measured against a 12-item scale. Items OI_1 & 7-12 were deleted for cross-loading. One factor was identified and extracted. Factor loading range from 0.523 to 0.844.

Table 16: Pattern Matrix.

	1	2	3	4
BP_1	.848			
BP_2	.834			
BP_3	.929			
BP_4	.844			
BP_5	.598			
SI_1		.587		
SI_2		.815		
SI_3		.859		
SI_4		.573		
SI_6		.644		
COMPI_2			.782	
COMPI_3			.833	
COMPI_4			.582	
COMPI_6			.807	
OI_2				.522
OI_3				.537
OI_4				.714
OI_5				.845
OI_6				.657

Source : Primary Data

Extraction method: Principal Axis Factoring

Rotation method: Promax with Kaiser normalisation

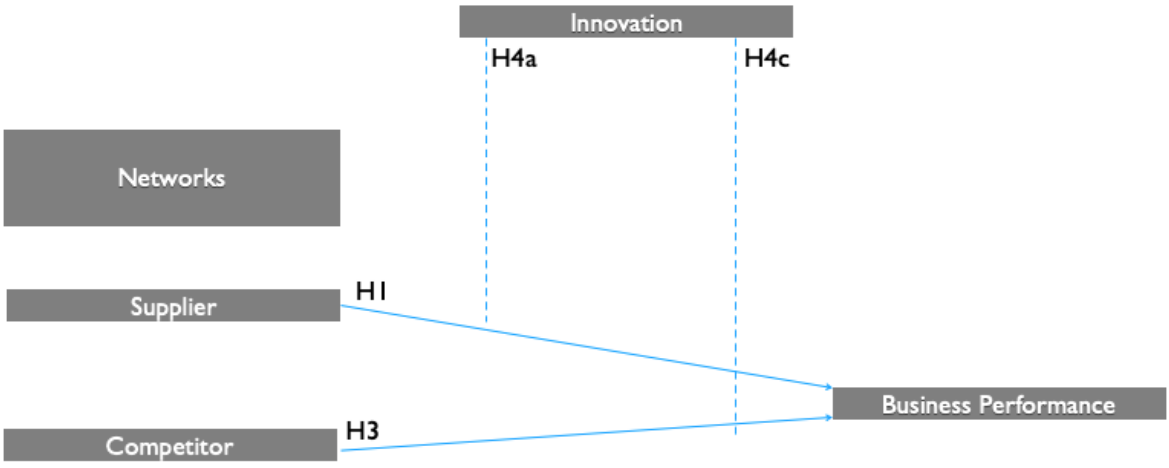
a) Rotation converged in 5 iterations

As per SPSS output for EFA analysis, the pattern matrix illustrated in the table provides an overview of the loadings for each factor.

The factors are labelled 1 to 4, each of which represents a specific construct.

Factor 1 represents Business performance (BP), factor 2 = Supplier networks (SN), factor 3 = Competitor networks (COMPN) and factor 4 = Innovation (Innov). Factors 1, 2 and 4 each loaded with 5 items while factor 3 was loaded with 4 items per factor, respectively.

All factors loaded with more than the minimum of 3 items per factor. These factor loadings impacted the original conceptual model for the study. Figure 19, below, depicts this change.



Source: Authors Own

Figure 19: Updated Study Conceptual Model

4.4.2 Reliability Scale

4.4.2.1 Cronbach Alpha Results

It is common for the reliability (or internal consistency) of instruments used in research to be framed in terms of the Cronbach's Alpha and is considered routine (Taber, 2018).

In this study, Cronbach's coefficient (μ) was used to determine the internal consistency of the items included in the questionnaire put to sample (SME owners and managers).

Cronbach Alpha's coefficients range from 0.00 to 1.0. According to Taber (2018), Alpha coefficients (μ) are categorised in terms of their strength and degree of internal consistency.

4.4.2.1.1 Reliability results, Business Performance (Dependant Variable)

Analysis of the reliability for the scale used to measure Business Performance, as depicted in table 17, provided a Cronbach Alpha 0.911.

Table 17: Reliability Statistics for Business Performance (BP).

	Cronbach's Alpha based on standardised Items	
Cronbach Alpha		**N items**
0.911	.0911	5

Source : Primary Data

The results show that the scale had excellent internal consistency and reliability (5 items a = 0.911). The consensus amongst authors and scholars is that a Cronbach Alpha score of 0.7 is acceptable.

As such, the business performance scale items are considered highly correlated with each other.

4.4.2.1.2 Reliability results – Supplier Networks (Independent Variable – SN)

Analysis of the reliability for the scale used to measure Supplier networks, as depicted in Table 18, provided a Cronbach Alpha 0.817.

Table 18: Reliability results Supplier Networks (independent variable - SN)

Cronbach's Alpha based on standardised Items		
Cronbach Alpha		**N items**
0.814	0.817	5

Source : Primary Data

The supplier networks scale items correlate with each other to a good degree with a Cronbach Alpha a = 0.817. Like the business performance scale, the results for this scale achieved a Cronbach Alpha score greater than the minimum required value of a = 0.7, indicating good internal consistency and reliability among scale items.

4.4.2..1.3 Reliability results – Competitor Networks (Independent Variable – COMPN)

Analysis of the reliability for the scale used to measure Competitor Networks, as depicted in Table 19, provided a Cronbach Alpha 0.837.

Table 19: Reliability results in Competitor Networks (independent variable - COMPN).

Source : Primary Data

Cronbach Alpha	Cronbach's Alpha based on standardised Items	N items
0.835	0.837	4

Competitor networks scale correlate with each other to a good degree, and a somewhat better degree than Supplier interaction illustrated in table 18, with a Cronbach Alpha a = 0.837. Like that of the business performance scale, the results for this scale achieved a Cronbach Alpha score greater than the minimum required value of a = 0.7, indicating good internal consistency and reliability among scale items.

4.4.2.1.4 Reliability results – Innovation (Moderating Variable - Innov)

Analysis of the reliability for the scale used to measure Innovation, as depicted in Table 20, provided a Cronbach Alpha 0.784.

Table 20:Reliability results Innovation (Moderating variable – Innov.).

Cronbach Alpha	Cronbach's Alpha based on standardised Items	N items
0.772	0.784	5

The competitor networks construct (5 items a = 0.786) had a lower internal consistency and reliability than the rest of the factors. However, the constructs met the minimum Cronbach Alpha score of 0.7.

Based on the reliability scores for all factors, all constructs had a reasonable degree of internal consistency. This meant it was possible to go ahead with further inferential statistical analysis.

4.4.2.1.5 Summary of reliability results

The analysis began with a total of 5 constructs. After running an EFA analysis, only four factors remained, and their reliability was confirmed through a Cronbach Alpha test. Factors that were eliminated during the EFA analysis were deleted for either no loadings or cross-loadings.

4.5 Correlation Analysis

For this study, the measure of the linear relationship between Networks (supplier, consumer and competitor - X) and business performance (Y) is tested (Senthilnathan, 2019). Additionally, the effects of innovation (Z) on the relationship between (X) and (Y) is also tested, the aim of which is to determine whether innovation weakens, strengthens or has no effect on the relationship between the independent (X) and dependent (Y) variables (Field, 2013).

A product or interaction term (multiplication of predictor/ independent variables by the moderating variable, e.g., SN x Innov = Product term, SN_Innov.) was created to enable regression analysis (Field, 2013). However, the multiplication of the predictor variable by the moderator often causes issues of collinearity. To remedy this, all independent and the moderating variables was centred by their mean (e.g., SN – SN_mean = SN_centred; COMPI – COMPN_Mean= COMPN_centred & Innov – Innov_mean = Innov_centred) (HowtoStats, 2014).

The correlation analysis was done before the regression analysis, and the results are consolidated in Table 21 for the four factors and the centred product terms.

The significance, strength and direction of the correlations of each are interpreted and discussed below.

Table 21: Correlation Coefficients

Construct		SN	COMPN	Innov	SN_Innov_c	CompiN_Innov_centered
Business Performance	1					
Supplier networks	.210*	1				
Competitor networks	-.016	.209*	1			
Innovation	.192*	.303**	.101	1		
Supplier interaction_ Innovation centred	-.133	-.177*	-.054	-.375**	1	
Competitor interaction_ Innovation centred	.168*	-.066	.299**	-.158	.125	1

Source : Primary Data

4.5.1 Correlation results for Business Performance and Independent Variables

- The results show a weak, positive, yet significant correlation between business performance and supplier networks (r = 0.210*, p-value < 0.05).
- Business performance had a significant, weak and positive correlation with innovation (r = .192*, p<0.05).
- A significant, positive yet weak correlation to the competitor Innovation (COMPN_Innov) product term (r = .168*; p-value <0.05).

4.5.2 Correlation results amongst Independent Variables

4.4.2.1 Supplier Networks (SN)

Results show that Supplier networks had significant correlations with the following variables:

- Supplier networks had a moderate and positive correlation to Innovation (*r* = .303**; p-value<.001).
- Supplier networks had a weak and positive correlation to Competitor networks (*r* = .209*; p-value <0.05).
- Supplier networks has a negative and negligible correlations with the SN_Innovation_Centered product term (= -.177; p-value <0.05)

4.5.2.2 Competitor Networks (COMPN)

- Based on the results, the moderating impact of innovation had a moderate positive and significant correlation the product term COMPN_Innovation (r = 0.299**; p-value <0.01)

4.5.2.3 Innovation (Innov)

- The results show that innovation had a negative, moderate and significant correlation to the SN_Innovation product term (r = -.375**; p-value< 0.01).

Based on the correlation results, it is seen that Business Performance has a weak relationship to variables – IV, MV and product terms. Supplier networks showing to have the 'strongest' significant linear relationship with Business Performance.

Now that the relationships between variables have been confirmed via correlation analysis, further analysis was conducted via moderated hierarchical multiple regression to test the impact of innovation on the relationship between networks (supplier, consumer and competitor networks) on business performance.

4.6 Moderated Hierarchical Multiple regression

Moderated hierarchical multiple regression helps identify factors that change the relationship between independent and dependant variables. The study's objective was to test the extent to which innovation moderates the relationship between networks (supplier, consumer and competitor networks) and business performance. The results for the moderated hierarchical multiple regression analysis are presented in Table 22 and are discussed below. As such, this regression model helped identify if innovation indeed varied the relationship between networks (supplier, consumer and competitor) and business performance.

Table 22: Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	**.210[a]**	**.044**	**.033**	**1.398**	**.044**	**4.088**	**1**	**89**	**.046**
2	.218[b]	.048	.026	1.403	.004	.344	1	88	.559
3	.258[c]	.066	.034	1.397	.019	1.748	1	87	.190
4	.264[d]	.069	.026	1.403	.003	.285	1	86	.495
5	**.359[e]**	**.129**	**.078**	**1.365**	**.060**	**5.817**	**1**	**85**	**.018**

Source : Primary Data Dependent variable: BP

a. Predictors: (constant) : SupplierInetworks(SN)

b. Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN)

c. **Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov)**

d. **Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov), ProductTerm_SupplierN_Innovation_Centered.**

e. **Predictors (constant): Innovation, Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov), ProductTerm_CompetitorN_Innovation_Centered, ProductTerm_SupplierN_Innovation_Centered.**

The moderated hierarchical regression model summary was produced, depicted in table 22, the results reveal:

- Model one indicates that 4% of the variability in Business Performance is accounted for by Supplier networks (p-value< 0.05).
- Model 2, 3 and 4 show that adding Competitor networks (DR^2 .004),
- Innovation (DR^2 .019) and Product Term_SN_Innovation_Centered (DR^2 .003) to the model did not increase the model's predictive capacity in a statistically significant way, even though an increase in the R^2 values is witnessed.
- However, Model 5 reveals adding the product term – Product Term_COMPN_Innovation (DR^2 .060) to the model increased the models predictive capacity in a significant way (p-value< 0.05).

Table 23: ANOVA.

	Model	Sum of Squares	df	Mean Square	F	Sig
1	Regression	7.997	1	7.997	4.088	.046b
	Residuals	174.092	89	1.956		
	Total	182.089	90			
2	Regression	8.675	2	4.338	2.201	.117C
	Residuals	173.414	88	1.971		
	Total	182.089	90			
3	Regression	12.091	3	4.030	2.063	.111d
	Residuals	169.998	87	1.954		
	Total	182.089	90			
4	Regression	12.652	4	3.163	1.605	.180e
	Residuals	169.437	86	1.970		
	Total	182.089	90			
5	Regression	23.505	5	4.701	2.520	.035f
	Residuals	158.584	85	1.866		
	Total	182.089	90			

Source : Primary Data Dependent

variable: BP

a. Predictors: (constant) : SupplierInetworks(SN)

b. Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN)

c. Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov)

d. Predictors: (constant) : Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov), ProductTerm_SupplierN_Innovation_Centered.

e. Predictors (constant): Innovation, Suppliernetworks(SN), Competitornetworks(COMPN), Innovations (Innov), ProductTerm_CompetitorN_Innovation_Centered, ProductTerm_SupplierN_Innovation_Centered.

The ANOVA analysis, Table 23, reinforces the results found in the model summary.

- Model 1, Supplier networks had a significant impact on Business Performance, F (1, 89) = 4.08, p= .046.
- Models 2 – 4, competitor networks, innovation, and the product term of SupplierN_Innov did not have a significant impact on business performance.
- Model 5, Adding ProductTerm_CompetitorN_Innovation_Centered to the model had a significant impact on business performance, F (1. 89) = 2.520, p= .035

Table 24: Regression Coefficients.

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig	Collinearity Statistics	
		B	**Std.Error**	**Beta**			**Tolerance**	**VIF**
1. Constant		2.919	.776		3.759	.000		
	Supplier networks (SN)	.285	.141	.210	2.022	.046	1	1
2. Constant		3.017	.797		3.785	.000		
	Supplier networks (SN)	.303	.145	.223	2.093	.039	.956	1.046
	Competitor networks (COMPN)	-.062	.105	-.062	-.586	.559	-.956	1.046
3. Constant		2.097	1.056		1.986	.050		
	Supplier networks (SN)	.245	.151	.180	1.629	.107	.879	1.141
	Competitor networks (COMPN)	-.067	.105	-.068	-.641	.523	.955	1.047
	Innovation	.220	.166	.144	1.322	.190	.907	1.103
4. Constant		2.333	1.149		2.030	.045		
	Supplier networks (SN)	.240	.152	.176	1.581	.118	.872	1.147
	Competitor networks (COMPN)	-.067	.105	-.068	-.641	.523	.955	1.047

Innovation	.187	.177	.123	1.055	.294	.801	1.249
ProductTerm_SN_Innov_centered	-.071	.133	-.060	-.534	.595	-.855	1.170
5. Constant	2.105	1.122		1.876	.064		
Supplier networks	.268	.148	.197	1.813	.073	.866	1.154
Competitor networks	-.154	.108	-.156	-1.420	.159	.850	1.176
Innovation	.243	.174	.159	1.394	.167	.787	1.271
ProductTerm_SN_Innov_centered	-.095	.130	-.080	-.731	.467	.850	1.176
ProductTerm_COMPN_Innov_centered	.276	.114	.263	2.412	.018	.863	1.158

Source : Primary Data

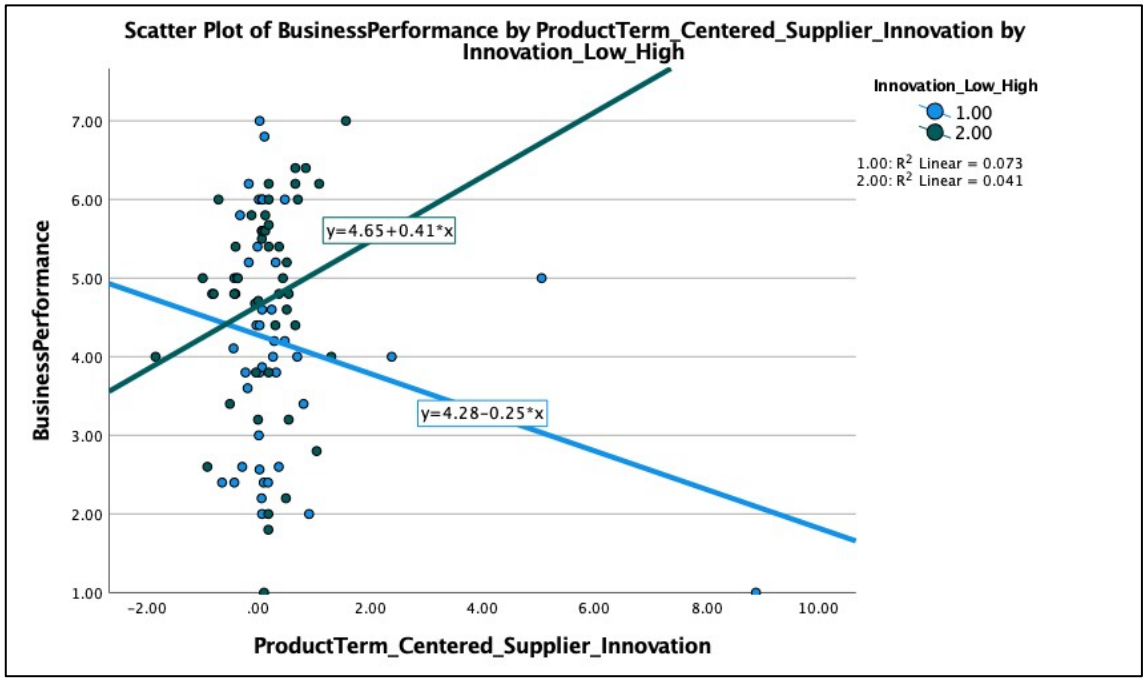
a. Dependent variable: BP

Based on the coefficient results, as per Table 24 above, Supplier networks (SN) (b=.210, p<0.05) and Product term COMPN_Innovation (b=.263, p<0.05) are significant predictors of business performance. As such, hypothesis 1 and 4C are supported.

Based on the collinearity results, all items have results which fall within the collinearity guidelines (T <1 and VIF is < 10), thus, it is evident that there is no collinearity problem.

Figures 19 and 20, below, aided through visualisation via scatterplot illustrates the impact product terms had on business performance across low and high innovation interaction.

Figure 20: Spotlight Analysis - Low and High Interaction - Business Performance and SupplierN_Innovation_Centered Interaction

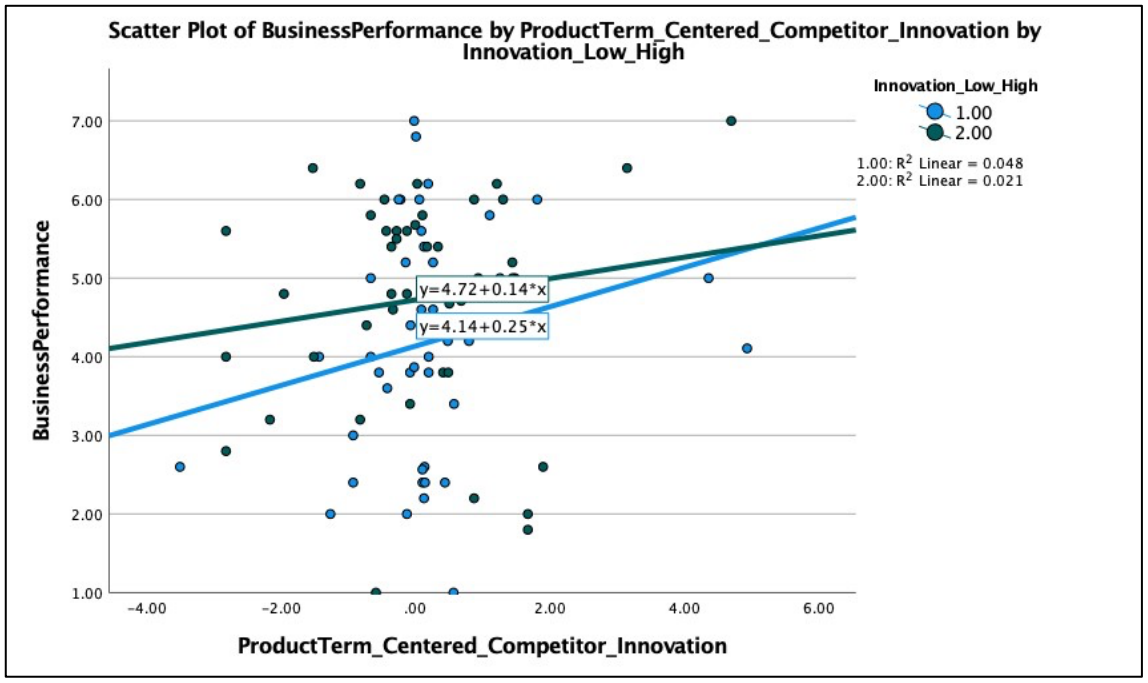


Source : Primary Data

Based on Figure 19, it is evident that both fit lines are quite steep. High innovation levels produce a stronger, positive impact between business performance and supplier networks. However, low innovation levels produce the opposite, a strong negative impact, between business performance and supplier networks.

Thus, higher levels of innovation moderate a strong and positive relationship between business performance and supplier network outcomes as opposed to lower levels of innovation.

Figure 21: Spotlight Analysis - Low and High Interaction - Business Performance and CompetitorN_Innovation_Centered Interaction



Source : Primary Data

From the graph, as depicted in Figure 20, we see that lower levels of innovation, overtime, rather than higher levels of innovation overtime, produces a stronger impact in the relationship between business performance and competitor networks.

Thus, higher levels of innovation moderate a strong positive relationship between business performance and competitor networks in the short term, while lower levels of innovation overtime moderates stronger positive relationship between business performance and competitor networks, overtime.

4.6.1 Hypotheses 1: A high degree of supplier networks positively impacts firm performance

The results show that supplier networks significantly impact business performance b=.210, p<0.05.

4.6.2 Hypotheses 2: A high degree of consumer networks positively impacts firm performance

Hypothesis 2 was not tested as the scale used cross-loaded and was eliminated in the EFA process. Therefore, the consumer networks construct was not suitable for further analysis as such was not part of the reliability and correlation analysis.

4.6.3 Hypotheses 3: A high degree of competitor networks positively impacts firm performance.

The results for hypothesis 3 are not significant and therefore not supported. However, the results do show that there is a negligible negative relationship to business performance and competitor networks.

The results show that competitor networks negatively impacted business performance b = -.062; however, it was not a significant p-value >0.05 (.559).

4.6.4 Hypotheses 4a: Innovation positively moderates the relationship between business networks (supplier networks) and firms performance.

The results show that Supplier networks moderated by innovation negatively impacted business performance b = -.030; however, it was not significant a pvalue >0.05 (.595). As such, there is a negligible negative relationship between the product term SupplierN_Innov and business performance.

Therefore, Hypothesis 4a is not significant and not supported.

4.6.5 Hypotheses 4b: Innovation positively moderates the relationship between business networks (consumer networks) and firms performance

Hypothesis 4b was not tested as the scale used cross-loaded and was eliminated in the EFA process. Therefore, the consumer networks construct

was not suitable for further analysis as such was not part of the reliability and correlation analysis.

4.6.6 Hypotheses 4c: Innovation positively moderates the relationship between business networks (competitor networks) and firms performance

The results show that competitor networks moderated by innovation (ProductTerm_COMPN_Innovation) significantly impacts business performance b=.263, p<0.05 (.018). As such, hypothesis 4c is significant and supported.

4.7 Chapter Summary

Data collection efforts resulted in 133 cases. After data screening and cleaning, the analysis of the remaining 91 cases was conducted. In this chapter, the results of the study were presented. Frequency analysis was conducted to analyse the demographic profile as well as the geographic footprint of the respondents. Frequency analysis also assisted in identifying SME characteristics of the businesses represented by respondents.

The respondents' demographic profile is summed up as follows: 64.8 % of all respondents were male and 32.9% female, while only 2 % of all respondents opted to identify as 'other'. Most respondents (51% of all respondents) were 36 years old or older, while 41.76% of respondents could be classified in terms of South Africa's youth demographic group – those aged between 18 – 35 years old. Additionally, 71.43% of all respondents had achieved, at the very least, an undergraduate degree or higher qualification, while 75% of all respondents were located in Gauteng.

The results also revealed SME characteristics of the businesses represented by the respondents. Key findings were that 76,9% of businesses were small or micro-businesses. Most (53,8%) SME's had been in operation for more than 5-years, with the fields of engineering, manufacturing, technology and trade accounting for 48,34% of the identifiable industries these SME's are active in. However, while most businesses had been in business for quite some time, 41% had not employed an employee yet, while only 39,5% could employ

between 1 - 5 employees. The majority of respondents had identified a need to integrate new capabilities into their businesses due to Covid 19.

Based on the above result for the demographic profile, geographic footprint and SME characteristics of the businesses represented by respondents, it is deduced that the average respondent is male over the age of 35 with an undergraduate degree located in Gauteng. Active in either the engineering, technology, trade or manufacturing industry and at the very least might have been able to employ between 1 – 5 people so far. Having been in business for more than 5-years is looking to integrate new capabilities into their business due to the pandemic.

The validity and reliability of the measurement scales used in the study were tested, which produced a factor structure used to test the study's hypotheses. After EFA analysis, 4 factors were extracted. To enable the moderation effect analysis, 2 product terms were computed and centred (ProductTerm_SupplierN_Innovation_Centered & ProductTerm_COMPN_Innovation_centered) for analysis purposes.

The correlation analysis provided evidence for a weak and positive relationship between Supplier networks (SN) and business performance (BP), thus supporting Hypothesis 1. Correlation's analysis further also provided a moderately weak and positive relationship between business performance and product term COMPN_Innovation, thus supporting Hypothesis 4c.

Hypothesis 2 and 4b were not tested as items for the Consumer networks variable items cross-loaded at the EFA analysis stage. Lastly, hypothesis 3 and 4a regression results did not support the hypothesis.

Results for the study's hypothesis testing are summarised in table 25.

Table 25: Summary of Hypothesis Testing

	Hypothesis	Significant	Supported (Y/N)
H1	A high degree of supplier interaction positively impacts firm performance	Yes	Yes
H2	A high degree of consumer interaction positively impacts firm performance	Not tested	Not tested
H3	A high degree of competitor interaction positively impacts firm performance	No	No
H4a	Innovation positively moderates the relationship between business networks (Supplier networks) and firms performance	No	No
H4b	Innovation positively moderates the relationship between business networks(Consumer networks) and firms performance	Not tested	Not Tested
H4c	Innovation positively moderates the relationship between business networks (Competitor networks) and firms performance	Yes	Yes

5 CHAPTER 5 : DISCUSSION OF THE RESULTS

5.1 Introduction

The study examined the extent to which innovation moderated the relationship between networks (supplier, consumer and competitor networks) and business performance. Proceeding from the results presented in chapter four, this chapter discusses the findings of the following: demographic profile and geographic footprint of respondents, SEM characteristics, and results from the hypothesis testing.

Finally, the implications of the findings are discussed.

5.2 Demographic profile, geographic footprint & SME Characteristics of respondents

Proceeding from chapter 4, the samples key demographic profile and geographic footprint is summarised as follows: The majority, 64.8 %, of all respondents were male. Most respondents (51% of all respondents) were 36 years old or older, while 41.76% of respondents could be classified in terms of South Africa's youth demographic group – those aged between 18 – 35 years old. Additionally, 71.43% of all respondents had achieved an undergraduate degree or higher qualification. The majority (75%) of all respondents were located in Gauteng.

5.2.1 Biological Sex

According to studies, biological sex plays a vital role in the kind of business activity undertaken and the type of growth perused. More males (64.8%) than females took part in answering the study's survey.

This finding aligns to results reported in previous studies (Msimang-Galawe, 2017; Mlotshwa, 2019) as well as GEM's (2018) results which found that men,

regardless of the level of economic development, were more likely to engage in entrepreneurial activity than women, who face more significant struggles and challenges, in becoming entrepreneurs. This is true for women in South Africa. Women's low levels of participation in entrepreneurship have been attributed to various factors such as lack of access to resources (capital – financial and human resources, suppliers, customers), education and training, and challenges thrust upon women in social and cultural settings. Recognised as one of the previously disadvantaged and vulnerable groups in South Africa, the government has set policies to advance and develop greater female engagement in entrepreneurial activities in the country (Irene, 2017).

5.2.2 Age

The results showed that most of the respondents (51%) were 36 years and older.

Those aged 26 – 35 (39,5) and those at a slightly lower level, aged 36 – 44 years (31,8), undertook the highest entrepreneurial activity level compared to other adult age groups in South Africa.

Again, this seems to align with GEM's (2018). According to their report, those broadly aged 26 – 44 years tend to exhibit the prevalence of engaging in entrepreneurial activity (GEM, 2018). This trend is attributed to the fact that these individuals are in the early to mid-stages of their career cycle, attained knowledge and skill through education and are developing networks critical to accessing resources.

However, in South Africa, another factor needs to be considered: the high cost of unemployment (GEM, 2018). With South Africa's youth unemployment rate amongst the highest in the world (Stats SA, 2020), even amongst those who have attained undergraduate and higher levels of education, and no simple solution to alleviating this in the short term, many young South African have looked to self-employment as a means to overcome this challenge out of opportunity as well as necessity.

5.2.3 Education

The results show that the majority of respondents had achieved an undergraduate degree or higher (71.43%). Those who did not progress beyond achieving some College were a small minority (< 20%).

According to Venter and Urban (2015), as cited by Mlotshwa, 2019, there is a positive relationship between education and entrepreneurial behaviour, asserting that empirical research suggests that entrepreneurs, when compared to non-entrepreneurs, tend to have higher levels of education.

However, an additional factor for consideration in this study's instance is that the bias in education levels of the sample may be due to the means used by the researcher to connect to respondents for the study, which was LinkedIn. LinkedIn users' profile generally tends to be those who are higher educated, mid to senior-level employees, and entrepreneurs (99firms.com, 2021).

5.2.4 Business Size, No of employees, and Duration of Operation

The majority of the businesses represented by respondents were either small (45%) or micro (31%), collectively accounting for 76.92% of the business size. The rest were medium-sized businesses. With only 39.56% of which have been able to employ between 1 – 5 employees. Most SME's (41%) have not employed anyone. Additionally, most of these businesses had been in businesses for 5-years (53.84%) or more.

According to Msimang-Galawe (2017), this is indicative of the problems facing economic growth and that of businesses in South Africa's. Citing Mike & Penny (2016), Msimang-Galawe asserts that this trend is concerning as businesses do not grow to medium-sized or beyond, most likely attributed to broader economic challenges faced in the country. According to GEM (2018), as an efficiency-based economy, only 43% of entrepreneurs expect to create jobs within 5-years.

As results show, only 39.56% have been able to employ between 1 – 5 people, these results seem to echo the assertions made by GEM (2018) regarding job creation and entrepreneurship.

5.3 To what extent does networks (supplier, consumer and competitor networks) impact business performance

5.3.1 Hypothesis 1

A high degree of supplier networks positively impacts firm performance

The hypothesis suggests that the association between supplier networks and business performance is beneficial to a business's financial performance when supplier networks are harnessed and developed.

According to the study's findings, the relationship between supplier networks and business performance is significant, supported and confirmed. In the context of this study, suppliers networks refer to the collaboration between businesses and their suppliers. This relationship is exhibited by leveraging supplier resources, whether strategic or operational, to pursue business goals.

The importance of supplier networks and their impact on business performance has been supported in prior research. According to Zhang et al. (2018), the interconnection of supplier networks and SME's is hard to match by competitors. Key to this interconnection and integration is a business's ability to draw on external resources, such as insights, knowledge, technology and external capabilities, to overcome market constraints (Yeng et al., 2012). This can influence performance in many ways, according to Flynn (2013), and sustain any competitive advantage held.

These findings contrast those of Abbas et al. (2019), who found no significant relationship between entrepreneurial business networks and business performance. One of the critical reasons for this outcome could be because their sample was much bigger.

5.3.2 Hypothesis 2

A high degree of consumer networks positively impacts firm performance

The hypothesis suggests that there is a positive and beneficial association between consumer networks and business performance.

Consumer networks, in the context of this study, refers to businesses collaboration with consumers. The consumer business relationship can take many forms, leveraging insights gained from observing consumer behaviour to understanding consumers' role in influencing choice and recommendations or co-creation, the ultimate form of collaboration between consumers and business.

However, Hypothesis 2 could not be tested since the variable items for Consumer networks cross-loaded at the validity analysis stage, and as such, were deleted. The hypothesis aimed to test the extent to which consumer networks impacted business performance. Based on how the respondents answered the scale items (see descriptive analysis 4.3.3), most respondents answered toward the mid to upper end of the scale. Respondents see the importance of engaging consumers as it allows for feedback on products and services.

This suggests that the consumers as a network are crucial to the development and growth of SME's. This inference aligns with previous research findings; according to Ho et al. (2020), consumer engagement assists in maintaining and expanding network relationships between the business and its consumers. The benefit of which can result in co-creation (Zabrorek & Mazur, 2019).

Ultimately, according to Piligrimiene et al. (2015), this is advantageous to performance, as it can help cultivate a strong brand and increase consumer loyalty.

5.3.3 Hypothesis 3

A high degree of competitor networks positively impacts firm performance

The hypothesis suggests that when competitor networks are cultivated, business performance benefits or improves.

Competitor networks, in the context of this study, refers to collaboration amongst competitors. As a topic, collaboration among competitors has gained interest from many researchers in recent years (Das, 2019; Abbas et al., 2019; Ritala et al., 2008). Literature supports collaboration between competitors along strategic lines and is delineated by engagement terms.

While an association between competitor networks and business performance is evident in the descriptive results, further analysis did not indicate that a significant relationship exists between competitor networks and business performance. This finding aligns with Abbas et al. (2019) findings, where they found no significant relationship between entrepreneurial business networks and business performance.

In contrast, literature supports the view that cultivating competitor networks is beneficial to business performance, such as Bengtsson & Kock (2000), who found that cooperation through ‘coopetition’ can bring about more advantages than competition pursued separately.

5.4 To what extent does innovation moderate the relationship between networks (supplier, consumer and competitors interactions) and business performance

5.4.1 Hypothesis 4 a

Innovation positively moderates the relationship between business networks (Supplier networks) and business performance

The hypothesis suggests that performance benefits when innovation is used to manage the relationship between supplier networks and business performance. Innovation in this context refers to any means of innovation used

to harness and support collaborative efforts between business and their suppliers.

While the moderation effect of innovation on the relationship between suppliers and business performance is evident in the spotlight analysis, this relationship is not significant.

This finding contrasts with many researchers (Chesbrough, 2003; Enkel, 2009; Oberga, 2017; Qiao, 2014).

However, it does align with the findings of Abbas et al. (2019).

5.4.2 Hypothesis 4b

Innovation positively moderates the relationship between business networks (Consumer networks) and business performance

This hypothesis suggests that the relationship between consumer networks and business performance would benefit from the moderating impact of innovation.

However, similarly to Hypothesis 2, 4b was not tested as the scale items for consumer networks cross-loaded at the validity testing stage. As such, a factor for consumer networks was not produced, which meant a product term could not be created to test the hypothesis.

However, a sense of how respondents perceived how innovations assisted them in sustaining and developing their consumer networks can be deduced from perusing their responses to the scale item (see descriptive results for Innovation 4.3.5). Respondents tended to answer toward the positive end of the scale when asked about engaging consumers when developing innovation on both an incremental and radical scale (84.6% and 89%, respectively). A deduction based on this feedback suggests that consumers are a crucial source of feedback for SME's, especially when seeking to bring innovations to market.

This inference aligns with findings in previous extant research. According to Pittway (2014), consumers were crucial in instances where businesses sought

to implement incremental innovation. The realisation of innovation relies on interaction and exchange of knowledge (Qiao et al, 2014); as Enkel (2009) asserts, not all intellectual people work within a single business. There is a need for businesses to look outside, as innovation is often linked to external networks, harnessed through social capital (Chesbrough, 2003).

5.4.3 Hypothesis 4c

Innovation positively moderates the relationship between business networks (Competitor networks) and firms performance

The hypothesis suggests that when innovation is used to assist in the cultivation of competitor networks, business performance benefits.

Competitor networks moderated by innovation, in the context of this study, refers to collaboration amongst competitors via means of innovation such as digital technology.

Literature shows that networks tend to influence incremental innovation (Oberga, 2017). When harnessed, innovation can be used to overcome limitations, scan an environment for new ideas, build ties and improve capabilities (Chesbrough, 2006; Qiao et al., 2014). These authors also suggest that innovation and the development thereof benefit from a highly competitive environment.

According to the findings, the importance of the relationship between competitor networks and business performance, when moderated by innovation, is significant and supported. The findings align with previous research on collaboration amongst competitors and businesses (Bengtsson & Kock, 2000); however, it contrasts with others' findings (Abbas et al., 2019).

According to the findings of Abbas et al. (2019), there is no significant relationship between entrepreneurial business networks and business performance.

However, as mentioned above, collaboration among competitors has gained researchers' interest in recent years (Das, 2019; Abbas et al., 2019; Ratala et al., 2008). Literature supports collaboration between competitors along

strategic lines and is delineated by engagement terms, which are viewed to advance growth and development across industry.

5.5 Chapter Summary

The purpose of this study was to measure the extent to which supplier, consumer, and competitor networks, while moderated by innovation, impacted business performance.

Data was collected using a self-administered survey distributed to respondents via Qualtrics, and 133 responses were received. However, only 91 responses were useable. EFA and reliability analysis was conducted to determine the accuracy of the measurement scale used. In contrast, a correlation analysis was used to determine the size, strength and direction of the relationships between network (supplier, consumer and competitor), interaction and business performance factors.

Further, a moderated hierarchical multiple regression was used to indicate how each factor impacted business performance. The results showed that supplier networks positively impact business performance while competitor networks moderated by innovation negatively impacted business performance. The results further showed that the results show a weak, positive, yet significant correlation between business performance and supplier networks ($r = 0.210^*$, p-value < 0.05). Business performance had a weak and positive correlation with innovation ($r = .192^*$, $p<0.05$). A positive yet weak correlation to the competitor Innovation product term ($r = .168$; p-value <0.05).

Supplier networks had significant correlations with the following variables: innovation had a moderate and positive correlation to Supplier networks ($r = .303^{**}$; p-value$<.001$) and a weak and positive correlation to Competitor networks ($r = .209^*$; p-value <0.05). In conclusion, the study aimed to look at the role networks and innovation play in impacting business performance while keeping in mind that businesses do not have all resources required to compete internally, thus needing to collaborate with external partners.

6. Chapter 6: CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

6.1 Introduction

The study's conclusions are discussed in this chapter, along with the proposed implications of the findings. Recommendations are also presented for future research to be considered by those interested in undertaking research studies focusing on networks, innovation and business performance.

6.2 Conclusions of the Study

The study's objective was to understand the extent to which networks, mainly supplier, consumer, and competitor networks, impact business performance when moderated by innovation amongst SME's in South Africa.

The choice to explore the impact of external networks was influenced by the fact that most extant literature had explored the impact of personal, managerial and family networks. While there is a plethora of literature on the impact of suppliers, consumers and competitors on business performance, few studies seemed to have taken the stance to measure their impact moderated by innovation from a network perspective.

This was drawn from network literature, theory and theorists, Innovation literature and theory, and literature on various methodologies to measuring business performance integrated with entrepreneurial theory that set the foundation for framing the study and development of its measurement scales.

The study results showed that supplier networks (SN) and competitor networks moderated by innovation (Product Term_COMPN_Innovation) are significant predictors of business performance. Further, the results showed that competitor networks (COMPN) and supplier networks moderated by innovation (Product Term_SupplierN_Innovation) are not significant predictors of business

performance. Competitor networks (COMPN) and the product term for supplier networks and innovation

(ProductTerm_SupplierN_Innovation) is negligibly and negatively associated with business performance. Lastly, results for consumer networks and the product term for consumer networks moderated by innovation and the extent to which they impact business performance was not tested as items measuring consumer networks cross-loaded and was subsequently deleted at the validity testing stage of the analysis process.

The overall results for hypotheses 1 and 4c contrast to Abbas et al. (2019) findings, where scales for supplier, competitor and consumer networks were drawn. However, results for hypotheses 3 and 4a aligns with Abbas et al. (2019) findings. Thus, the results cannot be considered definitive in explaining how mainly supplier, consumer and competitor networks moderated by innovation impact business performance. Nevertheless, cautiously considered in this instance as results are mixed. Further broader findings of interest are listed in the following section.

6.3 Implications and Recommendations

Researching the moderating impact of innovation on the relationship between networks and business performance has garnered interest for some time. Literature linking the impact of networks on a firms ability to innovate suggests that networks play a crucial role in identifying new ideas and possibilities. However, these may often be incremental rather than disruptive (Oberga, 2017).

A business's innovative capability is essential to its performance abilities and an effective means to achieving a competitive advantage (Prajogo, 2014). According to Chesbrough (2003), not all intellectual people work within a business. Therefore there is a need to work with individuals both inside and outside of the business. He further notes that networks are consistently linked to innovation as networks are essential to growth and performance. One of the

biggest obstacles facing SME's in South Africa is a lack of internal resources as well as the ability to access external resources (IFC, 2019). As Lin (2005) emphasises, it is impossible to leverage the embedded resources therein without access to networks. Therefore, to sustain a competitive edge, entrepreneurs are encouraged to cultivate their innovative internal capabilities by harnessing resources embedded in their networks.

The findings of this study illustrate this importance, as it shows that collaboration and engagement of supplier networks positively impact business performance. The study further illustrates that when competitors leverage innovation to extend their capabilities and know-how, they are better positioned to compete. Thus, more competitive.

The implications are discussed below:

6.3.1 Implications for SME's and Supplier Networks

- Selection and harnessing of supply networks provide an opportunity to improve performance, productivity, growth, innovation and product delivery while also providing a opportunity to establish a competitive edge.
- Broadening supplier partners enables businesses to diversify their supply networks, which in a South African perspective particularly, enables the ability to integrate small, local and black owned suppliers into their supply networks. This encourages economic integration, participation, development and growth. While also facilitating and supporting employment growth.
- Draw on cooperation, knowledge and know-how of suppliers to overcome internal constraints, as well as help, gain a "go-to-market" advantage.

6.3.2 Implications for SME's and Consumer Networks

- Build deeper relationships with consumers, gain a better understanding of consumers needs and behaviours. Thereby increasing a brand and businesses ability to drive offline awareness through consumer advocacy word-of-mouth) and drive social influence.

- Leverage collaboration with consumers to evolve offering through cocreation indicatives. Engaging with consumers provide businesses with real-life research opportunities, which presents the opportunity to gain more meaningful, genuine and insightful feedback from consumers.
- Strengthen brand loyalty, increase brand reach as well as deepen brand ties and association.

6.3.3 Implications for SME's and Competitor Networks

- Competitors face similar markets, challenges, risks and rely, to a large extent, like resources and technologies. Collaboration amongst competitors, along strategic lines and delineated by engagement terms, has the potential to influence industry-wide strides in innovative capabilities through the transfer of knowledge and resources. Thus, moving the entire industry forward, not simply a lucky few with greater access to resources.
- It also has the potential to improve industry competitiveness and its innovative capacity, improving the degree and type of innovation coming from a particular industry. In turn, allowing businesses to leverage the strengths and know-how within a competitor networks and integrate resources while also curbing the initial investment burden, otherwise carried solely by a single business, in new technologies and innovations.
- Collaborating among competitors "coopetition" also enables business to reach a broader consumer base.

6.3.4 Implications for Developing SME Innovative Capability

- Innovation is often viewed as the catalyst that helps businesses grow. It has potential to improve SME's capabilities to evolve and remain current and competitive. As the risk of not innovating could mean losing market share, decline in efficiencies and productivity, reduced profit as well as losing key staff.
- More efficiently and effectively meet market and consumer demands as well as build relationships with consumers– improving quality of their offering.

- Improved efficiencies further assist businesses in reducing cost and wastage, leaving it better financially positioned. This also means a business is better able to anticipate, prepare fand quickly adapt to emerging market changes.

Therefore, it is concluded that entrepreneurs should cultivate the facilitation and engagement of business networks (supplier, consumer and competitors) to enhance their business performance and leverage internal and external innovative capabilities to better position themselves competitively in the market. These activities have become essential to the differentiation of their businesses in the market and enhance performance.

While the study did illustrate the relationship among variables, though weak, it is recommended that this kind of study be conducted on a larger sample as this will likely improve the quality of the results.

6.4 Suggestions for Further Research

The study notes the relationship between supplier, consumer and competitor networks and business performance and the understanding of how each of these networks potentially impacts an SME's financial performance. The finding of this study can be used in later studies as a basis to conduct a more thorough analysis of the extent to which networks impacts business performance.

It would be beneficial to consider the following in future research:

- The study took place between November 2020 – February 2021, during the global pandemic and the height of the second wave in South Africa. As such, there were a variety of restrictions inhibiting the "usual" economic environment which resulted in many businesses, SME's in particular, experiences significant financial consequences as a result. This may very well have impacted the results observed. A replication of the study in a more 'normal' or post-pandemic economic environment is encouraged as it would be beneficial to see whether there is a change in results observed.

- The sample was very small and thus likely impacted results observed. It is recommended, and would be beneficial, to repeat this study on a much larger sample.
- The sample was dominated by respondents that had obtained an undergraduate degree or higher, predominantly located in Gauteng. Repeating the study on SME's located in poorer resourced areas could provide deeper insights as the importance of networks and innovation in improving business performance.
- The survey also did not ask respondents to identify themselves along racial lines. It would be interesting and beneficial, taking into account South Africa's demographics, to do a comparative study to find out if there are differences in amongst entrepreneurs is significant.
- Future research can consider the extent to which network activities and resources impact the relationship between supplier, consumer and competitor networks and its impact on business performance
- The study's focus was measuring impact on the financial indicators of business performance, it would be interesting to see future research measure impact on alternate performance measures, such as growth, market share, social impact or employee and consumer satisfaction and growth.

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APPENDIX A- RESEARCH INSTRUMENT

Q1

Welcome to my research study!

Dear Participant,

In pursuance of my masters in Entrepreneurship and New Venture Creation at the Wits Business School I have chosen to base my research paper on the following topic:

" Business networks and the moderating impact of innovation on business performance."

If you are an entrepreneur, business owner and/ manager you are perfect fit for this study! I would appreciate it if you could spare approximately 10-15 minutes of your time and complete the survey.
Please be assured that your feedback will be kept confidential and your participation in this study is voluntary. You have the right to withdraw at any stage during the survey, for any reason, and without prejudice.

Should you wish to contact my supervisor for this study, please email Dr jabulile.Msimang-Galawe@wits.ac.za. By clicking the consent button below, you acknowledge that your participation in the study is voluntary, you are above the age of 18 years old, and that you are aware that you may choose to withdraw your participation herein at any time, for any reason. ○ I consent, begin study (1) ○ I do not consent; I do not wish to participate in the study (2)

Q2.1 What is your gender?

- Male (1)
- Female (2)
- Other (3)

Q2.2 What is your age?

- 18 -25 years (1)
- 26 - 35 years (2)
- 36 - 45 years (3)
- 46 - 55 years (4)
- 56 and above (5)

Q2.3 What is your level of education?

- ○ No High School (1)
- ○ High school graduate (2)
- ○ Some college (3)
- ○ Undergraduate Degree (4)
- ○ Post Graduate Degree (5)
- ○ Professional Degree (6)

Q3.1 Where are you located?

- ○ Eastern Cape (1)
- ○ Free State (2)
- ○ Gauteng (3)
- ○ Kwazulu-Natal (4)
- ○ Limpopo (5)
- ○ Mpumalanga (6)
- ○ Northern Cape (7)
- ○ North West (8)
- ○ Western Cape (9)

Q3.2 What is the size of your business?

- ○ Micro (1)
- ○ Small (2)
- ○ Medium (3)
- ○ Large (4)

Q3.3 How long has your business been operational?

- ○ less than a year (1)
- ○ 1 - 2 years (2)
- ○ 3 - 5 years (3)
- ○ 6 - 8 years (4)
- ○ 8 - 10 years (5)
- ○ More than 10 years (6)

Q3.4 Over the last 2 years, the business has increased the number of people employed on a full-time basis by?

- ○ None (1)
- ○ 1 - 5 people (2)
- ○ 6 - 10 people (3)
- ○ 11 -15 people (4)
- ○ 16 - 20 people (5)
- ○ > than 20 people (6)

Q3.5 Do you plan to develop or incorporate new capabilities in your business as a result of covid19?

- ○ Yes (1)
- ○ Considering it (2)
- ○ No (3)

Q3.6 Please identify the industry/ sector that describes the nature of your business activity?

- ○ Agriculture (1)
- ○ Finance/ Banking/ Insurance/ Tax (2)
- ○ Trade (3)
- ○ Manufacturing (4)
- ○ Transportation (5)
- ○ Communications & Marketing (6)
- ○ Legal (7)
- ○ Construction/ Engineering (8)
- ○ Education (9)
- ○ Mining (10)
- ○ Property management/ Real Estate (12)
- ○ Sport/ Entertainment (13)
- ○ Medical (14)
- ○ Retail (16)
- ○ Tech (17)

○ Other (15)

Q4.1 Please consider the statements on business performance below and indicate the extent to which you agree or disagree.The next questions are 7-point Likert Scales with Strongly Disagree=1 and Strongly Agree=7.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither agree nor disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
Return on investment (ROI) goals have been achieved (1)	○	○	○	○	○	○	○
Return on asset goals (ROA) goals have been achieved (2)	○	○	○	○	○	○	○
Return on equity (ROE) goals have been achieved (3)	○	○	○	○	○	○	○
Net profit goals have been achieved (4)	○	○	○	○	○	○	○
The business has achieved sales growth compared to competitors (5)	○	○	○	○	○	○	○
The business has gained market share compared to competitors (6)	○	○	○	○	○	○	○

Q 5.1 Please consider the statements on the importance of supplier networks below and indicate the extent to which you agree or disagree.The next questions are 7-point Likert Scales with Strongly Disagree=1 and Strongly Agree=7.

	Strongly Disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Our business strives to create close business ties with supply partners (1)	○	○	○	○	○	○	○
Our business discusses our offering with existing and potential suppliers (2)	○	○	○	○	○	○	○
Our business actively seeks out feedback from supply partners (3)	○	○	○	○	○	○	○
Supply partners have assisted in solving a problem for our business (4)	○	○	○	○	○	○	○
Our business does not promote successful cooperation with supply partners (5)	○	○	○	○	○	○	○

Our business customises and tailors cooperation with supply partners (6)	○	○	○	○	○	○	○

Q6.1 Please consider the statements on the importance of consumer networks below and indicate the extent to which you agree or disagree.The next questions are 7-point Likert Scales with Strongly Disagree=1 and Strongly Agree=7.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Our business strives to create close business ties with consumers (1)	○	○	○	○	○	○	○
Our business discusses our offering with existing and potential consumers (2)	○	○	○	○	○	○	○
Our business actively seeks out feedback from consumers (3)	○	○	○	○	○	○	○
Our consumers have assisted in solving a problem for our business (4)	○	○	○	○	○	○	○
Our business does not promote successful cooperation with consumers (5)	○	○	○	○	○	○	○

Our business customises and tailors cooperation with consumers (6)	○	○	○	○	○	○	○

Q7.1 Please consider the statements on the importance of competitor networks below and indicate the extent to which you agree or disagree.The next questions are 7-point Likert Scales with Strongly Disagree=1 and Strongly Agree=7.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Our business strives to create close business ties with competitors (1)	○	○	○	○	○	○	○
Our business discusses our offering with existing and potential competitors (2)	○	○	○	○	○	○	○
Our business actively seeks out feedback from competitors (3)	○	○	○	○	○	○	○
Our competitors have assisted in solving a problem for our business (4)	○	○	○	○	○	○	○
Our business does not promote successful cooperation with competitors (5)	○	○	○	○	○	○	○

Our business customises and tailors cooperation with competitors (6)	○	○	○	○	○	○	○

Q8.1 Please consider the statements on innovation below and indicate the extent to which you agree or disagree.The next questions are 7-point Likert Scales with Strongly Disagree=1 and Strongly Agree=7.

	Strongly Disagree (1)	Disgree (2)	Somewhat Disgree (3)	Neither agree nor disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
Our business actively keeps track of new technology breakthroughs. (1)	○	○	○	○	○	○	○
External sources of knowledge and ideas are important to our business (2)	○	○	○	○	○	○	○
Our company has sourced and bought new technology from other firms and institutions (3)	○	○	○	○	○	○	○
Our company sources information on trends and developments from the industry (4)	○	○	○	○	○	○	○
Our business continuously strives to introduce new products and services to market. (5)	○	○	○	○	○	○	○

The number of new products and services our business has introduced to market over the last two years has increased steadily (6)	○	○	○	○	○	○	○
Our business has collaborated with suppliers when considering incremental product/ service innovation goals and the acquisition of new technologies (7)	○	○	○	○	○	○	○
Our business has collaborated with suppliers when considering radical product/ service innovation goals and the acquisition of new technologies (8)	○	○	○	○	○	○	○

Our business has collaborated with competitors when considering incremental product/ service innovation goals and the acquisition of new technologies (9)	○	○	○	○	○	○	○
Our businesshas collaborated with competitors when considering radical product/ service innovation goals and the acquisition of new technologies (10)	○	○	○	○	○	○	○
Our business seeks feedback from consumers when considering incremental product/ service innovation goals (11)	○	○	○	○	○	○	○

Our business seeks feedback from consumers when considering radical product/ service innovation goals (12)	○	○	○	○	○	○	○

APPENDIX B – ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: WBS/BA2385599/841**

PROJECT TITLE Business networks and the moderating impact of innovation on business performance

INVESTIGATOR	Miss Brigitta Jordaan
SCHOOL/DEPARTMENT OF INVESTIGATOR	MM (Entrepr & New Venture Creation)
DATE CONSIDERED	09 October 2020
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	LOW RISK
EXPIRY DATE	30 JUNE 2021

ISSUE DATE OF CERTIFICATE 23 October 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Dr Msimango-Galawe

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Brigitta Jordaan
Signature

24 / 10 / 2020
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX C - CONSISTENCY MATRIX

Business networks and the moderating impact of innovation on business performance

Aims of research	*Literature Review*	*Hypotheses*	*Research Question*	*Variables: Independent & Dependent*	*Source of data*	*Type of data*	*Analysis*
Investigate the impact of Supplier networks on busines performance	(Abbas, 2019) (Huang, 2012) (Jack, 2004) (Lin N., 1999) (Madzimure, 2019) (Lin N., 2005)	H1: A high degree of supplier network engagement positively impacts firm performance	Q1: To what extend does supplier networks impacts business performance?	IV1a: Supplier Networks DV: Firm performance	IV1: Supplier Networks (BN_SI 5.1. – 4 questions) DV: Firm performance (BN_BP: 8.1 – 9 questions)	Ordinal (7-point Likert scale)	Correlation, distribution, regression
Investigate the impact of consumer networks on busines performance	(Abbas, 2019) (Huang, 2012) (Jack, 2004) (Madzimure, 2019) (Lin N., 1999) (Lin N., 2005)	H2: A high degree of consumer network engagement positively impacts firm performance	Q2: To what extend does consumer networks impacts business performance?	IV1b: consumer Networks DV: Firm performance	IV2: Consumer I Networks (BN _CI: 6.1– 4 questions) DV: Firm performance (BN_BP: 8.1 – 9 questions)	Ordinal (7-point Likert scale)	Correlation, distribution, regression
Investigate the impact of Competitor networks on busines performance	(Abbas, 2019) (Huang, 2012) (Jack, 2004) (Madzimure, 2019) (Lin N., 1999) (Lin N., 2005)	H3: A high degree of competitor network engagement positively impacts firm performance	Q3: To what extend does competitor networks impacts business performance?	IV1c: competitor Networks DV: Firm performance	IV3: Competitor Networks (BN_CI:7.1 – 4 questions) DV: Firm performance (BN_BP: 8.1 – 9 questions)	Ordinal (7-point Likert scale)	Correlation, distribution, regression
To determine when the moderating impact innovation has on the relationship between supplier networks and firm performance	(Huang, 2012) (Adams, 2008) (Öberga, 2017) (Pittaway, 2004) (Pittaway, 2004)	H4A: Supplier networks moderated by innovation positively impact firm performance	Q4: To what extent does innovation impact supplier networks and firm performance?	IV Networks MV: Innovation DV: Firm performance	MV4A: Innovation (I: 8.1 – 4 questions) IV: Networks and DV: Firm performance	Ordinal (7-point Likert scale)	Correlation, distribution, regression
To determine when the moderating impact innovation has on the relationship between consumer networks and firm performance	(Huang, 2012) (Adams, 2008) (Öberga, 2017) (Pittaway, 2004) (Pittaway, 2004)	H4B: Consumer networks moderated by innovation positively impact firm performance	To what extent does innovation impact consumer networks and firm performance?	IV Networks MV: Innovation DV: Firm performance	MV4B: Innovation (I: 8.1 – 4 questions) IV: Networks and DV: Firm performance	Ordinal (7-point Likert scale)	Correlation, distribution, regression

To determine when the moderating impact innovation has on the relationship between competitor networks and firm performance	(Huang, 2012) (Adams, 2008) (Öberga, 2017) (Pittaway, 2004) (Pittaway, 2004)	H4C: Competitor networks moderated by innovation positively impact firm performance	To what extent does innovation impact competitor networks and firm performance?	IV Networks MV: Innovation DV: Firm performance	MV4C: Innovation (I: 8.1 – 4 questions) IV: Networks and DV: Firm performance	Ordinal (7-point Likert scale)	Correlation, distribution, regression

APPENDIX D – CERTIFICATE OF EDITING



EDITING SERVICES RENDERED BY
Delicia Langenhoven

CERTIFICATE *of* EDITING

the following thesis

Business networks and the moderating impact of innovation on business performance

By

Brigitta Jordaan

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation

This document certifies that the above manuscript was proofread and edited by

DELICIA ROSELINE LANGENHOVEN (5106030062087).

It certifies that the document was edited for proper English language (UK) grammar, punctuation, spelling and overall style.

All amendments were tracked with the Microsoft Word 'Track Changes feature 'which allowed the author to accept or reject each change individually.

The editor endeavoured to ensure that the author's intended meaning was not altered during the review.

Dated : 27 April 2021

Best wishes

DR Langenhoven