

**THE INFLUENCE OF SUPPLY CHAIN NETWORKS,
FLEXIBILITY AND INTEGRATION ON THE
PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES
IN THE SOUTHERN GAUTENG REGION**



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DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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DEDICATION

I dedicate this research to Almighty God and to the memory of my father, Mr Oghovbenroro Omoruyi, who laid the foundation for my education, upon which my mum built.

I also dedicate this research work to my husband (Olubunmi Olusegun Adesile) and to my children (Damilola Eminent Adesile and Eniola Victoria Adesile). You are the best. I appreciate your endurance and for being there for me throughout the entire doctorate programme.

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ABSTRACT

The South Africa economy has embraced the importance of small and medium enterprises (SMEs) as agents of economic growth and sustainability. However, for SMEs to be more efficient and effective towards the growth of the economy, it is important for SMEs to implement and take cognisance of the global competitive strategy among the so-called “best in class” organisations in order to also sustain and grow their business. The supply chain network with its flexibility has become the most commonly used business strategy worldwide for the improvement of performance in organisations, more especially among larger organisations. In today’s competitive environment, successful organisations are those that have been able to link their business functions within the organisation itself as well as across other businesses outside the organisation. Competitive challenges in the modern business environment have resulted in the need for organisation to integrate business processes strategically across other business units within the supply chain network.

Network perspective theory, social network theory, network management theory and relational view theory are discussed to better understand the importance of SMEs supply chain network, flexibility and integration.

The purpose of this study was to examine the influence of supply chain network, flexibility and integration on the SMEs business performance in the Southern Gauteng region. The research survey was conducted in the Meyerton, Vereeniging and Vanderbijlpark and 401 SMEs participated in the study. SPSS 22.0 was used to analyse the data and AMOS 22.0 was used to perform the confirmatory factor analysis. The structural equation modelling (SEM) was used to assess the proposed model fit and to test the statistically significant relationship of the hypothesis. The research study results revealed that supply chain network, flexibility and integration positively influence SMEs business performance. This study contributes new knowledge to the existing literature by providing a research framework that can enhance SMEs performance and also provide practical recommendations based on the research findings for SMEs and for future research. Furthermore, as one of the first studies addressing the influence of supply chain network, flexibility and integration on the performance of SMEs in the southern Gauteng region it has generated new insights and information as well as outlined the strategic reasons for SME owners and managers to improve on their business relationships.

Keywords: supply chain networks, supply chain flexibility, supply chain integration, SMEs performance

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Supply chain has become a source of competitive advantage in many organisations for the creation of customer value and customer satisfaction, both in South Africa and abroad (Martinsen & Bjorklund 2012:566). Supply chain is seen also as an important strategy that promotes business growth. Supply chain can be viewed as a strategic management activity in an organisation that can affect the operational, market and financial performance of the organisation (Narasimhan & Talluri 2009:115). In other words, organisational efficiency and performance can be enhanced if supply chain networks are considered as an important business strategy that can reduce uncertainty in the internal and external environment.

McKinnon (2009:293) defines supply chains as “the networks for processes and activities that produce values in the form of products and services in the hands of the ultimate customer.” Supply chain is a link that connects independent organisations together for creating value in products or services to satisfy the customer’s needs. Therefore, a careful integration of supply chain and supply chain flexibility can improve small and medium enterprises’ (SMEs) performance, create more value, and bring capital into the organisation. This will enhance product life cycle for continuous improvement and product development, because the key to an organisation’s success is that more money or capital should flow into the organisation than flows out (Kruse 2007:13). This can only happen with careful implementation of supply chain networks and flexibility by SMEs.

For the sake of reducing costs, increasing efficiency and providing better service to customers, firms no longer compete as independent entities, but rather as integral parts of supply chain links, and the ultimate success (performance) of a firm depends on its managerial ability to integrate and coordinate its supply chain strategy (Hartmann & Grahl 2012:526). As a result of supply chain flexibility, supply chain strategy is recognised as an important source of competitive advantage (Martinsen & Bjorklund 2012:562). Therefore, a successful integration of supply chain strategy can improve a firm’s supply chain performance. However, the management of supply chain strategy is a complex task (Golicic & Davis 2012:726-727). Hence, a clear understanding of the influence of supply chain

networks, their flexibility and integration is critical to supply chain performance. SMEs are the major focus of this study.

Therefore, this study is undertaken to determine the influence of supply chain networks, flexibility and supply chain integration on the performance of SMEs. Within the South African economy, the small and medium enterprise sector is a subset of the small, medium and micro enterprise (SMMEs), and it is referred to as a separate, legal and distinct owner-managed entity that cannot form part of a group of companies (KNC & Associate 2002:3).

The aim of this study is to investigate the influence of supply chain networks on integration strategy and performance, the influence of supply chain flexibility on supply chain integration and performance, as well as the influence of supply chain integration on performance. This is followed by an exposition of the problem statement, purpose, the research objectives (theoretical and empirical objectives), significance/justification of the study, and the scope of the study, review of research variables, as well the hypotheses. The spotlight then turns to the research design and methods used to investigate the problem, and data analysis. In addition, the layout of the study and the definition of key concepts are discussed.

1.2 THEORETICAL FRAMEWORK

SMEs are essential to developing countries like South Africa because South Africa faces employment and income distribution challenges (Oke, Burke & Myers 2007:735). SMEs contribute to the annual output of South Africa's job creation, thereby reducing poverty (Chiwere & Dick 2008:145). SMEs contribute significantly to South Africa's aggregate savings and investments because SMEs, through their business process, create wealth and employment (Nieuwenhuizen 2011:355). Therefore, it is important to look into the significance of flexibility on performance, as well as value of strategic integration on performance among SMEs in order for them to better improve the economy through achieving competitive edge (Ellegaard 2006:273).

The definition of small and medium enterprises (SMEs) is itself a challenging task, as it varies from country to country (Padmore, Taylor & Frecknall-Hughes 2006:362; Deros, Yusof & Salleh 2006:398; Mutula & Brakel 2006:402). Loecger (2000:261) defines SMEs as the efficient motor of every market economy that is differentiated from large enterprises as having less than 250 workers, a maximum of R40 million annual turnover, a minimum of 75

percent of company assets owned by the company manager (owner-manager or their families manage the company personally), and a maximum of R27 million balance sheet total. SMEs are further sub-divided according to the number of employees, for example up to 50 employees for small companies, 50 to 250 employees for medium companies, and more than 250 employees for large companies (Loecger 2000:261-262).

This study will use the definition provided by South Africa's National Small Business Amendment Act (26 of 2003). The South African National Small Business Amendment Act (26 of 2003) defines an SME as a small enterprise, which constitutes fewer than 50 employees, with an annual turnover of between R2 million and R25 million; and a medium enterprise as a business with between 50 and 200 employees, with an annual turnover of between R4 million and R50 million.

1.2.1 Supply chain networks

Supply chain networks are a link connecting independent organisations for creating value products or services to satisfy the customer's needs. Supply chain networks involve the collection and extraction of information about competitors, competitive environment and competitive strategies, with the aim of winning and maintaining competitive advantages of enterprises (Zha & Chen 2009:230). The successful integration of the function of supply chain networks and supply chain flexibility will help SMEs to overcome competitive rivals in both internal and external market environments.

According to Bozarth, Donald and Barbara (2007:78), supply chain networks require an organisation to widen the scope of the business activities further, which can become more challenging as product life cycles shorten, product variety increases, technological advancement proceeds at an exponential rate, and there is an increase in demand for customer satisfaction.

According to Gelinas and Bigras (2004:266), pressure from customers often triggers SME supply chain network's integration, or by the larger organisations whose focus is on the adoption of a pull approach, rather than the traditional push approach. As a result, they widen the vision of their supply chain networks to refocus activities on basic skills. Due to these increasing needs of supply chain networks, SMEs may experience more difficulties or challenges of integrating supply chain strategy because of its complexity to compete effectively (Thakkar, Kanda & Deshmukh 2008:75). SMEs, because of their dependence for

survival on financing channels like banks, grow slowly (Duan, Han & Yang 2009:73). This study, therefore, aims to provide persuasive arguments for SMEs to depend on the function of supply chain networks, supply chain flexibility, and supply chain integration for survival and effective performance, as well as enhance growth capabilities, which will result in more capital inflow.

To be successful, SMEs should appreciate the function of supply chain flexibility and integration through supply chain networks, to be observant and adjust to the needs of their customers, to preserve their market shares, and to assure their growth (Gelinas & Bigras 2004:267).

1.2.2 Supply chain flexibility

Supply chain flexibility is defined as an attribute of a system's technology or organisation's ability to cope with uncertainty, and to adapt or respond to changes (Tachizawa & Gimenez 2010:214). Supply chain flexibility is also required to face increasing variety in its environmental needs and expectations without incurring excessive costs, time, organisational disruptions and performance losses (Zhang, Vonderembse & Su Lim 2003:174; Narasimhan, Talluri & Das 2004:93; Sanchez & Perez 2005:683; Gong 2008:746-747; Gosling, Purvis & Naim 2009:2). Quick responses to customer's orders are the reason for the implementation of supply chain networks in the increasingly competitive environment and as a result, organisations seek to enhance supply chain flexibility in the business strategy (Ahmed, Hardaker, & Carpenter 1996:563-565; Zhang *et al.* 2003:173; Choy, Chow, Tan, Chan, Mok & Wang 2008:2001).

Chen (1999:332) states that firms formulate and implement a supply chain strategy to gain a competitive advantage and as a result, many organisations have realised that to provide a quick response to changing customer needs, to cope successfully with uncertainty, to minimise inventory costs, and to achieve high levels of customer satisfaction, is to display the supply chain flexibility necessary for success (Skintzi, Ioannou & Prastacos 2008:956).

Supply chain flexibility may represent potential sources of improved efficiency. According to Choy *et al.* (2008:2001), "increasing flexibility in the supply chain system can be regarded as a strategy for improving a firm's responsiveness to change." Supply chain flexibility produces a different way of thinking in order to serve each distinct customer's needs, and for meeting the time-based constraints (Duclos, Vokurka & Lummus 2003:450-451). Flexibility

is a powerful quality in the system that enhances value offerings appreciated by customers, and it ensures stable performance under changing conditions (Ling-yee & Ogunmokun 2008:739-740). Increased flexibility in SMEs supply chain networks can be regarded as a strategy for improving organisation's responsiveness, particularly in the decision-making process (Sanchez & Perez 2005:682). Thus, supply chain flexibility allows organisations to make alternative decisions. Supply chain flexibility can be viewed as a device, enabling organisations to respond effectively to future changes, by gradually improving on their future commitment and maximising expected value (Barad & Sapir 2003:156-159). The basic supply chain flexibility occurs with regard to machines, material handling, operations, automation, labour process, routing, product design, delivery, volume, expansion, programming, production and market flexibility (Duclos *et al.* 2003:450; Gong 2008:746).

1.2.3 Supply chain integration

Supply chain integration (SCI) is considered an important vehicle to address supply chain challenges and to achieve improvement on supply chain performance. According to Van der Vaart and Van Donk (2008:42), it has been recognised to be a key source of innovation, flexibility and responsiveness in organisations. They further state that SCI is responsible for the positive impact on corporate and supply chain performance.

Leavy (2006:333-334) argues that supply chain strategy cannot sustain competitive pressures without careful integration of the set objectives. SCI is a vital force behind the progress of organisations competitive performance, and as a result, new products are introduced and new technologies are improved and developed. As an important source of supply chain innovation, organisations put more competitive pressure on their supply chain strategy, flexibility and performance (Fantazy, Kumar, & Kumar 2009:177). A well-integrated supply chain strategy can be seen as a significant component of the solution to the organisation's lack of responsiveness, coordination with key suppliers, prolonged lead time in production and delivery, and costs of carrying inventory levels (Lummus, Krumwiede & Vokurka 2001:431). Therefore, SCI is fundamental to the growth and success of an organisation. The focus on SCI strategy is vital to SMEs in South Africa because without it, supply chain network, flexibility and performance may suffer in the emerging competitive environment.

1.2.4 SMEs performance

The pursuit to achieve and retain competitive advantage implies that supply chain performance should be stated according to the customer's specific requirement (Pienaar & Vogt 2012:30; Town 2000:44). Since supply chain networks, flexibility, and integration outcome focus on customer satisfaction and value-added advantage, this study measures performance resulting from supply chain networks, flexibility and strategic integration of set objectivities. According to Forslund and Jonsson (2007:547), supply chain networks, flexibility and integration performance measure is a key to achieving competitive advantage. For this study, supply chain performance is an integrated process between supply chain networks, flexibility and integration.

1.3 PROBLEM STATEMENT

According to Chapman, Moore and Thompson (2000:354), Nabhani and Shokri (2007:1162), and Vaaland and Heide (2007:21), compared to larger enterprises, SMEs lag behind in the implementation of supply chain due to changing customer demands, lack of competences/knowledge of supply chain networks, lack of understanding of the function of supply chain flexibility and integration, and lack of skill among the workforce to implement supply chain technology efficiently and effectively.

The lack of understanding and knowledge of the function of supply chain networks, flexibility and integration to achieve competitive performance, and its value-adding techniques, may prevent SMEs from using them to overcome existing performance gaps in external markets as well as preventing them from exploiting new opportunities. It also prevents the accomplishment of the strategic goals of efficiency, effectiveness and innovation that impact negatively on the SMEs competitiveness (Chapman *et al.* 2000:355). Poor supply chain service quality may lead to a lack of access to innovation and expertise, which may result in customers switching over to a substitute product because of the high cost and lack of sustained competitive advantage, and customer dissatisfaction because of lack of product availability. Lack of skills and knowledge of supply chain networks, flexibility and integration capabilities among SMEs may result in poor organisational performance and fragmentation of interest in the business, which may further have a negative impact on economic growth/performance (Ballou 2004:13; Louw & Venter 2006:119).

According to Wagner, Fillis and Johansson (2003:343), supply chain networks capture the notion of organisations and the coordination of their activities from procurement of raw materials to delivery to the customers. In other words, individual firms service one another by focusing on operations across the firm's boundaries, as opposed to seeking only to maximise that particular firm's efficiencies. The economic benefits such as reduced time-to-market, lower costs, reduction of operating expenses, increased revenue growth, and improved customer services levels are a result of crucial supply chain integration.

Nevertheless, the issue of supply chain performance in general is a complex task to achieve in the global competitive environment. The larger organisations, with their strong position in the competitive environment, still find it difficult to compete successfully and yet, SMEs are expected to also compete successfully with rivals. It is still the same competitive environment within the larger organisation that SMEs are expected to get their inputs into business from their suppliers, sell their goods and services to the customers, and compete for these customers with larger organisations (Duclos *et al.* 2003:448). If they are to survive, the need for supply chain networks, supply chain flexibility, and supply chain integration should be the key to achieving supply chain performance. If they are surviving, to what extent are supply chain networks, supply chain flexibility, and supply chain integration influencing SMEs business performance, and to what extent are SMEs able to compete successfully? Hence, there is a need for the study.

The strategic connection with supply chain networks will help SMEs to be more flexible in the integration of the business vision and mission statement in order to outperform their competitors. In this process, there is a transfer of a variety of information and assistance from the supply chain networks in terms of technological advancement, marketing ability, financial resources and managerial skills, which can further enable SMEs to exploit their capability to undertake innovation. Supply chain networks can also contribute to the enhancement of their business performance as well as enhancement of South Africa's economic performance (Subrahmanya 2008:25). Based on this knowledge, a conceptual model is developed focusing on the influence of supply chain networks on supply chain performance; the influence of supply chain networks on supply chain integration; the influence of supply chain flexibility on supply chain integration; the influence of supply chain flexibility on supply chain performance; as well as the influence of supply chain integration on supply chain performance.

A further problem is that none of the studies so far has researched into the influence of supply chain networks, flexibility and integration on the performance of SMEs within the South African context. Again, none of the studies has used structural equation modelling (SEM) to analyse quantitatively the influence of supply chain networks, flexibility and integration on the business performance of SMEs. A model (Figure 1) showing the possible influence of the variables is proposed for the study.

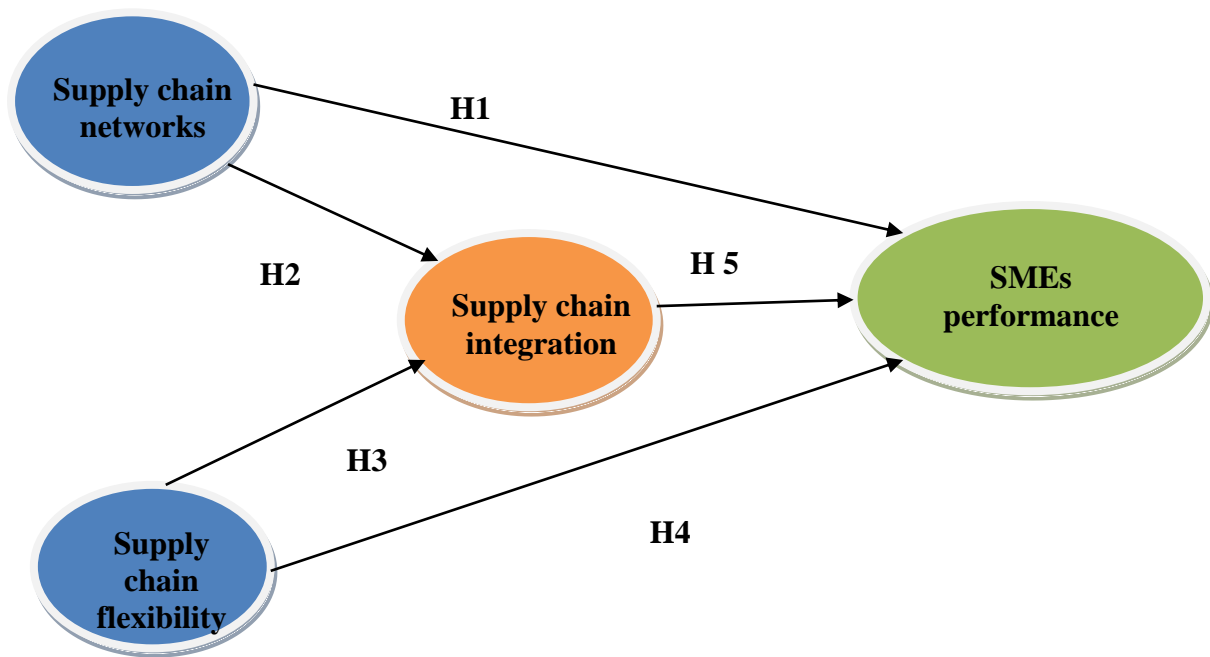


Figure 1.1: Schematic diagram of the proposed framework for this research

The aim of the research framework is to measure the influence of supply chain networks, supply chain integration, and supply chain flexibility on SMEs business performance. This will help SMEs to be more competitive in their business environment, enhance performance, as well as contribute to the economic development of South Africa. Therefore, the following hypotheses are developed for this study:

- H1:** Supply chain networks have a significantly positive influence on SMEs performance.
- H2:** Supply chain networks have a significantly positive influence on SMEs supply chain integration.

H3: Supply chain flexibility has a significantly positive influence on SMEs supply chain integration.

H4: Supply chain flexibility has a significantly positive influence on SMEs performance.

H5: Supply chain integration has a significantly positive influence on SMEs performance.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study are categorised into primary and secondary objectives. The secondary objectives are divided into theoretical and empirical objectives.

1.4.1 Primary objective

The purpose of this study is to examine the influence of supply chain networks and supply flexibility on supply chain integration and SMEs performance in South Africa.

1.4.2 Secondary objectives

The secondary objectives are divided into theoretical and empirical objectives as follows:

1.4.2.1 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- To conduct a literature review on the overview and contribution of SMEs in South Africa
- To conduct a literature review on the barriers of supply chain performance among SMEs
- To conduct a literature review on the variables influencing SMEs performance within the supply chain networks.
- To theoretically review the relationship of the concept of supply chain networks, supply chain flexibility, supply chain integration and SMEs

1.4.3 Empirical objectives

The following objectives were formulated in support of the primary and theoretical objectives:

- To determine the influence of supply chain networks on SMEs performance

- To investigate the influence of supply chain networks on SMEs integration
- To determine the influence of supply chain flexibility on SMEs integration
- To investigate the influence of supply chain flexibility on SMEs performance
- To determine the influence of supply chain integration on SMEs performance.

1.5 SIGNIFICANCE OF THE STUDY

The result of the study will assist SMEs strategically to compete efficiently and effectively in their dynamic environment and globally. It will help SMEs to re-position business strategies in order to interact with the customer's changing demands. Furthermore, as an agent of economic growth in the economy, SMEs will have a better social contact with government and the society within, which they operate. The strategic influence of supply networks, flexibility and integration, as well as its antecedent to supply chain performance, will assist SMEs in their business management planning strategy, organising strategy, and controlling strategy. It will also aid SMEs to overcome uncertainty and risk within the competitive business environment. This study investigates the extent and variety of support SMEs will benefit through supply chain networks, flexibility and integration, as well as the influence on business and economic performance. In the current proposed study, an attempt is made to develop a conceptual model that has not been done previously. It is expected that new insight will be drawn from utilising the proposed conceptual research model. In addition, previous studies have focused on large firms, but the focus of this study is on SMEs, which happen to be a neglected research context.

1.6 LITERATURE REVIEW

In order to achieve the aim of the study, a literature study on the influence of supply chain networks, flexibility and integration on supply chain performance, will be undertaken. The researcher will utilise a wide range of materials, which include articles, conference papers, textbooks, journals, magazines, newspapers and the Internet, as sources of data. This will help the researcher to analyse the literature critically by comparing and constructing the perspectives, viewpoints and arguments by other researchers in similar studies.

1.7 RESEARCH METHODOLOGY

The methodology used in this research was based on a survey of the relevant literature in the field. The study also use a quantitative method of data collection and analysis because it was the type of methodology that suit the type of questionnaire structure that was designed to collect data for the study (Maree 2007:78). Therefore, the study was a positivist paradigm.

According to Fouche and Delport (2005:74) and Malhotra (2004:137), quantitative research is as an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether the predictive generalisations of the theory hold true.

A questionnaire was constructed to test the influence of supply chain networks, flexibility and integration on supply chain performance among SMEs. Letters were sent to the managers or owners of selected SMEs in the Southern Gauteng region to notify them of the research purpose and benefit.

1.7.1 The empirical study

Bless and Higson-Smith (1995:46), define a research design as, “The plan of how to proceed in determining the nature of the relationship between variables”. The following steps, as alluded to by Tustin, Ligthelm, Martins and Van Wyk (2005:339) was used in the sampling design procedure.

1.7.1.1 Target population

The target population for this study consists of selected small and medium enterprises in the Southern Gauteng region. The reason for this region was that it has three main town centres, namely Vereeniging, Vanderbijlpark and Meyerton within the area. It forms the heartland of what was known formally as the Vaal Triangle. The Southern Gauteng region is renowned for its contribution to the iron and steel industry in South Africa. Leedy and Ormrod (2005:205) characterise population as “generally a homogeneous group of individual units”. The Southern Gauteng region is the target area in which this study took place, and it consists of the following towns: Meyerton, Evaton, Sharpville, Sebokeng, Bophelong, Polokong, Vereeniging and Vanderbijlpark.

1.7.1.2 Identification of sampling frame

A list of registered SMEs was drawn up from the databases of the southern Gauteng region. The Small Business Directory of the Vaal Triangle was used in order to gain access to a representative sample consisting of small and medium enterprises.

1.7.1.3 Sampling techniques

A probability sampling technique was used in this study. In probability sampling, the odds of selecting a particular individual are known and can be calculated (Gravetter & Forzano 2003:118). A simple random sampling was used because theoretically, each individual case in the population has an equal chance of being selected for the sample (Strydom 2005:200). The simple sampling method offers the research element in the sample frame and equal opportunity to be selected by the researcher for the purpose of the study.

1.7.1.4 Sample size

A sample size refers to the number of elements that was chosen for the study. The determination of the sample size is a scientific judgment made by the researcher, based on past studies (Zikmund 2010:519). Using the historical evidence approach, the sample was set at 500 SMEs. In a quantitative survey study, a bigger sample size is advised. However, most of the previous studies have used a sample size of 400 to 500. The size of the sample was based on the studies undertaken by Overby and Servais (2005:71), Zeimpekis and Giaglis (2006:367), Haan, Kisperska-Moron and Placzek (2007:119), Vaaland and Heide (2007:20), and Thakkar *et al.* (2008:74) on supply chain performance in SMEs.

1.7.1.5 Measuring instrument

Primary data was generated by means of a questionnaire. Closed questions were used in the study. The questionnaire was divided into four sections, namely supply chain networks, supply chain flexibility, supply chain integration, and supply chain performance. The research scales were adopted mainly based on previous works. Minor adaptations was made in order to fit the research context and purpose. Supply chain networks measuring items were adapted from Kenny and Fahy (2011:374). Flexibility measuring items were adapted from Merschmann and Thonemann (2011:45), while integration measuring items were adopted from Narasimhan and Kim (2002:321). Lastly, the overall supply chain performance measuring items were adopted from Green, Whitten and Inman (2012:1012). All the

measurement items were measured on a seven-point Likert scale to express the degree of agreement, with one being strongly disagree, to seven being strongly agree.

1.7.1.6 Delimitation of the study

This study only focused on the influence of supply chain network, flexibility and supply chain integration on the performance of SMEs, specifically in Meyerton, Vereeniging and Vanderbijlpark. Therefore, this study does not fully represent all the SMEs in South Africa. The larger enterprises (LEs) around this region are omitted due to the fact that supply chain networks, flexibility and integration are implemented and also well known among the LEs (Chapman *et al.* 2000:354; Coyle, Bardi & Langley 2003:50; Gelinas & Bigras 2004:267).

Within the South African economy, the SME sector is a subset of the small, medium and micro enterprise (SMMEs), but differs from the latter in that micro enterprises were excluded due to a survivalist element.

1.8 STATISTICAL ANALYSIS

Profile data was analysed using descriptive statistics. Tabulation to make comparisons in the demographics data and graphs was used. Data captured on SMEs supply chain networks, flexibility and integration was analysed using measures of central tendency (mean) and measures of variability.

The reliability and validity of the measuring instrument was tested using the measurement model assessment. This was achieved through confirmation factor analysis (CFA). For example, reliability was tested using the Cronbach's alpha value and the composite reliability values. Measurement of convergent validity was tested by using extracted item-loading value and average variance (AVE). Discriminant validity was measured using the inter-construct correlation matrix and AVE, as well as shared variance comparison.

The SEM tests the model fit and hypotheses by using statistical package for the social sciences (SPSS) software and analysis of moment structures (AMOS) version 22.0 to assess the measurement and the structural models.

1.9 ETHICAL CONSIDERATIONS

The significance of the study and the importance of participating in the study was made clear to all participating SMEs. In order to maintain confidentiality and anonymity of the SMEs, the questionnaire did not include any identifying information such as names, trademarks, registration numbers or telephone numbers. In addition, neither personal nor sensitive questions were contained in the questionnaire. Permission was requested from all SMEs prior to conducting the study.

1.10 OUTLINE OF THE STUDY

The study is divided into seven chapters.

Chapter 2: Overview of SMEs

The focus of this chapter is on the review of the relevant literature, which provides an overview on the concept of SMEs.

Chapter 3: Theoretical Perspectives and Research Variables

This chapter focuses on the research theory and variables, namely supply chain networks, supply chain flexibility, supply chain integration and SMEs performance.

Chapter 4: The Conceptual Model and Hypothesis Development A review of the literature on the concept of supply chain networks, flexibility, and supply chain integration within the SMEs context. Barriers to SMEs performance was also provided in this chapter.

Chapter 5: Research design and methodology

This chapter discusses the research design and the methodology used in carrying out this study. The method of sampling and the data collection method is discussed, as well as outlining the method of data analysis and the statistical techniques.

Chapter 6: Data Analysis and Discussion

This chapter presents the results and interpretation of result.

Chapter 7: Conclusions and Recommendations

This chapter presents the recommendations, based on the main objectives and findings of the study. Limitations and implications for further research are also highlighted.

1.11 DEFINITION OF KEY CONSTRUCTS

SCN: Supply chain networks – are a link that connect independent organisation together for the purpose of creating value products or services to satisfy customers needs

SCF: Supply chain flexibility – is defined as the organisation’s ability to cope with uncertainty, and to adapt or respond to market changes

SCH: Supply chain integration – is responsible for the positive impact on corporate and supply chain performance

SCP: Supply chain performance – is the standard by which supply chain networks, flexibility and integration are managed to achieve business success

SMEs: Small and medium enterprises – are enterprises that are characterised according to the number of fulltime employees, financial requirements and total annual turnover.

1.12 CONCLUSION

This chapter provides an overview of the research title, the primary and theoretical objectives, as well as empirical objectives of the study. It also includes the hypotheses, problem statement to be investigated, scope of the study, and the research design/method that will be used. The influence of supply chain networks, flexibility, and integration on supply chain performance reduces operating costs, as well as improves customer satisfaction.

CHAPTER 2

OVERVIEW OF SMALL AND MEDIUM ENTERPRISES

2.1 INTRODUCTION

In the previous chapter, a background of the research, namely supply chain networks, its flexibility and integration was provided. In addition, an overview was provided on the research methodology and design of the research. Chapter 2 extends the theoretical review in order to gain an in-depth understanding of SMEs and their business operations process as well as their competitive position within the business environment.

The South African government has recognised the importance of SMEs as the biggest employer, innovators of new products and engines of economic growth. This means that, the success of SMEs in South Africa is very important to the continuous development of the economy. With this recognition and importance of SMEs, SMEs, therefore, have an obligation to be successful in their business environment. They also need to position themselves strategically within their business environment and become innovative to satisfy the future needs of the customer's as well as the economy. It is only when the SMEs are successful that they can contribute significantly to the wealth and development of the South African economy.

A well-planned strategy in the management of SMEs without considering supply chain network, flexibility and integration may lead to SMEs failure within the competitive environment. According to Lynch, Keller and Ozment (2000:47), many SMEs use the business level strategy and Porter's theory of generic strategy to determine their performance. Furthermore, SMEs cannot be successful without certain resources and supply chain networks with other organisations. This networking supplies SMEs with innovative ideas, information sharing and knowledge transfer through collaborative relationships that may not be achieved with the business level strategy only. SMEs, in their effort to be successful, should make significant efforts to implement supply chain network capabilities as a strategic management tool to enhance firm's performance with varying results, which may lead to sustained competitive advantage (Barney 1991:99).

2.2 GLOBAL OVERVIEW OF SMEs

According to Acs (1997:2), “globalisation is referred to as the web of linkages and interconnections between states, societies and organisations that make up the present world economic system. Globalisation creates new structures and new relationships, with the result that business decisions and actions in one part of the world have significant consequences in other place”. Throughout the world, governments have acknowledged the impact of (SMEs) on job creation, improvement of people’s standards of living and hence, an overall impact on the economy (Yang 2006:862). The definition of SMEs is complex with authors using the SMEs gross asset value, the number of employees and total revenue as indicators to help define the term SME (Nieman 2006:10). According to Falkena (2000:26), an SME is defined as any enterprise, whether or not incorporated or registered under law, which consists mainly of persons carrying on small business concerns in any economic sector, or which has been established for promoting the interests of small business concerns. Indeed, SMEs often form the backbone of national economies and moreover, SMEs have increased in importance recently (McCartan-Quinn & Carson 2003; Burns 2005:188). SMEs and the development of SME sectors in national economies is an important element of political and public policy life. Thus, the way these SME firms perform and manage their activities justifies a detailed investigation.

SMEs contribute greatly towards economic growth through alleviating poverty, reducing unemployment and improving gross domestic product (GDP) Zang, Xie & Tam (2010:183). A 2004 report by the International Finance Corporation (IFC) states that in much of the developing world, the private economy is comprised largely of SMEs, and it is the only realistic employment opportunity for millions of poor people throughout the world. However, some experts explain that a significant section of SMEs in developing countries remain in traditional activities generally with low levels of productivity, poor quality products, serving small localised markets (IFC 2004). They further reveal that there is little or no technological dynamism in this group, and few graduate into large size or modern technologies. More so, in many poor countries, there is also a large underclass of (formal and informal) micro enterprises that eke out the necessities for bare survival (Kroon & Moolman 1992:129). Nevertheless, SMEs still play an important role in the economy of any country.

SMEs are multitudinous, suppliers of employment, creators of work opportunities, innovators and initiators, subcontractors for large companies, responsible for the manifestation of the

free market system and in many instances the entry point into the business world, playing an important socio-economic role. According to Chan, Chong and Zhou (2012:330), “SMEs form the largest group of manufacturing firms that provide specialty manufacturing and support services to large companies. SMEs also play a crucial role in the economy of most countries by accounting for more than half of employment and GDP”.

A study done by Gupta, Seetharamana, and Rajb (2013:861) reveals that there are 154,000 SMEs in Singapore which contribute about 46 percent to Singapore’s GDP yearly and that they also contribute 63 percent employment. According to the Organisation for Economic Co-operation and Development (OECD), 95 percent of the enterprises are SMEs, which provide 60 to 70 percent of employment to the workforce in OECD member countries (Mayer-Haug, Read, Brinchmann, Dew & Grichnik 2013:1251). In the European countries, two thirds of jobs are provided by SMEs. In India, about three million SMEs contribute 50 percent to the Indian economy’s GDP. SMEs in India are the second largest employer for its workforce and contribute 40 percent of exports to countries outside India. SMEs are further recognised as the driving force for economic growth, a source of technical development, as well as their increasing involvement in export and import activities in global markets (Yang 2006:863).

SMEs provide economic stability by distributing wealth across all citizens, thereby alleviating poverty (Pasanen & Laukkanen 2006:684). However, SMEs need a permitting environment to survive and grow. According to the United Nations development programme (UNDP) (United Nations 1999:1), SME development is slow in countries where the policy environment has been restrictive. SMEs need an incubating and permitting environment to develop their natural entrepreneurial behaviour. The creation of a favourable environment for the birth and growth of SMEs has been a major objective of many countries, hence, governments have prioritised the development of policies to promote a viable SME environment and South Africa is no exception. The sections that follow discuss SMEs in South Africa.

2.3 SMEs IN SOUTH AFRICA

In South Africa, the number of SMEs operating within the economy was between 1.2 million in 2003 and 2.5 million in 2009. The SMEs comprise 95 percent of the enterprises in South Africa. The National Small Business Act (102 of 1996) and the government White Paper for

the development and promotion of SMEs are the two main instruments that the government is using to stimulate a suitable environment for small firms. The National Small Business Act (102 of 1996) provides the legal framework for the conduct of SMEs, while the White Paper provides a support strategy for the SME sector.

This strategy hinges on four components, namely government vision for economic development and principles of support, the institutional support framework, targeted areas of support, and an enabling environment. A key component of the strategy is the creation of an enabling environment, which involves:

- Creating an enabling legal framework that includes the National Small Business Act, a Transaction and Procurement Act and Small Business Finance Act.
- Provision of access to the market and procurement, training, finance and technology as these are major constraints facing SMEs. For example, newly established businesses are often unable to sell their products and services while lack of access to finance remains a global problem.
- Streamlining regulatory conditions to ensure the appropriateness of the rules and regulations for the SME sector taking into cognisance the fact that unduly restrictive legislation and regulations are viewed as critical constraints to SME development.
- Ensuring access to appropriate, relevant and easily understandable information and advice, especially to micro, survivalist and small start-up enterprises with the knowledge that information is now critical for the survival of businesses of any size.
- Encouraging supply chain networks for the fact that the needs of SMEs are so complex that it is impossible to devise support mechanisms that will satisfy each category. Hence, the only viable way is to encourage partnerships among SMEs that will allow for the transfer of experience, innovative ideas, and skills.

The key issue facing the South African government is how to promote the creation of more SMEs with growth potential and at the same time help start-up SMEs to survive and become efficient enough to achieve entrepreneurial growth, such that there is net firm creation and firm expansion that exceeds contraction of existing SMEs (Nieman 2001:446).

Despite the existence of many SME support programmes that provide backing to SMEs in South Africa, SMEs in the country continue to weaken (not all SMEs are experiencing

positive growth) (Baloyi 2010:35). SMEs in South Africa, which represent 98 percent of the South Africa's total number of firms, continue to experience high failure rates (Mbonyane 2006:1). About 75 percent of the new SMEs that are started eventually fail to become established firms (Fatoki & Garwe 2010:730). Furthermore, there are other SMEs that have stagnated at the survivalist stage due to lack of supply chain networks (Zeng *et al.* 2010:184). This raises questions on whether the SME owners/managers have the adequate and requisite skills, competences and capacity as well networking skills to manage and grow their organisation in a manner that enhances growth and survival, thereby contributing to the economic development. Therefore, there is a need for SMEs to recognise the importance of supply chain network and supply chain flexibility in order strategically to integrate both business objectives and supply chain goals for success and performance of the organisation.

Supply chain network is a business strategy that helps SMEs to establish a framework of unique success factors that improve the growth and performance of SMEs (Kale, Singh & Perlmutter 2000:217). Supply chain network, its flexibility and integration, should be promoted for the benefit of both the existing SMEs and the new entrants in the market place (Wareham, Mathiassen, Rai, Straub & Klein 2005:201). This being the case, there is, a great need for SMEs to display supply chain networking capabilities in order to survive in the emerging global business competitive environments. SMEs should apply supply chain network, flexibility and integration to business strategy in order to compete effectively in this economically challenging world (Chang, Chiang & Pai 2012:1118).

The research focus of this study is on the influence of supply chain network, flexibility and integration on the performance of SMEs. SMEs are of importance to the South African economy because they enhance economic growth, help accelerate development and are a business solution to rural poverty (Bidzakin 2009:20). The next section focuses on the characteristics and importance of SMEs in economic development.

2.4 CHARACTERISTICS AND IMPORTANCE OF SMEs IN SOUTH AFRICA

An SME as defined according to the National Small Business Act of 1996 of South Africa is,

a separate and distinct business entity, including cooperative enterprises and non-governmental organisations, managed by one owner or more, which including its branches or subsidiaries, if any, is predominantly carried on in any sector or sub sector of the economy and which can be classified as a very small, a small or a micro enterprise (SME) (Fatoki & Garwe 2010:731).

However, most researchers and academics will consider a small business if it is independently owned, operated and financed, that is one or very few people manage it without a formalised management structure, it has a relatively small share of the market place or relatively little impact on its industry, is independent and does not form part of a large enterprise (Storey 2000:9, Nieman 2006:4).

SMEs share many characteristics with the entrepreneurial new venture and they are often interchangeable (Ellegaard 2006:273) for example, with regard to risk taking, flexibility, innovation, creativity and hands-on management. The classification and limitations of SMEs that underpin this study are taken from the South African National Small Business Amendment Act (26 of 2003). This act classified SME as a small enterprise, which constitutes fewer than 50 employees, with an annual turnover of between R2 million and R25 million, and a medium enterprise as a business with between 50 and 200 employees, with an annual turnover of between R4 million and R50 million (South African Small Business Amendment Act (26 of 2003).

In spite of these classifications of SMEs according to the number of employees, annual sales and balance sheet, the role of SMEs in facilitating economic development, alleviating poverty, increasing employment and providing and supplying various items of daily use at an affordable cost to both consumers and LEs of any country is widely acknowledged (Rogerson 2000:688; Ruiz-Santos, Ruiz-Mercader & McDonald 2003:164; Simpson & Docherty 2004:315).

According to Hulbert, Gilmore and Carson (2013:293), SMEs provide approximately 75 million new jobs, and represent 99 percent of the 23 million enterprises in the European Union (EU), and 22.5 million (64%) of new jobs in United States (US). In South Africa, for example, SMEs constitute 95 per cent of the total business of both the formal and informal sectors (Soontiens 2002:712). SMEs, therefore, are an important segment and driver of

economic growth in South Africa and as a result, government, co-operate bodies, and institutions are putting more emphasis on innovative SMEs research and development (Oke, Burke & Myters 2007:735-736; Nielsen & Thomsen 2009:176). According to Zelealem and Pansiri (2006:15), “SMEs create substantial job opportunities, help narrow the gap between urban and rural development, and employ more people per unit of investment as compared to large firms”. SMEs are the source of new ideas, materials, processes and services that larger organisations are unable to provide (Savioz & Blum 2002:92). Figure 2.1 shows the characteristics of SMEs as innovators or traders.

SMEs as innovators or traders	
Innovators	Traders
Focus on developing new products	Alert to profit opportunities
Aim to find and exploit new markets	Operate in competitive marketplace, which is governed by price
Combine exiting factors to create something new	Some people are more astute in spotting opportunities than others
Apply determination and leadership to cause change	Will buy at the lowest price and sell at the highest
Profit is by-product	Risk takers motivated by profit

Figure 2.1: SMEs as innovators or traders (Rae 1999:12)

SMEs are known for their strategic decision-making, just-in-time delivery of goods and services/raw material at the right time, place and in the right quantity/quality to customers. SMEs are also engines for organisation’s innovation of new products and processes, which drive the growth of SMEs. According to Karjalainen and Kemppainen (2008:231), SMEs possess flexible personal characteristics that help them adapt to and respond to constant customers changing demands (Karjalainen & Kemppainen 2008:231). For this reason, Soontiens (2002:710) refers to SMEs as a “building block for achieving economic development and growth”. SMEs have advantages in terms of flexibility, reaction time and innovation capacity that make them central actors in the economy (Raymond & Croteau

2006:1013). On the other hand, SMEs lack technical manpower, research and development, finance and education (Cocca & Alberti 2010:191).

As a key driver and engine of economic growth and development, supply chain network, its flexibility and strategic integration will help SMEs develop themselves strategically to be more competitive in meeting domestic, international and globalisation competitive challenges. Supply chain networking will aid SMEs in offering quality products and service designs that exceed customers' requirements (Raymond & Croteau 2006:1014). The supply chain network plays a key role in aligning business strategy such as delivery, ordering, productivity and responsiveness to customer needs across other businesses (Deros, Yusof, Salleh. 2006:397). SMEs originate from individuals, who identify new opportunities in society and who are motivated to exploit such opportunities (Hill & Wright 2001:433; Davies, Hides & Powell 2002:406-407; Burke 2006:34).

SME owners are entrepreneurial-minded individuals who not only conceive and setup business but also frequently take risks in setting up their business (Hulbert *et al.* 2013:294). Driven by their vision and goals, SMEs become relentless in the pursuit of opportunities beyond resources currently controlled and also sport opportunities that larger organisation have not recognised or are not interested in (O'Regan & Ghobadian 2004:65). SMEs owners, therefore, are individual personnel who arrange, coordinate, organise and plan the time, talent, money and other resources of other people through supply chain networks to make their vision a reality (Pasanen & Laukkanen 2006:684). SMEs owners put up their time, talent, money and other resources to achieve business performance.

SMEs discover and exploit new opportunities through the process of resource acquisition, organising and strategising ways to create value and make profits from the marketing efforts. SMEs are usually the pioneers in terms of product offering (Wickham 2001:206). They are highly innovative when it comes to producing new products. Producing these new products is an opportunity that is pursued by innovation, which involves doing something different in a radical or incremental manner. Therefore, the agility and flexibility of small firms and their need to survive make them quick to spot new technologies and run with them in producing new products (Nieman 2006:11).

SMEs fill isolated niches, which might not be profitable to large firms by searching for information, identifying potential opportunities in the external business environment, and

identifying possible competitive advantages (Harland, Caldwell, Powell & Zheng 2007:1235). Once these gaps (isolated niches) are left open, it makes it easier for SMEs to spot the opportunity and make the most of it and also proceed with further planning in pursuit of success through supply chain networks (Burns 2005:187). SMEs offer better customer service as they are flexible, allowing them to tailor their products and services to the satisfaction of the market. They enjoy low costs, as in most cases they can produce products and services at a low cost. This may be due to the fact that SMEs receive support that may take the form of skills training on business strategy, financing, and access to government tenders and assistance with market access (Nieman, 2006:12). The following discussion relates to the contributions made by SMEs to the South African economy:

2.4.1 Contribution to gross domestic product

Big businesses are in the process of becoming efficient and lean, resorting to restructuring and downsizing, which sheds labour (Ladzani 2006:154). The contribution of SMEs to the economy of South Africa cannot be understated; small business contribute approximately 36.1 percent to the GDP of South Africa, micro enterprises make up 5.9 percent of this contribution, small enterprises make up a further 14,8 percent and medium enterprises make up the balance of some 15.4 percent of the GDP as shown in figure 2.1 (DTI 2003:28).

Figure 2.2, shows that SMEs contributions warrants significant attention and, as argued earlier, as large businesses are not providing direct solutions to issues such as unemployment. For SMEs to contribute further to the South Africa GDP, the strategic implementation of supply chain networks needs to be embraced for survival.

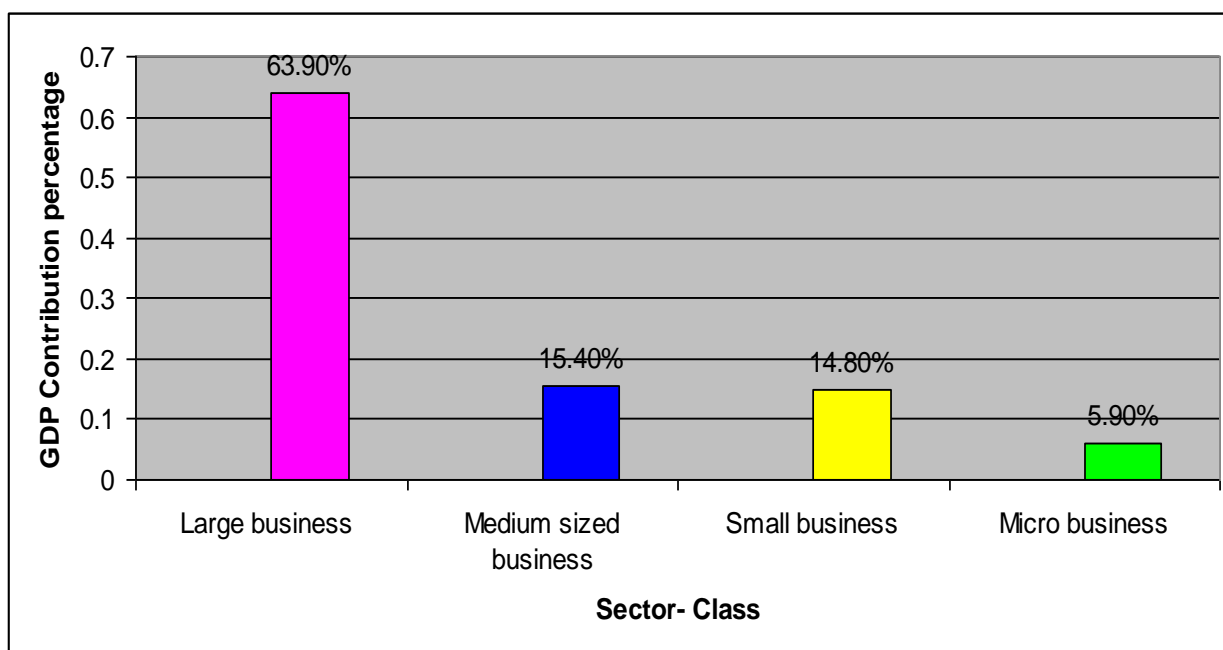


Figure 2.2: Estimated GDP contribution by size (Source: Adapted from Ntsika 2002)

2.4.2 Contribution to employment

Small firms produce a balanced share of new jobs. In a study, Tybout (2000:34) stresses that a major macroeconomic objective of any state should be to employ fully the available factors of production, especially labour. More so, the unemployment rate should be kept low. Comparison of the South African figures to those of the developed countries like the USA brings home the South African reality. For example, in the USA an unemployment rate in excess of 6 percent is considerably alarming. Currently, South Africa's unemployment rate of about 25.2 percent and the average poverty rate of 50 percent is too high and warrants immediate action from policy makers (Ladzani 2006:123).

There is significant evidence of the high labour absorption ability of the SMEs. The SMEs contribute considerably to the support of the formal economy's inability to provide jobs (DTI 2003:10). It is the labour absorption capacity of the SMEs sector that is of major interest, especially in the South African context. The average capital cost in creating a job in the small business sector is lower than that of creating employment in the big business sector (DTI 2003:11). Ntsika (2002) points out that small and micro business contribute 50-60 percent toward employment in South Africa.

Supply chain networks will help SMEs to be more innovative in creating new products and services that create new market niches, which can contribute to the employment percentage in South Africa's economy. This may further reduce poverty levels in the country. SMEs, through sharing of information, learning from best in class within the supply chain networks will aid SMEs to better respond to customers' changing demands. Through supply chain networks, SMEs may further expand their business to gain economies of scale benefits. The result of this, therefore, is a reduction of unemployment in South Africa (Gosling, Purvis & Naim 2010:12).

2.4.3 Innovators of new products

The modern increasing business competitive environment has forced many organisations to be more innovative in their business strategy. These innovative ideas stem from the development of new products and technologies that exceed customers' requirements (Zeng *et al.* 2010:181). The constant customers changing demand for more products and service that exceed their requirement has made SMEs and larger organisations constantly look out for ways to improving and developing both new and existing products. The ability of organisations to innovate new products and technology strategies can contribute greatly to the economic growth of any country.

According to Bagchi-Sen (2001:47), the classification and characteristics of SMEs such as economies of scale, risk takers, owners and managers of their business indicates that SMEs have a determined entrepreneurial drive and motivation to be more innovative in order to improve on business efficiency, productivity and performance. This is because SMEs personality and characteristics are coupled with being innovative. According to Liao and Rice (2010:117), though innovation is seen as beneficial to any organisation, but the activities involved in the innovation of a new product and technology may be risky with market uncertainty regarding the future costs and possible returns. Avlonitis and Salavou (2007:566), add that SMEs attitude and characteristics toward the creation of new business ventures are reflected in the innovation of a new product. Therefore, there is a high uniqueness between SMEs and product innovation, which can affect product and business performance positively.

According to Siu, Lin, Fang and Liu (2006:323-324), larger organisations have been regarded as the innovators of new products and processes due to their competitive capabilities as well as economies of scale, but recently SMEs are becoming even more important to economic

development because of their personnel characteristics (skills, motivation and flexibility) and their ability to innovate new products. SMEs are likely to be more innovative than the larger organisation due to their flexibility and ability to respond to customer changing demands quickly. As competition within the business environment grows stronger and more difficult, SMEs over the years have developed supply chain networks as a strategy to respond to sudden market changes, create new product processes that differentiate them from existing competitors (Kumar & Subrahmanya 2010:559).

Their innovative ability allows SMEs to compete successfully with rivals and thereby improve SMEs business performance (Bagchi-Sen 2001:46). As a result, the South African government is putting more effort into financing SMEs innovative efforts through supply chain networks. SMEs involvement in supply chain networks will help them overcome business constraints such as high cost, fear, lack of knowledge base, limited financial resources and time, which may impact negatively on SMEs business performance, growth and survival (Barge-Gil 2010:196). Supply chain networks aid SMEs relationships with external organisations, suppliers and customers. With the combination of core competences and complementary resources, SMEs are able to improve in their innovative skills and profit through knowledge sharing.

Due to the limited resources available to satisfy consumers' unlimited wants, SME's ability to innovate new products has improved because SMEs have learned that the key to business success relies not only on individual effort but on a network of relationships for innovation (Sok, O'Cass & Sok 2013:161). With this, SMEs have developed business strategies such as "forming strategic contacts with external organisations, acting as suppliers to larger organisations, cooperating with universities for improvement, forming joint ventures with foreign firms and also collaborating with external SMEs in order to update themselves on technological trends and market environments for innovation (Siu *et al.* 2006:325).

According to Kumar and Subrahmanya (2010:558), SMEs apply supply chain network strategy to improve and extend their supply and distribution of products and services to customers locally and internationally. This shows that SMEs business performance, innovation and operations has improved through the integration of supply chain networks. Bougrain and Haudeville (2002:736) add that reliance on self-dependency for business success and innovation has declined tremendously due to advances in technology development as well as the global changes in market environment. SMEs, therefore, should

rely on supply chain networks for performance improvement, survival and above all, to speed up innovation to compete effectively with rivals.

2.5 SMEs BUSINESS OPERATIONS PROCESS

The business operation process of SMEs is based on the size and maturity of the business (Shafeek 2009:60). The size and maturity of SMEs can be measured in terms of sales (turnover) volume, total assets, net profit, or number of employees, or even a combination of these measures (Nieman & Nieuwenhuizen 2009:281). Nevertheless, the main internal factors that affect SMEs business operations processes are the access to finance, availability of a sound business plan to give direction to the SME owner/manager and help access funds, good marketing, human resources management and supply chain operational skills. As a result, SMEs may find it difficult to introduce new products, be innovative and competitive.

The increasing competitive challenges among larger organisations today has forced SMEs to be more innovative in identifying isolated niches that have not been supported by the larger organisations (Hussinger 2010:57). SMEs are forced also to continually upgrade the quality of services and products through supply chain technology and human resources. With all these business challenges faced by SMEs in terms of acquiring and being able to afford the supply chain technology, skills and human resources, SMEs, therefore, need to form independent and flexible relationships with suppliers and competing organisations (supply chain networks) in order to focus and improve on their core competencies (Lee, Park, Yoon & Park 2010:290). Hence, the need for supply chain networks by SMEs is important to business process in order to respond quickly to customers' changing demands, be more responsive, flexible and creative.

The SMEs business process begins by formulating a viable mission and vision for the business. In an effort to succeed, SMEs no longer depend on their own skills to fully sustain their business growth but also develop a cross-functional team and division of labour among the employees (Kuratko & Hodgetts 1995; Shafeek Sha 2009:66).

As the SMEs business grows into maturity, SMEs may become more sophisticated in their control systems and more bureaucratic in its centralised decision making and procedures (Hong & Jeong 2006:295). They start to focus more on developing the products and marketing skills to satisfy customers' specific needs. In other words, SMEs soon take on some of the characteristics of larger organisations (Nieman & Nieuwenhuizen 2009:283).

These characteristics may include demonstrating competitive advantage strategy to integrating supply chain networks, use of technology, profit through marketing skills to attract more customers, financial management skills, human resources management skills and external investment in order to exploit early success and to make the business economically viable (De Maeseneire & Claeys 2012:409; Stokes & Wilson 2006:305). With these skills well established in SMEs management system, SMEs can begin to reap the benefits of financial gains resulting from growth and maintaining the benefits from flexibility, responsiveness to customers' changing demands and entrepreneurial behaviour (Story 2000:123),. Therefore, the operational processes of SMEs mean taking all the steps necessary to reach start up that may also influence growth.

As the growth of SMEs progress, owner/managers begin to take heed by keeping a close eye on new entries into the market to avoid customers switching over to substitute products from external competitors as well as fear of losing their market share (Deakins & Freel 1998:145). In other words, SMEs begin to learn how to adjust to market needs, take strategic decisions and develop competitive strategies in order to survive. At this stage according to Shafeek Sha (2009:70), SMEs do not only focus on increasing sales but, with the introduction of new control systems and the increase in competition, SMEs also strive to coordinate new systems more effectively in order to efficiently manage the allocation of limited resources. SMEs further engage in supply chain strategic planning to cope with the business expansion and competitive rivals.

SMEs in their quest for survival often shift their focus from growth orientation to ensuring that the organisation consolidates its position in the market place by looking strategically to the future (Done, Voss & Rytter 2011:501). With their innovative and entrepreneurial skills, SMEs are able to reduce the impact of failure and enhance re-growth, capitalising on the abundant resources, especially financial resources, through the adoption of supply chain network as a strategy that favours business growth.

Supply chain strategic activities include everything from the moment a product or service needs to be manufactured, through to incoming raw materials management, production, and finished goods storage, delivery to customer and after sales service (Day 1998:661). Supply chain network is concerned with the profitable movement of information and materials into the organisation (time-based activity), through it and out to customers (Hugo, Babenhorst-weiss & Van Rooyen 2002:38; Coyle *et al.* 2003:37; Ballou 2004:3). Because supply chain

network is a strategy that affects other functional areas in the organisation, it is necessary that the supply chain network be given the most attention during SMEs strategy formulation. The formulation of supply chain strategy will help SMEs focus on:

- Creating value, flexibility and responsiveness to customers' request in the market place, that is the SMEs should deliver as promised (transportation), go where the customer wants them to go (marketing and brand name) and offer customer service (information). According Kim, Cavusgil and Cavusgil (2013:880), responding to customer demand or being customer focused cannot be achieved through individual organisations self-effort, rather through supply chain networks. Supply chain networks improve SMEs capabilities to providing value product, services and responsiveness to customers through their limited resources. Achieving customer satisfaction and responsiveness are always strategic in nature. Supply chain networks make it easy for SMEs to focus their attention on achieving valuable customer services and also secure SMEs against future competitive challenges (Huttinger, Schiele & Veldman 2012:1194). Therefore, SMEs may realise relational benefits and competitive advantage through supply networks.
- The use of information systems as a control strategy that is continuously checking if the needs of the customer are being met is another strategic benefit emanating from organisation's collaborative relationship (Day 1998:661; Perks & Bouncken 2004:7). The control strategy will help SMEs gather necessary information about their customers' continuously, checking if customers are satisfied with products or services and gathering ideas from customers concerning new product development. Supply networks do not only serve as control strategy, but also allow SMEs to be more proactive to future customers' requirements in order to manage customers' life-time value (Malthouse, Haenlein, Skiera, Wage & Zhang 2013:270-271). This means that SMEs may develop a database of customers' market segments by using the activity based cost (ABC) analysis to know what specific product to invest more in.

Just as supply chain strategy formulation is not optional for larger organisations, it is also not optional for SMEs. At first, SMEs may not have a formal supply chain strategy but they still make strategic choices through their actions. Accordingly SMEs utilise an internal growth strategy, which is divided into three sub-strategies: the market penetration strategy, market development strategy and the product development strategy together with supply chain

activities to secure competitive advantage, that provide strategic direction and flexibility (Rwigema 2006:212-214).

2.6 CHALLENGES FACED BY SMEs IN SOUTH AFRICA

The major reasons SMEs should implement supply chain network are based on challenges within the business environment. In other words, knowing how to deal with these challenges found in both the external and internal environment could be the reason for the implementation of supply chain network among SMEs.

According to Bozarth et al. (2007:78), the implementation of supply chain networks require SMEs to widen the scope of their business activities further, which can become more challenging as product life cycles shorten, product variety increases, technological advancement proceeds at an exponential rate and there is an increase in demand for customer satisfaction. According to Gelinas and Bigras (2004:266), SMEs' supply chain network and integration often are triggered by pressure from customers or by the larger organisations whose focus is on the adoption of a pull approach rather than the traditional push approach. As a result SMEs are required not only to widen the vision of their supply chain strategy but also to refocus their business strategy activities on basic skills such as forming supply chain networks with external organisations for continuous improvement purposes (Soni, Jain & Kumar 2014:12-13). The increasing need to survive and grow among SMEs is the very reason SMEs should embrace implementing supply chain network relationships that build collaborative benefits to help reduce business challenges found in the business environment. This will further help SMEs to compete effectively (Thakkar *et al.* 2008:75).

To be successful, SMEs must know the importance of supply chain network, supply chain flexibility and supply chain integration in order to be observant and adjust to the needs of their customers to preserve their market shares and to assure their growth. However, the need for independence and autonomy by the SMEs, together with a low propensity to delegate and consult, may be obstacles to the introduction of success factors such as participatory management, the use of a decision support system, and the use of external expertise for logistics subcontracting as well as supply chain network (Gelinas & Bigras 2004:267). SMEs need to understand how these challenges affect the success of the business to be able to manage the business.

SMEs business challenges are those constraints that affect the SMEs owner/manger's ability to operate efficiently, despite any innate potential in the owner/manager (Baloyi 2010:36). According to Stokes and Wilson (2006:212), SMEs business challenges are the personal attributes, skills and competencies of the individual owner/manager, which are crucial to how well the business faces up to the inevitable crises that arise. Important to note about these business challenges is the fact that they are controllable by implementing a supply chain network. These business challenges include lack of capital, personal characteristics, marketing, financial management, strategy, human resource, operations, access and use of information technology and the availability of a sound business plan. The following sections, therefore, discuss the SMEs business challenges affecting SMEs implementation of supply chain strategy, flexibility and supply chain integration.

2.6.1 Human resources management

The competence of the SME owner/manager is the ultimate determinant of survival, which can also pose challenges because of the lack of human resource management. The root cause of SMEs poor performance is almost invariably a lack of management attention to strategic issues such as human resources management. Moreover, the early founder of the SMEs personal competence in selecting the right business and running it will be crucial, as the firm is likely to be indistinguishable from the owner. Therefore, as the business develops, growth can be rapid, partially due to unwillingness or inability to draw others to help with the management of the SMEs (Pasanen 2006:7). In addition, the management of people (human resources management) is particularly important as it includes not only the personnel issues of dealing with employees, but also of managing people outside of the organisation who are also critical to its success, such as key customers, suppliers, partners, banks and investors (Stokes & Wilson 2006:213). The over-reliance on the single owner/manager of most SMEs for its operations, may pose a challenge resulting in poor human resources practices where no newly qualified staff are hired or authority and responsibility delegated to other employees (Nieman 2006:20).

Larger enterprises (LEs) are highly specialised with multiple competencies because of the effective human resource management. SMEs on the other hand, are moderately specialised with specific core competencies. LEs tend to implement more autonomy in their internal operation while SMEs tend to be more focused in their organisational decision-making and information flows due to the differences in size and nature (Hong & Jeong 2006:294).

2.6.2 Marketing

According Shafeek Sha (2009:50), marketing is the one and only functional area that links the products or services of a business to its customers. The author adds that, it is vitally important to ensure that this function is performed properly. To have a good chance of survival, SMEs need to answer the basic strategic questions: “What markets are we targeting, with what products?” A common weakness in the SMEs owner/managers lies in their failure to understand key marketing strategies. Stokes and Wilson (2006:213) are of the view that product or service concepts and standards often reflect only the perceptions of the owner, which may not be mirrored in the market place. The authors posit that, minor fluctuations in markets can topple a newly established SME, particularly where it is reliant on a small number of customers. Implementing supply chain networks can help SMEs overcome marketing challenges such as competition and differentiation of product. According to Gilmore, Carson and Rocks (2006:278-279), supply chain networks will enable SMEs to be aware of what is happening within the competitive markets and also help SMEs understand the benefits of inter-organisational relationships in business-to-business markets. In terms of marketing decisions, it helps SMEs recognise the need to utilise their limited resources more effectively to compete with increasingly powerful competitors.

2.6.3 Financial management

According to Fatoki and Garwe (2010:734), the lack of capital seems to be the primary reason for business failure and is considered the greatest problem facing SME business owners. This was supported by Shafeek Sha (2009:62), who affirms that from a business viewpoint, without adequate financing the business will be unable to maintain and acquire facilities, attract and retain capable staff, produce and market a product, or do any of the other things necessary to run a successful operation. Stokes and Wilson (2006:214) posit that financial difficulties of SMEs arise either because of an inability to strategically raise sufficient funds to properly capitalise the business, or a mismanagement of the funds that exist or a combination of both. According to Nieman and Nieuwenhuizen (2009:90), financial management must be regarded as one of the most important aspects of business.

SMEs are expected to use financial information management to enhance greater probability of their business growth and survival. However, the availability of financial information is not an indication of the uses to which it is put (Shafeek 2009:65). Hall (1995:35) states that

SMEs who collect financial information and are involved in supply chain networks with external businesses, survive the competitive rivals among organisations.

More so, the strategy with which the information is collected and the person who collects the information are of essence. Thus, a supply chain network aids frequent information gathering about new trends, competitors, best in class as well as improvement of quality products and services within and outside the business environment (Hoberg & Thonemann 2014:133). The management of supply chain networks has a key impact on the survival of SMEs. Therefore, the sooner the implementation of supply chain networks, its flexibility and integration for customers' satisfaction and financial inflow, the better the chances of survival and improvement of core competences among SMEs (Nieman 2006:22).

2.6.4 Supply chain strategy plan

According to Nieman and Nieuwenhuizen (2009:90), a supply chain strategic plan is a written presentation that carefully explains the business, its management team, its products/ services and its goals, together with strategies for reaching goals. A living document that forms part of the formal planning done by firms, it serves as a tool for reducing the risk of venture failure, a benchmark for a firm's internal performance as well as a tool for accessing funds. SMEs avoid formal supply chain strategic planning, and as such do not have proper business plans. This in turn makes them unable to assess the firm's internal and external supply chain performance, market competitive challenges, and to be exposed to the higher risk of venture failure as a result of increased competition. A business plan needs to be updated constantly in order for it to increase SMEs chances of growing and surviving in the market.

According to Shafeek Sha (2009:63), all firms undertake strategy whether or not they would use the term to describe what they were doing. The SMEs need to decide on their operating hours, location and product lines, all of which are strategic decisions. Thus, the key to business success lies in the decisions of the SME owner/manager who identifies opportunities, develops strategies (forming supply chain networks), assembles resources and takes initiative (Bidzakin 2009:18). More so, the ability of the SMEs owner/manager to formulate and communicate his or her long-term view (vision) to their employees is vitally important. Supply chain strategy is all about the essence of understanding the business environment. Therefore, the awareness of the impact of the supply chain strategy on SMEs is

critical for the continuous existence given that they have limited resources and cannot absorb the implications of making mistakes (Clover & Darroch 2005:20).

Hall (1995:29) found that supply chain strategic planning is not common among SMEs and as a result, larger organisations are able to exert more influence on their supply chain networks due to their relative strength and market positions. Larger organisations are also more flexible in forming strategic alliances with suppliers and distributors. As a result, the scope of SMEs influence on supply chain networks may be more restricted, for example, fewer SMEs will actually receive contracts from LEs (Vaaland & Heide 2007:20-21). According to Hong and Jeong (2006:292), SMEs focus on building their unique competencies and strive for effective customer and supplier management.

According to Rwigema and Venter (2004), one needs to begin with a clear understanding of a manager's tasks and responsibilities if professional competence is to be developed. These managerial tasks are planning, organising, leading and control. However, as Longenecker, Moore and Petty (2003:453-454) and Nieman (2006:19) argue, SMEs managers plan to some degree and the amount of planning they do is typically less than ideal. They further argue that these SMEs managers focus on the immediate issues rather than the long-term ones. Research thus informs us that managers fail to plan because of their ignorance and lack of vision of supply chain networks, flexibility and supply chain integration (Cheng & Lin 2009:61). As a result, SMEs are short of specific objectives and ideas on how to better satisfy customers' specific and changing demands; lack of information on which to make assumptions about the future as well as lack of self-discipline and the flair to stay close to goals they have set (De Maeseneire & Claeys 2012:408).

2.6.5 Supply chain operations skills

Most SMEs fail due to technical inefficiencies involved in their production/operation. An SME is said to be technically efficient when it produces as much output as possible with a given amount of inputs, or produces given outputs with the minimum possible quantity of inputs. Thus, the more SMEs strive towards the maximum possible level of outputs obtainable from a given set of inputs in its operations, given a range of alternative technologies available, the higher the chances of the firm's survival and growth (Bidzakin 2009:21).

Supply chain networks, flexibility and integration within SMEs are a clear advantage, because in operational terms it is one of the most important integration mechanisms. For example, with regard to small-batch production, low costs, short setup times and versatility, SMEs are more flexible than LEs and they are also able to adapt better to environmental changes and disturbances (Gelinas & Bigras 2004:270). However, SMEs tend to have smaller or more independent management units that tend to be immature and dependent on the experience and expertise of the owner/manager (Vaaland & Heide 2007:23). Nevertheless, SMEs strategies are more advantageous for supply chain integration because they naturally encourage minimisation of delays in the integration process as well as the identification of solutions to their basic problems (Gelinas & Bigras 2004:274).

2.6.6 Personal characteristics

The personal characteristics of SMEs are correlated positively with the probability of the SMEs survival and growth. These include SME owner/manager's level of education, gender, and previous management/professional experience (Shafeek Sha 2009:68). The level of education and the attendance of management training courses is an important aspect in terms of SMEs competitiveness and survival. According to Clover and Darroch (2005:19), education is thought to increase intrinsic motivation and energise behaviours and the more enterprise education SMEs receive, the greater the possibility of success. Supply chain network education among SMEs is essential because it provides SMEs with the ambition or capacity to grow; the capacity to innovate and collaborate with other businesses and individuals outside the organisation in order to promote higher firm growth. Behaviours such as planning, budgeting, and training employees, that derive from a "venturesome spirit", which can inspire any decision SME owners make to ensure business survival and growth (Stefanovic *et al.* 2009:743).

Tied to education is the question of whether the SME owner/manager has previous management and professional experience in terms of having owned/managed a business and whether or not the business had failed (Shafeek Sha 2009:71). The SMEs owners' management and professional experience are essential means of acquiring abilities and attitudes, reinforcing motivations and improving energizer capacity. An increased management and professional experience improves the quality of SMEs, hence increasing the chances of the SMEs survival and growth (Clover & Darroch 2005:20).

2.6.7 Information technology

Technological innovation has long been a chief contributor to progress of SMEs and will continue to influence the growth and survival of SMEs (Baloyi 2010:39). The author further posits that SMEs in developing countries like South Africa are poor and as such have no access to information technology. It is this lack of access to information technology that also bears a negative effect on SMEs ability to survive and grow.

According to Ramos, Acedo and Gonzalez (2011:561) and Savioz and Blum (2002:92-93), SMEs contemplating to purchase new technology suffer great difficulties since they do not have enough knowledge, coupled with the high opportunity cost of scarce management time, in isolating the flows pertaining to the project. In addition, Jones and Tilley (2003:8) elucidate that many SMEs lack time, resources, technology or expertise to research and develop new business ideas and innovations. This limitation can develop into a critical factor restraining growth, development as well as implementing supply chain network in SMEs.

Information, as one of the most valuable assets in any organisation, can assist SMEs in decision-making that improves their day-to-day operations (Madria 2001:216). The Internet-based information and communication technology provides the opportunity for small firms to improve their competitiveness (Yoon 2001:169). According to Chapman *et al.* (2000:354), the use of information technology has been found to improve business competitiveness, with the Internet providing the opportunity for SMEs to compete on equal terms with LEs. For example, e-mail and the World Wide Web present such opportunities for SMEs.

However, according to Gelinas and Bigras (2004:271), supply chain networks, flexibility and integration need more than generic information with regard to the evolution of the organisation's social and economic environment. A number of information technologies for supply chain networks, flexibility and integration have been identified. For example, electronic data inter-change (EDI), automation, computerisation and precision of production-related information, material requirement planning (MRP), computerisation of stock management and precision of stock-related information as well as the information quality in general (Ballou 2004:433; Coyle *et al.* 2003:50). Compared to LEs, SMEs lag behind in the implementation of supply chain networks due to financial constraints, competencies, and other major issues such as lack of understanding, lack of knowledge and lack of skill among

the workforce to implement supply chain technology efficiently and effectively (Chapman *et al.* 2000:354; Nabhani & Shokri 2007:1162; Vaaland & Heide 2007:21).

The lack of understanding and knowledge of the impact of supply chain networks and its value-adding techniques may prevent SMEs from using them to overcome existing performance gaps in external markets as well as preventing them from exploiting new opportunities. It also prevents the accomplishment of the strategic goals of efficiency, effectiveness and innovation that impacts negatively on the SMEs competitiveness (Chapman *et al.* 2000:355).

According to Wagner *et al.* (2003:343), supply chain networks capture the notion of organisations and the coordination of their activities from procurement of raw materials to delivery to the customers. In other words, individual firms service one another by focusing on operations across the firm's boundaries as opposed to seeking only to maximise that particular firm's efficiencies. The economic benefits such as reduced time-to-market, lower costs, reduction of operating expenses, increased revenue growth, and improved customer service levels are as a result of crucial supply chain network integration mechanisms through dynamic information exchange, which requires cooperation between SMEs and larger organisations.

Larger organisations with resources and technical budgets are in a stronger position to implement supply chain strategy like e-supply and e-logistics. SMEs do not have skills or time to implement all the supply chain network, flexibility and supply chain integration techniques that are being requested by business today (Vaaland & Heide 2007:22). In other words, SMEs might continue to find this a challenge due to incompetency, lack of investment in staff training and poor knowledge of supply chain network benefits. According to Wagner *et al.* (2003:345), the use of the Internet for procurement and supply chain is still at an emergent stage and larger organisations will be the first to demonstrate the costs and benefits from early adoption. Gelinas and Bigras (2004:264), outline some basic factors that increase the complexity of supply chain management, which are as follows:

- It involves more sophisticated management methods, for example just-in-time
- There is pressure to reduce cycle times and general response times
- There are greater demands from order-givers

- The competition on domestic markets is fierce
- There is improved supply chain excellence among competitors
- There has been organisational transformation, for example, network enterprises
- There are changes in the relationship between order-givers and subcontractors
- Outsourcing of low value-added activities is on the increase, which increases the use of supply chain subcontracting for activities other than transportation
- There is now a refocusing of activities on basic skills
- Greater diversity exists in the physical and information flows.

All these are very important to the success of supply chain integrated management and SMEs involvement. These processes of supply chain integration will produce a number of benefits such as long-term commitment, increased market-share, transfers of knowledge and so forth (Zacharia & Mentzer 2004:187-188). SMEs must reposition themselves as units that are complementary to larger enterprises and also must redefine their physical and information flow synchronisation mechanisms to maximise overall process efficiency (Yoon 2001:164).

2.6.8 SMEs supply chain practices

SMEs and larger organisations use similar supply chain management processes in the areas of customer relationship/service management, order fulfilment, demand management, manufacturing flow management, product development and commercialisation, quality management and returns management (Hugo *et al.* 2002:87; Coyle *et al.* 2003:85; Ballou 2004:299-301). Larger organisations use their management processes to achieve multiple performance outcomes while SMEs try to achieve focused performance outcomes. The primary differences between large firms and SMEs are in the scope of information and product flows (Hong & Jeong 2006:293).

Though SMEs are at a resource disadvantage in terms of managerial capabilities, competencies, investment in providing training for employees and constraint resulting from intellectual knowledge and information technology, SMEs are still able to collaborate effectively with multinational enterprises (Cheng & Lin 2009:61). Through supply chain networks, SME achievements in production goals may result from relocating labour-intensive production to low cost emerging countries in order to achieve cost effective performance and

management efficiency. SMEs collaborate with multinational enterprises through supply chain network opportunities that may not be possible when operating as individual organisations. The limitations of SMEs may pose some challenges to SMEs because of their restricted resources such as knowledge, size, skill, human and financial resources, but these challenges are being reduced through joining competencies with organisations having stronger reputations (Fink, Harms & Kraus 2008:430).

Supply chain networks are very important to SMEs success as it provides SMEs with the willingness and openness to communicate and establish collaborative relationships with other organisations in the external business environment and also within the individual SMEs internal operation process. Supply chain network reduces market uncertainty resulting from global increasing competitive environment for SMEs.

2.7 CONCLUSION

This chapter looked at the background of SMEs globally and in South Africa. SMEs, as an agent of change and as the engine of economic growth, should continuously look out for business strategy such as supply chain networks, its flexibility and integration for the growth of the business as well as contribute to the South African economy. This chapter also discussed SMEs challenges that may restrict SMEs implementation of supply chain network.

SMEs compete directly against larger organisations because of their limited resources, but SMEs are more flexible than larger organisations as they gradually develop their supply chain networks to seek specialisation, products and services differentiation, and diversification of their customer base as their business strategies grow (Bennett & Smith 2002:73). SMEs generate sufficient profits due to their competitive priorities that protect their market niche (Hong & Jeong 2006:292-293).

According to Ballou (2004:13) and Louw and Venter (2006:119), poor supply chain network service quality may lead to a lack of access to innovation and expertise, which may result in customers switching over to a substitute product because of the high cost and lack of sustained competitive advantage, and customer dissatisfaction because of lack of product availability. Lack of skills and knowledge of supply chain networks capabilities may also result in poor organisational performance and fragmentation of interest in the business.

The integration of supply chain networks within other functional areas may help bring SMEs to realise the full potential of their value-added activities and, hence, to gain a significant competitive advantage. It may also lead to a reduction in operational costs and an improvement in customer services (Richardson 1995:60).

SMEs that consider supply chain networks to be a strategic factor tend to develop long-term performances that are both financial and organisational. On the other hand, SMEs that remained at the functional stage of business strategy often rationalised their costs and increased their sales turnover but were unable to develop autonomously and independently (Fawcett, Stanly & Smith 1997:37).

Therefore, the neglect of the importance of supply chain networks by SMEs regarding marketing and production of products, may lead to a fragmentation of interest in the overall performance of the enterprise. This may also lead to lower customer service levels and higher total logistics costs that are unnecessary in terms of time and place value (Halley & Guilhon 1997:478).

The next chapter will discuss the research theories, supply chain networks, supply chain flexibility, supply chain integration and SMEs performance.

CHAPTER 3

THEORETICAL PERSPECTIVES AND RESEARCH VARIABLES

3.1 INTRODUCTION

In the previous chapter, the background of SMEs was discussed. Chapter 3 extends the theoretical review in order to gain an in-depth understanding of the theories underpinning supply chains and supply chain management. This study will consider theoretical frameworks germane to supply chain networks, flexibility and integration.

In today's competitive environment, successful organisations are those that have been able to link their business functions within the organisation itself as well as across other businesses outside the organisation. According to Stefanovic *et al.* (2009:743), competitive challenges in the modern business environment have resulted in the need for organisations strategically to integrate business processes across other business units within the supply chain network. Supply chain networks may be a true source of competitive advantage as they link connecting individual business functions in order to stay alert and ahead of competitive rivals (Romano & Danese 2011:62). Hence, it is important to understand the theories of supply chain networks.

Supply chain networks have contributed significantly to the success of organisations (Hakansson & Ford 2002:133; Bizzi & Langley 2002:225; Windahl & Lakemond 2006:807). This can be seen mainly among large organisations such as Toyota, IBM and Dell that have taken advantage of supply chain networks. Individual organisations as well as their customers stand to benefit from the supply networks they operate in (Elg 2008:56). Yet, for organisations to gain the benefit from supply chain networks there needs to be trust, understanding, a win-to-win attitude and flexibility (Cruz & Liu 2011:39). This means that success over competitors depends not on individual organisation competence, but on the collaboration of individual organisations within the network (Cao & Zhang 2011:164).

3.2 THEORETICAL PERSPECTIVES UNDERPINNING SUPPLY CHAIN NETWORKS

Various theories have been elucidated in order to understand supply chain networks, its flexibility and integration. Those theories that are relevant to this study are expounded below.

3.2.1 Network perspective

The network perspective focuses on the communications exchange among organisations that could improve their capabilities to leverage resources and skills effectively (Rabinovich, Knemeyer & Mayer 2007:662). Network perspective requires organisations to adopt different strategic links within the individual relationship with single suppliers as well as the entire supply chain network (Roseira, Brito & Henneberg 2010:925). The network perspective offers organisations the potential to achieve low transaction costs, complementary relationships and to exceed customers' requirements (Lin, Huang, Lin & Hsu 2012:450).

The network perspective environment comprises the interconnected relationships of actors, resources and activities needed to create competitive advantages (Mouzas, Henneberg & Naude 2008:168). The actor, which is the focal organisation, maintains different relationships through assets investment, knowledge sharing, and complementary resources and capabilities (Hu & Tsai 2007:637; Mouzas & Ford 2009:497). A network relationship is viewed as a resource since the network resources determine the constitution of the network relationship, which comprises the network internal assets (Ramos & Ford 2011:449).

The network perspective helps in understanding the influence of supply chain network as a strategy to generate increased revenue growth, reduce time-to-market, lower cost and improved customer satisfaction (Yeung *et al.* 2013:548, Lorentz, Kittipanya-ngam & Srai 2013:221). The network perspective extends the focus of this study from the single firm to a network, while also focusing on the strategic relationship and interactions with the network. A firm's competitive advantage emanates from its relationship with its own supply chain network.

3.2.2 Social network

The social network theory is a management approach used to understand organisational performance, turnover, promotion and innovation (Hatala & Lutta 2009:10; Wang & Noe

2010:116; Moqbel 2012:29-34). It includes all different organisations with different aims and objectives. According to Pozo, Manuel, Gonzalez-Aranguena and Owen (2011:191) a social network is a “set of nodes representing people, groups, and organisations or enterprises that are connected by links showing relations or flows between them”. Lee, Ruan and Lai (2005:250) posit that when organisations are involved in a social network, the relationship ties and the embedded resources constitute the focal individual organisation’s social capital. This can help the organisation in pursuing set objectives and goals and also enable the organisation to cope with uncertainty in the market environment.

A social network consists of a network of organisations among which there is a system of relationships that are interdependently connected (Toivonena, Kovanena, Kivelaa, Onnelab, Saramakia & Kaskia 2009:241; Faust 2010:222). It is also seen as relational ties or links between organisations that provide individual organisations the opportunity for the transfer of flow of resources, information and creative ideas, which enhance organisations’ performance (Ramirez-Ortiz, Caballero-Hoyos & Ramirez-Lopez 2004:176; Wang & Noe 2010:117). Therefore, social organisational networking can be a source of innovation and creativity.

A social network theory refers to the study of the phenomena of organisational functioning and performance and of the behaviour of groups and individuals working in them (Pustejovsky & Spillane 2009:224; Faust 2010:223). It refers to the mechanisms and processes that interact with network structures to yield certain outcomes for individuals and groups (Simpson, Markovsky & Steketee 2011:168). It is also about the consequences of network variables, such as having many ties or being centrally located (Doreian & Mrvar 2009:3). The theory of networks refers to processes that determine why networks have the structures they do – the antecedents of network properties. In essence, it includes models of who forms what kind of tie with whom, who becomes central and what characteristic the network as a whole will have (Robins, Pattison, Kalish & Lusher 2007:175; Simpson *et al.* 2011:166).

According to Kim, Cho, Yan and Dooley (2011:194), an organisation’s supply chain network may consist of ties to its immediate suppliers and customers, and ties between them and their immediate suppliers and customers. This network tie between organisations may influence the degree of information symmetry between the organisations, which may result in opportunity for information access (Bartol & Zhang 2007:389; Faust 2010:221). The social

network framework provides a good approach for examining the network structure and patterns.

There has been a shift in the way a modern organisation operates and competes. It has moved from managing an individual organisation to managing the supply chain comprising the relationship among a set of different actors within the nodes making decisions as a group. The nodes represent organisations that are linked up to form a system of interdependencies called a network. These networks enable some kind of flow between organisations as they interact with one another in terms of ideas, innovation, information, and goods or services (Borgatti & Halgin 2011:3).

This study centres on the importance of supply chain networks between SMEs business functions and across other business functions to improve competitive performance. Within these network ties, friendships that seek advice are developed and improved upon. Supply chain network is a new source of information and knowledge flow (Krackhardt & Kilduff 2002:280). According to Borgatti and Halgin (2011:3-4), the stronger the link between two or more organisations, the more the benefits of the relationship help them to outperform their competitors. This network can become a source of innovative ideas because supply chain network links a particular organisation to a supplier who is also connected to other suppliers. Through this link, that particular organisation can gain more information and innovative ideas faster than its competitors could (Ramirez-Ortiz *et al.* 2004:177). The network function is the flow of product, service and related information.

3.2.3 Network management

Network management is a key to organisation competitiveness as the quality of the supply chain network impacts individual organisation's growth and well-being (Roseira, Brito & Ford 2013:235). According to Lemmetyinen and Merilainen (2011:28), "the strategic management of networks could be defined as the active enabling of interactions occurring in inter-organisational relationships embedded in networks, regardless of intentionality, which is incorporated into the value-creating network strategy that is manifested on the level of the whole network". The value creation is a result of four network management functions: framing - setting goals, establishing and influencing the operating rules of the network and altering the perceptions of the network participants; activating - the process of identifying participants and structuring the network; mobilising - building commitment among actors;

and synthesising - creating conditions for productive interaction while preventing, minimising, and removing obstacles to cooperation (Jarvensivu & Moller 2009:658). Therefore, strategically managing the supply chain network is a major factor in network organisation's development and change.

As the management of interactions for competitive advantage between network organisations, network management proposes that a firm cannot be isolated from its business environment, which consists of a network of nodes, like people, organisations and physical locations (Fjeldstad & Ketels 2006:110; Baraldi, Brennan, Harrison, Tunisini & Zolkiewski 2007:890). Therefore, organisations should implement a supply chain network that allows interactions, flow, monitoring and management of services in order to improve market understanding as well as the ability to adapt within the market environment (Elg 2008:55). Lin, Chen, Sher and Mei (2010:612), view supply chain network as an adaptive unit that has interaction effects with their environments, which are sustained by alliance organisations that are strategically located in the network across different system levels. These organisations are able to diffuse ideas about cross-sector business models and formulate notions about how the network can adapt to market changes to gain competitive advantages.

Chang *et al.* (2012:1116) and Lee and Habte-Giorgis (2004:103) posit that networks represent a mode of organisation that allows members to gain or sustain competitive advantage above their competitors outside of the network. Therefore, network management assists in minimising customers' dissatisfaction through the development of customer management strategies. According to Wu and Shangguan (2012:1610), the effective integration of supply network information resources can provide collaborative services in information flow and business flow for network organisation that can reduce operating costs and improve market responsiveness. This means that a firm can cope within the supply chain network through integration and continuous interaction with other parties constituting the context with which the organisation interacts, endows the organisation with flow of goods, planning and control as well as flow of information (Ozbas 2005:201; Van Donk & Van der Vaart 2005:90;). Such a concept of enterprise could lead naturally to a shift in focus, away from the control of resources towards the integration of resources (Chena, Leea, Ng, & Foo 2011:207).

3.2.4 Relational view

The relational view theory influences the pattern of supply chain management as a strategy and also improves supply chain network competitiveness and performance (Wieland & Wallenburg 2013:302). The supporters of strategic management (Chen, Paulraj & Lado 2004:508; Ketchen & Giunipero 2004:52; Killen, Jugdev, Drouin & Petit 2012:527) have researched on the sources of competitive advantage and have come up with two important views, namely the industry structure view (ISV) and the resources based view (RBV).

The ISV theory argues that a firm's competitive advantage is based on the firm's structural characteristics such as threats from competitors, powerful suppliers, powerful buyers, substitute products and new entrants (Hill & Jones 2001:210; Lopez-Gamero, Molina-Azorin & Claver-Cortes 2009:3112). According to Louw and Venter (2006:23), the RBV theory "assumes that organisations are conceptualised groupings of resources that are heterogeneously distributed across the organisation and persist over time". Resources can be defined as the "assets, knowledge and processes that enable the firm to implement strategies that improve efficiency and effectiveness" (Rapp, Trainor & Agnihotri 2010:1229). In other words, the ISV and RBV theories presuppose that an organisation can only achieve competitive advantage over its competitors if it acquires the key competences that are uncommon, valuable, costly to imitate, and cannot be substitutable, (Wong & Karia 2010:52; Fahy 2002:57). These theories focus their unit of analysis on a single firm (Steinthorsson & Derholm 2002:234; Kim, Kim & Park 2010:313).

The relational view proposes that a firm's critical resources may extend beyond firm boundaries in terms of inter-firm knowledge transactions like knowledge exploration, knowledge retention and knowledge exploitation, which may be coordinated externally (Jap 2001:20; Lichtenthaler 2008:201; Yeung, Lee, Yeung & Cheng 2013:546). In other words, a firm's most critical competitive resources may reside in supply chain network relationships (Charterina & Landeta 2010:172). Madhok's (1998:275) finding shows that as a result of the dependence of the organisation's capabilities on supply networks, there is greater attention paid to inter-organisational capability-related strategy.

The relational view helps to understand the type of competitive advantage achieved in the supply chain networks through firm's relation-specific investments and combined resources in a unique way (Wieland & Wallenburg 2013:300). The more organisations combine

resources, ideas, and skills in this manner the more they achieve high return on investment, profitability, market share growth and sales volume growth over their competitors who are unable to do so (Borgatti & Cross 2003:435). The relational view stresses the value of using inter-organisational relationships to access critical network resources and focuses on how a firm can achieve and preserve sustained competitive advantage through developing relationships with other firms in a network environment (Hammervoll 2011:265; Albino, Dangelico & Pontrandolfo 2012:305).

This view also proposes that through relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and effective governance supply chain network firms will achieve significantly reduced cost, shorter lead-time, increased productivity, enhanced quality performance and sustainability (Li, Humphreys, Yeung & Cheng 2012:353). The relational view of competitive advantage focuses on inter-organisational practices and processes as an important unit for analysing strategic collaboration advantages (Jap 2001:21).

Inter-organisational collaboration is a process whereby individual organisations come together and interact (researching, development, production, selling and distribution of product or service) within the supply chain for mutual benefits (Ku, Gurumurthy & Kao 2007:296 Wieland & Wallenburg 2013:303). According to Cao and Zhang (2011:163), supply chain collaboration means “two or more autonomous firms working jointly to plan and execute supply chain operations, which can generate substantial benefits and advantages”. This entails active participation of individual organisations involved in order to sustain the relationship and to achieve the coordinated supply chain objectives (Huggins 2001:444; Gebrekidan & Awuah 2002:680). According to Tidd and Izumimoto (2002:134), organisations collaborate for the purpose of cost reduction and risk of technological/market development, reduce time to market as well as the exploitation of economies of scale.

The relational view theory is important since it provides a theoretical foundation for supply chain network and serves as source of inter-organisational mutual benefits in the network environment. According to Chang *et al.* (2012:1119), the relational view theory supports the framework and theory of network management. The relational view coordinates effectively with supply chain relationship analysis and exploration. Therefore, this study adopts the relational view advocated by Dyer and Singh (1998: 662) as a foundation into the influence

of supply chain networks, integration, and supply chain flexibility on SMEs performance. The following outline the characteristics of the buyers/suppliers arm's length relationships:

- There is an absence of concern by both parties about the other party's well-being (win-lose manner).
- One of a series of independent deals. In other words, each transaction is entered into based on the advantage of the other party and not for collaboration and learning.
- Cost, data and forecasts are not shared (arm's length relationship and no openness).
- Price is the focus of the relationship and as a result, neither buyer nor supplier will rush to the others' assistance in bad times or when problems arise.
- A minimum of purchasing time and energy is required to establish prices.
- Communication difficulty
- Considerable investment in expediting and the monitoring of incoming quality is required to ensure timely delivery of the right quality.
- Relationships are inflexible when flexibility may be required. Changing technology and changing market conditions can require flexibility in buyer/supplier relationships.
- Procurement results in more delivery problems as friends look out for friends and not strategic buyers/suppliers relationships.
- Quality is good as required (no need for improvement) and suppliers only provide the minimum service required.
- Buyers tend to experience less effective performance by their suppliers and as a result customers are subjected to more supply disruptions (Burt, Dobler & Starling 2003:78-79; Burt, Petcavage, & Pinkerton 2010:67).

It can be seen in the above relationships that efficiency, improvement, collaboration, as well as synergistic strategy were not the focus of arm's length relationships (Spekman & Carraway 2006:10). It was easy for a particular firm to switch from one supplier to another supplier without any effort to improvement of product design (Dequiedt & Martimort 2004:953). This may be due to lack of interest or because the other supplier delivers substitute products. The arm's length relationship brings distrust between the purchasing firms and suppliers (Hobbs & Andersen 2001:467). Therefore, using a single firm as a unit of

analysis disadvantages the firm because arm's length relationships produce incompetence of creating network relationships (Gebrekidan & Awuah 2002:679). There is nothing important or no distinct characteristics about the arm's length relationship that allows both the purchasing firm and the supplier to generate profits that exceed the benefits from supply chain networks (Choe & Matsushima 2013:199).

Supply chain network is the true source of competitive advantage for SMEs. According to Jap (2001:20), competitive advantage is "a strategic benefit gained over competing dyads that enable the dyad to compete more effectively in the marketplace". In this study, therefore, sustained competitive advantage is defined as the creation of more value and as an extraordinary profit on investment that is only generated and acquired by firms within supply chain networks (Killen *et al.* 2012:252). Sustained competitive advantage is possible when individual SMEs build a strategic alliance relationship that exchange and invest in relation-specific asset, knowledge and resources/key capabilities as well as effective governance mechanism.

The relational view theory proposes four potential sources of inter-organisational competitive advantage. These are discussed below:

3.2.4.1 Investments in relation-specific assets/resource

According to Charterina and Landeta (2010:174) and Wong and Karia (2010:53), investment in relation-specific assets is important for gaining competitive advantage as organisations within the supply chain network strive to achieve specialisation and uniqueness. Specific asset investments are investments in physical, human or intangible assets (such as research and development (R&D) and firm-specific knowledge) that are dedicated to the business partners within the supply chain and whose redeployment entails considerable switching costs to best use that may bring about a reduction in operating cost (Jing & Zhonghua 2012:519). According to Jap (2001:24) and Ku *et al.* (2007:297), the unique competencies brought together by members of the supply chain may include learning curves and differing levels of efficiency, which when combined, members of the supply chain network gain access to critical resources that enable the creation of superior value in the marketplace.

Relation-specific assets believe that with continuous improvement and commitment of the networking organisation to the inter-firm transactions can influence the abilities of SMEs collaborative relationship to provide superior product offering to customers (Buvik & Reve

2001:102). As the major determinant of integration choice, Coles and Hesterly (1998:384) argue that relation-specific assets are an important source of competitive advantage and as a result, organisations should present themselves as unique by creating specialised assets through core competences and capabilities in conjunction with the core capabilities of supply chain partners.

Productivity benefit gains (such as higher quality products, increased flexibility, lower inventory levels and lower total cost) in the supply chain networks are possible when organisations are willing to make relation-specific investment (Yeung *et al.* 2013:547). In this process there is exchange of information know-how among the supply chain partners, which can be gained from dedicated supplier engineers, procedures and buyers (Sloof Sonnemans & Oosterbeek 2004:1400). This human co-specialisation increases as the patterns with the supply chain network develop experience through mutual relationships and accumulate specific information, language, and know-how (Morita & Servatka 2013:96). This allows for efficient and effective use of individual organisation's knowledge base and resources, enhanced quality and increased speed to market through effective communication (Buvik & Haugland 2005:43).

3.2.4.2 Joint learning through knowledge sharing

In this global competitive rivalry between organisations, knowledge sharing has become a strategic weapon for competing organisations who want to succeed. According to Park (2011:75), organisations that receive the inflow of new knowledge or information from social networking gain sustained competitive advantage. Knowledge sharing is another source of organisations' learning and sustained competitive advantage (Borgatti & Cross 2003:433; Huggins 2001:445). Knowledge-sharing transfer facilitates knowledge resource exchange between supply chain partners by enhancing partner-specific resources/capability as well as transparency and reciprocity (Wong & Karia 2010:53). Supply chain networks provide a fundamental opportunity for organisations to share and learn from each other. Chai, Yap and Wang (2011:12) show that supply chain networks positively affect an organisation's capability of knowledge identification, transfer, protection, institutionalisation and competitive advantage. According to Charterina and Landeta (2010:173), network information exchange can be a source of creativities and innovative ideas for new product development, service and technology.

Through collaborative learning, organisations ensure that strategic decisions are informed by the network partners, suppliers and customers' feedback, suggestion and ideas on product/service become important for innovative ideas, which may further strengthen the supply chain network relationship (Kang & Park 2012:69). According to Fahy (2002:58) knowledge transfer within the supply chain network can result in innovative ideas, improvements and enhancement of individual organisation's performance. In other words, supply chain network is the supply of new ideas and information that enhance performance and innovative ideas and not through individual organisations working alone (Lee, Park, Ghauri & Park 2013). The transfer of information know-how across the supply chain networks will help organisations within the supply chain to outperform their competitors (Tidd & Izumimoto 2002:137). Organisations working independently may be at a competitive disadvantage. Supply chain knowledge transfer is defined as an organisations' collaborative interaction of resources and management structures that permits the transfer, recombination, or creation of value and specialised knowledge (Hammervoll 2012:129).

A supply chain network further enhances the partners' ability to recognise, assimilate and apply the importance of knowledge and information transfer throughout the product development process, and efficiently use of existing resources to satisfy ultimate consumers (Yao, Yang, Fisher, Ma & Fang 2013:216; Swierczek & Dhakal 2004:54). This strategy is known as the supply chain networks absorptive capability. According to Gebauer, Worch and Truffer (2012:58), the success of supply chain network capabilities in transferring information know-how depends on the extent to which the individual firms within the supply network have direct, intimate and extensive face-to-face interactions. Figure 3.1 shows the supply chain knowledge complementary, knowledge absorption effectiveness and new product performance.

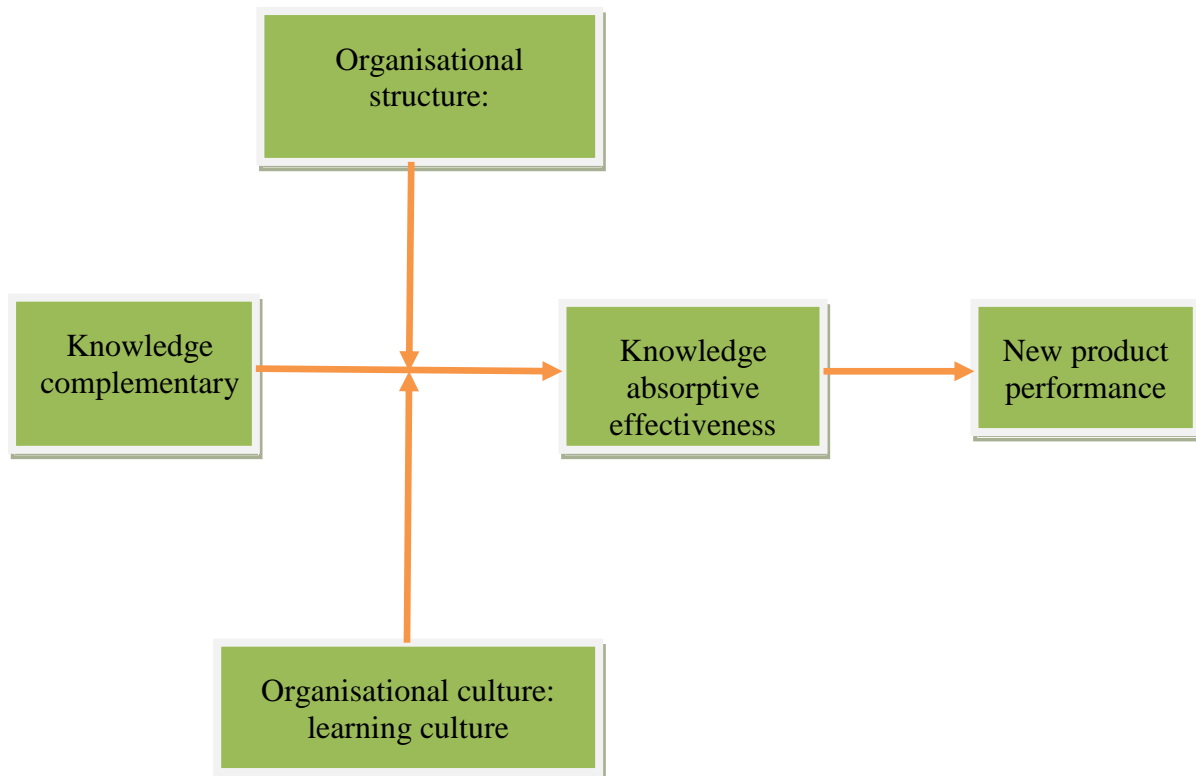


Figure 3.1: Supply chain knowledge complementary, knowledge absorption effectiveness and new product performance (Yao *et al.* 2013:218).

The sharing and transfer of complementary knowledge and information results in intense inter-organisational social networks that increase the supply chain network-specific absorptive capability (Yao *et al.* 2013:218). Absorptive capacity refers to the internal resources that strengthen a firm's ability to value, understand, assimilate and apply new knowledge received from external sources such as customers, suppliers or alliance partners (Park 2011:76; Liu, Ke, Wei & Hua 2013:1453). The process of sharing of information can be characterised as “genuine, frequent and involving personal contacts” (Wieland & Wallenburg 2013:302). According to Huggins (2001:445), a supply chain network is a strategy to solve problems, share information and acquire innovative skills across the supply chain.

3.2.4.3 Complementary resources capabilities

Complementary resources capabilities is the combining of complementary, but scarce resources or capabilities (typically through multiple functional interfaces), which comprises a large potential for learning and value creation through joint creation of unique new products, services, or technologies (Yao *et al.* 2013:218). According to Gu and Jung (2013:88), an

organisation's complementary resources are defined as a multidimensional construct consisting of other firm's resources, such as organisational openness and flexibility orientation, knowledge orientation, organisational commitment and business processes. The more unique the combination of skills, resources and capabilities, the greater the potential for the supply chain network to generate supernormal returns than competitors (Jap 2001:24). These dimensions serve as the basis upon which organisations within the supply chain network can differentiate their ability to gain competitive advantage over competitors (Morabito, Themistocleous & Serrano 2010:202). An organisation's ability to outperform competitor's may require that its resources be used together with complementary resources of another firm. In strategic alliance relationship, a complementary resource capability is the driving force behind return on investments and sales (Wong & Karia 2010:55).

Complementary resource capability is the supply chain partners' distinct capabilities, collectively generated to achieve sustained competitive advantage and stimulate innovation over those obtained from the capability of each individual organisation within the supply chain network (Lai, Chiu & Liaw 2010:184). For these resources to generate sustained competitive advantage and future growth through the supply chain network, it is important that competitors find it hard to imitate the organisation's capabilities (Wu, Yeniyurt, Kim & Cavusgil 2006:495). Supply chain networks allows each individual organisation within the supply chain to gain access to complementary resource capabilities and also allows those organisations to purchase valuable, rare and difficult to imitate complementary assets, competencies/capabilities (reputation) that are not readily available in competitive factor markets (Deligonul, Elg, Cavusgil & Ghauri 2013:507). Therefore, supply chain network give organisations the opportunity to gain stronger competitive advantages by leveraging the network complementary resource capabilities than those individual organisations operating in isolation.

According to Antonio, Richard and Tang (2009:308) the combination of supply chain networks' resources, capabilities and processes may become too complex to imitate by competitors, thereby enhancing the partner's potential to gaining sustained competitive advantage. Supply chain network capabilities need to be used in conjunction with complementary assets in order to generate economic returns (Lai *et al.* 2010:185). Complementary competitive advantages can only be appreciated when organisations in

supply network have operating systems, decision-making processes and cultures that are compatible enough to help coordinate supply network activities.

3.2.4.4 Effective governance

Effective governance is a way of safeguarding investment made by the supply network partners. The achievement of supply chain network goals and objectives may depend on effective governance as it leads to lower transaction costs than competitors (Yeh, Shu & Su 2012:757). Chen and Chen (2012:395) argue that effective governance serves as a mechanism for aligning the interests of the supply chain networks and that it also plays a role in enhancing the network performance. Good governance motivates the supply chain partner's willingness to invest more in relation-specific assets because it not only decreases transaction cost but also increases value creation initiatives thereby gaining competitive advantage (Jing & Zhonghua 2012:519). The reason for effective governance is that without it, the supply chain partners' specialised investment may be exposed to greater risk of opportunism because the value of the specialised assets may depreciate over time (Kusnadi 2011:555). In other words, supply chain partners should implement effective governance structure to safeguard and secure transaction investment and enhance efficiency of the supply chain network.

According to Buvik and Haugland (2005:42), designing and implementing a good governance structure that creates sufficient coordination to reaching the investment outcomes at the lowest possible costs can pose a major challenge for the supply chain networks relationships. Supply chain partners might decide to use third-party enforcing agreements (legal contracts) or rely on self-enforcing agreements to enhance the network efficiency.

3.3 CONCLUSION ON SUPPLY CHAIN THEORIES

This chapter discussed the theoretical literature review, which presents the relevant theories that underpin this study. The theories discussed above include the network perspective theory, social network theory, network management theory and relational view theory. Supply chain network can generate more return on investment and competitive advantage because with the presence of different resources and capabilities within the individual organisation of supply chain network, they can identify joint competitive strategy for which there may be limited competition. With this, the joint competitive strategy may become difficult for competitors to imitate and substitute. Long-term commitment in the relationship

is further encouraged through the creation of specific and distinct investments, which differentiate them from competitors. The paradigm shift from arm's length relationship to supply chain networks aid competing organisations to be more unique in creating potential for earning competitive advantages through specialised assets investment, knowledge sharing, complementary competencies and effective governance (safeguard mechanisms).

The next section presents the literature review on the research variables such as supply chain network, supply chain flexibility, supply chain integration and SMEs business performance.

3.4 RESEARCH VARIABLES

After discussing the theories pertaining to supply chain networks, this section focuses on the literature review of the influence of supply chain networks, flexibility and integration on small and medium enterprises' performance. In essence, this refers to how supply chain networks, flexibility and integration, can result in sustainable competitive advantages and superior SME performance.

Customer satisfaction is the key focus of any enterprise, irrespective of size (Terpstra & Verbeenten 2014:500). Furthermore, an organisation's existence is based on how it is able to use the available limited resources to generate more profit in the near future. Nonetheless, the issue revolving around how best to satisfy customers and make profits is not an easy task to overcome in one day. As a result, organisations are forced to continuously look out for strategies and ways of dealing with the global unpredictable challenges within the business competitive environment as they arise. Therefore, it implies that competing effectively is the drive of so many organisations and recently, the integration of supply chain networks is becoming the most important strategy to compete effectively (Ketchen & Hult 2007:574; Chan *et al.* 2012:330; Chang, Chiang & Pai 2012:1119).

Hence, organisations focus on achieving high levels of customer service, profits and competitive advantages through supply chain networks so that the implementation of flexibility strategy and integration is possible and easy. SMEs are, therefore, compelled to re-evaluate their strategic decision making based on supply chain networks, flexibility and integration in order to survive the changing competitive environment.

3.5 SUPPLY CHAIN NETWORKS

Supply chain network is a collaborative relationship between individual organisations for the benefit of information exchange, complementary ideas and knowledge sharing (Chakraborty, Bhattacharya & Dobrzykowski 2014:766). Supply network creates a collaborative environment that allows organisations within the networks to work in mutual relationship on ways to survive and reduce uncertainty in the competitive environment. This collaborative effort helps individual organisations maximise profits and customer satisfaction (Musa & Abdullah 2014:267). Chan *et al.* (2012:329) adds that the ultimate benefits of the implementation of supply chain networks by SMEs are efficient inventory control and returns, superior customer service, improved supplier relationships and reduced operation costs. In theory, supply chain network (SCN) means a proactive relationship and integration among various tiers in the chain (Trkman *et al.* 2007). SCN is a proactive strategy to cope effectively with competitive turbulences and the increasing changes in consumers' demands (Wieland & Wallenburg 2013:300). Thus, supply chain networks are about independent organisations and the relationships that connect them.

According to Lemmetyinen and Merilainen (2011:26), supply chain network is defined as an inter-organisational web of loosely articulated groups of independent organisations linked together and embodied in destinations and as a set of nodes and the interconnected relationships within the destination. Jarvensivu and Moller (2009:654) add that supply chain network is a way of organising economic activities through inter-firm coordination and cooperation whereby the behaviour of actors within the supply network is intentional and goal-oriented. Therefore, the success of supply chain networks can be rooted organisations' relationship and collaboration, which helps organisations to specialise in distinctive capabilities. As a network of firms, the environment would consist of end consumer markets that exert demand for the products and services provided by the supply chain network, economic systems and cultural systems that define and confine the supply chain networks interpretation of reality and its subsequent behavior (Huggins 2001:445).

According to Huggins (2001:443), "supply chain networks consist of two or more firms pursuing common objectives or working towards solving common problems through a period of sustained interaction". Recently in supply chain management literature, supply chain has become supply chain network as a result of its complexity within the supply chain environment (Choi, Dooley & Rungtusanatham, 2001:351; Stefanovic, *et al.* 2009:743). This

study does not focus on the complexity of the supply chain network but rather on its advantage and importance (problem solving, information sharing and acquiring of innovative skills) among the SMEs who are involved in supply chain networks. For the purpose of this study, supply chain network refers to a strategic action that successfully responds to competition and changing customers demand (Ketchen & Hult 2007:573; Chang, Chiang & Pai 2012:1119).

Supply chain networks help SMEs to decide on how to achieve a sustainable competitive edge through collaborative relationship within the supply chain. Therefore, it is important for SMEs to use supply chain networks as a strategy to improve time, delivery, cost, quality and design (Roseira *et al.* 2013:236). Supply chain network has gained much interest in management and organisational disciplines such as change and transformation, innovation, human resources practices and strategy have been examined using concepts from supply chain theory (Windahl & Lakemond 2006:807; Elg 2008:57). Organisations no longer work in isolation as supply chain networks enhance the ability of firms to work collectively with few suppliers for competitive benefits. Supply chain networks are organisational networks that allow SMEs to use their resources, capabilities and architecture in the most efficient and effective way in order to accomplish competitive advantage (Meade & Sarkis 1998:201-202, Louw 2006:10).

Surviving in today's business environment requires that SMEs may need to continually update their business strategy in order to accommodate new product innovation and development as well as networking (Elg 2008:56). This means that the SMEs business culture may have to go through a transformation phase of understanding and knowing how to compete better and how to cope in the changing competitive environment. Understanding how the competitive environment operates is of utmost importance for SMEs. There are forces and actors in the business environment that the SMEs should understand such as competitors, partners, customers as well as the market participants. During benchmarking, these forces and actors give SMEs a reflection of their business operation's strengths and weakness and also give SMEs owner or manager the ability to look at the business operation afresh from a different angle in order to improve on it (Calfee 2006:230; Etzold & Buswick 2008:280-284) .

Supply chain networks provide SMEs with a fresh angle of looking at the business. According to Davies (2000:25-26), supply chain network is a web of policy, strategy and

resources. The policy detailed out the overall goals and objectives of the supply chain network and the strategy detailed how the goals and objectives of the individual SMEs operational units will be achieved and structured. Lastly, the supply chain network resources detailed how the strategic resources needed will be acquired and used to accomplish the individual SMEs goals and objectives. Therefore, supply chain network is a strategy that helps SMEs with the limited resources and materials achieve their business goals and objectives.

According to Sterling (2003:34), supply chain networks resources and materials include “capital, physical plant, raw materials, and parts, and components such as distribution networks, technology, human resources, market data and market reputation”. Supply chain methods include a range of management, manufacturing, and marketing functions and processes, such as motivational, negotiating, and alliance skills and other intangible resources that are covered by terms like benchmarking, best practices, outsourcing, international organisation for standardisation (ISO) competencies, total quality management, core competencies, transportation and competitive capabilities”. This, therefore, means that SMEs can survive and grow in the competitive environment and also contribute to the South African economic development with supply chain networks.

Supply chain network is a strategy that will helps SMEs to be innovative to introduce new products and best practices within and across the organisation. Supply chain networks may bring about improvements within the SMEs operational activities and also prepare the SMEs for future technological change and competitive uncertainty through their flexibility and integration skills gained from supply networks (Done, Voss & Rytter 2011:500).

3.5.1 Evolution of supply chain network

The first new broader view of supply chain network was the materials management concept. According to the International Federation of Purchasing and Materials Management (IFPMM), “materials management is a total concept having its definite organisation to plan and control all types of materials, its supply, and its flow from raw stage to finished stage so as to deliver the product to customer as per customer’s requirements in time”. Materials management is important to all businesses because it has to do with the flow of raw materials, in-process inventory, and finished goods within a production plant, retail store or warehouse (Voortman 2004:88).

“Supply chain network is concerned with the flow of materials from point of origin to the point of consumption by the customer. Materials management is an important part of this flow. It is concerned with the planning, organising, scheduling, moving, storing and controlling of all activities such as (weight, and vulnerability to damage, method of packaging, storage on site, the movement as well as plant availability) and personnel concerned with the flow of goods into an organisation” (Agapiouet *et al.* 1998:131). Material management can be defined as the “planning and control of the flow of materials that are part of the inbound logistics system. Materials management includes procurement, warehousing, production planning, inbound transportation, receiving, materials quality control, inventory management and control, and salvage and scrap disposal” (Coyle *et al.* 2003:119). All these activities play an important role in reducing inventory, lowering costs and increasing customers.

Materials management includes the following: Inventory – the raw materials, work-in-process, finished goods and supplies required for creation of a company’s goods and services; the number of units and value of the stock of goods a company holds (Coyle *et al.* 2003:680); production control – the decision-making area that determines when and where and in what quantity a manufacturer is to produce goods; subcontracting – a business practice in which a producer hires another firm to perform part of the manufacturing process or to finished sub-assemblies that will be incorporated into the end product (Hugo, Bedenhorst-Weiss, van Biljon, & Van Rooyen 2006:74); stores or work station storage and supporting or indirect materials – the function is associated with storing and issuing frequently used items (Ballou 2004:470); purchasing – procurement or buying pieces, pounds, gallons, tons of raw material and maintenance, repair and operating supplies; purchasing functions are associated with buying the goods and services the firms require (Tassabehji & Moorhouse 2008:55); transportation or incoming and finished goods freight movement; salvage or disposing of surplus and scrap. All these activities were possible through efficient materials management.

The introduction of materials management and the computer tools that came with it called materials requirement planning (MRP) and material resource planning (MRPII) forced individual organisations for the first time to look at the entire flow of both incoming materials and the outgoing finished goods as a system. MRP is a decision-making tool used to determine how much material to purchase and when to purchase it based on forecast (Burt *et al.* 2010:473). The MRP system allows businesses to reduce inventory levels, use facilities

more efficiently, and improve customer services. Nevertheless, this integration only improved internal production communication and accepted poor quality levels of goods and services to customers because of the arm's length relationship between buyers and suppliers. That is, both the buyer and supplier were still operating or designing in isolation (Storey, Emberson & Reade 2005:247). Here the buyers and suppliers go through a rigorous selection process to building and designing of the products (Hobbs & Andersen 2001:466).

During 1960-1985, the increasing competition from Japan with its growing reputation for high quality products and a different management style, started to panic US executives at large firms as they started to lose market shares (Chang, Chiang & Pai 2012:1115). The Japanese developed efficient supply chain management approach, which builds on the synergy advantages of materials management and expand the strategy to include suppliers at the planning and design stage in a partnership atmosphere (Dequiedt & Martimort 2004:952). According to Spekman and Carraway (2006:11), this collaborative supply-chain network helps the Japanese firms to 140 percent greater output per worker, lower inventory by twenty-five percent and achieved fifty percent fewer defects than competitors did. During this time, just in time (JIT), which was made possible by TQM, improvement of transportation networks and cycle time reduction also became mandatory. According to (Wagner 2006:687) supplier development is a "long-term cooperative effort between a buying firm and its suppliers to upgrade the suppliers' technical, quality, delivery and cost capabilities and to foster ongoing improvement".

These developments changed the way buying organisations had traditionally operated with supplying organisations. The focus is now on a long-term relationship based on trust or win-win negotiation philosophy and sharing of confidential information. The individual organisation became more proactive and strategic and moved from exchange thinking (purchase order to purchased order) to a long-term relationship. The buying organisations then take the initiative to obtain supplying organisation support and involvement in a variety of projects to reduce procurement cost, gain competitive advantage and improve performance. The long-term relationship has moved from procurement of supplies to managing the supply chain networks. Supply chain networks relate to the way in which materials processes are managed within the company. It also relates to the way in which the external materials processes are managed (Van Weel 2010:205).

The newness of the field results from the concept of managing them separately in order to add value to products and services that are essential to customer satisfaction and sales. Supply chain networks include all activities associated with the flow and transformation of goods from the raw materials stage (extraction) through to the end user, as well as the associated information flows (Ibeh & Kasem 2011:360). Supply chain networks are defined as the systematic, strategic integration or coordination of the traditional business functions and the tactics across business within the supply chain, for the purpose of improving the long-term performance of the individual companies and the supply chain collectively (Bhalla & Terjesen 2013:1667). Materials and information flow both up and down the supply chain. The next section discusses the evolution of supply chain network within the South African context.

3.5.2 Evolution of supply chain network within the South Africa context

Just as the focus increased on global competition, increased focus on market requirements, advanced information and communication technology forced the international organisations to revolutionised their supply chain networks, South Africa is also affected by these global changes. In this modern competitive environment, organisations are involved in supply networks that operate over multiple locations and products and are highly interconnected (Nichter & Goldmark 2009:1455). Therefore, neglecting supply chain network interactions in South Africa may result in loss of profit. Nevertheless, many organisations in South Africa have extended their operating centers closer to customers in order to be competitive and to respond to customer changing and diverse demand. For time sake, most of the organisations have started to outsource some part of operating process to professionals that can do it better and faster and thereby focusing on their core competences or strengths within the organisation (Storey *et al.* 2005:245). This method of supply chain networks helps organisations achieve their goals and objectives in terms of achieving high performance through customer satisfaction. This means that SMEs have to reposition their business strategy to managing the supply chain networks in order to be agile enough to produce and deliver customised products and services that meet customers' specific requirements (Lemoine & Skjoett-Larsen 2004:795).

Organisations in this modern time consider supply chain networks as a strategy for achieving immediate economy of scale benefits as well as long-standing competitive advantage. Supply chain network is a combined business approach and efforts following the effective and

efficient coordination of producer, suppliers and distributors so that products and services are produced and delivered in the right quantity, quality, time and at the right place to achieve customer satisfaction (Chang *et al.* 2012:1117). Contemporary development in information and communication technology (ICT), global competition and globalisation of world trade, cross-functional teams for time compression and improvement in supply alliances and improved quality, strategic sourcing (selection and suppliers and managing the suppliers relationships, e-procurement, changing consumer patterns as well as increasing competition, have revolutionised supply chain networks in South Africa. These enable South African organisations to create synergistic strategy to meet diverse customer demands. This synergistic relationship represents supply chain networks, which implies that supply chain networks have shifted from the engineering and improvement of individual functional processes to the coordination of activities of a dynamic supply chain network (Folinas, Manthou, Sigala & Vlachopoulou 2004:275).

3.5.3 Trends driving supply chain network (Development or movement)

The following trends driving supply chain networks may have a positive impact on the success of SMEs if adhered to and well integrated. The complexity and development of these trends cause organisations to realise the need of supply chain networks. SMEs may not survive the present and emerging competitive rivals if not part of a supply chain network.

3.5.3.1 Customer relationship management

According to Cruceru and Moise (2014:156), customer relationship management is about attracting customers and building unique customer relationships to achieve organisational goals and objectives. It is a process of achieving or gaining lifetime customer loyalty, which can result in an increase in competitive advantages and profit (Wu & Chou 2011:332). It involves the collaborative use of information technology that allows SMEs to manage customer relationships efficiently throughout the supply chain (Tu & Yang 2013:2137). This may be possible through periodically collecting and analysing customer data in order to better satisfy customers and create value added benefits for the organisation (Khodakarami & Chan 2014:27).

Customers are very important to any organisations as they are the reason for an organisation's existence as well the reason for competition among organisations (Kim *et al.* 2013:881; Martelo, Barroso & Cepeda 2013:2042; Yeung, Ramasamy, Chen & Paliwoda 2013:406,). As

a result many practitioners and researchers are continuously looking for enhanced business strategies that helps implement and improve customer service as well as building customer relationship management in order to enhance business, market and financial performance (Eisingerich & Bell 2007:253; McManus 2013:140; Verhoef & Lemon 2013:1-2; Schaarschmidt & Kilian 2014:350,). According to Miocevic and Crnjak-Karanovi (2012:115), the most critical goal of supply chain network is creating customer value and customer satisfaction.

Supply chain network has shifted from offering excellent customer service to managing customer relationships with targeted customers in mind so as to manage and control inventory and profit maximisation (Ming, Grabot & Houe 2014:56-57; Baxter 2012:1250). Customer service focuses on managing all customers as though they were equal but supply chain network has helped organisations to manage each customer segment as a unique relationship in order to satisfy each customer's unique requirement (Cruceru & Moise 2014:156; Cuadros & Dominguez 2014). The understanding of customer uniqueness is a starting point to achieving customer trust through building a close and lifelong relationship with each market segment (Hansen, Samuelsen & Silseth 2008:207; Shy & Stenbacka 2013:92-92). This, therefore, may allow SMEs to become more efficient in minimising operational cost, maximising profits and also be able to survive the present competitive environment (McDougall & Levesque 2000:393).

Supply chain activities in terms of stock availability and delivery on time are very important to enhancing internal business performance. However, these strategic activities only focus on customer service and have nothing to do with customer relationship (Lam & Ip 2011:875). As a result, SMEs have developed the capabilities of offering uniform delivery services to all customer segments (Wu & Chou 2011:332). Customer segmentation refers to the method of classifying and learning about customer purchase behavior so as to build close customer relations by providing products or services for each segment (Wu & Chou 2011:333; Chan, Kwong & Hu 2012:1371). This indicates that SMEs main focus is based on achieving internal business goals and objectives through delivery on-time and managing customer complaints without considering how to efficiently serve and satisfy customers by implementing customer relationship management (Che-Ha, Mavondo & Mohd-Said 2014:2811). SMEs, therefore, find it difficult to compete effectively because competitors easily imitate their business strategies behind satisfying customers. Supply chain is a network

of managing relationships with customer of different segments, which cannot be easily imitated by competitors (Vickery, Jayaram, Droge & Calantone 2003:523; Hansen, Samuelsen & Silseth 2008:206). Supply chain network is important to SMEs performance as it enable SMEs to build strong relationships with their customers (Rexhausen, Pibernik & Kaiser 2012:269; Yu, Jacobs, Salisbury & Enns 2013:347).

SMEs operating under a customer service level that standardises customer satisfaction may fail to see the definition of value by different customers. In other words, a service that satisfies one group of customers may not satisfy the other group because the service rendered does not reflect the uniqueness of the customers (Vera & Trujillo 2013:580). SMEs, therefore, need to improve on their service operational efficiency by managing unique relationships with customers in order to meet customer's special requirements even at the price they are willing to pay (Baxter 2012:1250). This is because each customer segment may differ in terms of service, quality and satisfaction (Hansen, Samuelsen & Silseth 2008:206; Kuo, Wu & Deng 2009:888-890). According to Xu, Koh and Parker (2009:188-189), supply chain networks help SMEs create close customer relationships and also help SMEs identify the long-term requirements, expectations, and preferences of current and/or potential customers. Supply chain networks also enable SMEs to develop operational configurations that deliver tailored supply chain delivery with optimal profitability. SMEs can achieve a competitive edge through close customer relationships. Those relationships enable SMEs to become more proactive with customers, anticipate customer expectations, and measure the extent to which customers' needs are satisfied.

3.5.3.2 Collaborative relationships

In these recent times, supply chains require a close collaborative relationship among its partners, which is based on mutual trust for the purpose of improving cost effectiveness and quality customer services (Verdecho, Alfaro-Saiz, Rodriguez-Rodriguez & Ortiz-Bas 2012:249; Chen, Li & Arnold 2013:1181; Roden & Lawson 2014:90). Collaboration is about managing organisational relationships/partnerships within the supply chain in order to achieve competitive edge and high value for customers through long-term relationships that can lead to win-win benefits (Wu, Chuang & Hsu 2014:122-123). According to Xu *et al.* (2009:188), Claro and Claro (2010:222), and Ozcan and Islam (2014:116), the improvement and development of supply chain network, operational efficiency and customer satisfaction is driven by collaborative relationships between buyers and suppliers.

Collaborative relationship is a buyer-supplier and customer relationship based on active partnering where the buyer collaborates with the supplier fully in extensive social, economic, service and technical terms over time, with the intention of knowing total costing and increase in value, and thereby increasing mutual benefits (Chan & Zhang 2011:2320; Stuart, Verville & Taskin 2012:392). In other words, the partnering supplier should possess both technical and production capabilities required to do the desired quality and cost job. SMEs collaboration with highly specialised organisations may bring about a reduction in operational cost, flexibility in meeting customers' demands, product innovation and overcoming competitive challenges (Nyaga, Whipple & Lynch 2010:102). With this, SMEs are able to bring better value and service to customers. Collaborative relationship is an opportunity to combine resources (material and knowledge) to make business processes and strategies more sustainable as well as continuous improvement (Samaddar & Kadiyala 2006:192; Deitz, Tokman, Richey & Morgan 2010:863-864). It is regarded as a strategic solution to global business challenges because it improves team work within the supply chain (Roden & Lawson 2014:90). It is the ability of SMEs to work through different business teams and business owners around the world. Collaborative relationship is a genuine engagement as opposed to transactional relationships. It is the process of adding a deeper level of value to the organisation and customers (Verdecho *et al.* 2012:250).

A transactional relationship is mainly about competing to get the best value for transactions made, which leads to win-to-lose situation because of the lack of interdependency among buyer and supplier (Whipple, Lynch & Nyaga 2010:508). Supply chain network provides SMEs with the collaborative capabilities across other organisations in order to enhance business growth (Arend & Wisner 2005:403). Collaboration for efficient and effective business operation and performance is the main reason for supply chain networks. Supply chain network entails trust, commitment and satisfaction between organisations by developing mutual understanding of the set goals and objective, sharing and establishing common goals for mutual benefits (Wagner, Eggert & Lindemann 2010:841). It also involves integrated information sharing in order to support technology and use the information gathered to analyse threats and opportunities found in the external environment for mutual benefits (Claro & Claro 2010:222; Otero, Pastor, Portela, Viguera & Huerta 2013:12; Wu *et al.* 2014:122). In other words, collaborative relationship enables the supply chain partners work towards a common goal, and gets people to participate in achieving the organisational common goal (Whipple *et al.* 2010:508).

3.5.3.3 Information Technology

The importance and benefits of information technology are well known among practitioners, researchers, academicians as well as government institutions (Buckingham 1991:133, Zheng, Gorla, Somers & Wong 2010:207; Zhao & Stylianou 2013:514). Some of these benefits, according to Love, Matthews, Simpson, Hill and Olatunji (2014:2), Ali, Whiddett, Tretiakov and Hunter (2012:500), include reduction in SMEs operating costs, improved quality of new product development, integration of information exchange among SMEs and supply chain network partners, integrated information flow between project teams, reduction in the propensity for reverse logistics and improvement in interoperations efficiency as well as the whole life cycle associated with customer relationship management (Zheng *et al.* 2013:514; Kossai & Piget 2014:10). Creating value for customers has led to many organisations, if not all, looking for a strategic road map that helps them understand how to satisfy customers better and improve both business and service performance (Skok, Kophamel & Richardson 2001:410; Azma, Mostafapour & Rezaei 2012:94). Information technology brings about a fundamental connectivity that rectifies the way individuals, organisations and environments relate to each other, combining it with a new way to bring value to the society through various information communications (Henfridsson & Lind 2014:12). Through information technology, SMEs are able to analyse their market position within the competitive environment. They are also able to analyse the necessary skills and expertise required to ensure optimum use as well their impact on economic development (Ragowsky, Ahituv & Neumann 1996:91).

The mega trends of information systems in supply chain are (1) from technology central to business central; (2) from wide and complex total systems to decentralised small and simple services and applications; (3) from own system to leased system; (4) from proprietary and legacy systems to flexible and networked systems; (5) from customised systems to modular systems; (6) wireless, mobility and new terminal devices; (7) the role of information system from support process to primary process (Salmela & Lukka 2004:30). Figure 4.1 shows the integration of different types of systems in an organisation.

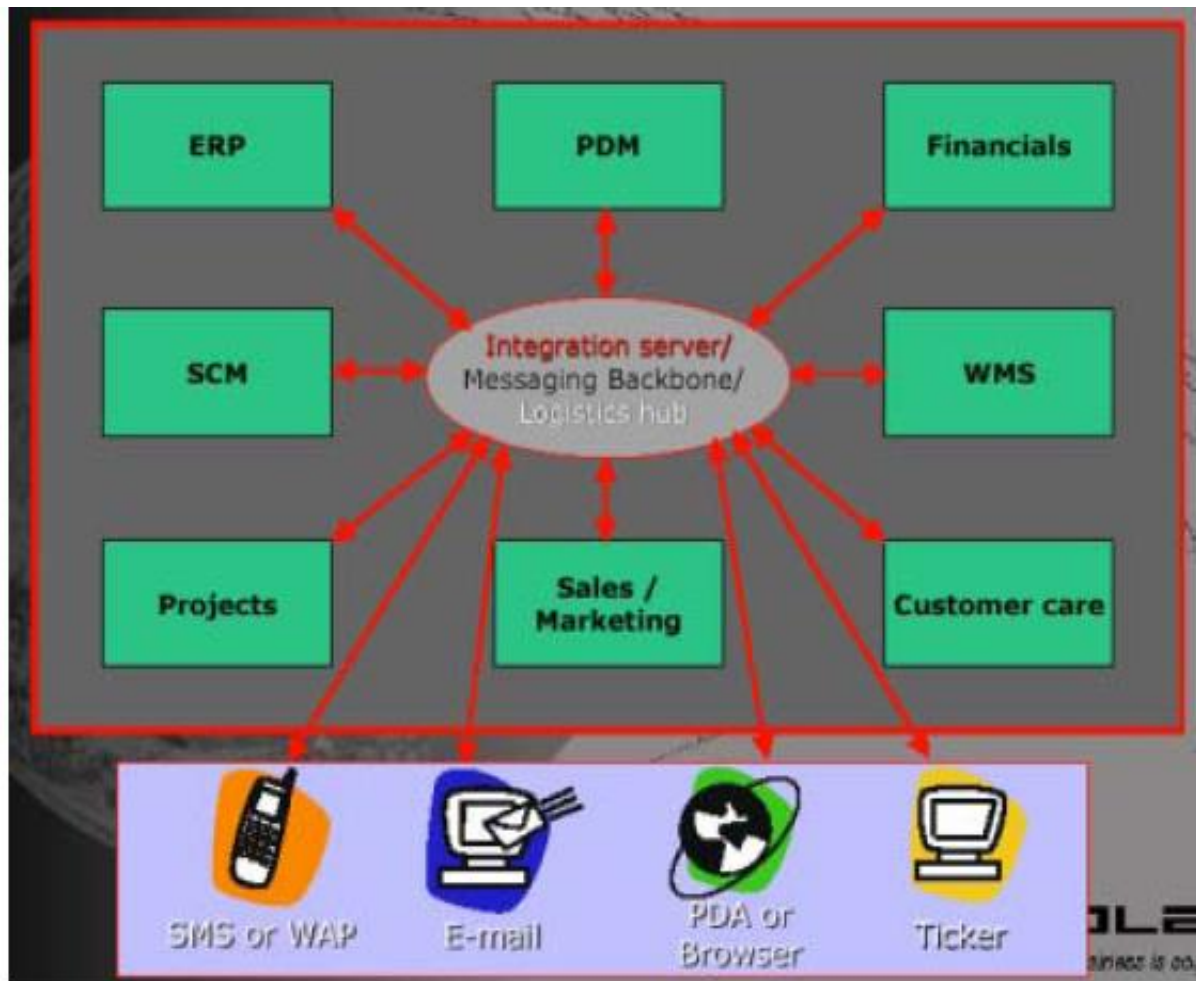


Figure 3.2: Integration of different systems internally in a company (Salmela & Lukka 2004:31)

All the information technology elements shown in Figure 3.2 makes it possible for different SMEs in the supply chain network to integrate their systems and databases despite compatibility differences. Information technology improves the flow of information and information exchange, as well as response time at different levels of the supply chain network (Coyle *et al.* 2003:8). Effective business design and execution depends on how technology is used to deliver services faster, cheaper, and with better quality than competitors do (Nickles, Mueller & Takacs 1998:495; Salmela & Lukka 2004:6).

Recently, many organisations have been unable to operate efficiently without the use of information technology as it enables SMEs to connect, be informed, engage through communication with suppliers and customers around the world (Kossai & Piget 2014:10). With all the daily business challenges, SMEs rely on information technology for sustainability and to make their business process relationships less challenging and also to

achieve business goals and objectives (Esteves, Santos & Anunciacao 2012:599). Information technology drives supply chain networks due to advancement of product through Internet marketing and sales, product and service quality assurance, support for all organisation's technical activities like infrastructure, core activities, edge services and production services and accounting and finance (Trainor, Rapp, Beitelspacher & Schillewaert 2011:162; Lee, Kim & Kim 2014: 286; Peppard, Galliers & Thorogood 2014:2; Royle & Laing 2014:163). The ability to determine the need of customers faster, deliver significant services to customers at any time that they need it, requires information technology to be successful in achieving organisational goals (Khalil & Wang 2002:128).

In conclusion, in the emerging economic and competitive environment, organisations need to be more productive and competitive to grow. One way forward lies in new information technology, which can help firms become more competitive. Information technology is important for SMEs as it not only reduces cost, but also enhances organisational growth. It also helps SMEs plan, execute and manage strategy, risk, operations, finance, people and customers. Information technology has a positive impact on business performance through improvement of labour productivity and collaboration with the SMEs (Kobelsky, Larosiliere & Plummer 2014:48).

3.5.3.4 Demand-management

Demand management has become popular among researchers and practitioners because of its link between SMEs internal supply chain activities and customers (Gupta, Maranas & McDonald 2000:2614; Jaipuria & Mahapatra 2014:2395; Shi, Song & Powell 2014:110). Demand management can be defined as the SMEs capability to understand customer demands and requirements in order to efficiently manage and schedule inventory (forecasting) within the supply chain network (Rexhausen *et al.* 2012:270; Petropoulos, Makridakis, Assimakopoulos & Nikolopoulos 2014:153). The processes of demand management include customer and product segmentation as well as integrated sales and operations planning. During the supply chain integration process, understanding and knowing how to manage customers' demands within the supply chain network is important to achieving set performance levels and improvement on accurate forecasting strategy in terms of product availability (Lane & Piercy 2004:660). The disadvantages of not being able to identify future fluctuations and changes in demand may result in higher production costs, loss of market shares and dissatisfied customers (Kaya 2013:680; Tiemessen, Fleischmann, Van

Houtum, Van Nunen & Pratsini 2013:367). SMEs are able to sell and anticipate future changes in customer demands through accurate demand and inventory visibility. In other words, though forecasting is important it should be coupled with effective demand management strategy put in place to earn higher cash inflow (Juttner, Christopher & Baker 2007:378). This, therefore, calls for SMEs collaborative relationship across the supply chain network.

Forecasting is a future guess about what is likely to happen, which may cause the risk of product obsolescence if the demand forecast is too high and also may result in unhappy customers if the demand forecast is too low (Heikkila 2002:748). This may further result in product return by customers, thereby causing delays in sales (Lui, Mantin & Wang 2014:82). Demand management on the other hand, focuses on the transformation of demand forecast into a more collaborative business plans that requires a collaborative organisational culture, a robust set of processes and effective information technology tools (Tiemessen *et al.* 2013:368). Information is the key to demand forecasting: information from the market place in the form of medium-term forecasts; information from the customer, preferably based on the actual usage and consumption; information on production schedules and inventory status; and information on marketing activities such as promotions that may cause demand to fluctuate from the norm (Waters 2003:27; Dietrich, Ettl, Lederman & Petrik 2012:9).

The management of inventory, materials and parts are essential to effective inventory requirements. SMEs need to make an accurate forecast of the amount of material that is needed. Demand management techniques such as JIT or materials requirement planning (MRP) approaches are important to obtaining an accurate forecast of the market's needs. Demand management is also necessary in determining what is needed from suppliers, and also attempts to determine the future price of raw material or products (Coyle *et al.* 2003:256; Voortman 2004:64; Li, Fonseca & Chen 2006:509-510).

Mason *et al.* (2003:142-143) define supply chain as a “network of facilities and distribution options that performs the functions of materials procurement, transformation of these materials into intermediate and finished products and product distribution to customers”. The critical task that underlies successful distribution today is demand-management forecasting because demand forecasting is the process of anticipating and fulfilling orders against defined customer service goals (Ray & Jewkes 2004:769; Juttner *et al.* 2007:377).

3.6 SUPPLY CHAIN FLEXIBILITY

As global competition among organisations grows stronger, and as customers require JIT product and service delivery, organisations begin to realise that supply chain flexibility and agile strategy are the key to overcoming competitive rivals and unpredictable changes in the market environment (Bertrand 2003:134; Garavelli 2003:142; Braunscheidel & Suresh 2009:119). Over the years, the quest to respond to customer orders has forced many organisations to refocus their decision-making strategy from incremental change to responding to customer demands in order to be flexible, responsive, and to quickly adapt to changing competitive environments (Sanchez & Perez 2005:681; Moon, Yi & Ngai 2012:191).

Gaining competitive strategy depends on how fast SMEs are in implementing modern business strategy and information technology to respond quickly to customers' needs and demands. This means that SMEs need to have the ability to deliver products or services as quickly as possible and thereby improving innovative skills in processes, products and services as well as business performance (Yuan, Zhongfeng & Yi 2010:301; Cingoz & Akdogan 2013:582). Supply chain flexibility is the ability of the SMEs to respond quickly and efficiently to uncertain changes in the market environment as well as opportunities and threats in the external environment (Braunscheidel & Suresh 2009:120). Being sensitive to changing competitive conditions and actions, sensitive to customers' changing demands and sensitive to suppliers capabilities and even predict government policy and regulations may be a key to SMEs performance (Swafford, Ghosh & Murthy 2006:170).

Supply chain flexibility enables SMEs to develop a transformational agile capability in responding to customer demands (Li, Ragu-Nathan, Ragu-Nathan & Rao 2006:109). In other words, supply chain flexibility is an adaptive strategy that can help SMEs to be proactive in responding to unpredictable market changes. Supply chain flexibility is the ability to respond quickly to market demand changes and being able to adapt in the competitive environment (Gong 2008:746). SMEs need to be flexible and responsive in order to be able to stay connected within the supply chain networks.

Though supply chain network provides a cross-functional team with the right talent and decision-making capabilities that enable SMEs cope and gain competitive advantages over rivals (Das 2011:170), supply chain flexibility capability entails a flexible adjustment of

operational strategy within the SMEs and supply chain network (Chandra & Grabis 2009:743). This, therefore, means that, for SMEs to achieve competitive advantage over competitors requires a flexible coordination of operational strategy with customer and across the supply chain network to effectively and efficiently align mutual competences in order to quickly respond to changing market demands (Kesen, Kanchanapiboon & Das 2010:126).

Supply chain flexibility as the heartbeat and backbone of SMEs, is the only agile strategy that enables SMEs contribute to employment and economic growth (Chan & Chan 2010:134). It also enables SMEs to be more alert to opportunities and threats (Schutz & Tomasgard 2011:301). Therefore, the success of supply chain network is built on a flexible foundation (Swafford *et al.* 2006:170). That is, supply chain flexibility strengthens the effective functioning of supply chain networks as its main focus is on quick response to customers changing demands. Supply chain flexibility can result in a high level of SMEs performance as customer satisfaction generates more profit over time and thereby gain competitive advantage over rivals (Caldwell, Walker, Harlend, Knight, Zheng & Wakely 2005:243).

Enhancing customer satisfaction means being able to maneuver operational activities to accommodate different customer needs. Operational activities are referred to as SMEs core business capabilities such as manufacturing, distribution, marketing and selling of product and service. These strategic operational activities determine SMEs business performance and sustainable competitive advantages. These activities also determine whether SMEs are making profit or not whilst improving on delivering on time the right volume and product variety requirement (Gong 2008:747; Schutz and Tomasgard 2011:300; Das 2011:170).

SMEs strategic level decision making should accommodate different volumes and variety changes in future so as to be flexible and predictably improve cost efficiency (Andersson & Stahl 2011:669). Supply chain flexibility is the ability to handle different volume or “change the volume of output of a production process in accordance to customer orders” (Husseini, O’Brien & Hosseini 2006:654). The management of volume, variety and delivery flexibility is important to both manufacturing organisations and service organisations in order to control shortage or excess inventory. Flexibility in delivering the right volume requirements enables SMEs retain and manage inventory so that there is no shortage or excess delivering of products (Bertrand 2003:134; Metternich, Bollhoff, Seifermann & Beck 2013:79). Volume flexibility is the ability of SMEs to adjust quickly to changing volume requirements and new market situations without much effort, time and cost.

For SMEs to achieve business sustainability and long-term success, the business quality strategy should be based on a flexible foundation. Researchers of supply chain strategy suggested that quality, cost, delivery and flexibility are key indicators of business success and performance. (Devaraj, Vaidyanathan & Mishra 2012:560). This, therefore, will enable SMEs to adapt quickly to any dip in demand, surge in sales and shift in market conditions with minimum disruption (Jack & Raturi 2002:520). Other success factors that drive and make possible supply chain flexibility are purchasing flexibility, outsourcing flexibility, product life cycle management and information technology. These enable SMEs make regular contact with customers, respond quickly to customer demands, manage planned and unplanned events all the time without delay and protect business reputation and brand name. To accomplish this, SMEs need to maintain collaborative relationships with supply chain partners, implement strategic leadership, develop sustainable core capabilities, invest on human capital development, implement new organisation structure that embrace innovative culture as well as new manufacturing and information systems (Yuan, Zhongfeng & Yi 2010:302; Cingoz & Akdogan 2013:582).

Supply chain flexibility requires SMEs to expand operation capacity in order to accurately manage demand forecasting and exceed customer expectations at the right time and place. The increase in JIT production of products or services at the right time and place as well as in the right quantity and quality has also contributed to the need of supply chain flexibility (Jack & Raturi 2002:522). According to Hussein *et al.* (2006:655), “the JIT production approach aims to produce defect free goods in the required amount at the right time mainly through eliminating wastes, improving capabilities and establishing a continuous flow of production”.

Though organisations’ competitive advantage and performance stem from customers who have developed loyalty and commitment to a particular product brand, flexibility is the road map to building customer loyalty. This is because, responding to customers demand for higher performance levels with respect to on-time delivery and being able to provide new improved products is called supply chain flexibility. Competitive advantage is achieved through the ability to respond to customer demands without delay. On-time response to customer needs can also lead to reduction in operational cost and enhanced greater flexibility. Hence, supply chain flexibility requires collaborative relationships between SMEs for it to be more effective in satisfying customers’ requirements (Garavelli 2003:142; Oh, Ryu & Jung 2013:157).

Organisations rival within the competitive environment are as a result of many organisations selling similar products or services to the same group of customers (Johnson, Scholes & Whittington 2005:85). In this case, SMEs need to be alert to customer demand in order to be innovative and improve on existing products or services offered. Zhang *et al.* (2003:175), add that larger organisations tend to achieve a more competitive advantage over SMEs because of their ability constantly to deliver new innovative products as well as their reliance on supply chain networks for flexibility. Supply chain flexibility, therefore, gives the members within the supply chain network the ability to quickly respond and to cope with changes within the competitive environment (Das 2011:172; Wieland & Wallenburg 2013:301).

In conclusion, the emerging global competitive environment has increased organisation's concern for survival and success. The increased organisational concern for their well-being has resulted in reliance on supply chain flexibility, for business growth, through customer satisfaction. Strategic flexibility helps SMEs within the supply chain networks to be able to determine customer future demands and to respond quickly to the ever-changing customers' demand. It also enables SMEs to adjust to the shifts in the supply chain network, manage business performance and helps SMEs to be prepared when business crisis arise Li and Lin (2006:334).

3.7 SUPPLY CHAIN INTEGRATION

The importance of supply chain networks has prompted many practitioners and academicians to start researching on ways, methods and strategies to improve and align supply chain network. Stefanovic *et al.* (2009:744), emphasis on the use of a 'process approach' to enhance supply chain network performance as well as creating business opportunities to employ expertise and best practice. Chang, Chiang and Pai (2012:1115), also emphasise the use of cooperative strategy to gain competitive advantage with "its partnering firms (i.e., upstream suppliers and downstream buyers) within a specific type of supply chain network".

Supply chain integration uses information and communication technology to coordinate the flow of materials, information and finance in order to improve business performance and customer satisfaction (Farhanghi, Abbaspour & Ghassemi 2013:665). SMEs within the supply chain network integrate shared information technology across the supply chain for effective planning, execution and controlling the network activities (Choi *et al.* 2001:352). According to Savioz and Blum (2002:92), information and communication technology may

lead to more innovative SMEs because the integration of technology in the administrative operations of production and development process leads to best employment of technology. They go on to state that through information and communication technology, SMEs may acquire external knowledge that will aid their decision-making, for example getting specialists to join the board of directors.

The resulting benefits from SCI are as follows: there is a high level of information exchange with key supplier through information technology; the establishment of quick ordering system; a high stable procurement through supply network; data integration and system-wide information system integration among internal functions; integrative inventory management system; periodic interdepartmental meetings among internal functions; a high level of follow-up with customers for feedback; organic linkage with customers through information network and agility of ordering process (Narasimhan & Kim 2002:321; Danese, Romano & Formentini 2013:125; Lee, Kim & Kim 2014:285; Palma-Mendoza, Neailey & Roy 2014:167). Other business advantages include favourable cost and efficient services that can benefit customers as well as economies of scale, which can reduce costs. SMEs may be a step ahead of their competitors as they are able to supply value-added products and meet customers' specific requirements in the right condition, at the right time and place.

SMEs are also able to utilise limited resources (factors of production) wisely, and are better effective planners (Rajaguru & Matanda 2013:621). This will further create a less stressful working environment that motivates the employees to utilise their skills efficiently and effectively towards achieving the organisations goals and objectives as well as the overall supply chain network goal. A sound SCI mechanism or process and people are important asset to SMEs as they may be difficult to duplicate or imitate by competitors Danese, *et al.* (2013:126). SCI is a very important requirement for supply chain network maturity, improvement and continuous development (Prajogo & Olhager 2012:514). SCI is divided into internal and external integration and is discussed in the following section.

3.7.1 Internal integration

According to Zhao, Huo, Selen and Yeung (2011:17), internal integration is the degree to which SMEs business practices, procedures and behaviours are structured in collaborative, synchronised and manageable processes in order to satisfy customers. One of the reason for setting business objectives and goals to an extent, is to have an idea on how to implement and

integrate the different functional areas of an organisation so that together the overall set goals are achieved (Louw 2006:10; Ehlers & Lazenby 2007:3; Etzold & Buswick 2008:280-284). It has been found that almost every organisation (large or small) is organised in a structural manner, which in turn influences organisational behavior (Guerrero & Kim 2013:75). Whether the organisation's hierarchy is centralised, flat or horizontally structured, responsibility, power, authority and work procedure among the organisation's members needs to be integrated as a system in order to achieve the desired outcome (Chen, Qiao & Lee 2014:84). Organisations can hinder their progress toward achieving high level of performance if integration strategy is not put in place. Each structural unit of the organisation may neglect the set objectives in pursuit of its own interests and goals, and thereby competing with one another within the organisation.

In some instances, the overall internal business goals may not be well understood by all the functional areas within the business and as a result there may be a mixed alignment of strategic objectives focus (Li & Tang 2010:401). It may also be that SMEs do not have a process integration strategy that is well built into the culture of the business. This may require SMEs to establish a business culture that supports internal process integration within the firm in order to better satisfy both their customers and suppliers within the supply chain. Supply chain network enables SMEs to gather valuable information, value for customers' and better decision-making through information technology that may not be possible to achieve by individual SMEs operating in isolation (Cao & Zhang 2010:359).

The division among an organisation's functional units may lead to customer dissatisfaction, increased operational cost as well as inflexibility (Vuksic, Bach & Popovic 2013:15). Therefore, the process of strategy development and implementation should be integrated carefully to ensure that the SMEs accomplish the expected results (Love *et al.* 2014:4). Supply chain integration (SCI) is a very important concept in ensuring business performance because of its added benefits emanating from significant savings and high levels of profitability (Prajogo & Olhager 2012:515). Supply chain integration will help SMEs build an effective and efficient value system for customer by aligning the objectives of internal business functions toward attaining the overall set goals of the organisation. Therefore, SMEs should shift their focus away from functional focus to process integration to increase the level of customers' satisfaction within the organisation.

Therefore, it is of no use having organisational vision, goals and objectives without the careful integration strategy that underlines how the different functional activities should be organised and coordinated to achieve the set goals and objectives (Li, Yang, Sun & Sohal 2009:126). The organisational objectives may specify all the organisational functional units as well as their specific job requirement, but the most important is that all the functional units or activities must cooperate and work together in order to fully achieve the target goals (Danese 2013:1029; Kocoglu, Imamoglu, Ince & Keskin 2011:1630).

According to Markham and Westbrook (2001:186) and Rajaguru and Matanda (2013:620;), all organisations within the supply chain network need to direct, organise and integrate all the functional activities in order to function effectively and efficiently. SCI is the alignment of all organisations' activities within the supply chain from the point of manufacture to point of consumption of goods or services by the ultimate customer (Paulraj, Chen & Flynn 2006:108). SCI, therefore, involves coordinating, planning, implementing and controlling the efficient and effective flow of products and services, information, money and decisions within and outside the organisation in order to meet customer's specific requirements at a low cost (order fulfilment) (Flynn, Huo & Zhao 2010:60). According to Monczka, Handfield, Giunipero, Patterson and Waters (2010:104), "integration is the process of bringing together different groups, functions or organisations, to work together on common business-related assignments in order to solve problems and improve on performance".

In conclusion, SMEs require a SCI strategy to contribute to the continuous success of the organisation and to the South Africa's economy. The ability of SMEs to integrate business activities with supply, across the supply chain and with customers will no doubt achieve competitive advantages over its competitors (Swierczek 2013).

3.7.2 External integration

External integration is divided into customer and supplier integration. Supplier integration is the strategic relationship that exists between the purchasing firm and the supplier (Li & Tang 2010:401). It involves the setting of standard performance levels required by each party in a relationship for commitment purposes (Droge, Jayaram & Vickery 2004:556; Zhao *et al.* 2011:18). Furthermore, both parties put key performance indicators (KPIs) forward as a roadmap in order to achieve a high level of performance. Customer integration involves the coordination, implementation and controlling of goods and services as well as the forward

and backward flow of information from the point of origin to the point of consumption (Yu *et al.* 2013:347). External integration, therefore, is the collaboration and involvement of suppliers and customers into the overall business plan and process of an organisation in order to gain competitive advantages through exceeding customer expectations.

External supply chain integration aligns an organisation's process with those of customers and suppliers (Jayaram & Xu 2013:59). External integration involves the distribution of knowledge and information among customers and suppliers regarding sale forecasting, product design and marketing plans, inventory levels and promotion plans (Tzabbar, Aharonson & Amburgey 2013:481; Zhao, Carvugil & Cavusgil 2014:1058). This allows quick replenishment of store shelves and increases flexibility for keeping up with changing customer demands and catering for diverse customer needs. Customer integration can be a source of innovation for SMEs as customer demand for goods and services changes over time (Cabigiosu, Zirpoli & Camuffo 2013:662; Schaarschmidt & Killian 2014:350). Supply chain network provides the opportunity for achieving strategic integration and management within and outside the organisation. This is because supply chain management comprises of interconnected organisation, suppliers and management processes working together to bring value added benefits to customers through JIT delivery of product or service (Yu *et al.* 2013:348).

Organisational competitive advantage also depends on the organisation's ability to integrate knowledgeable information that is sourced within the supply chain network (Li & Tang 2010:401; Tzabbar *et al.* 2013:482). External integration requires integrated information technology as well as talented individuals to analyse the data Kocoglu *et al.* 2011:1631). External integration, therefore, will enable SMEs to maintain and develop knowledge-based learning environments for both suppliers and customers within the supply chain (Jayaram & Tan 2010:262). SMEs are faced with the challenge of finding, hiring and developing talented individuals or well-skilled supply chain personnel that would otherwise bring transformational change. The embedded supply chain network consists of various personnel or professionals who are coordinated to achieve world-class through information sharing, skills and competent in order to maintain commitment to customers and also to exceed customer expectations (Jang 2014:105).

External supply chain integration is also concerned with the ability of the SMEs to align information and knowledge gained from the collaborative relationships within and across the supply chain networks to achieve visibility for better planning and execution of strategic

objectives. Strategic integration is concerned with making clear from the onset the role and responsibility of each partner within the supply chain network in order to act efficiently and effectively with flexibility towards to the overall set objectives. This means that through external supply chain integration, all partners are accountable for the overall supply chain and business performance (Olavarrieta & Ellinger 1997:559; Duclos *et al.* 2003:450; Salmela & Lukka 2004:14; Gosling *et al.* 2009:3). Therefore, the success of external integration with customers and suppliers depends on the level of coordination within the internal integration of each individual SME (Zhao *et al.* 2011:19; Horn, Scheffler & Schiele 2014:56).

3.8 SMEs PERFORMANCE

SMEs play a vital role in supply chain performance as many of them serve the roles of suppliers, distributors, producers and customer. Supply chain network, flexibility and its integration strategy are directed towards improving SMEs performance for both internal and external environments. For an SME to compete effectively and to gain a sustainable advantage over its competitors, it is necessary to improve the quality, lead times and cost of its products and services (Sohal, Netto, Fitzpatrick & Noori 2001:437). Supply chain network can influence the operational performance of SMEs in areas such as cost, quality, flexibility, lead times, inventory, transport, delivery time and delivery dependability as well as financial performance (Done *et al.* 2011:501). Supply chain network also leads to sustainability of business strategy and competitive advantage and further improvement in every other area of the business.

SMEs business performance can be improved through supply chain networks, it flexibility and integration and can also have a positive impact on SMEs revenue and profitability (Mentzer, Flint & Hult 2001:82). As engines of economic growth, SMEs are expected to contribute significantly to the South African GDP. SMEs, therefore, need to improve on business strategy in order to compete effectively and increase both business performance and economic growth (Herrmann, Huber & Braunstein 2000:77). Supply chain networks, flexibility and integration impact positively on “speed, reliability, post-sale customer service, responsiveness to the target market, wide-spread distribution coverage, selective distribution coverage as well as low-cost distribution” (Li & Lin 2006:335).

3.9 CONCLUSION

This chapter presented the literature review with regard to supply chain network, supply chain integration, supply chain flexibility and SMEs performance. These four major concepts form the pillars of this study. This chapter also concludes the theoretical literature review of the study. The day to day running of SMEs depends heavily on their ability to generate more profit for the organisation and also depends on the ability to provide value added goods and services that can satisfy or exceed customer requirements and expectations. Exceeding customer requirements and expectations requires that organisations should be more strategic, flexible and responsive. It also further requires that SMEs network with other organisations in order to overcome uncertainties successfully both within and outside the business environments. In addition, the information-sharing benefits, knowledge transfer benefits, complementarities advantages as well as the collaborative advantages that may result from supply chain network require integration strategy for achieving competitive advantages and business performance. Figure 3.3 shows the diagrammatic summary of the theoretical review. The next chapter will discuss the research hypothesis development and the research methodology.

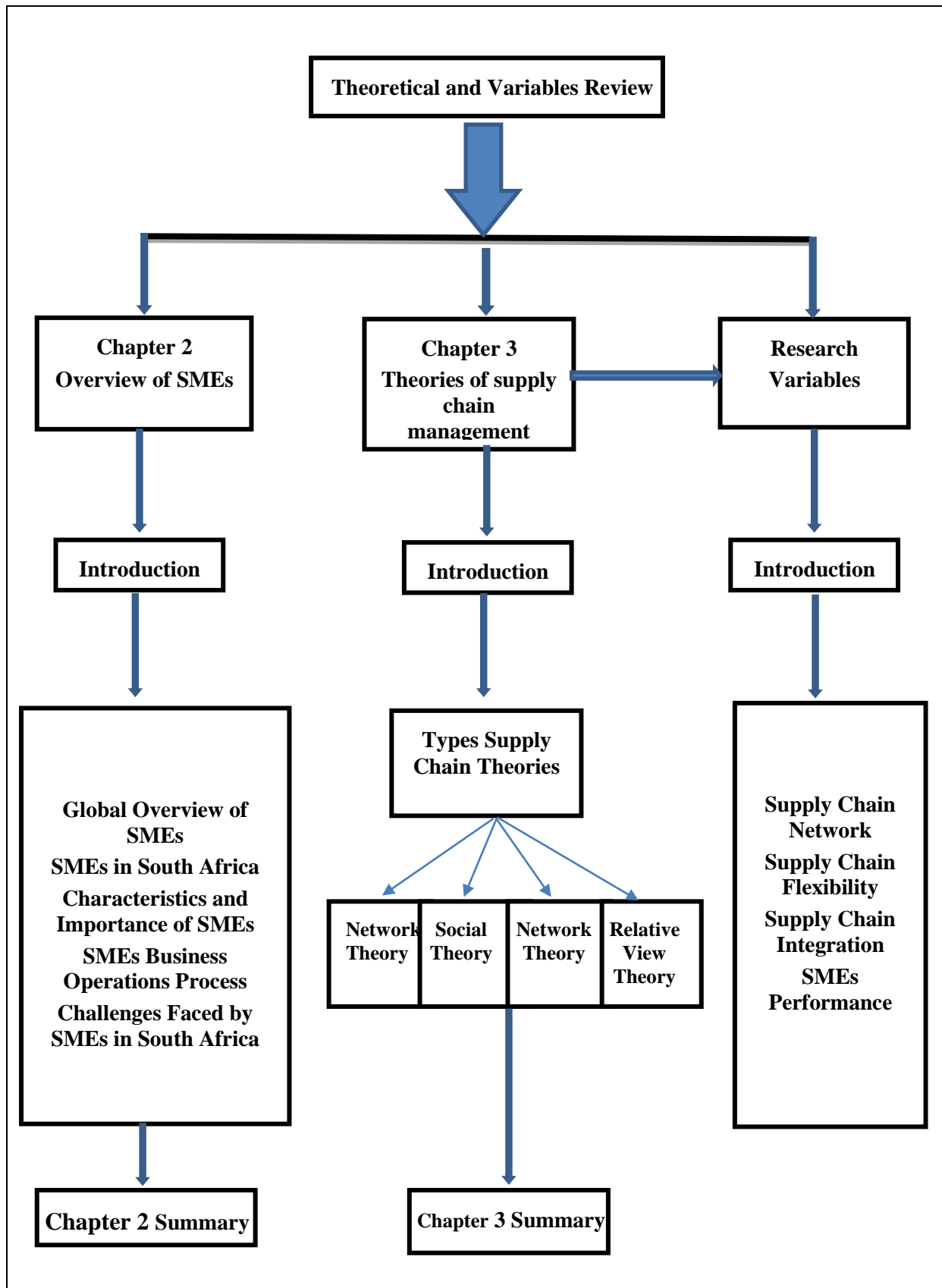


Figure 3.3 Diagrammatic summary of the theoretical review

CHAPTER 4

THE CONCEPTUAL MODEL AND HYPOTHESIS DEVELOPMENT

4.1 INTRODUCTION

In the previous chapter, the literature review and theory perspective was carried out on supply chain network, flexibility and supply chain integration among SMEs. This chapter establishes and discusses the research conceptual model and hypothesis development for the supply network relationship to SMEs performance and integration, supply chain flexibility relationship to supply chain integration and performance and finally, relationship of supply chain integration to SMEs business performance. Based on the literature reviewed and the theoretical perspective discussed in the preceding Chapter, five hypotheses are formulated for further empirical investigation. Figure 4.1 presents the conceptual model for this study, which presents both the direct and indirect effect of supply chain network, flexibility with the mediating role of supply chain integration on SMEs performance.

4.2 CONCEPTUAL MODEL

A conceptual model is a schematic diagram that describes the relationships between the research variables and also indicates the research boundaries (Houser 2012:143). A logical structure guides the researchers' understanding and development of the research study (Sekaran & Bougie 2010:81). According to Marriam (2009:67), the conceptual model is important because it “guides the research process in terms of the identification of relevant concepts/constructs, definition of key variables, specific hypothesis statements to be investigated, selection of a research design, choice of a sample and sampling procedures, data collection strategies, data analysis techniques and interpretation of findings”.

The study proposed a conceptual model consisting of two antecedents (supply chain network and supply chain flexibility), one mediating variable (supply chain integration) and one outcome variable (SMEs performance). Supply chain network relationship in the study refers to inter-organisational collaboration of independent organisations linked together as a set of nodes for the purpose of achieving business performance (Lemmetyinen and Merilainen 2011:26). By networking, SMEs may become more flexible through integrating skills and knowledge gained from the relationship into their business. The proposed conceptual model

showing the hypothesised relationship between the research variables is presented in Figure 4.1. The individual hypotheses are developed and discussed thereafter.

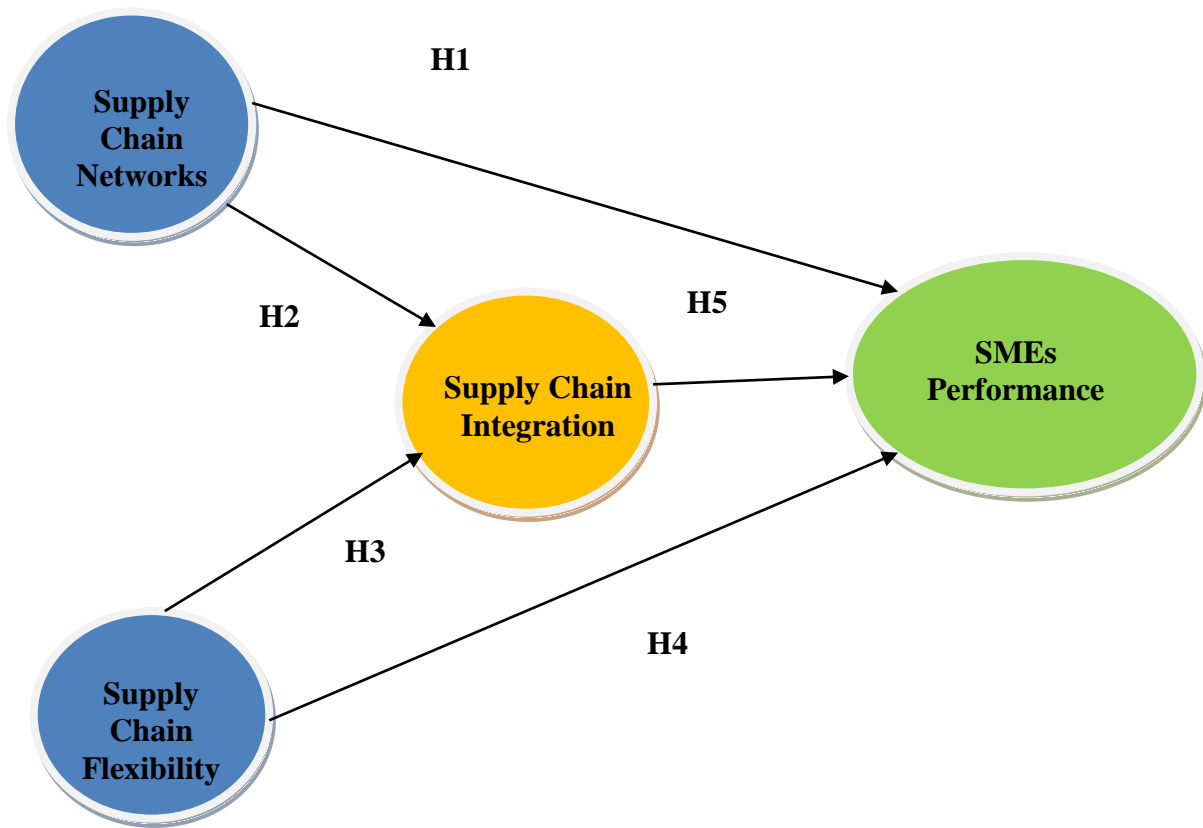


Figure 4.1: The research conceptual model

4.3 RESEARCH HYPOTHESIS

A hypothesis is an uncertain explanation that accounts for a set of facts and can be tested by further investigation (Punch 2005:38). Hypothesis is referred to as an empirical statement or proposition about a factor that is of interest to the researcher (Singh & Bajpai 2008:91). It is a predicted statement proposed by the researcher to statistically test and find a solution to the research problem or question based on observation or experience (Cargan 2007:36). In other words, it is a prediction of what the researcher believes the study will find. These developed hypotheses, after being statistically analysed, can either be proven statistically significant (H_a = alternative hypothesis) or null statistically significant (H_o = null hypotheses) through the research study findings (Cooper & Schindler 2003:118). An alternative hypothesis is a statement that states there is a significant positive relationship between the research variables. While the null hypothesis is a statement that states that, there is no difference (not very similar) in the relationship between the research variables (Martin & Bridgmon 2012:26).

However, rejecting the null hypothesis and accepting the alternative hypothesis is the basis for building a good research study. Tredoux and Durrheim (2002:128) point out that a well-developed research study needs a hypothesis statement in order to effectively answer the research questions. The research hypothesis development for this study represents a testable statement predicted to have a statistically significant relationship and is discussed in the following sections:

4.3.1 Supply chain network and SMEs performance

Researchers have indicated that supply chain networks can enable SMEs to be more competitive and increase performance to customers as well organisational performance (Harland *et al.* 2007:1235; Bayraktar, Demirbag, Koh, Tatoglu & Zaim 2009:134; Chin, Hamid, Rasli & Baharun 2012:615). SMEs can gain strategic business skills through communication exchange among organisations within the supply chain network, which may further enable SMEs leverage limited resources and skills efficiently and effectively (Rabinovich *et al.* 2007:662; Barnes & Liao 2012:888). The results emanating from supply chain network directly influence SMEs performance, for example, increased revenue growth, reduce time to market, lower cost and improved customer satisfaction (Hakansson & Ford 2002:134). The risks and challenges of doing business such as customers' changing demands, (Martelo *et al.* 2013:2043), meeting customers specific requirements (Lai, Xie, Tan & Yang 2008:202), varieties of new products and on-time delivery of products and services through information technology may also become less challenging through supply chain network (Chin *et al.* 2012:616; Cao, Gan, & Thompson 2013:720).

The existing literature also reveals that the supply chain network can be a source of innovation as it provides SMEs the opportunity for the transfer of the flow of resources, information and creative ideas, which can enhance SMEs performance faster than competitors (Ozbas 2005:97; Van Donk & Van der Vaart 2005). As a result, SMEs cannot compete successfully through supply chain networks because today's emerging competitive environment occurs between supply chain networks rather individual organisations (Li, Ragu-Nathan, Ragu-Nathan & Rao 2006:107; Jarvensivu & Moller 2009:654). Therefore, supply chain networks enable SMEs reach the maximum level of competitive advantage and performance. This study, therefore, proposes that:

H1: Supply chain networks have a significant positive influence on SMEs performance.

4.3.2 Supply chain network – flexibility and integration

In the emerging global and technological business challenges, both researchers and practitioners of supply chain network believe that gaining competitive advantage is no longer achieved through a single organisation working in isolation; competitive advantage is achieved through a network of inter-organisational relationships (Jap 2001:21; Hammervoll 2011:265; Albino *et al.* 2012:305; Li *et al.* 2012:353; Wu, Chuang & Hsu 2014:122).

While this may be true as indicated by these researchers, the backbone connecting and aligning all the logistical activities within the functional areas of SMEs and across the entire supply chain network to making sure that objective and set goals are achieved is the hardest part of any business strategy process (Chen, Preston & Xia 2012:392). Enhancing flexibility within a supply chain network requires a well-organised and planned integration strategy of all functional activities so that the whole process of supplying and delivering to customers is efficient and effective (Kim 2009:328; Flynn *et al.* 2010:59). A plan to implement supply network relationship into the business strategy can also mean a plan to implement flexibility strategies that are well integrated to keep up with competitors (Droge, Vickery & Jacobs 2012:251; Williams, Roh, Tokar & Swink 2013:543).

Effective integration within the supply chain network can enhance SMEs marketing and logistics efforts by helping the SMEs respond to changing customer demands and overcome information technological challenges as well as the improvement of new product development. Successful integration requires information technology to improve on productivity both internally and within the supply chain network. Well-integrated information is the key to supply chain network excellent because networking involves the sharing of strategic and tactical information with suppliers and customers to enhance supply chain performance. With this in mind, achieving organisational goals, costs reduction, continuous improvement in customer satisfaction as well as development of products and services become easier and faster to accomplish (Van Weele 2010:161). Supply chain network and its flexibility make strategic integration a business strategy for SMEs to effectively compete and maintain competitive advantage. The success and value of supply chain network depends on SMEs ability to maintain collaboration among its members and stakeholders. This, therefore, means that SMEs supply chain network and supply chain flexibility require integrated information systems that connect all members within the supply chain for it to improve cost-

efficiency, profit, healthy collaborative relationships, customer satisfaction, and superior supply chain performance (Kim 2009:329). Therefore, it is hypothesised that:

H2: Supply chain networks have a significant positive influence on SMEs supply chain integration

H3: Supply chain flexibility has a significant positive influence on SMEs supply chain integration

4.3.3 Supply chain flexibility and SMEs performance

Different strategic processes to achieving business performance have been researched on, for example, setting goals and objective, managerial structure as well as culture and procedural strategies has been researched as having direct influence on SMEs performance (Garengo, Biazzo & Bititci 2005:25; Li, *et al.* 2006:108; Braunscheidel & Suresh 2009:120; Wu, Chuang & Hsu 2014:122). However, a rigid or a strict vision and objectives that restrict the SMEs to operate in one direction may have a negative effect on the performance of SMEs as the set business objectives may provide inflexibility when flexibility may be needed. In today's business competitive environment, flexibility is needed to respond to market uncertainty, changing customer requirements and expectations without incurring excessive costs, time, organisational disruptions and performance losses (Narasimhan *et al.* 2004:91; Sanchez & Perez 2005:681; Shang & Marlow 2005:218). Supply chain flexibility aids SMEs use of limited resources efficiently and effectively, cope with the emerging technological challenges as well as global business competitive challenges (Zhang *et al.* 2003:174; Tachizawa & Gimenez 2010:214). In this respect, Gosling *et al.* (2009:5), define supply chain flexibility as the SMEs ability to cope and periodically adjust business objectives to rapidly changing market uncertainty.

According to Swafford *et al.* (2006:531), Alpkhan, Yilmaz and Kaya (2007:155), and Gong (2008:745), being flexible and responsive to customers specific requirements within the supply chain is the key to business success and performance and as such be used by SMEs as a strategic weapon to overcoming market uncertainty and business challenges. With supply chain flexibility SMEs are able to establish new business opportunities and market gaps faster than competitors, thereby keeping pace ahead of competitors (Laforet 2013:490). Supply chain flexibility enables SMEs to continuously improve and provide value added products and service as well as sustained competitive advantages (Li *et al.* 2006:107; Chan &

Chan 2010:334). In other words, ensuring quick response to deliver innovative product and service at the right time, place, and in the right quality and condition can directly influence SMEs performance (Schutz & Tomasgard 2011:682). This study, therefore, hypothesises that:

H4: Supply chain flexibility has a significant positive influence on SMEs performance.

4.3.4 Supply chain integration and SMEs performance

The increased of interest in integration and organisational performance as the essential way of achieving competitive advantage has been the focus of many academicians, researchers and practitioners (Jayaram & Tan 2010:262; Prajogo & Olhager 2012:515; Danese 2013:1029; Yang 2014:104). According to Chen *et al.* (2012:391) and Wong, Wong and Boon-itt (2013:566), supply chain performance may not be possible if the SMEs goals and objectives are not well implemented. The implementation of strategic goals, therefore, requires integrated mechanism such as people and information system that align both the tactical and operational activities as well as organisational procedures within the supply chain (Li *et al.* 2009:125; Flynn *et al.* 2010:58; Danese 2013:1030; Williams *et al.* 2013:543).

Integration as the mediating variable between supply chain network, supply chain flexibility and SMEs business performance build stronger links in a collaborative manner, which could lead to customer satisfaction and the achievement of organisational goals and thereby enhance organisational performance (Yu *et al.* 2013:346). Apart from the enhanced organisational performance, supply chain integration also has a positive influence and impact on new product development (Droge *et al.* 2012:250), product quality and service (Wong *et al.* 2011:604; Lotfi, Sahran, Muhtar & Zadeh 2013:473; Jang 2014:105), inter-firm relationship and collaboration (Prajogo & Olhager 2012:514), organisational orientation and innovation (Lin, Wang & Yu 2010:320; Wong *et al.* 2013:566). This study, therefore, hypothesises that:

H5: Supply chain integration has a significantly positive influence on SMEs business performance.

4.4 CONCLUSION

This chapter discusses the conceptual model and the hypothesis development for the research study. Figure 4.2 shows the diagrammatic summary of this chapter. The next chapter presents the research method for data collection as well as the statistical techniques used for this study.

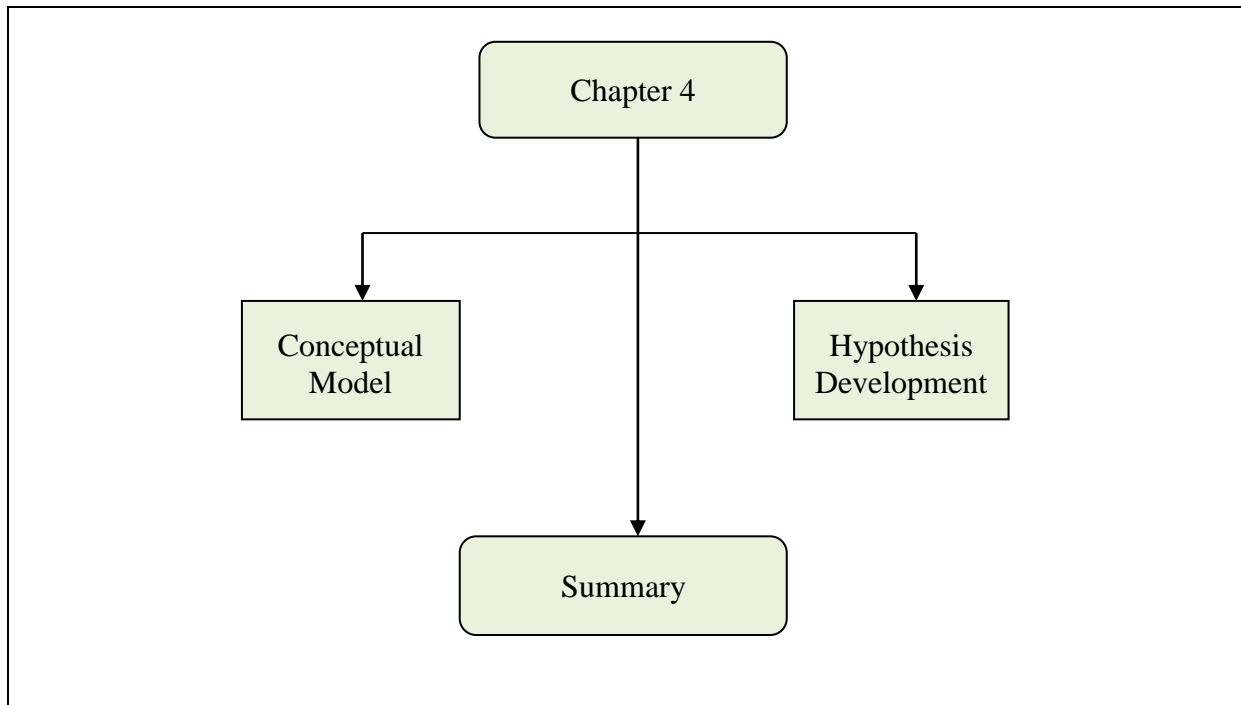


Figure 4.2: Diagrammatic summary of Chapter 4

CHAPTER 5

RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

The previous chapter discussed the research conceptual model and hypothesis development referring to the influence of supply chain network, its flexibility and integration on the performance of SMEs. Because SMEs are referred to as a strong hold for economic development and sustainability, a study leading to SMEs performance can then be seen as essential both to literature and to economic growth. The lack of understanding of business strategy to enhancing performance may lead to or prevent SMEs from contributing to economic growth as expected. The literature review of this thesis shows that supply chain network, flexibility and integration can aid SMEs performance.

The aim of the chapter is to present the methodology and design; the method of sampling and data collection method; data analysis method and statistical techniques for this study. According to Cooper and Schindler (2003:163), research methodology refers to the way in which data are gathered for a research project. It is a plan or a guide on how the researcher proposes to collect, measure, and analyse data in order to achieve the objectives of a research goal. This chapter begins by discussing the data collection techniques and then moves on to discuss the statistical analysis techniques used to determine the extent of the data fit to the proposed model.

The research methodology used for this study will follow a typical research process. The research process is divided into six steps. Step 1 will focus on the type of research approach and design used in this study as well as the motivation for the type of research chosen. This will be followed by step 2, where the sampling method used for this study will be presented. Step 3 will explain the questionnaire design and the data collection method. The motivation for the data collection method will be given. Step 4 will present the data preparation methods such as editing and coding of data. Step 5 will present the statistical analysis technique of the study. In step 6, the reliability and validity of the data will be explained. Finally, in step 7, confirmatory factor analysis (CFA) as well as SEM criteria used in assessing the model fit and the hypothesis testing will also be explained.

5.2

STEP 1: RESEARCH APPROACH AND DESIGN

At present, there are two well-known and recognised approaches to research, namely the qualitative and the quantitative paradigms. These two methodological paradigms differ from each other. According to Fouche and De Vos (2005:108), the prospective researcher must orientate him or herself to the differences between the two approaches and come to a decision as to which one would be the better choice for the study. Table 5.1 briefly discusses the differences between quantitative and qualitative approaches to research. For the purpose of this study, a quantitative research approach was used and is discussed below.

Table 5.1: Differences between qualitative and quantitative research methods

Factors/ Characteristics	Qualitative	Quantitative
Research Objectives	Discovery and identification of new ideas, thoughts, feelings; preliminary insights on and understanding of ideas and objects	Validation of facts, estimates, relationships, predictions
Type of Research	Normally exploratory designs	Descriptive and causal designs
Type of Questions	Open-ended, semi-structured, unstructured, deep-probing	Mostly structured
Type of Execution	Relatively short time frames	Usually significantly longer
Representativeness	Small samples, limited to the sampled respondents	Large samples, normally good representation of target populations
Type of Analyses	Debriefing, subjective, content, interpretive, semiotic analyses	Statistical, descriptive, causal predictions and relationships
Researcher Skills	Interpersonal communications, observations, interpretive skills	Scientific, statistical procedure, and translation skills; and some subjective interpretive skills

Factors/ Characteristics	Qualitative	Quantitative
Generalisation of Results	Very limited; only preliminary insights and understanding	Usually very good; inferences about facts, estimates of relationships

Source: Hair, Bush and Ortinau (2000:215).

5.2.1 Quantitative approach

According to Fouche and Delport (2005:74) and Malhotra (2004:137), quantitative research is defined as an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether the predictive generalisations of the theory hold true.

Mouton and Marais (1990:155-156), have identified the following characteristics of the quantitative approach:

- It is more highly formalised and more explicitly controlled than the qualitative approach.
- Its range is defined more exactly than the qualitative approach.
- It is relatively close to the physical sciences.

The main objective of quantitative research is to quantify the data and to generalise the results from the sample to the population of interest. The sample contains a large number of representative cases, the data collection is structured, data analysis is statistical and the outcome is that a final course of action is recommended. For this study, therefore, a quantitative approach was undertaken. The rationale for pursuing quantitative research is that the researcher will be able to quantify the data as this enhances the accuracy of research findings. Quantitative research is an objective research approach because it is cheap, flexible and less time-consuming. Further rationale for quantitative research, based on the definition, is that quantitative research provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships; it involves the generation of models, theories and hypotheses; the development of instruments and methods for measurement; collection of empirical data; modelling and analysis of data collected as well as evaluation of result (Cooper & Schindler 2006:166).

This study, therefore, is a quantitative study used to determine the extent of the influence of supply chain network, flexibility and integration on SMEs performance. The research design for this study is discussed in the next section.

5.2.2 Research design

Bless and Higson-Smith (1995:46), define a research design as, “The plan of how to proceed in determining the nature of the relationship between variables”. According to Fouche and De Vos (2005:105), any fully scientific endeavours should have exploratory research, descriptive research and explanatory research as one of the primary objectives. Descriptive research is used in this study. A brief explanation of descriptive research and the motivation for the chosen research design will follow in the next section.

5.2.3 Descriptive research

Descriptive research presents a picture of the specific details of a situation, social setting or relationship, and focuses on “how and why” questions (Neuman 2000:22). The researcher, therefore, begins with a well-defined subject and conducts research to describe it accurately. Descriptive research can have basic or applied research goals and can be qualitative or quantitative (Fouche & De Vos 2005:106).

Descriptive research serves a variety of research objectives as suggested by Cooper and Schindler (2006: 202). These objectives are:

- Descriptions of phenomena or characteristics associated with a population (the who, what, when, where, and how of a topic)
- Estimates of the frequency of appearance and the proportion of the population that has these characteristics
- Discovery of associations among different variables.

There are two types of descriptive studies, namely cross-sectional studies and longitudinal studies (Burns & Bush 2006:121). Cross-sectional studies measure units from a sample of the population at one point in time. Cross-sectional samples may be based on small or large samples. Sample surveys are described as cross-sectional studies whereby samples are drawn in such a way as to be representative of some larger population.

A cross-sectional descriptive survey is used in this study. Data were collected using a self-administered structured questionnaire. The purpose of these research designs according to Creswell (2003:54) is “to generalise from a sample to a population so that inferences can be made about some characteristic, attitude or behaviour of this population”.

For this study, descriptive research was conducted as it assisted the researcher in obtaining information from various cases in the sample population, and it further allows the researcher to focus on the exact characteristics under consideration (Bless & Higson-Smith 1995:46).

The next step discusses the sampling methods for this study.

5.3 STEP 2: THE SAMPLING DESIGN PROCEDURE

A sample, according to Strydom (2005:194), comprises elements of the population considered for actual inclusion in the study, or it can be viewed as a subset of measurements drawn from a population in which the researcher is interested. The following steps, as alluded to by Tustin *et al.* (2005:339), will be used in the sampling design procedure. The target population, identification of sampling frame, sampling techniques, as well as the sample size will be discussed in the sections that follow.

5.3.1 Target Population

A population is the entire group of people about whom information is needed, which is also called universe or population of interest (McDaniel & Gates 2002:396). The population for this study consists of small and medium enterprises in the southern Gauteng region, South Africa. The reason for this region is that it has five main town centres among others, namely Walkerville, Heidelberg, Meyerton, Vereeniging and Vanderbijlpark within the area and Sasolburg is only 10 kilometres to the south across the provincial boundary. For the purposes of this study, collectively these towns are referred to as southern Gauteng region, mainly due to their geographic location within the Gauteng province.

Leedy and Ormrod (2005:205) characterise population as “generally a homogeneous group of individual units”. The population is the aggregate of all the elements. A sample as defined by Neuman (2005:219) is the element of the population that is considered for actual inclusion in a particular study. Therefore, the population or sampling frame for this study is defined as consisting of SMEs operating within the southern Gauteng region. The larger enterprises

(LEs) around this region are omitted due to the fact that supply chain collaboration and networking relationship strategy is implemented and also well known among the LEs (Chapman *et al.* 2000:354, Coyle *et al.* 2003:50; Ballou 2004:433; Gelinas & Bigras 2004:267; Nabhani & Shokri 2007:1162; Vaaland & Heide 2007:21). Figure 5.1 shows the Southern Gauteng region map and its surrounding areas.



Figure 5.1: Southern Gauteng Region map and its surrounding area

Sources: www.wheretstay.co.za

5.3.2 Identification of sampling frame

A list of 1800 registered SMEs was drawn up from the databases of the Southern Gauteng Region through the Enterprise Development Centre (EDC) and Emufuleni Municipality. The Small Business Directory of the Vaal Triangle was also used in order to gain access to a representative sample consisting of small and medium enterprises. The sampling frame consisted of small and medium enterprises. Major towns represented in this demarcation are Meyerton, Vereeniging and Vanderbijlpark due to their proximity to the researcher. It was also impossible to observe all the SMEs located in the various towns as listed in section

5.3.2.1 and figure 5.1 above due to the estimated proposed sample size of the study by the researcher. Other compelling reasons for the demarcation of sampling include time and cost involved, ease of accessibility by both SMEs and the researcher, greater speed of data collection, greater accuracy of the results and availability of population elements (Strydom 2005:194).

5.3.3 The sampling techniques

Sampling methods can be divided into two broad categories: probability and non- probability samples. A probability sample is one in which every element has a known non-zero probability of being selected (Nel, Radel & Loubser 1988: 292). With probability sampling, statistical projections of the sample are generalised to represent the total population though there may be a sampling error. A sampling error is the degree to which the sample results might differ from those of the whole population.

According to Strydom (2005:201), in non-probability sampling ‘the odds of selecting a particular individual are not known because the researcher does not know the population size or the numbers of the population’. Martins, Loubser and Van Wyk (1996:253), further comment that it relies on the judgment of the researcher as its representative is based on the researchers’ judgment and skills. Methods of non-probability sampling include convenience, quota, judgment and snowball.

Probability sampling methods are grouped into the following types namely, simple random sampling, systematic sampling, stratified sampling, cluster sampling and multi stage sampling. For the purpose of this study, the probability sampling and a simple random sampling technique was used because each individual case in the population theoretically has a known and equal chance of being selected for the sample (Gravetter & Forzano 2003:118, Strydom 2005:200). Simple sampling is appropriate because it is simple to apply; a random sample is chosen from the population and without any order. Furthermore, data analysis is reasonably easy and has a sound mathematical basis (Cooper & Schindler 2006:192). The list of small and medium enterprises was used as the sample frame and each element within the population frame was given a unique number from 1 and a random number table was used to select the sample.

5.3.4 Sample size

A sample size refers to the number of element used in this study. The determination of the sample size is a scientific judgment made by the researcher, based on past studies (Zikmund 2010:519). Out of 1800 registered SMEs identified from the Southern Gauteng Enterprise Development Centre (EDC). Emufuleni Municipality, as well as the Small Business Directory of the Vaal Triangle, a total of 800 questionnaires were randomly distributed among SMEs owners within the selected towns for this study. Although a sample of 500 participants was estimated for this study, a total of 401 of 800 questionnaires that were distributed, were collected and used for the final data analysis.

In a quantitative survey study, a bigger sample size is advised. However, most of the previous studies have used a sample size of less than 400 and more than 500. The sample size is consistent with that used by a number of logistics researchers, like: Bourlakis, Maglaras, Aktas, Gallear and Fotopoulos (2014:117), Wu, Chuang and Hsu (2014:127), Van Hoof and Thiell (2014:243), Bayraktar, Demirbag, Koh, Tatoglu and Zaim (2009:133), Vaaland and Heide (2007:20) on supply chain performance in SMEs. Table 5.2 below describes the basis for the selection of the sample size used as an average of the sample sizes in previous research.

Table 5.2: Determining the sample size

Year	Authors	Scope of Study	Sample Size
5.3.5 2014	5.3.6 Bourlakis, M., Maglaras, G., Aktas, E., Gallear, D. & Fotopoulos, C.	5.3.7 Firm size and sustainable performance in food supply chains: insights from Greek SMEs	591
5.3.8 2014	5.3.9 Wu, I.L., Chuang, C.H. Hsu, C.H.	5.3.10 Information sharing and collaborative behaviors in enabling supply chain performance: a social exchange perspective	201
5.3.11 2014	5.3.12 Van Hoof, B. & Thiell, M.	5.3.13 Collaboration capacity for sustainable supply chain management: small and medium-sized enterprises in Mexio	191
5.3.14 2009	5.3.15 Bayraktar, E., Demirbag, M., Koh, S.C.L., Tatoglu, E. & Zaim, H.	5.3.16 A causal analysis of the impact of information systems and supply chain management practices on operational performance: evidence from manufacturing SMEs in Turkey	229
5.3.17 2007	5.3.18 Vaaland T.I & Heide M	5.3.19 Can the SMEs survive the supply chain challenges	200

5.4 STEP 3: QUESTIONNAIRE DESIGN AND DATA COLLECTION METHOD

The next step in the research process will discuss the questionnaire design as well as the data collection method of the study. The questionnaire and its components are discussed in the sections that follow.

5.4.1 The Questionnaire Design

The New Dictionary of social work (1995:51) defines a questionnaire as ‘a set of questions on a form which is completed by the respondent in respect of a research project’. Therefore,

a questionnaire is a structured technique for data collection that consists of a series of questions, written or verbal, that respondents answer. A questionnaire, whether it is called a schedule, interview form, or measuring instrument, is a formalised set of questions for obtaining information from respondents (Malhotra 2004:280). Typically, a questionnaire is only one element of a data collection package that might also include (1) fieldwork procedures, (2) some reward gifts for the respondents and (3) communication aids such as maps. Burns and Bush (2006:300) suggest six functions of a questionnaire which are listed below:

- It translates the research objectives into specific questions that are asked of the respondents;
- It standardises those questions and the response categories so every participant responds to identical stimuli;
- By its wording, question-flow and appearance, it fosters cooperation and keeps respondents motivated throughout the interview;
- Questionnaires serve as a permanent record of the research;
- Depending on the type of questionnaire used, a questionnaire can speed up the process of data analysis; and
- Finally, questionnaires contain the information on which reliability assessments may be made, and they are used in follow-up validation of respondent' participation in the survey.

Primary data for this study was generated by means of a questionnaire to collect data. Closed questions were used because it is coupled with the type of measuring scale used in this study which is 'Likert scale questions' where each answer has a specific number and value attached to it. The researcher is also able to get a high responds rate from large size of respondents through closed questions.

The questionnaire was divided into five sections, namely SMEs demographic, supply chain networks, supply chain flexibility, supply chain integration, and supply chain performance. The research scales are adopted mainly based on previous works. Minor adaptations were made in order to fit the research context and purpose. The supply chain networks measuring items were adapted from Kenny and Fahy (2011:374), Kohn, McGunnis and Kara (2011:302)

and Lo and Power (2010:149). Flexibility measure items were adapted from Merschmann and Thonemann (2011:45) while integration measuring items were adopted from Narasimhan and Kim (2002:321). Lastly, the overall supply chain performance measuring items were adopted from Green, Whitten and Inman (2012:1012). All the measurement items was measured on a seven-point Likert scale to express the degree of agreement, with one being strongly disagree, to seven being strongly agree.

According to Aaker, Kumar and Day (2000:275), “Likert scale is the process of creating a continuum on which objects are located according to the amount of the measured characteristic they possess”. Likert scale was used in this study because it is faster and easier for the respondent to complete; Likert scale eliminates the development of response bias amongst the respondents; it makes the response items standard and comparable; it can be used to assess respondents characteristics such as attitudes, beliefs, opinions and perception; the questions are easy to code and analyse as each answers has value attached to them; interviewed bias is reduced, and questions can be administered more quickly (Cooper & Schindler 2003:421). The scale items for the questionnaire are attached in Appendix 1. Table 5.3 shows the research constructs, the research measuring items adapted as well the original measuring items by researchers in the related field.

Table 5.3: Adapted and Original Measurement Items

RESEARCH CONSTRUCTS		RESEARCH MEASUREMENT ITEMS (ADAPTED)		MEASUREMENT ITEMS (ORIGINAL)	
Supply Chain Network	SCN-1	5.4.2	Supply chain networks allows efficient use of our resources	5.4.3	Network relationships allow efficient use of our firms resources (Kenny & Fahy 2011:374)
	SCN-2	5.4.4	Supply chain networks lead to sound economic use of our firm	5.4.5	Network relationships lead to sound economic use of our firm (Kenny & Fahy 2011:374)
	SCN-3	5.4.6	Supply chain networks allows effective use of our firm's knowledge base	5.4.7	Network relationships allow effective use of our firms knowledge base (Kenny & Fahy 2011:374)
	SCN-4	5.4.8	There is high complementarities (combination of skills) between the resources	5.4.9	There is high complementarity between the resources/capabilities (Kenny & Fahy 2011:374)

	SCN-5	5.4.10 There is high similarity/overlap between the core capabilities of each partner	5.4.11 There is high similarity/ overlap between the core capabilities of each partner (Kenny & Fahy 2011:374)
	SCN-6	5.4.12 The organisational cultures of our network partners are incompatible with each other	5.4.13 The organisational cultures of our network partners are incompatible with each other (Kenny & Fahy 2011:374)
	SCN-7	5.4.14 The management style of our network partners are compatible	5.4.15 The management and operating styles of our network partners are compatible (Kenny & Fahy 2011:374)
	SCN-8	5.4.16 We strive to achieve synergy through working together.	5.4.17 We strive to achieve synergy through working together (Kenny & Fahy 2011:374)

RESEARCH CONSTRUCTS		RESEARCH MEASUREMENT ITEMS (ADAPTED)	MEASUREMENT ITEMS (ORIGINAL)
Supply Chain Flexibility	SCF-1	5.4.18 Our organisation has the ability to reduce lead-times.	5.4.19 Reduction of manufacturing lead-time (Narasimhan & Kim 2002:321).
	SCF-2	5.4.20 Our organisation has the ability to reduce product development cycle times.	5.4.21 Reduction of product development cycle time (Narasimhan & Kim 2002:321).
	SCF-3	5.4.22 Our organisation has the ability to increase frequency of new product introductions.	5.4.23 Increase of frequency of new product introductions (Narasimhan & Kim 2002:321).
	SCF-4	5.4.24 Our organisation has the ability to increase level of customisation.	5.4.25 Increase of level of customisation (Narasimhan & Kim 2002:321).
	SCF-5	5.4.26 Our organisation has the ability to adjust worldwide delivery capacity/capability.	5.4.27 Adjustment of worldwide delivery capacity/capability (Narasimhan & Kim 2002:321).
	SCF-6	5.4.28 Our organisation has the ability to improve the level of customer service.	5.4.29 Improvement of level of customer service (Narasimhan & Kim 2002:321).
	SCF-7	5.4.30 Our organisation has the ability to improve delivery reliability.	5.4.31 Improvement of delivery reliability (Narasimhan & Kim 2002:321).
	SCF-8	5.4.32 Our organisation has the ability to improve responsiveness to changing market needs.	5.4.33 Improvement of responsiveness to changing market needs (Narasimhan & Kim 2002:321).
Internal integration across Supply Chain	IAS-1	5.4.34 Our organisaiton has data integration among internal functions through information network.	5.4.35 Data integration among internal functions through information network (Narasimhan & Kim 2002:321).
	IAS-2	5.4.36 Our organisaiton has system-wide information system integration among internal functions.	5.4.37 System-wide information system integration among internal functions (Narasimhan & Kim 2002:321).
	IAS-3	Our organisaiton has real-time searching of the level of inventory.	Real time searching of the level of inventory (Narasimhan & Kim 2002:321).

	IAS-4	Our organisaiton has real-time searching of the logistics-related operating data.	Real time searching of logistics-related operating data (Narasimhan & Kim 2002:321).
	IAS-5	Our organisaiton has data integration in production process.	Data integration in production process (Narasimhan & Kim 2002:321).
	IAS-6	Our organisaiton has integrative inventory management.	Integrated inventory management (Narasimhan & Kim 2002:321).
	IAS-7	Our organisaiton has construction of system-wide interaction system between productions.	The construction of system-wide interaction system between production and sales (Narasimhan & Kim 2002:321).
	IAS-8	5.4.38 Our organisaiton utilise periodic interdepartmental meetings among internal function.	5.4.39 The utilisation of periodic interdepartmental meetings among internal function (Narasimhan & Kim 2002:321).
RESEARCH CONSTRUCTS		RESEARCH MEASUREMENT ITEMS (ADAPTED)	MEASUREMENT ITEMS (ORIGINAL)
SMEs Performance	SBP-1	5.4.40 Our organisation has a high level of return on investment.	5.4.41 Average return on investment (Green, Whitten & Inman 2012:1012).
	SBP-2	Our organisation has a high level of profitability.	Average profit (Green, Whitten & Inman 2012:1012).
	SBP-3	Our organisation a high level profit growth.	Profit growth (Green, Whitten & Inman 2012:1012).
	SBP-4	Our organisation has a high level of return on sales.	Average return on sales (Green, Whitten & Inman 2012:1012).
	SBP-5	Our organisation has a high level of market share growth.	Average market share growth (Green, Whitten & Inman 2012:1012).
	SBP-6	Our organisation has a high level of sales volume growth.	Average sales volume growth (Green, Whitten & Inman 2012:1012).
	SBP-7	5.4.42 Our organisation has a high level of sales (in Rands) growth.	5.4.43 Average sales (in dollars) growth (Green, Whitten & Inman 2012:1012).

5.5 DATA GATHERING

A covering letter which listed the researcher's details, the topic of the researcher's study and the purpose of the study as well as contacts details of both the supervisor and the co-supervisor signature was clearly presented. This was very helpful in mitigating the challenges such as SMEs owner or mangers refusal to complete the questionnaire, reduce lack of confidence that the questionnaire is for research purpose only.

In order to enhance more responds rate from the SMEs, a self-administered method of gathering data was used and two field workers were trained for the distribution and collection the questionnaires. The time duration for the distribution and collection of the questionnaires took place between August and December 2013. SMEs managers or owners were the only respondents allowed to complete the questionnaires because they understand and known more about the field of study. This was done to ensure the competence of the SMEs in determining the influence of supply chain network, flexibility and integration on their business performance. The questionnaire took about 15-20 minutes to complete.

5.6 STEP 4: DATA PREPARATION METHODS

Editing, coding and tabulation are some of the data preparation methods that were used in this study to ensure that the questionnaire was complete and ready for answering. These methods are discussed in the sections that follow.

5.6.1 Editing

This is the process of checking completeness, consistency, and legibility of data and of making the data ready for coding and transfer to storage. The purpose of editing is to ensure completeness, consistency and readability of the data to be transferred to storage. The editor's task is to check for errors and omissions in the returned questionnaires or other data collection forms. When the editor discovers a problem, the data is adjusted to make it complete, consistent, or readable (Zikmund 2000: 556).

Editing is often done in two stages, the field edit and the central office edit. The field edit is a preliminary edit, designed to detect the most glaring omissions and inaccuracies in the data. It is also useful in helping to control the field force and to clear up its misunderstandings about procedures and specific questions (Churchill & Iacobucci 2005: 406). The field edit is typically followed by the central office edit, which involves more complete, and exacting scrutiny and correlation of the completed returns. The work calls for a keen eye of a person well versed in the objectives and procedures of the study. To ensure consistency of treatment, it is best if one individual handles all completed instruments (Churchill & Iacobucci 2005: 407).

For this study therefore, the wordings of the questionnaire was thoroughly check and proof read by the research supervisor and co-supervisor. The necessary correction was made for

good readability and understanding by the SMEs owners and managers. Editing was also done through the careful examination of the collected data in order to be sure that the data is accurate. During the collection of the questionnaire from the respective SMEs owners and managers who participated in the research study, editing of the questionnaire data was done or check immediately by the field workers and the researcher by quickly running through the pages of the questionnaire. This was done to determine any omitted answers to questions within the sections of the questionnaire so that the necessary corrections are made and also to provide necessary understanding where appropriate for the SMEs.

This was very helpful for assessing the accuracy, completeness and general usability of the questionnaire. With this, the researcher was able to overcome the risk of bias in the data by filling in the SMEs response to the unanswered sections in the questionnaire. It also reduced the cost of contacting the individual SMEs to complete missing response because the respondents for this study are above 300 SMEs. However, not all the questionnaires were edited immediately during collection because some questionnaires were collected in groups from organisation dealing with SMEs business development and growth. Hence, few questionnaires were eliminated because of the large proportion of missing data that was up to 15 percent of the total respondents (Hair, Celsi, Money, Samouel & Page 2011:296). In addition, some of the questionnaires were omitted because some SMEs gave the same answer through out the questionnaire.

5.6.2 Coding

The process of identifying and classifying each answer with a numerical score or other character symbol is called coding. Assigning numerical symbols permits the transfer of data from the questionnaire to the computer. Codes generally are considered to be numbered symbols, however, they are more broadly defined as rules for interpreting, classifying, and recording the data. Codes allow data to be processed in a computer.

Researchers organise coded data into fields, records and files (Zikmund 2000:560). For this study, the questionnaire was pre-coded. It is advisable to follow certain conventions when coding the data. Churchill and Iacobucci (2005:409) suggest the following conventions when coding data:

- Use only one character per column. Most computer programs cannot read multiple characters per column. When the computer allows multiple responses, use separate columns for each answer
- The field or portion of the record assigned to the variable should consist of as many columns as are necessary to capture the variables
- Use standard codes for no information. Thus, all ‘don’t know’ responses for any question on the survey, might be coded 8, ‘no answers’ as 9 and ‘does not apply’ as 0
- Give each respondent an identification number. This number need not, and typically does not, identify the respondent by name
- The final step in the coding process is to prepare a code book. The code book contains general instructions indicating how each item of data were coded, so that the people conducting the data analysis can see what the coders did.

For this study, a code book was prepared in order to successfully enter the information from the research questionnaire into the format that SPSS can understand. In this process, the researcher defines and labels each of the research variables such as (SMEs demographic profile, supply chain network, supply chain flexibility, supply chain integration and SMEs performance) and assigns identification numbers to each of the possible responses. Table 5.4 shows the example of a code book for this study.

Table 5.4: Example of a code book

Variable	SPSS variable name	Coding instructions
Identification number	ID	Number assigned to each survey
1. Number of year operating in business	A1	1 = 2 to 4 years 2 = 5 to 7 years 3 = 8 to 10 years 4 = 11 or more
7. Capacity in which SMEs run their business	A7	1 = Manager 2 = Owner

Supply chain network;	SCN	1 = Strongly disagree
Supply chain flexibility;	SCF	2 = Disagree
Supply chain integration;	IAS	3 = Slightly disagree
SMEs performance	SBP	4 = Neutral
		5 = Slightly agree
		6 = Agree
		7 = Strongly agree

In the first column of Table 5.4, the names of the variables are spelt out fully rather than in computer talk. In the second column, the variables abbreviated name that will appear in SPSS are indicated and in the third column contains the detail on how the researcher coded each of the responses obtained for this research by assigning a numerical code before it is computed into SPSS.

5.7 STEP 5: STATISTICAL ANALYSIS

This section describes how the data for this study were analysed in light of the research objectives and the proposed hypothesis. It is a process of using analytical techniques on the data to determine the consistency, validity and reliability of the measuring construct. According to Cooper and Schindler (2003:86), data analysis is described as a process of gathering, inspecting, cleaning modelling and transforming data with the goal of discovering useful information, suggesting conclusions and supporting decision making. Data were analysed using descriptive statistics. Tabulations to make comparisons on the demographic data were used. Data captured on SMEs supply chain networks, flexibility and integration were analysed using measures of central tendency (mean) and measures of variability.

The reliability and validity of the measuring instrument was tested using the measurement model assessment. This was achieved through confirmation factor analysis (CFA). For example, reliability was tested using the Cronbach's alpha value and the composite reliability values. Measurement of convergent validity was tested by using extracted item-loading value and average variance extracted (AVE). Discriminant validity was measured using the inter-construct correlation matrix, and AVE, as well as shared variance comparison.

The SEM was used to test the model fit and to test hypotheses by using AMOS version 22.0 to assess the measurement and the structural model. An elaboration of the statistical methods used during analysis is presented in the next sections.

5.7.1 Descriptive statistics

Descriptive statistics are techniques that help the researcher to state the characteristics or appearance of sample data (Zikmund 1999:296). Measures of central tendency such as mean and standard deviation were employed in this study. Through descriptive statistics, data were displayed with the use of tables and frequency distributions. These are discussed below.

5.7.2 Tables and charts

Frequency distribution tables and charts in the form of graphs, line charts, pie charts, histograms and bar charts were utilised to display research findings. Charts are also used to depict absolute and relative magnitudes, differences, proportions and trends (Hair *et al.* 2000:524). These methods use both pie charts and horizontal bars to examine different elements of a given variable. In Section 6.3 of this study, bar charts and pie charts was used to describe the demographic frequency results of the participating SMEs.

5.7.3 Mean and standard deviation

Mean is the average, the value obtained by summing all elements in a set and dividing by the number of elements. The mean, or average value, is the most commonly used measure of central tendency. It is used to estimate the mean when the data have been collected using an interval or ratio scale (Kruger, De Vos, Fouche & Venter 2005:233). While standard deviation (SD) is an average measure, by which scores in a set of scores differ from the mean of a set of data (Cramer & Howitt 2004:156). Standard deviation indicates how a set of data clusters around its mean. That is, it indicate how far, on average, a given observation will be away from the mean and thus, it is roughly the average distance of the observed values from their mean (Macfie & Nufrio 2006:87). Section 6.4 (Table 6.1) shows the different between the mean scores and standard deviation values for each research scale. The mean and standard deviation values were very important in assessing the degree or the extent to which the items that make up the measuring scale ‘hang’ together while assessing the internal reliability of the measuring constructs.

5.7.4 Tabulation

Tabulation of the data is the processing of the data in such a way as to make the data ‘talk’ and arrive at meaningful answers. Tabulation consists of counting the number of cases that fall into the various categories. (Churchill & Iacobucci 2005:410). The tabulation may take the form of a simple tabulation or a cross tabulation. Simple tabulation involves counting a single variable while cross tabulation, two or more of the variables are treated simultaneously (Churchill & Iacobucci 2005:410). For this study, cross tabulations were used to show and explain the Cronbach’s alpha value (α), the average variance extracted (AVE), composite reliability values (CR), the square root of factor loadings for the research constructs, maximum shared variance (MSV) and to show calculated value of the correlation matrix (Table 6.1). Cross tabulation was also use in Section 6.5 (Table 6.3 and 6.4) to present the confirmatory factor analysis (CFA) result and also present the structural equation model fit results (SEM). In Section 6.7 (Table 6.5), present the path regression coefficients result, standard error (SE) values, critical ratio (CR) values and the significant level of acceptance.

5.7.5 Correlation analysis

Correlation analysis is the analysis of the degree to which changes in one variable are associated with changes in another (McDaniel & Gates 2002:560). Correlation analysis describes the relationship or joint variation between two continuous variables, in terms of both the strength of the relationship and the direction. (Pallant 2007:127). It is referred to as a technique (s) used in measuring the closeness of the relationships between variables and the measurement result is called correlation coefficient or correlation index (Sharma 2005:1-2) The level of association depicts the direction of relationships that exists between the independent and the dependent variables of interest (Hair *et al.*. 2000:56). This technique explains the closeness of the relationship among variables. For this study, correlation analysis was performed to assess the relationship between supply chain networks, supply chain flexibility, and supply chain integration on the performance of SMEs. The confirmatory factor analysis (CFA) for SEM was used as a correlation technique to discover and measure the degree of the relationship between the research constructs e.g. path coefficients correlation between the research constructs in Section 6.7.2 (Table 6.5 and Figure 6.7). Section 6.5 (Table 6.2) describe the correlation matrix between the research variables, CFA and SEM correlation analysis was also used to check the model fit and to test whether the research variables hypothesised relationship are or are not statistically significant.

5.8 STEP 6: RELIABILITY AND VALIDITY

In order to consider the study measuring scale as appropriate for measuring what it is intended to measure, a reliability and validity test should be done. The extent to which the measuring scales are consistent and accurately valid should be determined before further analysis can be performed. This helps the researcher have confidence in the data collected for the study (Andrew, Pedersen, & McEvoy 2011:202). According to Delport (2005:160), validity and reliability are the most important concepts in the context of measurement. In this step, the methods for assessing the reliability and validity test for this study are discussed below.

5.8.1 Reliability test

Reliability refers to the extent to which a scale produces consistent results if repeated measurements are made (Malhotra, 2004:267). It is the degree to which a measure is free from random error and, therefore, yields consistent results (Zikmund 1999:221). Systematic sources of error do not have an adverse impact on reliability, because they affect the measurement in a constant way and do not lead to inconsistency. Reliability is assessed by determining the proportion. The reliability for this study was used to determine the internal consistency of the measuring scale. There are different types of reliability. The different types are represented in Figure 5.2. For this study, Cronbach's alpha was used to test the internal consistency of the measuring scale. Furthermore, composite reliability (CR) and average value extracted (AVE) through confirmatory factor analysis (CFA) was also used to determine the internal consistency of the scale. The reason for this is because Cronbach's alpha assumes that different indicators have equal factor loadings and error variances but CFA takes into account the differences among the existing indicators and does not assume equal weight measures (Kern 2011:56). Hence, this study uses the CFA statistical value to further provide an additional estimate of reliability (Bauer 2009:80). See Table 6.5 in chapter six.

Type of reliability		Administration
Test-retest reliability		An approach for assessing reliability in which respondents are administered identical sets of scale items at two different times under as nearly equivalent conditions as possible
Alternative-forms reliability		An approach for assessing reliability that requires two equivalent forms of the scale to be constructed and then the same respondents are measured at two different times
Internal consistency reliability		<p>An approach for assessing the internal consistency of the set of items when several items are summated in order to form a total score of the scale</p> <ul style="list-style-type: none"> • Split-half reliability; a form of internal consistency reliability in which the items constituting the scale are divided into two halves and the resulting half scores are correlated. • Cronbach's alpha; a measure of internal consistency reliability that is the average of all possible split-half coefficients resulting from different splittings of the scale items.

Figure 5.2: Types of reliability and how they are administered (Malhotra 2004:268)

5.8.1.1 Cronbach's alpha

Cronbach's alpha coefficient is the most widely used method for measuring internal consistency. It is the average of all split-half coefficients resulting from different ways of splitting the scale items. Alpha measures how well a set of variables or items measures a single, one-dimensional latent response in a questionnaire with a higher value indicating a higher degree of internal consistency or reliability (Andrew *et al.* 2011:202; Gravetter & Forzano 2012:480). This coefficient varies from zero to one, and a value of 0.7 or less generally indicates unsatisfactory internal consistency reliability. This, therefore, indicates that, the closer the value of α to one, the better the reliability. An important property of coefficient alpha is that its value tends to increase when the number of indicators or the number of scale items increases (Coussement, Demoulin & Charry 2011:88; Tappen 2011:131). This study used the Cronbach's alpha coefficient value to assess the internal

consistency of the measuring constructs. In other words, the items of the measuring scale should measure the same thing and should correlate with one another. Section 6.4 depicts the Cronbach's alpha values for each construct.

5.8.1.2 Composite reliability (CR)

Composite reliability is another statistical method use to check the internal consistency of the measuring scale. According to Bauer (2009:81), "composite reliability represents the shared variance among a set of observed variables that measures an underlying construct". The result of composite reliability is similar to that of Cronbach's alpha. According to Hatcher and O'Rourke (2013:236) composite reliability is computed from the (square of the summation of the factor loadings)/(square of the summation of the factor loadings)+(summation of error variances) and the formula is presented below.

$$CR = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + (\sum_{i=1}^n \delta_i)}$$

A higher reliability of 0.7 and above indicate a good reliability and suggest that the variable scales are consistently measuring the measurement model (Vinzi, Chin, Henseler & Wang 2010:437; Kern 2011:55). For this study, the internal consistency was assessed using the AMOS programme for CFA to reveal that the composite reliability for all the measuring constructs which was higher than the 0.7 threshold, which, suggests that each measuring construct have satisfactory reliability. Section 6.4 and Table 6.5 of this study show the respective loadings for each measurement items on their respective construct and the composite reliabilities for each construct.

5.8.1.3 Average value extracted

The variance extracted estimate, (AVE) reflect the overall amount of variance in the indicators accounted for by the latent construct in relation to the variance due to random measurement error (Vinzi *et al.* 2010:437). It is more conservative than Cronbach's alpha and composite reliability and can be used to evaluate discriminant validity (Khosrow-pour 2006:75). A higher score of 0.50 and above represent the measuring construct and are treated as indications of convergent validity. The formula below was used to calculate average variance extracted (AVE):

$$V_{\eta} = \Sigma \lambda_{yi}^2 / (\Sigma \lambda_{yi}^2 + \Sigma \epsilon_i)$$

$$AVE = (\text{summation of the squared of factor loadings}) / (\text{summation of the squared of factor loadings} + (\text{summation of error variances}))$$

For this study, the construct reliabilities and the average variance extracted estimates reveals that the measuring scales are internally consistent. See Section 6.4 and Table 6.5 of this study for statistical results.

5.8.2 Validity tests

Validity is defined as the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random errors (Malhotra 2004:269). Content validity, criterion validity and construct validity (convergent and discriminant validity) are the main three approaches to assess of a measuring instrument. Content validity, convergent validity and discriminant validity was used in this study. These are discussed below:

5.8.2.1 Content validity

Content validity refers to the subjective agreement between colleagues that a scale logically reflects what it is supposed to measure (Zikmund 1999:222). To ensure content validity of the research instrument, various sources of evidence were consulted, including past research that tested the instrument were considered. The following steps by Cooper and Schindler (2006:214) were followed to ensure validity of the study:

- Using a statistician to evaluate the content of the questionnaire
- Sampling was carried out using probability methods ensuring external population validity
- Using a large sample size with a margin of error of not more than 5 percent and a confidence level of 95 percent
- Comprehensively reviewing the literature for theoretical constructs and empirical conclusions.

Content validity is assessed using simple, direct and non-technical terms to formulate the questions. The questionnaire was kept short and to the point so as to avoid respondent boredom, which may result in unanswered questions.

5.8.2.2 Convergent validity

Convergent validity measures the extent to which a measure correlates positively with other measures of the same construct (Robins, Fraley & Krueger 2007:255). Convergent validity refers to the degree to which the scale correlates in the same direction with other measures of the same construct, i.e. the items shows homogeneity within the same construct. In other words, convergent validity is found if two measures are highly correlated (Bearden, Netemeyer, & Haws 2011:8). Convergent validity for this study was assessed through the CFA focusing on the research composite reliability and model fits factor loadings results. Section 6.4 (Table 6.1) of this study presents convergent validity results for each of the research constructs.

5.8.2.3 Discriminant validity

Discriminant validity measures the extent to which a measure does not correlate with other constructs from which it is supposed to differ. It involves demonstrating a lack of correlation among differing constructs (Zikmund 1999:223). It is denoted by low correlations among the research constructs (Harrington 2009:6). Discriminant validity is supported by the degree to which a measure does not correlate with the measure of other constructs that are theoretically or empirical distinct (Robins *et al.* 2007:255). In other words, discriminant validity shows heterogeneity between different constructs where a low to moderate correlation is often considered evidence of discriminant validity (Bearden *et al.* 2011:8). As presented under Section 6.4 and Table 6.5 of this study, discriminant validity for this study was assessed through factor analysis using the correlation matrix, and secondly, the square root of average variance values (AVE) and shared variance values (SV) was also used examine discriminant validity. Figure 5.3 summarises the types of validity:

Content validity	A type of validity sometimes called face validity, that consists of a subjective but systematic evaluation of the representativeness of the content of a scale for the measuring the task at hand.
Criterion validity	A type of validity that examines whether the measurement scale performs as expected in relation to other variables selected as meaningful criteria.
Construct validity	<p>A type of validity that addresses the question of what construct or characteristic the scale is measuring. An attempt is made to answer theoretical questions of why a scale works and what deductions can be made concerning the theory underlying the scale.</p> <ul style="list-style-type: none"> • Convergent validity – a measure of construct validity that measures the extent to which the scale correlates positively with the other measures of the same construct • Discriminant validity – a type of construct validity that assesses the extent to which a measure does not correlate with other constructs from which it is supposed to differ • Nomological validity – a type of validity that assesses the relationship between theoretical constructs. It seeks to confirm significant correlations between the constructs as predicted by theory.

Figure 5.3: Types of validity (Malhotra 2004:269)

5.9 STEP SEVEN: CONFIRMATORY FACTOR ANALYSIS

Factor analysis is a statistical technique used to reduce large numbers of data or variables into a manageable number by using a smaller set of factors or components and detection of underlying dimensions of the research variables. Factor analysis also identifies components that explain the patterns of correlations among variables (Pallant 2007:181). It was further used to enhance validity and reliability of the research variables. In SEM, confirmatory factor analysis (CFA) is the two approach to factor analysis. CFA is a complex technique used to test hypotheses of this study because it requires *a priori* proposed model in which the number of the measuring variables are already specified through exploratory factor analysis (EFA) (Byrne 2013:76).

CFA is used appropriately when the researcher has some knowledge of some underlying latent variable structure. Based on knowledge of theory and empirical research, the researcher proposed relationships (which the researcher called the research hypotheses) between the observed measures and underlying factors. The hypothesised relationship between measures is then tested statistically (Byrne 2013:73). Thus, in CFA the researcher specifies a certain number of factors, which are correlated, and for which observed variables measure each factor. In EFA, the researcher explores how many factors there are, whether the factors are correlated, and which observed variables appear to best measure each factor. In CFA the researcher has a specified theoretical model, in EFA the researcher does not have such a model. This current study uses CFA model with standardised estimates since the measures have been adopted from previous literature.

The CFA standardised estimates path model or path analysis was used in this study to confirm presumed relations among observed variables. According to Kline (2005:94) in path analysis the researcher specifies a model that attempts to explain why X and Y are correlated. Part of this explanation may include presumed causal effects for example, X causes Y, on the observed scales, such as a spurious association between X and Y. The statistical estimates of these direct effects are called factor loadings or pattern coefficients, which are sometimes referred to as regression coefficients (Schumacker & Lomax, 2010:3).

These Factor loadings can either be in the form of standardised or unstandardised estimates. Observed variables to be caused by unobserved variables are referred to as effect indicators or reflective indicators i.e. the observed variables (dependent) in standardised CFA models that are endogenous, while the unobserved variables (independent) are exogenous (Kline 2005 166-167). The overall goal of path analysis is to assess how well the model accounts for the data that is the observed correlations or covariances. The path model for this study as shown in Section 6.6.1 (Table 6.5 and Figure 6.7) was used to hypothesise the impact of proposed relationships among research constructs, namely supply chain network, supply chain flexibility, supply chain integration and SMEs performance.

5.9.1 Structural equation modeling

SEM is *a priori* specification (which variables are assumed to affect other variables and the directionalities of these effects) that reflects the research hypotheses and also makes up the overall model to be evaluated in the analysis (Kline 2005:10). In other words, SEM can be viewed as a confirmatory approach because a proposed model is specified at the beginning of the analysis to assess whether it is supported by the data. According to Wothke (2010:6), SEM is a statistical technique that combines elements of traditional multivariate models, such as regression analysis, factor analysis and simultaneous equation modeling. It is also called causal modeling because competing models can be postulated about the data and tested against each other. Byrne (2013:3) defines SEM as “a statistical methodology that takes a confirmatory (i.e. hypothesis – testing) approach to the analysis of structural theory (causal processes that generate observations on multiple variables) bearing on some phenomenon”.

SEM uses various types of models to predict relationships among observed variables, e.g. path model and CFA model with the basic goal of providing a quantitative test of a theoretical model hypothesised by the researcher. According to Schumacker and Lomax (2010:4), the goal of SEM analysis is to determine the extent to which the theoretical model is supported by sample data. However, if the sample data supports the theoretical model then more complex theoretical models can be hypothesised. However, if the research data does not support the theoretical model then either the original model needs to be modified and re-tested or other theoretical models need to be developed and tested. Therefore, SEM allows the researcher to test the study model with regards to the inter-relationships among the research variables and also to test the overall fit of the model.

In SEM, the path model consists of two types of variables, namely latent variables or factors and observed or manifest variables (Schumacker & Lomax 2010:3). The latent variable (unobserved) are always assumed to cause the observed variables. The researcher also needs to specify or define both the observed and unobserved variables according to the underlying construct that they are representing.

5.9.2 The model fit criteria

Determining the extent to which the model best represents the research data depends on several model fit criteria called fit indices. It is recommended that various model fit criteria

be used in combination to assess model fit as global fit measures (Kline 2005:133; Mayfield & Mayfield 2008:48). The model fit criteria indices used to assess this study model fit as well as their recommended acceptable fit level are discussed in the foregoing section. The result of these model fit criteria can be found in Table 6.15 of Chapter 6.

5.9.2.1 CMIN/DF (normed chi-square)

In AMOS, statistical value of CMIN/df is shown. If the chi-square is considered non-statistically significant, the mode is regarded as significant and acceptable. This may indicate that observed covariance matrix is similar to the predicted covariance matrix by the model. The chi-square is deemed unacceptable when the chi-square is significant by the model (Blunch 2008:113). However, chi-square is sensitive to sample size exceeding 200 or so, assuming that if the sample size is large, the model is rejected and when the assumption of multivariate normality is violated; the chi-square fit index is inaccurate. As such, most researchers tend to disregard chi-square value (Schumacker & Lomax 2010:82-83).

According to Kline (2005:136), to reduce the sensitivity of chi-square to sample size, the chi-square value is divided by the degrees of freedom (CMIN/df), which generally results in a lower value called the normed chi-square. However, the criteria for CMIN/DF acceptance still varies across researchers ranging from 2.0 to 3.0 which have been recommended correct for the influence of sample size (Schumacker & Lomax 2010:82-83; Hooper *et al.* 2008:55; Byren 2013:75). For this study, the (CMIN/df) was used as one of the indices as shown in Table 6.3 and 6.4.

5.9.2.2 Root mean square error of approximation (RMSEA)

The RMSEA, according to Diamantopoulos and Siguaw (2000:85), is one of the influential informative fit indices that helps determine how well the model, with unknown but optimally chosen parameter estimates, would fit the population covariance matrix. The discrepancy, as measured by RMSEA, is expressed in per degree of freedom, thus making the index sensitive to the number of estimated parameters in the model. It is recommended that a good model fit is considered adequate if RMSEA is less than or equal to 0.08 (Hooper *et al.* 2008:55).

5.9.2.3 Goodness-of-fit index (GFI)

As an alternative to chi-square that, “assesses the magnitude of discrepancy between the sample and fitted covariances matrices” (Hu & Bentler 1999:2), GFI measures the proportion

of variance that is accounted for by the estimated population covariance. That is chi-square in multiple regression deals with error variance, whereas GFI deals with error in reproducing the variance-covariance matrix. GFI shows how the model closely replicates the observed covariance matrix (Hooper, Coughlan, & Mullen 2008:54). The GFI statistics range from zero to one, but theoretically can yield meaningless negative values. A large sample size increases the GFI value. However, GFI cut-off point for acceptable model should be equal to or greater than 0.90 (Tabachnick & Fidell 2007:718).

5.9.2.4 Incremental fit index (IFI), norm fit index (NFI) and Tucker-Lewis index (TLI)

The IFI, NFI and TLI statistics measure the relative improvement of the researcher model fit compared with a null model also called baseline model or independence model. For example, NFI=0.60 means the researcher's model improves fit by 60 compared to the null model. These indices assume zero population covariances among the observed variables and ranges from zero to one, with one equal to perfect fit. It is recommended that IFI, NFI and TLI be equal to or greater than 0.90 to be considered a satisfactory fit for the model (Kline 2005:140). Meaning that, NFI, TLI and IFI values below 0.90 indicate a need to re-specify the model (Hu & Bentler, 1995:82). These indices are relatively sensitive to sample size, for example in the case where the sample size is small, the value of NFI may indicate poor fit (Tabachnick & Fidell 2007:716).

5.9.2.5 The comparative fit index (CFI)

CFI also referred to as the Bentler comparative fit index is a revised form of NFI that takes into account sample size that perform well even when sample size is small. CFI assumes that the latent variables are uncorrelated and compares the existing model fit or sample covariance matrix with a null model. CFI values of the statistic ranges from zero to one, with CFI value close to one indicating a very good fit. A cut off criterion for CFI should be equal to or greater than 0.90 to accept the model, indicating that 90 percent of the covariation in the data can be reproduced by the given model (Hooper *et al.* 2008:55). Table 5.5 shows the model fit criteria and their acceptable level.

Table 5.5: Criteria for assessing model fit

Model Fit Index	Acceptable Level	Interpretation
CMIN/DF	less than 3.0	An attempt to adjust for sample size
Root mean square error of approximation (RMSEA)	Less than or equal to 0.08	Has a known distribution. Favours parsimony. Values less than 0.05 is considered excellent fit.
Goodness-of-fit (GFI)	Value greater than or equal to 0.90	Scaled between 0 and 1, with higher values indicating better model fit. This statistic should be used with caution.
Incremental fit index (IFI) and Norm fir index (NFI) or Trucker-Lewis Index (TLI)	Value equal to or greater than 0.90 is acceptable	These indices assume zero population covariances (no covariances) among the observed variables and ranges from 0 to 1, with 1 equal to perfect fit.
Comparative fit index (CFI)	Value equal to or greater than 0.90	Compares the existing model fit or sample covariance matrix with a null model. It ranges from 0 to 1, with 1 equal to perfect fit.

5.10 CONCLUSION

Descriptive and causal research designs were discussed in this chapter. These two designs help the researcher to answer the what, who, where and how questions about the influence of supply chain networks, flexibility and supply chain integration on the performance of SMEs. The quantitative research method is appropriate for this study as it entails the use of a large sample size, which gives an accurate representation of the entire population.

For this study, probability sampling was utilised whereby all respondents had an equal chance of being selected. A structured adapted questionnaire was drafted for this study. The validity and reliability of the measuring instrument was discussed. Confirmatory factor analysis, principle components analysis and criteria used for assessing the model fit for this study were also discussed. The statistical analysis and discussion of the research findings will be presented in Chapter 6. Figure 5.4 shows the diagrammatic summary of Chapter 5.

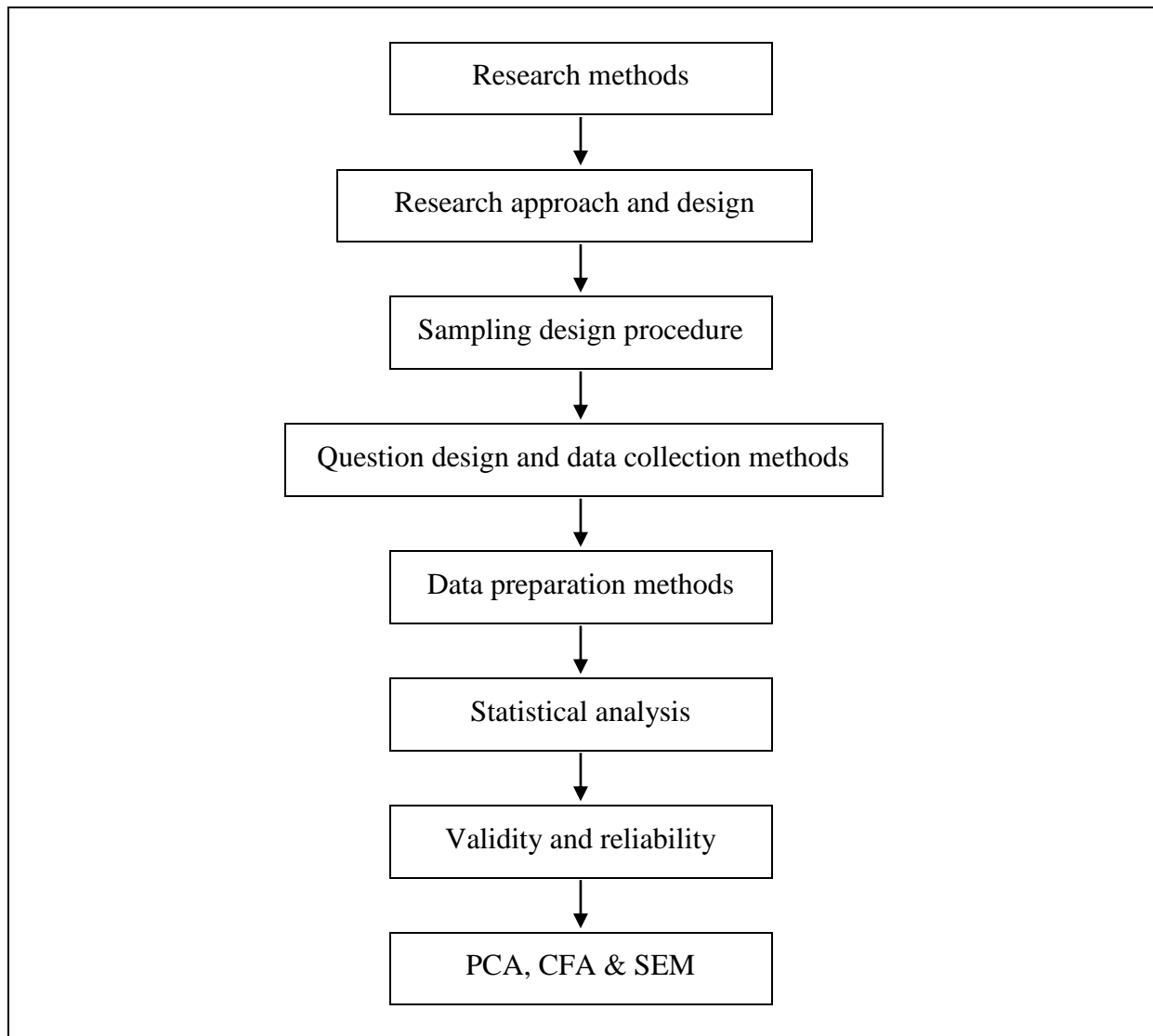


Figure 5.4: Diagrammatic summary of Chapter 5

CHAPTER 6

DATA ANALYSIS AND DISCUSSION

6.1 INTRODUCTION

The previous chapter discussed the research method, sampling design procedures, data collection method as well as the overview of the statistical analysis techniques that were used to analyse the data. This chapter presents the data results and discussion of the results in order to reach a conclusion regarding research objectives and hypothesis. This chapter begins by describing the data screening process, followed by the demographic description of the SMEs participants in the study. This chapter also discusses the findings from the measurement of internal consistency of the scale. For example, the average variance extracted (AVE) and composite reliability (CR) and Cronbach's alpha (α) value are presented and discussed in this chapter. The frequency description of the measuring variables was also presented and discussed.

Confirmatory factor analysis (CFA) findings were used to test the model fit of the measurement model using the model fit criteria and to analyse convergent and discriminant validity. SEM was used to test the path analysis and to test the interrelationship among the hypothesised research variables in order to assure the correlation pattern of the variables (Lei & Wu 2007:33). The CFA criteria used as indicators for a good fit are CMIN/DF, RMR, goodness of fit index (GFI), normed fit index (NFI), Lewis-Tucker index (TLI), incremental fit index (IFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA). The results are discussed. This chapter ends with the research hypotheses results discussion and conclusion.

6.2 SCREENING AND CLEANING DATA FOR ERRORS

Apart from the editing done earlier on the questionnaire, the coded data on the excel spread sheet needed to be further checked before the actual analysis began. According to Pallant (2007:43), it is very important to check the data file for errors and mistakes in order to rectify any missing value and data that are not within the minimum and maximum ranges of the coded data. In other words, values that are far below or far above the data scores need to be corrected. For example, the researcher might enter 77 when he or she meant to enter seven.

These mistakes can negatively interfere with the result of the correlation analysis. The screening and cleaning process of the raw data for this study involve two stages:

Stage 1: Checking for errors. First, the researcher checked each data variable for scores that are out of range. This stage was achieved through the SPSS - descriptive statistics frequencies to enable the researcher to easily identify any value that falls outside the range values of the research variables as well as identifying both the valid and missing cases.

Stage 2: Finding and correcting the error in the data file. Secondly, the researcher finds where in the data file the mistake occurred. Finding the actual mistake was achieved through SPSS- data sort cases so as to rectify or delete the value. When the error is identified, the record of the questionnaire is checked to find out what the missing value should be. However, frequencies were repeated to double-check if there are still any missing values.

6.3 DEMOGRAPHIC DESCRIPTION OF THE SAMPLE

The demographic section of the data analysis describes the SMEs profile with regards to the number of years SMEs have been operating in business, SMEs annual sales, physical asset, number of employees as well as the type of SMEs industry. The levels of capacity in which SMEs run their business and the highest academic qualification achieved by the SMEs owner or manager are also presented. Figure 6.1 shows the number of year the organisation has been operating in business.

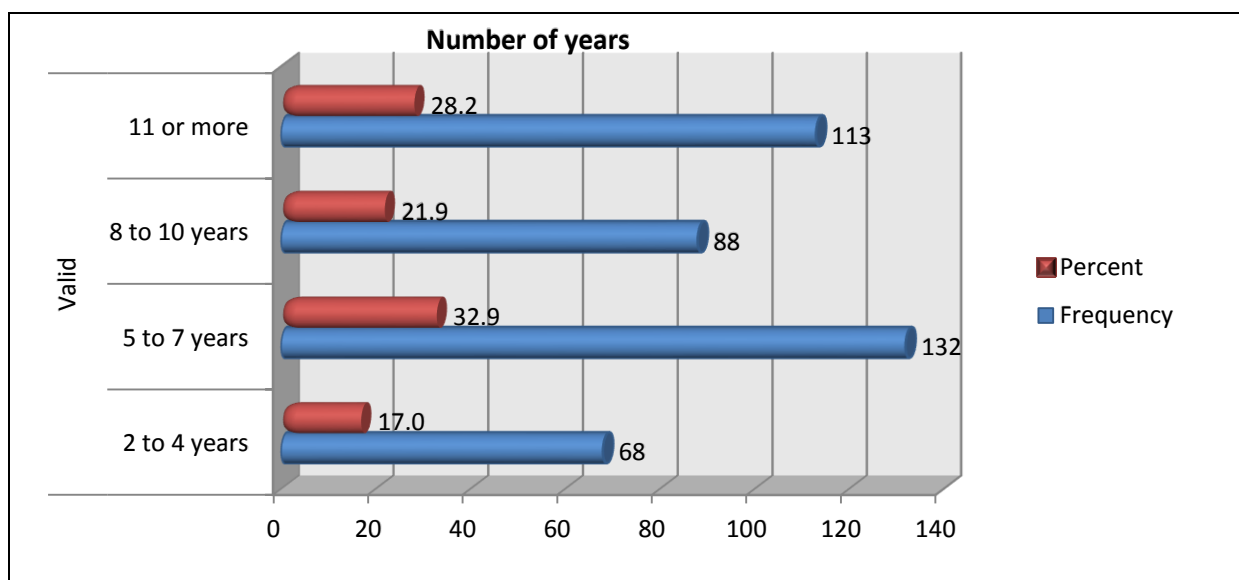


Figure 6.1: Number of years operating in business

Figure 6.1 describes the number of years the SMEs who participated in this study have been operating in business. The majority of the SMEs have been in business between 5-7 years (n=132; 32.9%) and some have been in operation for 11 years and more (n=113; 28.2%) followed by those SMEs who have been in business between 8-10 years (n=88; 21.8%). Those who have been operating their business for about 2-4 years round up to (n=68; 17.0%). This indicates that the SMEs within this region strive to stay and achieve success in business despite business challenges within the present competitive environment.

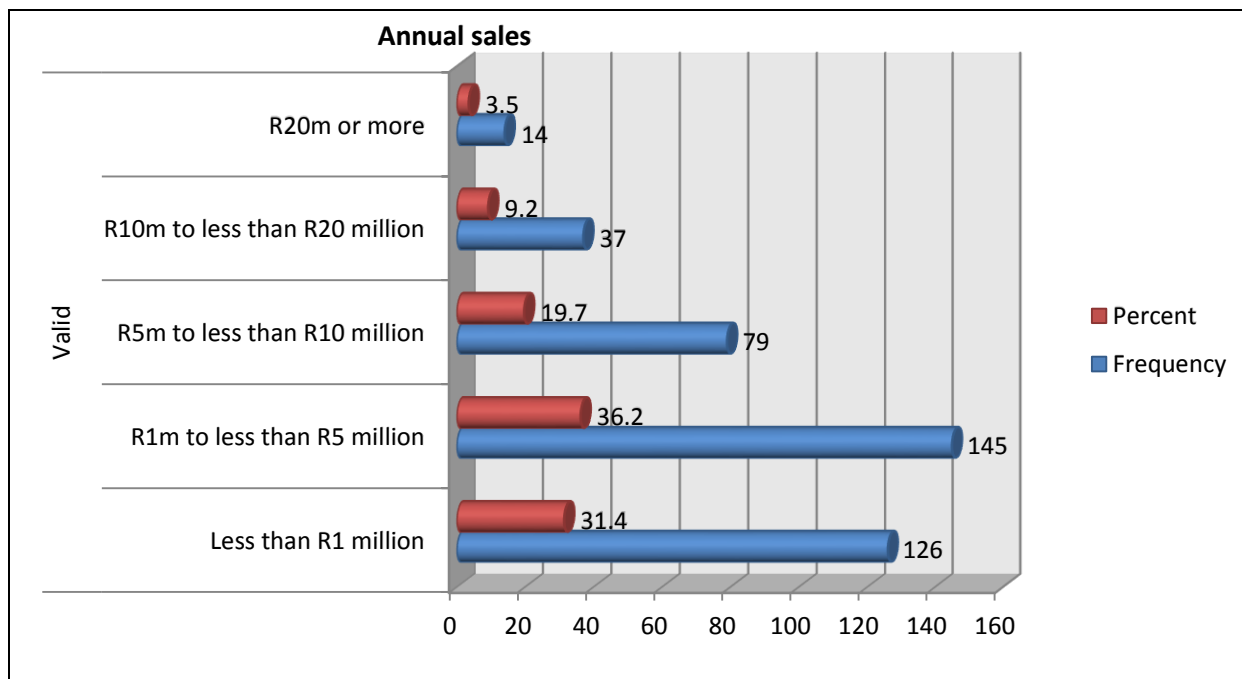


Figure 6.2: SMEs Annual sales

Figure 6.2 presents the annual sales profile of the SMEs. The profile indicated that the majority of the SMEs have annual sales of R1 million to less than R5 million (n=145; 36.2%) followed by those that have annual sales less than R1 million made (n=126; 31.4%); those that have annual sales of R5 million to less than R10 million (n=79; 19.7%). Out of the 401 sample size, few of the participated SMEs generate an annual sales of R10 million to less than R20 million (n=37; 9.2%) and those that generate annual sales between R20 million or more were also very few (n=14; 3.5%). SMEs compete with larger organisations that seem to be gaining more ground in the business environment and as such may influence negatively the SMEs annual sales.

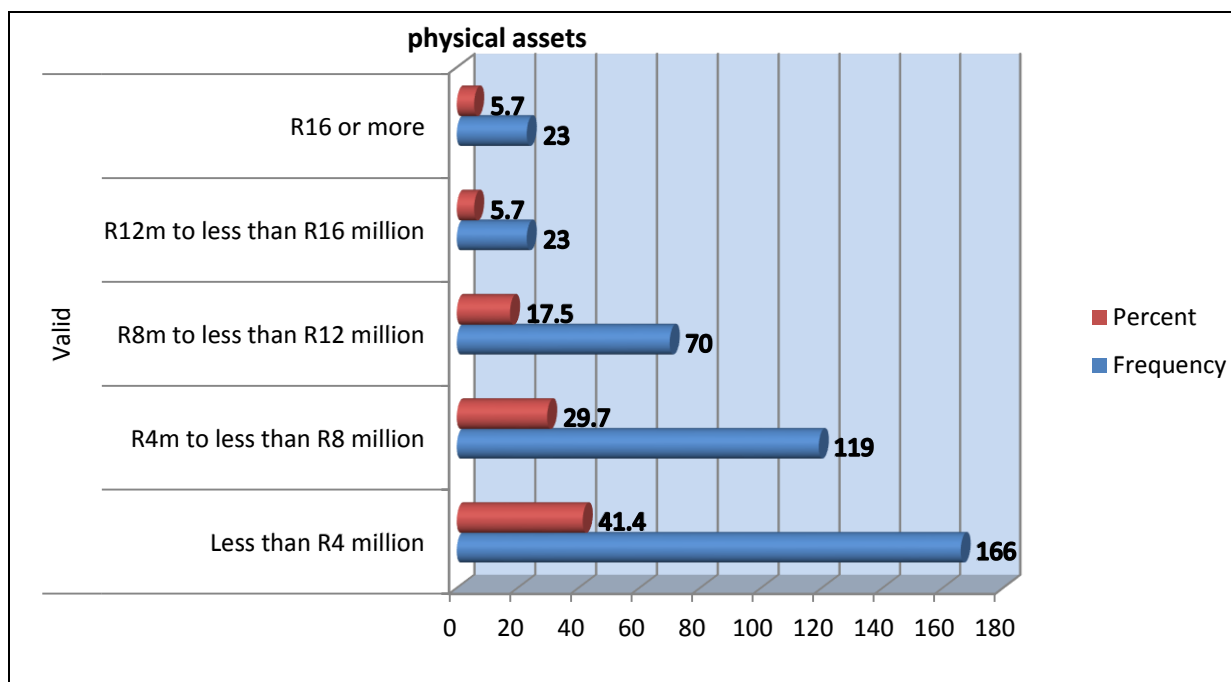


Figure 6.3: SMEs Physical assets

Figure 6.3 presents the physical assets of the SMEs. The statistics indicated that the majority of the SMEs have physical assets worth less than R4 million (n=166; 41.4%) followed by those that have physical assets of R4 million but less than R8 million (n=119; 29.7%); those with physical assets between R8 million to less than 12 million (n=70; 17.5%). Few of the SMEs have physical assets between R12 million to less than R16 million (n=23; 5.7%) and those that have physical assets of R16 million and more made up the balance of the sample (n=23; 5.7%).

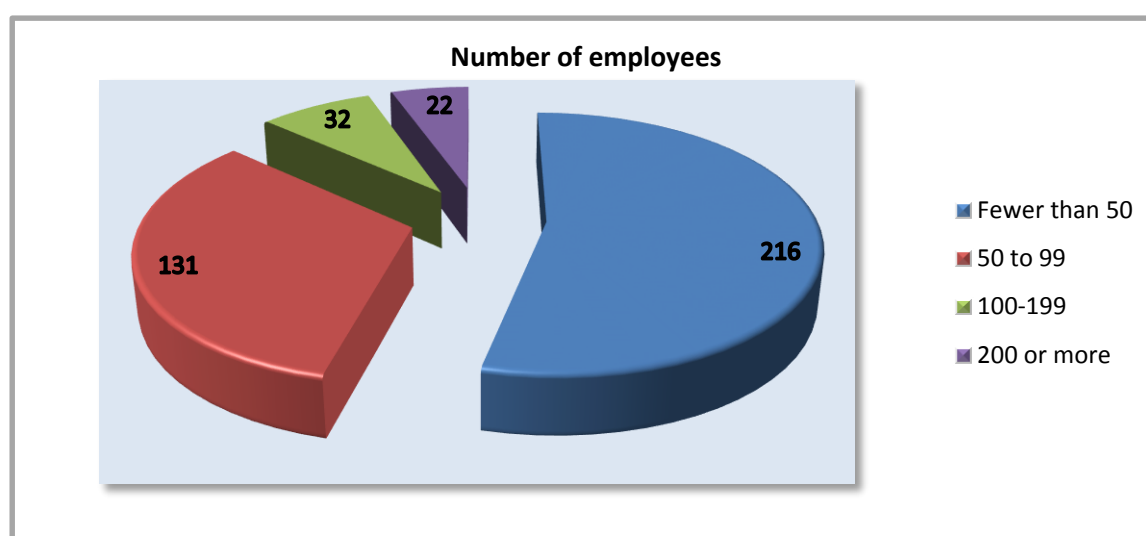


Figure 6.4: Number of SMEs employees

The distribution of the number of employees in the participating SMEs shown in Figure 6.4 indicated that more than half of the SMEs employ fewer than 50 employees (n=216; 53.9%) followed by those SMEs who employ between 50-99 employees (n=131; 32.7); those that have between 100-199 employees (n=32; 8.0%); those that employ between 200 and more (n=22; 5.5%). There are more SMEs that employ fewer than 100 employees than those that employ more than 100 employees.

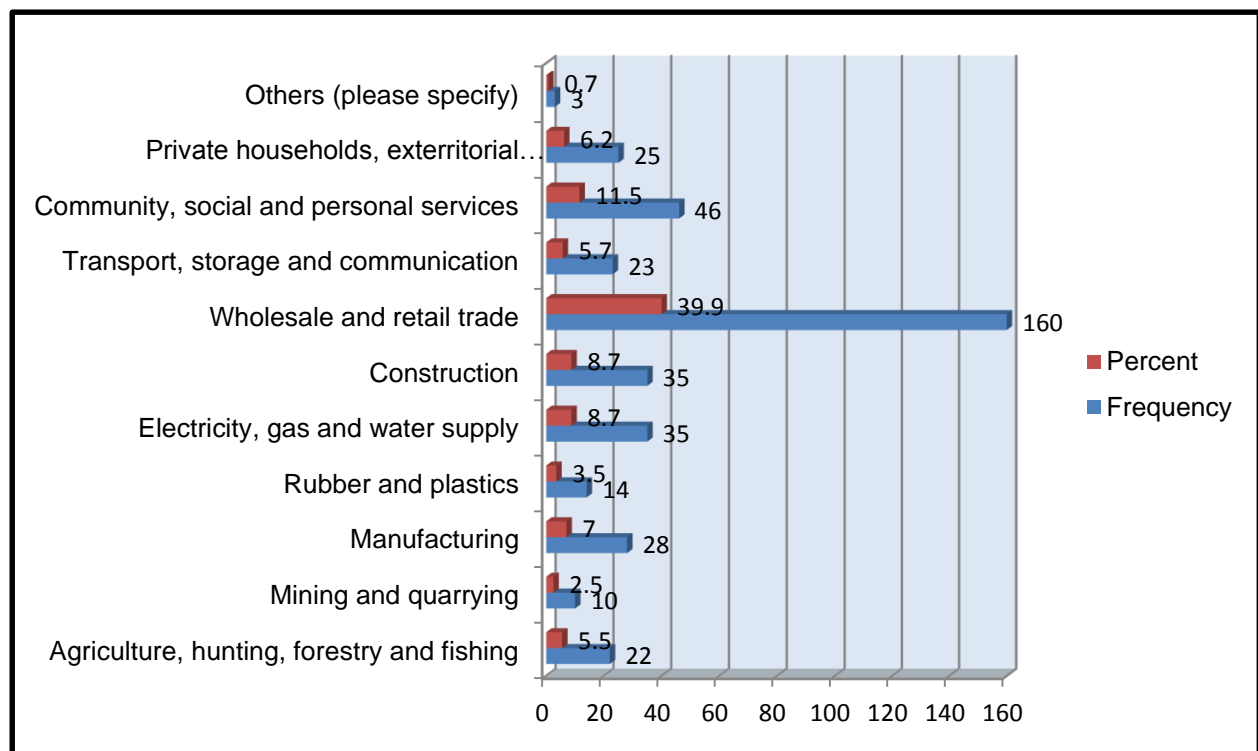


Figure 6.5: Type of industry

Figure 6.5 describes the frequency percentages of the participated SMEs industry type. The majority of the SMEs that participated in this study are in wholesale and retail trade industry (n=160; 39.9%) and the next highest rated industry are those offering community, social and personal services (n=46; 11.5%). This is followed by those SMEs in construction industry, electricity, gas and water supply (n=35; 8.7%) and manufacturing (n=28; 7.0%); those operating as private households, extritorial organisations and representative of foreign governments (n=25; 6.2%); those in agriculture, hunting, forestry and fishing industry (n=22; 5.5%) those in the transport, storage and communication sector (n=23; 5.7%); those in the rubber and plastics sector (n=14; 3.5%), those in the mining and quarrying (n=10; 2.5%) and other industry as specified by the SMEs round up to (n=3; 0.7%).

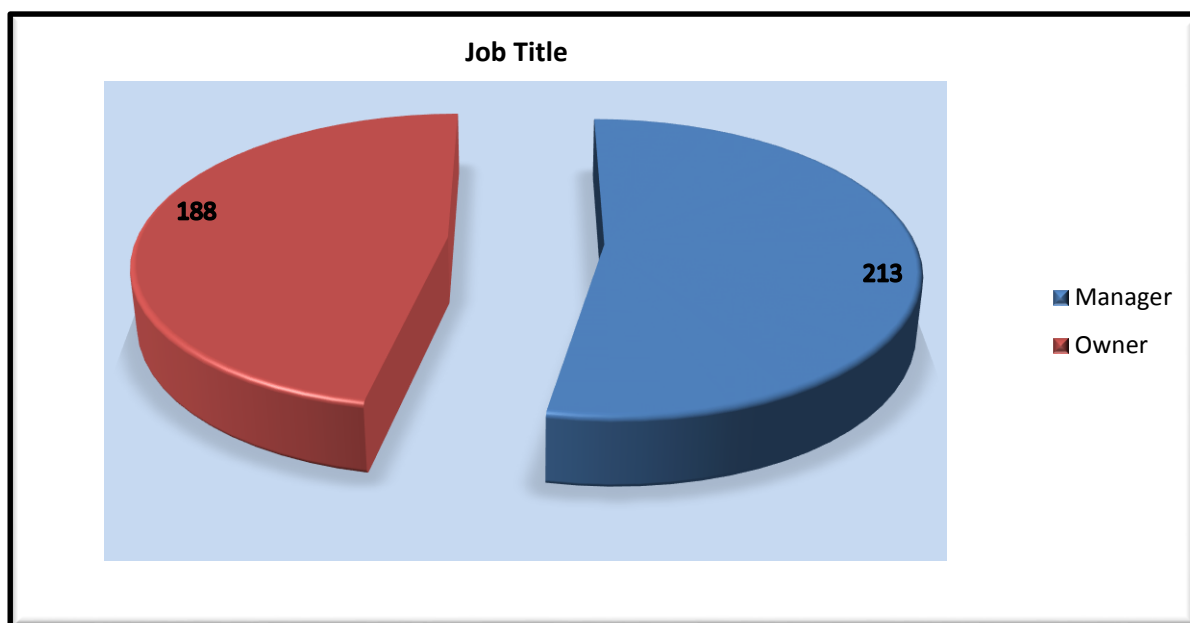


Figure 6.6: Participants Job Title

Figure 6.6 shows that the majority of the participants within the SMEs (n=213; 53.1%), were managers, while owners (n=188; 46.9%) made up the balance of the sample.

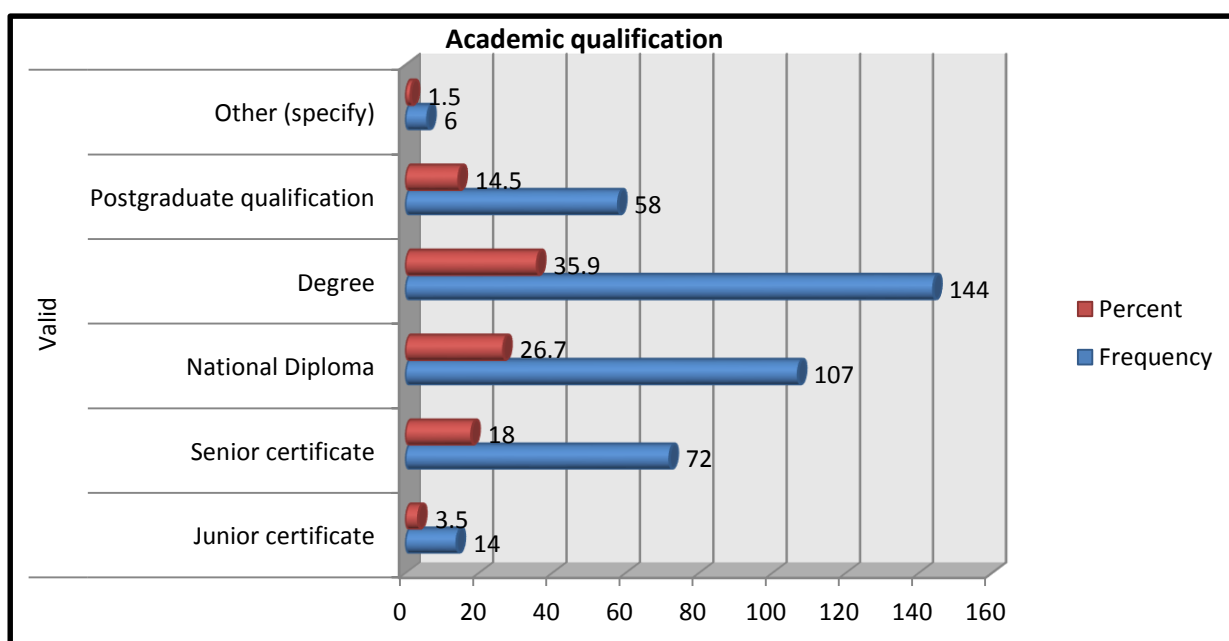


Figure 6.7: SMEs academic qualification of participants

Figure 6.6 presents the academic qualification of respondents. The majority of the participants have achieved their university degree (n=144; 36.9%). This is followed by those who have also completed a national diploma certificate (n=107; 26.7%). Some of the

participants, in addition to their first degree have also attained their postgraduate qualification (n=58; 14.5%). Only a few of the participating owners or managers have their junior certificate (n=14; 3.5%) and some also specified that they have other qualifications (n=6; 1.5%).

6.4 MEASURING THE INTERNAL CONSISTENCY OF THE SCALE (RELIABILITY TEST)

While progressing from demographic characteristics of the collected data, it is very important to assess the degree or the extent to which the items that make up the measuring scale are reliable. In order to check the measure reliability the Cronbach's alpha coefficient is used in this study. Two statistical methods were used to assess the internal reliability of the research constructs, namely Cronbach's alpha test (α) and composite reliability test (CR). This is very important for this study as most of the measuring scales have been adapted and modified to suit the study construct and aims. Table 6.1 shows the results of the reliability test for each research construct.

Table 6.1: Results of the reliability and item statistics

Research constructs		Descriptive statistics		Cronbach's test		AVE	CR	Factor loading	Maximum SV
		Mean	Std. deviation	Item-total	α Value				
Supply chain network	ISCN-1	5.10	1.390	0.581	0.895	0.591	0.895	0.617	0.232
	ISCN-2	4.98	1.316	0.746				0.785	
	ISCN-3	5.08	1.287	0.779				0.879	
	ISCN-4	5.07	1.325	0.789				0.857	
	ISCN-5	5.02	1.362	0.726				0.743	
	ISCN-6	4.86	1.533	0.713				0.700	
	ISCN-7	5.12	1.464	0.653				0.633	

Research constructs		Descriptive statistics		Cronbach's test		AVE	CR	Factor loading	Maximum SV
		Mean	Std. deviation	Item-total	α Value				
Supply chain flexibility	ISCF-4	5.55	1.106	0.755	0.872	0.560	0.835	0.789	0.349
	ISCF-5	5.61	1.140	0.710				0.816	
	ISCF-6	5.78	1.103	0.632				0.729	
	ISCF-8	5.76	1.220	0.605				0.648	
Internal integration across the supply chain	IIAS-1	5.09	1.272	0.655	0.909	0.538	0.902	0.659	0.349
	IIAS-2	5.11	1.152	0.702				0.674	
	IIAS-3	5.14	1.166	0.760				0.771	
	IIAS-4	5.38	1.209	0.692				0.777	
	IIAS-5	5.28	1.223	0.723				0.801	
	IIAS-6	5.20	1.268	0.774				0.821	
	IIAS-7	5.22	1.180	0.718				0.707	
	IIAS-8	5.27	1.245	0.624				0.634	
SMEs performance	ISBP-1	5.46	1.193	0.739	0.945	0.700	0.942	0.732	0.288
	ISBP-2	5.48	1.035	0.823				0.799	
	ISBP-3	5.53	1.046	0.837				0.838	
	ISBP-4	5.57	1.035	0.854				0.904	
	ISBP-5	5.52	1.072	0.848				0.904	
	ISBP-6	5.62	1.027	0.824				0.854	
	ISBP-7	5.65	1.045	0.805				0.813	

SCN= Supply Chain Network; SCF= Supply Chain Flexibility; IAS= Integration across Supply Chain; SBP= Small Business performance; C.R.: Composite Reliability; AVE: Average Variance Reliability; MSV: Maximum Shared Variance; * Scores: 1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Neutral; 5=Slightly Agree; 6= Agree; 7=Strongly agree

Note: ^asignificance level $p < 0.05$; ^b significance level $p < 0.01$; ^c significance level $p < 0.001$

Measurement CFA model fits criteria: CMIN/DF= 2.690; NFI=0.906, TLI=0.929, CFI=0.938, IFI=0.939, RMSEA=0.065

6.4.1 Cronbach's alpha Test (α)

The internal consistency (reliability) of the measuring items was assessed using the Cronbach's alpha coefficient. From Table 6.1, it can be seen that the Cronbach's alpha coefficient reported in each of the constructs ranges from 0.742 to 0.945. These values, therefore, indicate satisfactory internal consistency. According to Franzen (2000:22), Andrew *et al.* (2011:202), Johnson and Christensen (2012:142), α value greater than 0.7 signifies a higher reliability of the measurement scale. To further improve the internal consistency of the construct as represented by Cronbach's alpha value, positive higher inter-item correlations indicated that the items are measuring the same underlying characteristics which reveals statistical agreement among the measuring items. The item-total scale reliability results are presented in Table 6.1. From the Table, the item-total values range from 0.581 to 0.854 and are above the cut-off point of 0.3 (Pallant 2007:98). This indicates the degree to which the items are correlated with the scores. The next section discusses the composite reliability results.

6.4.2 Composite reliability test (CR)

The composite reliability formula as stated in Chapter 5 section (5.8.1.2) was used to calculate the composite reliability for further accuracy analysis regarding the reliability of each construct. The composite reliability results are reported in Table 6.1. The composite reliability values are greater than the recommended value of 0.7 (Kern 2011:55). The composite reliability ranges from 0.835 to 0.942 for the study, therefore, providing evidence for the measurement constructs.

6.4.3 Average variance extracted (AVE)

With regard to the average variance extracted for each construct, it is estimated that AVE values greater than 0.5 are acceptable (Khosrow-pour 2006:75; Vinzi *et al.* 2010:437). For this study, as denoted by Table 6.1, all the AVE values are above the recommended value of

0.5. According to Verhoef, Franses and Hoekstra (2000:22) and Huang, Wang, Wu and Wang (2013:219), AVE value of 0.50 is acceptable, stating that if the composite reliability of the construct is higher than 0.5, then the convergent validity of the measurement construct is adequate and acceptable. Above all, the AVE value for this study, which ranges from 0.538 to 0.700 are all accounted for by the latent construct and also provide an acceptable level of internal reliability of the research construct.

6.5 VALIDITY TEST

6.5.1 Convergent validity

Convergent validity was assessed to check if the four factors; supply chain networks, flexibility, supply chain integration and SMEs performance loaded highly on their factors. According to Vinzi *et al.* (2010:437), the recommended factor loadings for convergent validity should be above 0.5. As indicated in Table 6.1, the factor loadings are all above the recommended value ranging from 0.617 to 0.904. This, indicates acceptable individual item convergent in the validity of all scale items. Further, convergent validity was also examined using the composite reliability (CR) value for each construct, which should be greater than 0.7 (Kern 2011:55). In Table 6.1, the composite reliability estimate exceeds 0.7 providing adequate evidence of convergent validity.

6.5.2 Discriminant validity

Component correlation matrix was the first method used to check the discriminant validity of the research items. This was done by assessing whether the component correlation matrix among the construct was less than 1.0. In Table 6.2, the inter-correlation values for all paired latent variables are less than 1.0 and which\, indicate the existence of discriminant validity. Correlation value of SBP and IAS is 0.373, SCN and IAS is 0.420, SCN and SBP is .278, SCF and IAS is 0.492, SCF and SBP is 0.402, and SCF and SCN is 0.395 are all within the recommended threshold provides evidence of discriminant validity (Khosrow-pour 2006:75).

The square roots of average variance extracted (AVE) and maximum shared variance value (MSV) was used to determine discriminant validity of the research constructs. According to Deepen (2007:194) and Bearden *et al.* (2011:8), all construct average variance extracted estimations should be larger than the maximum shared variance (MSV). In Table 6.1, all the corresponding average variance extracted (AVE) are higher or above the maximum shared

variance (MSV) for all the research constructs. The measuring constructs possess discriminant validity.

Table 6.2: Correlation between constructs

Correlation matrix				
Component	1 IAS	2 SBP	3 SCN	4 SCF
1 IAS	1.000	.373	.420	.492
2 SBP	.373	1.000	.278	.402
3 SCN	.420	.278	1.000	.395
4 SCF	.492	.402	.395	1.000

SCN=Supply Chain network; SCF=Supply Chain Flexibility

IAS=Integration across Supply Chain; SBP=SMEs Performance or Small Business Performance

6.5.3 Conceptual model fit assessment

In this section, a confirmatory factor analysis CFA is performed to test the goodness-of-fit of the model. CFA is a statistical technique used to test the model fit of the measurement model using the model fit criteria and to analyse convergent and discriminant validity (Lei & Wu 2007:33). However, determining the acceptable fit of the model and assessing accuracy of scale, led to the deletion of some items in the construct scales. Table 6.3 presents the CFA model fit results.

Table 6.3: CFA Model fit results

CFA	CMIN/DF	NFI	TLI	CFI	IFI	RMSEA
INDICATOR VALUE	2.690	0.906	0.929	0.938	0.939	0.065

Table 6.3 shows the relevant information regarding the model fit of the different variables chosen for this investigation and the results provided in this table can be interpreted as follows:

The CMIN/DF value of 2.690 is less than three and, therefore, confirms the model fit. Recommended statistics for the final overall-model assessment showed acceptable fit of the measurement model to the data. Additionally, all correlation values also confirm the model fit because the values of NFI, TLI, CFI, IFI and RMSEA were 0.906, 0.929, 0.938, 0.939, and 0.065 respectively. All these model fit measures were above the recommended accepted threshold of greater than 0.90 for GFI, NFI, CFI, IFI, TLI and less than 0.80 for RMSEA, which indicates that the proposed conceptual model fit well (Kline 2005:140; Lei & Wu 2007:37). These measurement values also indicate that the proposed model possibly represents the underlying empirical data structure. Since an acceptable CFA measurement model fit has been obtained, the study proceeded to hypothesis testing stage using structural equation modeling with AMOS version 22.0 software programme.

6.6 STRUCTURAL EQUATION MODELING (SEM)

After assessing the measurement model results through CFA statistical analysis, it is possible to test the research hypotheses using SEM statistical analysis. SEM was used to test the path analysis and to test the interrelationship among the hypothesised research variables. In other words, SEM was used in this study to assess the relationships between variables and to model the relationships between constructs in order to make the conceptualisation of the theory under the study clearer or more explicit. The overall goodness of fit indices is also reflected in this section, for example incremental fit indices and absolute fit indices. Incremental fit indices for this study (NFI, TLI, RFI, CFI and IFI) signify that a higher value of 90% and more for the above fit indices, indicates larger improvement in the research baseline model fit and are also generally accepted as indicators of good fit. On the other hand, absolute fit indices for this study (CMIN/DF, GFI and RMSEA), which measure the sample covariance matrix were also used as indicators for better model fit for SEM.

AMOS is an easy-to-use structural equation modeling program that allows the researcher to test hypotheses and confirm relationships. Table 6.4 shows the model fit criteria results. SEM hypothesises that a relationship between observed variables and their underlying latent constructs exists. SEM was also used to discuss the appropriateness of the proposed hypothesis for the study.

6.6.1 SEM model fit results

In comparison with the CFA results, the SEM statistical analysis shows slight improvement in the model fit criteria results signifying a better model fit acceptance. For example, the normed chi-square over the degree of freedom has reduced from 2.690 to 2.451 and root mean square error of approximation has reduced from 0.065 to 0.060 respectively for SEM results. From Table 6.4, the model fit the sample data reasonably well as indicated by the selected overall goodness-of-fit statistics criteria for SEM. Other supporting evidence is provided by the $CMIN/DF = 2.451 (<0.3)$, with $p=000$, $RMSEA = 0.060 (<0.80)$, $NFI = 0.917 (>0.90)$, $TLI = 0.939 (>0.90)$, $RFI = 0.901 (>0.90)$, $CFI = 0.949 (>0.90)$, $IFI = 0.949 (>0.90)$, which are below the desired cutoff and considerably above recommended threshold, thereby, denoting satisfactory model fit. In other words, the model solution shows a good fit because all the values are within the recommended acceptable range parameter for model fit.

Table 6.4: SEM model fit results

SEM	CMIN/DF	NFI	TLI	RFI	CFI	IFI	RMSEA
INDICATOR VALUE	2.451	0.917	0.939	0.901	0.949	0.949	0.060

According to Lei and Wu (2007:38), after determining that the model fit the data well and is theoretically consistent, and that the estimation solution is considered proper, then the individual parameter estimates can be interpreted and examined for statistical significance. In AMOS, there are two ways of presenting and examining the hypothesised parameter estimate, namely using the path diagram output to visually display the parameter estimates or using tables similar to those containing the overall model fit statistics. This study, therefore, uses the table format to display the hypothesised relationships between the research variables. The next section discusses the hypotheses test results for statistical significance.

6.6.2 Hypotheses testing results

This section shows the result of the research hypotheses that hypothesised that there is a positive relationship between the research construct measuring supply chain networks, flexibility, supply chain integration and SMEs performance. Table 6.5 and Figure 6.8 show the causal paths and hypotheses.

Table 6.5: Results of structural equation model analysis

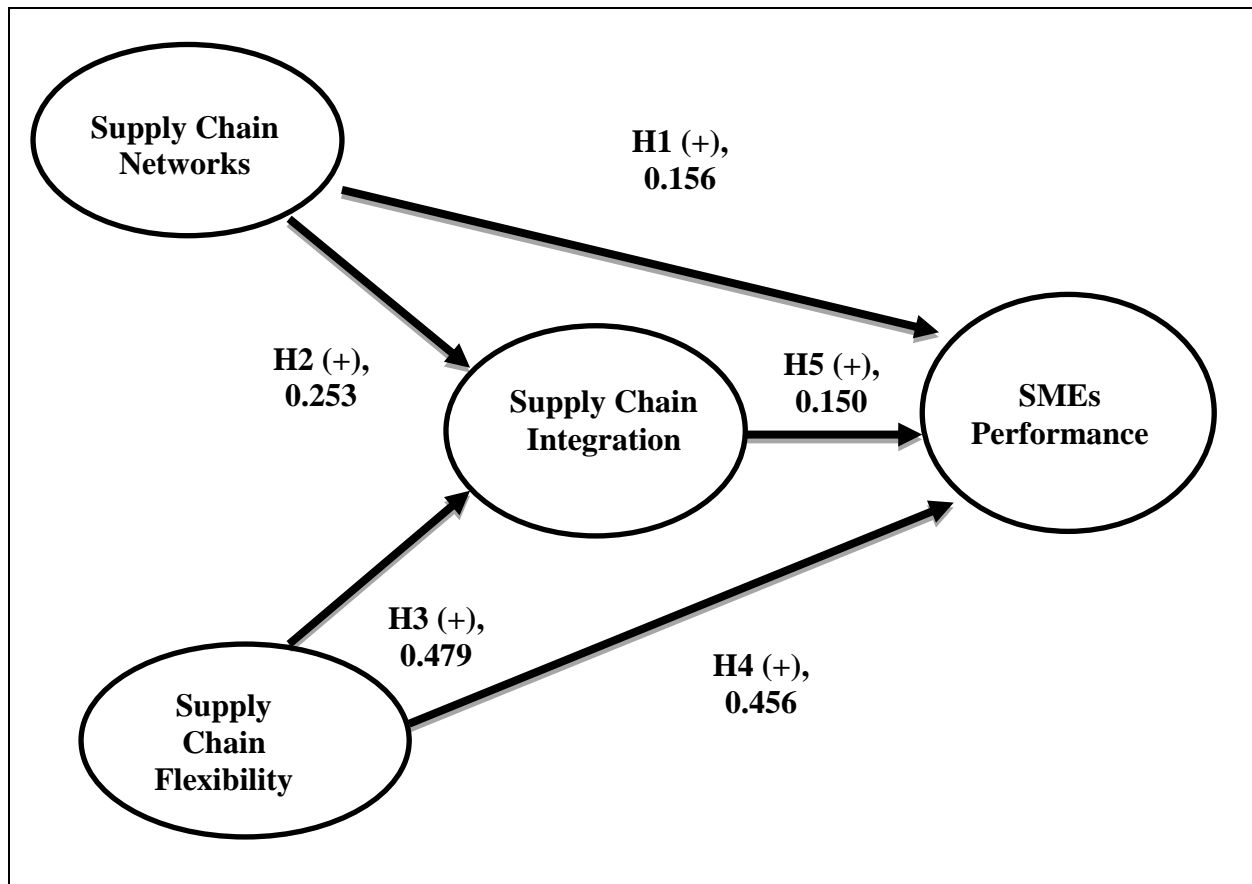
Causal Path	Hypothesis	Path Regression Coefficients	S.E.	C.R.	P	Significance Level
SBP <--- SCN	H1 (+)	.156	.051	3.085	.002	Accepted at p<0.05
IAS <--- SCN	H2 (+)	.253	.049	5.219	***	Accepted at p<0.001
IAS <--- SCF	H3 (+)	.479	.065	7.408	***	Accepted at p<0.001
SBP <--- SCF	H4 (+)	.456	.074	6.140	***	Accepted at p<0.001
SBP <--- IAS	H5(+)	.150	.071	2.102	.036	Accepted at p<0.05

Scores: 1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Neutral; 5=Slightly Agree; 6= Agree; 7= Strongly agree, **Structural equation model fits criteria:** CMIN/DF= 2.451; NFI=0.917, RFI=0.901, TLI=0.939, CFI=0.949, IFI=0.949, RMSEA=0.060

Table 6.5 displays the unstandardised path regression coefficient for structural model relationships, which represent the hypothesised relationships among the research constructs (Lei & Wu 2007:38). The table also shows the structural model standard error that is abbreviated as S.E and the estimate, which is divided by the standard error and is abbreviated as CR for the computation of the critical ratio. The probability value associated with the proposed hypothesis is displayed under the p column as well as their statistical significant levels. Figure 6.7 shows the path coefficient relationship between the research variables.

The path regression coefficient relationships results in Table 6.5 show that the entire regression path estimate is statistically significant. The regression coefficient, which ranges from 0.150 to 0.479 is significant because according to Moser (2007:185), Merschmann and

Thonemann (2009:21), Safavi, Zakaria and Am (2014:1672) path regression coefficient above 0.1 is high and should be considered significant if the critical ratio is greater than 1.96. This, therefore, indicates that the variable relationships between the measuring constructs are related and can be identified as reliable and can be trusted for this research. The next section explains further the statistical significance of the construct relationships.



Scores: 1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Neutral; 5=Slightly Agree; 6= Agree; 7= Strongly agree, **Note:** ^asignificance level $p<0.05$; ^b significance level $p<0.001$; **Structural equation model fits criteria:** CMIN/DF= 2.451; NFI=0.917, RFI=0.901, TLI=0.939, CFI=0.949, IFI=0.949, RMSEA=0.060

Figure 6.8: Research model relationships

6.6.3 P-values and CR values for path coefficient statistical significance

In Table 6.5 and Figure 6.8, the test for the individual hypothesised estimates for statistical significance is based on the ratio of the parameter projected to its standard error estimate, which is also called *t*-value.

The result in Table 6.5 and Figure 6.8 showing the pattern of correlation among the research variables, confirms that the respective relationships between the research variables and the construct measurement are statistically significant at a level of 5 percent. According to Lei and Wu (2007:38), Hair, Hult, Ringle and Sarstedt (2014:172) the absolute value of the critical ratio (CR or *t*-value) that is greater than 1.96 is statistically significant at the level of 5 percent. In other words, a significance level of 0.05 is assumed for the entire research variable for this study, which, therefore, represents a strong standard or factor loading on supply chain network variable, supply chain flexibility variables, supply chain integration variables and on SMEs performance variables. From Table 6.5, all the research variables for the critical ratio are greater than 1.96 and, therefore, exceed the recommended value. For example, SCF and IAS account for the highest value of 7.408 and also having the highest path coefficient estimate of 0.479, while IAS and SBP has the lowest critical ratio of 2.102 and also has the lowest path coefficient estimate of 0.150. As indicated in the table, the *p*-values for the research construct are less than 0.001 for H2, H3 and H4 and less than 0.05 for H1 and H5, which further shows a strong relationship between the construct. This means that the higher the path regression coefficient value, the greater the effect the independent variables have on dependent variables. Table 6.6 indicates that all five of the hypotheses are supported.

Table 6.6: Overall results of SEM hypotheses testing

	Hypothesis Statement	Results
H1	Supply chain networks have a significantly positive influence on SMEs performance.	Supported
H2	Supply chain networks have a significantly positive influence on SMEs supply chain integration.	Supported
H3	Supply chain flexibility has a significantly positive influence on SMEs supply chain integration.	Supported
H4	Supply chain flexibility has a significantly positive influence on SMEs performance.	Supported

	Hypothesis Statement	Results
H5	Supply chain integration has a significantly positive influence on SMEs business performance.	Supported

Scores: 1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Neutral; 5=Slightly Agree; 6= Agree; 7= Strongly agree, **Note:** ^asignificance level $p<0.05$; ^b significance level $p<0.001$; **Structural equation model fits criteria:** CMIN/DF= 2.451; NFI=0.917, RFI=0.901, TLI=0.939, CFI=0.949, IFI=0.949, RMSEA=0.060.

6.6.4 The overall relevance of the significant relationships

After ensuring the model fit for the study, it was now possible to analyse the hypothesis relationship focusing on the hypotheses results as shown in Table 6.5 and Figure 6.7. In Table 6.5, all hypothesis coefficients were either at a significant level of $p<0.001$ or $p<0.05$.

H1 proposes that supply chain networks have a significantly positive influence on SMEs performance. Indeed, the result of the structural path model reveals that the direct effect or link of supply chain networking and SMEs performance without the mediating variable (integration) is supported and accepted at significant level of $p<0.05$. This means that supply chain networks, whether a buyer-supplier relationship, marketing collaboration relationship, research and development (R&D) relationship or other strategic business relationships thus, have a direct influence on SMEs business performance. However, the regression coefficient indicates the lowest link in the measurement relationship representing that entering into a collaborative relationship with other organisation may be challenging for most of the participating SMEs. Thakkar *et al.* (2008:122), Antonio *et al.* (2009:308) confirm that indeed supply networking may be challenging for SMEs because of the capabilities and skills that are needed when developing relationships, as well as the fear of information revolution, increasing global competition, which creates more demanding customers. In addition, coupled with the limited power, resource, and business experience among SMEs, SMEs are perceived by larger organisations as unreliable partners in terms of delivery quality, which may result in little opportunity for SMEs to participate or network with larger organisations.

Harland *et al.* (2007:1240), and Chin *et al.* (2012:617) also support the significance of the relationship stating that SMEs that strive to achieve synergistic collaborating relationships through working together can enhance business performance because of the open communication that allows sharing and learning of skills and ideas. Chai *et al.* (2011:12), also reported a similar case that supply chain network influences performance because of its

attributes that allow efficient use of SMEs resources and effective use of SMEs knowledge base for innovation. With the knowledgeable information exchange within the networking SMEs they are able to outperform their competitors. SMEs, therefore, need to have integrated collaborative relationships in order to improve on resources, capabilities, and the overall business processes. The combination of resource, skills and knowledge may result in innovative skills and new product development, thereby enhancing business performance. Therefore, H1 was supported.

In the second hypothesis (**H2**), supply chain networks have a significantly positive influence on SMEs supply chain integration. Here the researcher analysed the correlation between SMEs supply chain network and the mediating variable (integration) in order to assess the indirect acceptance of the link. Table 6.5 and Figure 6.7 indicate that the proposed hypothesis between the relationship is true for supply chain network as having a positive influence on SMEs internal integration at an acceptable level of $p < 0.001$ indicating a significant relationship between the constructs. The level of relationship influence is higher than the level of relationship influence without the mediating variable between supply chain network and SMEs performance as presented in H1. This means that though supply chain network directly influences SMEs performance, supply chain integration also plays an important role in SMEs networking relationships in order to achieve a high level of performance. The result is supported by Prajogo and Olhager (2012:515), Flynn *et al.* (2010:59), and Kim (2009:328) that efficient internal integration across the supply chain determines the effectiveness of supply chain network on SMEs performance. SMEs supply chain network, therefore, requires a well-organised and planned integration strategy of all functional activities so that the whole process of supplying and delivering to customers is done in an efficient and effective manner and that the knowledge and the business experience gained can be internally integrated successfully. This means that a higher supply chain network value is associated with a higher integrated business strategy. Therefore, **H2** was supported.

H3 posited that supply chain flexibility will positively influence supply chain integration. The p -value of < 0.001 suggest a significant relationship between the constructs. This is supported by Swafford *et al.* (2008:295), Stefanovic *et al.* (2009:744), and Wong, Boon-itt & Wong (2011:604), that flexibility positively influences integration business flexibility and implies integrating business mechanisms to accommodate flexible changes. Therefore, SMEs supply chain networking should be built on the business foundation of strategic flexibility

and integration. Supply chain flexibility is the SMEs ability to easily adapt, integrate and cope with the changing market conditions. The path regression coefficient value of 0.479 reveals that a higher flexibility strategy is also associated with a higher integration strategy and, therefore, confirming that flexibility has a significantly positive influence on SMEs supply chain integration. SCF and IAS are significant and accepted. Therefore, **H3** was supported.

H4 states that supply chain flexibility has a significantly positive influence on SMEs performance. As presented in the path result shown in Table 6.5 and Figure 6.7, the *p*-value of <0.001 with the path coefficient 0.456 indicates a strong positive and significant relationship between supply chain flexibility and SMEs performance. In this case flexibility is very important to the participated SMEs. This may be due to the fact that as the global market emerges with demand uncertainty, the SMEs ability to reduce lead-times, reduce product development cycle times, increase frequency of new product introduction, increase levels of customisation, adjust and improve on delivery reliability, improve the level of customer service and the ability to improve responsiveness to changing market needs has become fundamental to achieving competitive advantages (Yung & Chan 2003:302). In other words, for SMEs to be more efficient and effective within the emerging global business environment, flexibility strategy is needed for continuous improvement. The SMEs ability to reduce lead-time both within and outside the organisation may also lead to a decrease in transaction cost, expedite delivery time and improve service to customers (Wadhwa 2012:445).

Steger-Jensena and Svensson (2004:85) findings also support the significant influence of flexibility on performance, stating that flexibility is not only important for gaining competitive advantage but also to increase the opportunities for reducing operating costs, efficient use of firms resources and also strengthen collaborative relationships within the supply chain. Although, Steger-Jensena and Svensson's (2004:85) findings were based on larger organisations, from this thesis it is evident that the aim for supply chain flexibility among SMEs is also to satisfy customer-specific demands for products.

Looking at the regression path coefficient value, the correlation significance between SCF-IAS-SBP is more highly supported to aid business performance for the participated SMEs, than the coefficient value of SCN-IAS-SBP. This indicates that most SMEs within the Southern Gauteng region have more awareness about the importance of supply chain flexible

than the importance of supply chain networks. This is also supported by Thakkar *et al.* (2008:122), who posit that supply-networking practices among SMEs are not strong, as compared to the larger organisations. The SCF and SBP proposed relationship is supported. Therefore, **H4** supply chain flexibility has a significantly positive influence on SMEs performance was supported.

Lastly, hypothesis five (**H5**), which posited that supply chain integration will have a positive influence on SMEs business performance was also supported (See Table 6.5 and Figure 6.7). The path coefficient value of 0.150 and $p < 0.05$ indicates that the relationship between the measuring constructs are significantly supported and accepted. Supply chain integration as the mediating variable between supply chain network, supply chain flexibility and SMEs performance suggests that networking and flexibility practices can result in strategic changes in the SMEs internal operations that may enhance business performance.

The reason for the implementation of internal integration mechanisms is so that SMEs are able to efficiently and effectively coordinate external activities towards building happy customers and suppliers as well as maintain a healthy relationship within the supply chain. This may involve implementing information technology associated with supply chain process to enhance JIT product or service delivery and communication as well as prompt customer feedback for continuous improvements; effective management of both forward and reverse logistics and improving networking relationships within the supply chain (Zhao *et al.* 2011:19, Horn *et al.* 2014:56). The path coefficient result indicates that supply chain integration is a dependent variable and that its implementation may not be possible or has a strong positive influence on performance without any strategic developmental changes resulting from SCN and SCF. For example, when assessing the relevance of the significant relationships between the research construct, it can be noticed that the SCN - IAS and SCF - IAS have a higher path regression coefficient value than the correlation path coefficient of IAS and SMP. This means that though strategic integration plays a big role in enhancing business performance, supply networking and flexibility are the strategic forces that trigger SMEs motives to improve on their internal integration mechanisms and thereby resulting in higher levels of business performance (Narasimhan & Kim 2002:321). In this result, SMEs business performance depends on their level of networking, ability to respond quickly to customers' demands in the changing competitive business environment and the ability to successfully integrate the business operational activities in order to effectively and efficiently

outperform competitors. Hence, H5: supply chain integration has a significantly positive influence on SMEs business performance, is true and supported for this study.

Overall, the findings also indicate that supply chain network, supply chain flexibility and supply chain integration have a strong influence on SMEs business performance. However, the direct relationship between SCN and SMEs business performance without strategic integration mechanism has yielded a weaker relationship in this study. Therefore, the benefits of supply chain network among the participating SMEs may not be achieved or be appreciated if flexible internal integration approach is not put in place or planned for by the networking SMEs. The theoretical review of the proposed hypothesis development also supported the reasoning that strategic flexibility and integration mechanisms play a vital role in SMEs supply chain networks to achieve high levels of performance.

6.7 CONCLUSION

This chapter begins by exploring the use of SPSS version 22.0 to check the data set for error (data screening and cleaning), this was followed by the demographic description of the participating SMEs; testing for the accuracy of the measurement (factor analysis) and analysing the model fit of the study proposed conceptual model. The entire model fit criteria results were found to be adequately acceptable and, therefore, were reliable and valid. The results also indicated that the data fit well with the hypothesised model.

This chapter proceeds to test the hypothesis for the study using SEM with AMOS version 22.0 to analyse and discuss the research findings. From the findings, all the hypothesised relationships among the investigated research variables such as supply chain network positively influence SMEs performance; supply chain network positively influences supply chain integration; supply chain flexibility positively influences supply chain integration; supply chain flexibility positively influences SMEs performance as well as supply chain integration positively influences SMEs performance were all supported as predicted. The recommendations and the overall conclusion of the research findings will be discussed in the next chapter. Figure 6.9 presents the diagrammatic representation of Chapter 6.

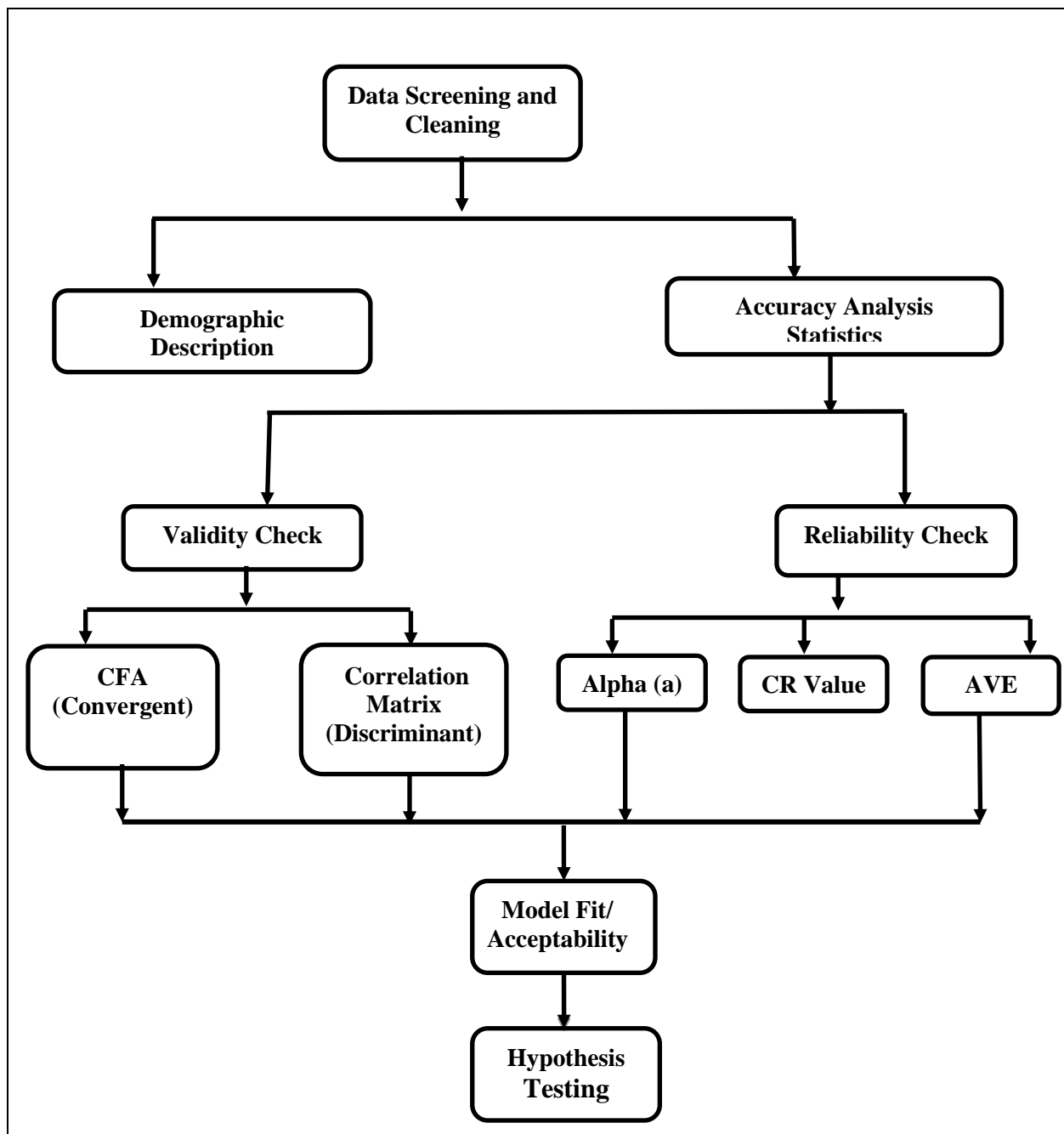


Figure 6.9: The diagrammatic representation of Chapter 6

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

The previous chapter presented the findings of the study. Descriptive statistics were used to explain the demographic profile of the SMEs. Confirmatory factor analysis (CFA) and SEM were employed to assess the goodness-of-fit and statistical significance among the measuring constructs, namely supply chain networks (SCN), supply chain flexibility (SCF), integration across supply chain (IAS) and SMEs business performance (SBP). The CFA and SEM results revealed that the proposed model fits well and also represents the underlying empirical data structure. Apart from the fact that the model fits well, SEM results further revealed that the variable relationships between the measuring constructs are statistically significant.

This chapter seeks to conclude the study, which examined the influence of supply chain network, its flexibility and integration on the performance of SMEs within the Southern Gauteng region. The remainder of the chapter is structured as follows: Section 7.2 discusses the achievement of the research objectives and hypothesis, while Section 7.3 highlights the recommendations for further study. Section 7.4 discusses the policy implications, SMEs implications and the research implications. Section 7.5 discusses the limitations of the study and finally, Section 7.6 provides a conclusion for the study.

7.2 ACHIEVEMENT OF THE RESEARCH OBJECTIVES

The main objective of this study was to examine the influence of supply chain networks, supply chain flexibility and supply chain integration on the performance of SMEs in the southern Gauteng region. The next section describes how the theoretical objectives were achieved, followed by the achievement of empirical objectives and, thereafter, the achievement of the proposed hypotheses.

7.2.1 Achievement of the theoretical objectives

The following theoretical objectives were formulated for the study as indicated in Chapter 1 (Section 1.4):

- To conduct a literature review on the overview and contribution of SMEs in South Africa
- To conduct a literature review on the barriers of supply chain performance among SMEs
- To conduct a literature review on the variables influencing SMEs performance within the supply chain networks.
- To review theoretically the relationship of the concept of supply chain networks, supply chain flexibility, supply chain integration and SMEs.

7.2.1.1 Theoretical objective 1

The overview and contribution of SMEs as well as the characteristics and importance of SMEs in South Africa were discussed in Chapter 2, Sections 2.2, 2.3, 2.4 and 2.5 respectively. This was possible through the review of literature from textbooks and research articles, policy research working papers as well as government publications. The South African National Small Business Amendment Act (26 of 2003) was used for the classification and definition of SMEs. This study adopted a definition of SMEs as multitudinous suppliers of employment, creators of work opportunities, innovators and initiators. SME are also subcontractors for large companies, responsible for the manifestation of the free market system and in many instances the entry point into the business world, playing an important socio-economic role (Chan *et al.* 2012:330). SMEs originate from individuals who identify new opportunities in society and who are motivated to exploit such opportunities, and also contribute significantly to economic growth.

The contribution and the role of SMEs in South Africa's economy is important, especially in the aspect of employment and poverty alleviation. SMEs contribute 50 to 60 percent to the gross domestic product (GDP) and employ up to 60 percent of the labour force of the economy. However, SMEs in South Africa still face some major issues, which have resulted in constraints to SMEs business performance. In order to strategically mitigate SMEs business constraints, a number of favorable strategic actions have been implemented by the South Africa government to further aid the business performance and growth of SMEs, for example, the National Small Business Act, Transaction and Procurement Act and the Small Business Finance Act were establish as enabling legal frameworks for SMEs access to procurement, finance, training and technology. Nevertheless, the performance success of the SMEs, especially the newly established ones are still expected to rise in order to mitigate the unemployment rate and also contribute significantly to economic development. Most of the

SMEs still struggle to survive considering the failure rate of about 75 percent of the new SMEs that are started eventually fail to become established firms. This questions the capability of the SMEs owner's business skills to perform well. Irrespective of the failure rate, there is still a need in the literature to promote the establishment, survival and performance efficiency of SMEs because the lack of it or the decline of SMEs may result into a decrease in economic growth and hence the importance of this study.

7.2.1.2 Theoretical objective 2

This objective was discussed in Chapter 2, Section 2.6. SMEs barriers to performance are challenging factors that hinder the achievement of performance. Just like the larger organisations strive to achieve high levels of performance, likewise the manager and owners of SMEs as they also have business goals and objectives to achieve performance. SMEs are managed by entrepreneurs who take the initiative to set up and manage a business with the intention to succeed considering the risk and competitive challenges in the business environment. However, financial support has been seen as the ultimate obstacle to SMEs business growth and performance. A well-managed business process is the key to performance, which may require business skills to survive. As discussed in Chapter 2, SMEs are challenged with human resources management, which also can be a source of sustained competitive advantage and economic growth. The lack of adequate human resources may lead to business stagnation or closure of the business. SMEs tend to ignore the importance of human resource management as an adequate business strategy to manage resource effectively and efficiently. This may be linked to the economies of scale and personal characteristics of SMEs in terms of owner/manager's level of education, as well as management/professional experience.

SMEs are also faced with the challenge of a well-formulated supply chain strategic plan, which is essential to achieving business goals and objectives with high performance. Supply chain strategic plan is a strategic road map outlining the key supply chain performance indicators, quality management, feasible analysis, decision and communication. This challenge is linked to the ineffective marketing strategy of the SMEs, lack of information technology to successfully integrate, share and gather information as well as to achieve valued customer service. Supply chain operations skills and supply chain practices in terms of managerial capabilities and competences was also viewed as barriers to SMEs supply chain performance. For example, larger organisations use their management processes to achieve

multiple performance outcomes while SMEs management processes achieve focused performance outcomes because of lack of continuous learning and improvement (Hong & Jeong 2006:293). Supply chain network is the effective management of business processes and challenges to achieve success and continuous improvement. SMEs, therefore, need to be proactive in dealing with the entire business operations to be successful.

7.2.1.3 Theoretical objective 3

Theoretical objective 3 was discussed in Chapter 3, Sections 3.1 to 3.3. Performance within the supply chain relationship depends on the SMEs flexibility strategy and integration strategy. The first part of Chapter 3 presented supply chain management theories underpinning the research variables. Several supply chain management theories were discussed, such as network perspective theory, the social network theory, the network management theory, and finally the relational view theory. These network theories denote the business ties and relationships among different organisations, which consist of actors, resources and activities. Organisational network relationships relate to both the internal relationship and external relationship structure of communications and exchange of resources that could improve SMEs capabilities to leverage resources and skills effectively. Investment of trust and mutual understanding are required in a network theory to maximise profit and long-term commitment. Of all these theories discussed, the relational view theory was more valued and accepted for this study since it provides a theoretical foundation for supply chain network and serves as source of inter-organisational mutual benefits in the network environment.

The relational view theory proposes that a firm's critical resources may extend beyond firm boundaries in terms of inter-firm knowledge transactions like knowledge exploration, knowledge retention and knowledge exploitation, which may be coordinated externally (Lichtenthaler 2008:201; Jap 2001:20). This means that, as global competition among organisations increase, organisations whether small or large, may not be able to compete effectively with its internal resources and capabilities alone. Therefore, SMEs are required in addition to the set business objective, to network their business activities and operations to compete effectively. The theory stipulated that for SMEs to achieve inter-organisational competitive advantages and performance within the supply chain there should be input commitment investment in relation specific assets or resources, joint learning through efficient flow of knowledge sharing, complementary resources capability and effective

governance. Lack of collaborative capabilities among SMEs is likely to impact negatively on the SMEs competitiveness and economic growth.

7.2.1.4 Theoretical objective 4

Theoretical objective 4 was discussed in Chapter 3 from Section 3.4 to 3.9 and also in Chapter 4. The aim of this objective was to gather background that is more theoretical on the research variable relationship benefits. Supply chain network represents a deeper understanding and approach to effective management of value chain of both the inbound and outbound logistics to satisfy specific customer needs. Organisation's determinations to exceed customer satisfactions with limited resources, has prompted organisations to continuously search for strategic opportunities for competitive benefits. For example, JIT system, materials requirement planning (MRP) and materials resources planning (MRPII) were seen as the evolution of buyer-supplier relationships. With the emerging global technology, supply chain networks, flexibility, and supply chain integration has also emerged as very important strategies to enhance competitive performance especially among the larger organisations. Hence, it is a mutual relationship between organisations for the benefits of information exchange, complementary ideas, knowledge sharing, efficiency in inventory control and return, superior customer services, as well as reduction in operation costs through effective leverage of resources and skills. Supply chain network boosts organisation supply chain flexibility to respond quickly to any uncertain changes within the business environment with little cost, time and less effort. Due to the global increase in customer relationship management, collaborative relationships, information technology and demand management, supply chain flexibility is required in all relationships decision-making and in every process dimension within the organisation to enhance efficient material flow and a well-defined customer satisfaction goal. Hence, this study recommends that SMEs who embrace supply chain flexible in their business-decisions and within their collaborative relationships will do better in competing effectively.

Supply chain integration is another important strategy within the supply chain network to ensure smooth running of business operations in time and to ensure high levels of performance. It is the alignment of all operational processes within the value chain (both upstream and downstream). With this, innovation and commitment are assured by all stakeholders, top management and employees to deliver customer's specific requirements. A well-integrated information and communication technology of efficient flow of materials

from the point of origin to the point of consumption is the strength of SMEs supply chain network. Supply chain integration allows the establishment of quick ordering system and a high stable procurement throughout the supply chain network. The theoretical hypothesis development as discussed in Chapter 4 revealed that supply chain network, supply chain flexibility and supply chain integration positively influence SMEs performance. Overall, the literature reviews helped the researcher identify the relevant research measuring items for each construct, which was used for data collection and serves as a foundation for empirical findings.

7.2.2 Empirical achievement of the hypotheses statements and its statistical significance

In this study, the research objectives as described in Section 7.2.2.1 below were transformed into theoretical models showing possible relationships between the measuring constructs, labelled hypothesis statement. In other words, the empirical objectives were determined by statistically testing the significance of the hypothesis relationship. Structural equation modeling was conducted to determine the relationships between supply chain network, supply chain flexibility, supply chain integration and SMEs business performance. These were statistically analysed and presented in Chapter 6 (Table 6.5). The following empirical objectives are based on the hypothetical relationships between the research variables that this study sought to measure.

7.2.2.1 To determine the influence of supply chain networks on SMEs performance

H1: Supply chain networks have a significantly positive influence on SMEs performance

The majority of the participating SMEs in this study believe that supply chain networks can enhance their competitive capability to survive through efficient use of business resources and effective implementation of innovative ideas. With this, there is reduction in cost and risk to market due to the development of new business skills and technology. The majority of the SMEs also attest to the fact that supply chain network serves as an opportunity to gain access into market in the industry and market in another industry. The influence of this relationship between supply chain network and SMEs performance was supported and accepted at a significance level of $p < 0.05$. Nevertheless, supply chain network capabilities and skills are still a challenge for most of the SMEs. This was theoretically supported by Thakkar *et al.*

(2008:122), Antonio *et al.* (2009:308), stating that indeed supply networking may be challenging for SMEs because of the capabilities and skills that are needed when developing relationships, as well as the fear of information revolution, increasing global competition, which creates more demanding customers.

7.2.2.2 To investigate the influence of supply chain networks on SMEs integration

H2: Supply chain networks have a significantly positive influence on SMEs supply chain integration

Although, supply chain network improves the performance efficiency of the SMEs, supply chain network also involves formulating and implementing integrated logistics-related strategies in order to manage product delivery effectively to customers within the organisation as well as across the supply chain. A high level of supply chain integration allows SMEs to differentiate themselves from competitors. The participated SMEs strongly accept the influence of this relationship at the level of $p < 0.001$ indicating a strong relationship between the construct. This was theoretically supported by (Flynn *et al.* 2010:59, Kim 2009:328), stating that a well-organised and planned integrated strategy positively influences the operational activities involved in supplying and delivering to customers throughout the supply chain.

7.2.2.3 To determine the influence of supply chain flexibility on SMEs integration

H3: Supply chain flexibility has a significantly positive influence on SMEs supply chain integration

The participated SMEs rated the relationship between flexibility and integration highly important. The influence of this relationship was empirically determined at the p -value of < 0.001 , which indicates strong acceptable relationships between the constructs. This indicates that those SMEs who are able to implement supply chain flexibility and supply chain integration internally and across the supply chain will definitely compete better and respond faster than their rivals. This was supported by Wong, Boon-itt and Wong (2011:604), that SMEs supply chain flexibility requires integrated information systems that connect all members within the supply chain for it to improve cost-efficiency, profit, healthy collaborative relationships, customer satisfaction, and superior supply chain performance.

7.2.2.4 To investigate the influence of supply chain flexibility on SMEs performance

H4: Supply chain flexibility has a significantly positive influence on SMEs performance

This investigation reveals that supply chain flexibility is an important competitive strategy among the participated SMEs due to reliable delivery of products and services, improved customer service level as well as agile responsiveness to changing customer demands and needs as arise. The p -value of <0.001 with the path coefficient 0.456 indicates a strong positive and significant relationship between flexibility and SMEs performance. However, supply chain flexibility acceptance is rated higher than supply chain network, which also stipulates competitive challenges among SMEs. This is also supported by Thakkar *et al.* (2008:122) that supply networking practices among SMEs are not strong compared to the larger organisations.

7.2.2.5 To determine the influence of supply chain integration on SMEs performance

H5: Supply chain integration has a significantly positive influence on SMEs performance

In this study, supply chain integration was the hearth of the relationship model between supply chain network, flexibility and SMEs performance but also a dependent variable. This suggested that SMEs strategic goals and objectives should embrace the emerging strategic developmental changes resulting from supply chain network and its flexibility to achieve high levels of competitive performance. The path coefficient value of 0.150 and $p < 0.05$ is further proof the positive influence between these measuring constructs. This was also supported by Narasimhan and Kim (2002:321), stating that though strategic integration plays a big role in enhancing business performance, supply networking and flexibility are the strategic forces that trigger SMEs motives to improve on their internal integration mechanisms and thereby resulting in higher levels of business performance (Narasimhan & Kim 2002:321).

7.3 RECOMMENDATIONS

SMEs as the backbone of South Africa's economic development are important and, therefore, should not be taken for granted. To foster the economic development, SMEs need to move away from the old way of doing business or arm's length relationship to collaborative relationship within the supply chain. The results of the findings present some

recommendations for the participated SMEs owners or managers. As indicated by the findings, SMEs seeking to achieve competitive and business performance, therefore, should embrace supply chain network, flexibility strategy and strategic integration as business strategies to overcoming competitive pressures.

Based on the findings of this study, the following recommendations are suggested to address the shortcomings faced by SMEs:

7.3.1 SMEs and supply chain network

The research findings showed that there is a significantly positive relationship between supply chain network and SMEs performance. However, the results also show that SMEs may have some difficulty in the implementation of supply chain networks, which may be due to SMEs competitive and market capabilities, business skills and experiences. As stated above, Antonio *et al.* (2009:308), confirmed that SMEs supply chain network is still a challenge because of larger organisations perception of the SME owners or managers as unreliable partners and hence SMEs may have a small opportunity to effectively network their business processes and activities. To enhance an easy access to supply chain networks, it is recommended that SMEs should be more alert to the competitive strategies by the larger organisations in order to act proactively. SMEs should continuously seek strategic direction and information that may further educate them regarding the implementation of supply networking as one of the key strengths of any business and for continuous development. Communication through e-mails and workshops on the strategic benefits of alliance relationships can help SMEs owners and managers make corrective decisions to improve business performance. Government can also intervene by creating awareness programmes of the significant influence of SMEs networking relationship within the supply chain. These will enhance SMEs business skills and opportunity to networking relationship with larger organisations.

7.3.2 SMEs and supply chain flexibility

The research findings between supply chain flexibility and SMEs business performance revealed that supply chain flexibility is a very important business strategy to SMEs performance. It is recommended that SMEs should re-define their business strategy to include supply chain flexibility strategy through research and development, benchmarking of

business process and building collaborative relationships within the supply chain. This will further enable SMEs to proactively anticipate and develop future plans on how to further satisfy changing customers' demands and offer good product/service designs. However, SMEs first need to understand the business objectives and the competitive environment within internal and external environments because the business objectives are linked to the supply chain network objectives and performance. Technology capability will also improve SMEs customer service capabilities. The research model also revealed that a higher flexibility strategy was also associated with a higher integration strategy. This indicates the need for SMEs to improve on their business flexibility strategy since being flexible and agile is the key to overcoming competitive rivals and unpredictable changes in the market environment (Bertrand 2003:134). Therefore, intervention leading to SMEs understanding of the supply chain flexibility strategy and supply chain integration should be part of the South Africa government's plan to improve SMEs. This will further enhance SMEs sustainability and growth, and in turn, will efficiently and effectively contribute to the South Africa GDP output.

7.3.3 SMEs supply chain integration

The research findings indicated that the ongoing supply chain network relationship among SMEs may be less effective if not strategically integrated to enhance performance. This is so because the relationship results between the supply chain network and supply chain integration were appreciated more than the relationship between supply chain network and SMEs performance. This suggests that SMEs existing networking relationships should be developed through a strategic intervention approach leading to further enhancement and strengthening of SMEs collaborative network skills. This will also strengthen SMEs integration strategy between customers and suppliers, and also may attract SMEs to embrace the importance of supply chain network. The intervention approach may begin by developing groups of supply chain networking SMEs within the sub-region of southern Gauteng where important information on effective business management strategy challenges are shared and thereby aid a better understanding and implementation of supply chain network and business performance. Awarding competition programmes for SMEs networking ability would play a strategic role in boosting SMEs supply chain networks integration and also promote SMEs collaborative relationship with larger organisations. This will lead to cost reduction in operation costs and risk, improve SMEs product quality, enhance smooth product and service

flow and improved SMEs business strategy techniques. In addition, improvement in the use of information technology also plays a critical role in enhancing supply chain flexibility and integration. Without the use of information technology, SMEs may miss out on important business strategies and latest trends in the competitive environment. Effective collaborating relationships may become difficult to manage without the integration of information technology for supply chain flexibility (Farhanghi *et al.* 2013:665; Love *et al.* 2014:4). Supply chain networks enhance SMEs continuous improvement and business sustainability and, therefore, may require information technology for flexible implementation and integration. SMEs may need further assistance in this area, in order to overcome both present and future competition and above all contribute to the South African economic growth. Supply chain flexibility helps SMEs to be more responsive and to maximise value-added products and services to customers.

The SMEs networking relationship should be based on synergy resulting in a win-win situation. Supply chain networks relationship is characterised by openness in costs, data, and forecast shared, presence of concern for each party's well-being, considerable investment, open communication that allows sharing and learning of skills and ideas, JIT delivery, continuous quality improvement, sound economic use of firm resources, effective use of their firm's knowledge base, as well as high level of business performance (Monczka *et al.* 2010:10; Wong & Karia 2010:55). With this, SMEs need some further motivating factor to ensure commitment within the supply chain network.

7.3.4 Gap between supply chain network and flexibility importance among SMEs

The research findings also revealed a gap between supply chain network and supply chain flexibility among SMEs business practices. The model showed that most SMEs within the Southern Gauteng region have more awareness about the importance of supply chain flexibility than the importance of supply chain networks. This is also supported by Thakkar *et al.* (2008:122), that supply-networking practices among SMEs are not strong compared to the larger organisations. It can finally be recommended that a strategic training programme aimed at assisting the SMEs supply chain networks to enhance more effective flexibility and integration should be implemented. This should also assist in mitigating supply chain challenges. For example, if challenges such as lack of skills among SMEs, high cost of information technology, education and easy access to networking relationships are addressed,

SMEs will have more reflexiveness in handling other surprising challenges such as greater demands from order givers, competition in domestic markets, increased global competition, organisational transformation, higher customer expectations of services and products and increased environmental concerns. SMEs may continue to experience challenges in implementing supply chain networks if properly educated and trained individuals do not manage them. The government, therefore, should focus more on addressing the issues of continuous improvement of SMEs business skills and experiences as well as technical skills and less of financial support. SMEs may have to depend less on financial support from the government to assure their business succeeds.

In addition, as a major agent that plays a key role in society, a definitive intervention from local government for SMEs in Southern Gauteng region should be based on improving SMEs implementation of supply chain network by developing viable and creating an enabling SMEs environment. The uniqueness of the viable-enabling environment should be linked to both private and government sector responsible for SMEs training programmes and workshops in collaboration with Higher Education Institutions (HEIs) in order to compete successfully both domestically and globally. This recommendation is also supported by Boysen (2010:4), who states that

in order to fully realise the potential of SMEs, the sector needs to be approached with a fresh perspective attuned to the challenges it faces. There is a need for the focus to shift from the available collateral in the business to the viability of the business and the ability of the SMEs. Each business needs finance tailored to their unique challenges. However, the business owner needs access to the expertise and market knowledge required to make their business a success.

7.4 IMPLICATIONS OF THE STUDY

7.4.1 Policy implications

The study revealed that supply chain network strategy is not well rooted among SMEs and that its implementation among a few SMEs is still emerging and slow with not much effect on business performance. SMEs implementation of supply chain network, its flexibility and

integration may be slow if the existing policy on SMEs development is restricted in making flexible decision in building SMEs competitive strength. The policy makers should develop SMEs supply chain networking policy in line with the SMEs effort to grow. A policy that allows enabling environments in which supply chain network capabilities are considered as an essential strategic tool in enhancing SMEs business performance and sustained competitive advantages is important. The South Africa Small Business Development Policy, such as the Broad-Based Black Economic Empowerment (BBBEE) policy, which implementation has been administered by Department of Trade and Industry (DTI), Department of Economic Development (DED), Department of Science and Technology (DST), the Presidency and the Department of Agriculture in South Africa for Enterprise Development (ED) need to readjust policy strategy (Mahembe 2011:27). Apart from providing debt or equity finance to SMEs, there is also a need to readjust the support policy to focus more on implementing the research framework as a more relevant transformational pillar for SMEs business success and contribution to economic growth. Supply chain networks in the present competitive environment serve as a source of innovation, information sharing and knowledge, which may not be achieved by only providing debt and equity financing for SMEs. The research framework should be implemented by policy makers because the financial support may become less effective if the SMEs lack the knowledge and supply chain network skills required to compete successfully both locally and globally.

This study has empirically investigated that supply chain networks, its flexibility and integration has a positive influence on business performance. Therefore, policy makers can use the results of the study to make policy changes that focus on developing SMEs business competence and capabilities towards the understanding and implementation of networking capabilities to compete effectively. The BBBEE policy programmes may serve as a vehicle that enables SMEs supply chain network practicable and less easy in terms of SMEs dealing with strict cooperation requirements among larger organisations. This will further help SMEs technical and technologies capabilities to administer flexibility requirement emanating from changing customer demand. These changes in the policy review in accordance with the research framework for SMEs will positively enhance economic growth. This also suggests that the South African EDAs can use the research model to enhance financial funding practices effectiveness on SMEs and the economy.

Integration mechanisms intervention by the government is also critical to SMEs survival and growth. According to the results of the study, supply chain integration link to SMEs business performance is low. This is because as stated by Wagner *et al.* (2003:343), the economic benefits of supply chain network such as reduced time-to-market, lower costs, reduced operating expense, increase revenue growth and improved customer services level are possible through successful integration mechanisms. Hence, supply chain integration, according to the research model, is a mediating variable between SMEs flexible collaborating capability and SMEs business performance.

7.4.2 Implications for SMEs

According to the results of the study, though supply chain network has a positive link to SMEs business performance, the link also indicates a weak relationship as compared to the relationship between supply chain networks, integration and performance. Therefore, supply chain integration as the mediating variable plays a critical role in SMEs networking relationships. In the case of supply chain flexibility, the model showed that though flexibility may directly influence SMEs business performance, the results indicated that internal integration performance is greatly determine by the level of flexible services performance to external customers. In other words, supply chain integration determines supply chain flexibility. The model also shows that supply chain integration can be less effective to SMEs performance if its implementation is not triggered by continuous developmental change within the organisation. In the emerging competitive market, continuous developmental change is as a result of the level of networking capabilities among organisations (McKinnon 2009:293). In other words, SMEs should continuously search for opportunities to network their business process and activities to ensure supply chain flexibility in coping with uncertainty, and to adapt or respond to market changes (Tachizawa & Gimenez 2010:214). Through this, SMEs are able to structure their business practices, procedures and behaviours in a collaborative, synchronised and manageable process that will enable effective fulfilment of business goals in comparison to competitors (Zhao *et al.* 2011:17).

This study has suggested a strategic model for SMEs owner and manager to enhance their business performance. To successfully implement the research performance model, SMEs would need to formulate supply chain network strategic plan describing networking objectives and goals in order to have a clear direction when entering into strategic relationship with suppliers and to improve on contract agreement from larger organisations.

However, SMEs supply chain networks should be based on trust, transparency and commitment. The research findings also indicated that SMEs supply chain network might be lacking commitment of resources and activities needed to create competitive advantages, interest and effective governance to effective relational ties that allow the transfer of flow of resources, networking competence, information sharing and creative ideas that are essential for successful integration. In this case, SMEs need to show more commitment and concern in their networking relationship. However, supply chain network among SMEs is still at the early stage according to the findings but the SMEs managers and owners still strive to compete by offering flexible products and service to customers. SMEs business strength should be developed to support their supply chain network performance.

7.4.3 Research implications

One of the major key issues the South African government is facing and in which its policy objectives and implementation is centered on, is how to further help the already established SMEs to grow, survive and become more efficient in the economic development. This study has put forth a strategic performance model for both SMEs owners and government to successfully achieve business objectives and goals and also for sustainability.

Further research should cover SMEs in the whole of South Africa, so as to provide a clearer picture of SMEs contributions, extent of implementation, challenges and benefits of supply chain network capabilities, flexibility capabilities and integration capabilities among SMEs in South Africa. A similar type of survey can be carried out in other provinces in South Africa and in other African countries to enhance SMEs improvement and effort towards economic growth. Further research could compare the difference in the implementation of supply chain network, its flexibility and integration benefits between the larger organisation and SMEs. This will not only contribute to existing supply chain literature but will also aid further recommendations that can benefit networking and organisation performance. Further studies can be extended to include production, purchasing, warehousing, inventory, transportation and distribution flexibilities, which can result in more realisation of the importance of supply chain network and integration on business performance.

Any investigation should be aimed at empowering and motivating South African SMEs to implement supply chain networks, flexibility and integration by the acquisition of supply sources that will bring about collaborative relationships with specific suppliers, who are also

in a strategic networking with other suppliers within the supply chain to achieve long-term commitment and goals. Supplier relationships can further enhance strategic alliances based on trust, help SMEs increase automation/mechanisation, and improve supply chain information technology. This will also promote firm growth and increase SMEs chances of survival and growth.

Further interventions on all the research variables should be tested through a longitudinal study to determine improvements among SMEs implementing collaborating networking relationships to improve business performance.

7.5 LIMITATIONS OF THE STUDY

This study only focused on investigating the influence of supply chain networks, flexibility and integration on SMEs performance. Despite the influence, more findings that are empirical are still needed on SMEs networking benefit to the economy. However, in SMEs business performance research, other external business factors could further influence the research results. In this case, more conceptual models and research should be carried out considering how other external collaborative factors could enhance SMEs networking performance. In this study, larger organisations are omitted from the study because it was assumed that larger organisation are well-grounded in the research variables and were not empirically tested in this study. Further study on the research topic could be extended to larger organisations.

The research survey for this study took place in the Southern Gauteng region of South Africa, and specifically around Vanderbijlpark and Vereeniging, but does not fully represent all the SMEs in South Africa. Consequently, the study findings cannot be generalised to all SMEs. Furthermore, because the study relied on quantitative method of data collection, the data collected through questionnaires may have been affected by the participated SMEs state of business relationships at the time of filling the questionnaire. In this case, qualitative or longitudinal method of data collection is recommended for any further research on supply chain network, flexibility and integration influence on SMEs performance. This will help to reflect on changing competition benefits, performance and challenges of SMEs supply network, flexibility and integration strategy over time. Furthermore, data triangulation incorporating both qualitative and quantitative method of research is also recommended in order to gain more insight into the research topic.

The research data were collected from both product and service sector SMEs and did not differentiate supply chain networks performance model between these two business sectors. Further research should compare and contrast the research findings using the research model to specifically differentiate uniqueness in SMEs supply chain networks flexibility and integration capabilities as well as implementation challenges for each of the business sectors. This could provide more recommendation on how the government can specifically render unique business relationship support to SMEs different sectors specific needs. This will also enhance the SMEs supply chain network capabilities and approach to networking relationship commitment and thereby enhancing more understanding of SMEs supply chain work practices.

The research model was empirically tested and validated within the SMEs sector in South Africa. Therefore, a further research study can be carried out in a similar context but in other developing countries in order to further validate the research model and findings.

With all these limitations mentioned above, the study has revealed the influence of supply chain network, flexibility and integration on SMEs business performance and in addition, this study empirically validated and confirmed the research model. The research findings should be verified and refined in a new research context. This study also suggests to both SMEs owners and government or policy makers in South Africa the importance of supply chain network relationship for SMEs business performance and economic growth. The research model, however, provides some insights and directions for SMEs supply chain performance researchers.

7.6 CONCLUSION

This chapter commences by presenting a brief summary on the achievement of research theoretical and empirical objectives and afterwards provides recommendations for the research study. The implications of the research study were discussed and finally followed by limitations for further study was highlighted. A brief concluding remark for the research study is presented below.

The literature review revealed the competitive importance of the research variables on the SMEs business performance. As mentioned above, four supply chain management theories were used to narrow the research focus with an extensive literature review. This was done to gain an in-depth understanding of the research constructs. Through this, possible trends

driving supply chain networks development among larger organisations were identified as customer relationship management, collaborative relationships, information technology and demand management. These relationship developmental changes also pose competitive challenges on SMEs performance because SMEs compete in the same competitive environment as larger organisations. For SMEs to compete successfully within the rival environment, they need to understand and implement the right business strategies. To accomplish this, a research model was developed as a conceptual framework for SMEs performance and to confirm the relationship significance of the research variables. The research model also guided the research design of the study and was further utilised to develop the research hypothesis statement. The hypothesised relationship between the research variables was developed theoretically by extensive review of literature in the context of supply chain network and supply chain flexibility as the predicting variables and supply chain integration as the mediating variable as well as SMEs performance as the outcome variable. The research variables relationships influence was also proposed for empirical testing because the literature review on the research variables reveals that there is the need to empirically investigate the influence of supply chain network, flexibility and integration on SMEs business performance.

It was revealed from the model that supply chain network, flexibility and integration statistically influence positively SMEs business performance. Evidence in the mediating role of supply chain integration in the model was also statistically significant as proposed. Figure 7.1 shows the diagrammatic representation of Chapter 7.

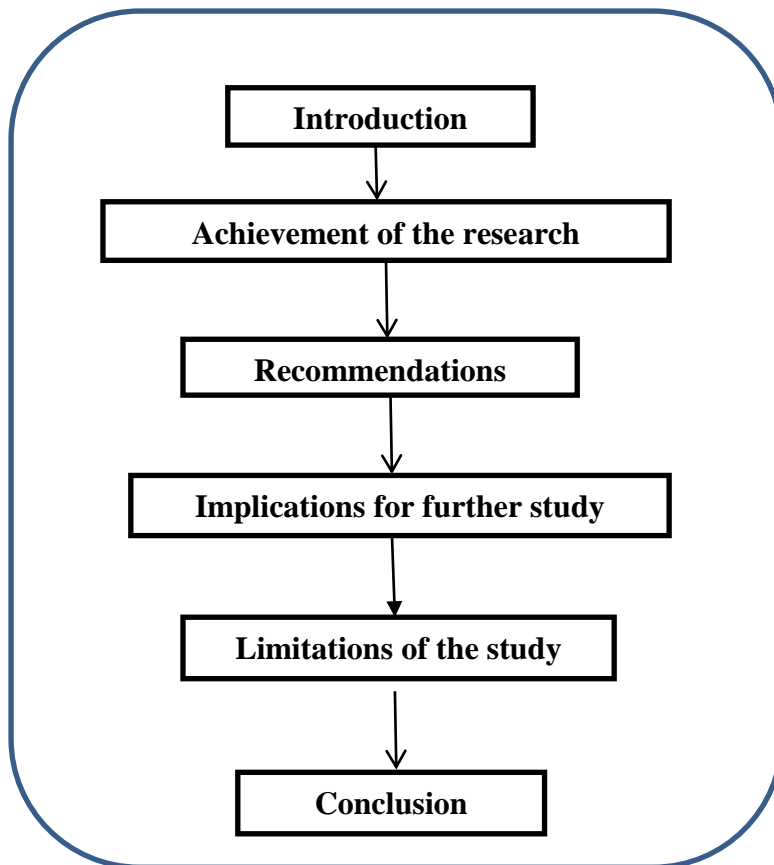


Figure 7.1: Diagrammatic representation of Chapter 7

BIBLIOGRAPHY

AAKER, D.A., KUMAR, V. AND DAY, G.S. 2000. *Marketing research*. 7th ed. New York: John Wiley.

ACS, Z.J. 1997. Small and medium-sized enterprises, technology and globalisation: introduction to a special issue on small and medium-sized enterprises in the global economy. *Small Business & Management*, 9:1-6.

AHMED, P.K., HARDAKER, G. & CARPENTER, M. 1996. Integrated flexibility – key to competition in a turbulent environment. *Long Range Planning*, 29(4):562-571.

ALBINO, V., DANGELICO, R.M. & PONTRANDOLFO, P. 2012. Do inter-organisational collaboration enhance a firm's environmental performance? A study of largest U.S. companies. *Journal of Cleaner Production*, 37:304-315.

ALI, N., WHIDDETT, D., TRETIAKOV, A. & HUNTER, I. 2012. The use of information technologies for knowledge sharing by secondary healthcare organizations. *International Journal of Medical Informatics*, 81(7):500-506.

ALPKAN, L., YILMAZ, G. & KAYA, N. 2007. Market orientation and planning flexibility in SMEs: performance implications and an empirical investigation. *International Small Business Journal*, 25(2):152-172.

ANDERSSON, C. & STAHL, J.E. 2011. Relations between volume flexibility and part cost in assembly lines. *Robotics & Computer-Integrated Manufacturing*, 27:669-673.

ANDREW, D.P.S., PEDERSEN, P.M. & MCEVOY, C.D. 2011. *Research methods and design in sport management*. Champaign, NY: Human Kinetics.

ANTONIO, K.W.L., RICHARD, C.M.Y. & TANG, E. 2009. The complementarity of internal integration and product modularity: an empirical study of their interaction effect on competitive capabilities. *Journal of Engineering and Technology Management*, 26:305-326.

AREND, R.J. & WISNER, J.D. 2005. Small business and supply chain management: is there a fit? *Journal of Business Venturing*, 20:403-436.

- AVLONITIS, G.J. & SALAVOU, H.E. 2007. Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research*, 60:566-575.
- AZMA, F., MOSTAFAPOUR, M.A. & REZAEI, H. 2012. The application of information technology and its relationship with organizational intelligence. *Procedia Technology*, 1:94-97.
- BAGCHI-SEN, S. 2001. Product innovation and competitive advantage in an area of industrial decline: the Niagara region of Canada. *Technovation*, 21:45-54.
- BALLOU, R.H. 2004. *Business logistics/ supply chain management: planning, organising, and controlling the supply chain*. 4th ed. Upper Saddle River, NJ: Prentice Hall.
- BALOYI, J.K. 2010. *An analysis of constraints facing smallholder farmers in the Agribusiness value chain: a case of farmers in Limpopo Province*. Pretoria: University of Pretoria.
- BARAD, M. & SAPIR, D.E. 2003. Flexibility in logistics systems modelling and performance evaluation. *International Journal of Production Economics*, 85(2):155-170.
- BARALDI, E., BRENNAN, R., HARRISON, D., TUNISINI, A. & ZOLKIEWSKI, J. 2007. Strategic thinking and the IMP approach: a comparative analysis. *Industrial Marketing Management*, 36:879-894.
- BARGE-GIL, A. 2010. Cooperation-based innovators and peripheral cooperators: an empirical analysis of their characteristics and behavior. *Technovation*, 30:195-206.
- BARNES, J. & LIAO, Y. 2012. The effect of individual, network, and collaborative competencies on the supply chain management system. *International Journal of Production Economics*, 140(2):888-899.
- BARNEY, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17(1):99-120.
- BARTOL, K.M. & ZHANG, X. 2007. Networks and leadership development: building linkages for capacity acquisition and capital accrual. *Human Resource Management Review*, 17:388-401.

- BAUER, E.M. 2009. *Top executives' work relationship and work-family balance: taxonomy development and performance implications*. Heidelberg, Germany: Gabler.
- BAXTER, R. 2012. How can business buyers attract sellers' resources? Empirical evidence for preferred customer treatment from suppliers. *Industrial Marketing Management*, 41:1249-1258.
- BAYRAKTAR, E., DEMIRBAG, M., KOH, S.C.L., TATOGLU, E. & ZAIM, H. 2009. A causal analysis of the impact of information systems and supply chain management practices on operational performance: evidence from manufacturing SMEs in Turkey. *International Journal of Production Economics*, 122:133-149.
- BEARDEN, W.O., NETEMEYER, R.G. & HAWS, K.L. 2011. *Handbook of marketing scales: multi-item measures for marketing and consumer behaviour research*. 3rd ed. Thousand Oaks, California: Sage.
- BENNETT, R.J. & SMITH, C. 2002. Competitive conditions, competitive advantage and the locations of SMEs. *Journal of Small Business and Enterprise Development*, 9(1):73-86.
- BERTRAND, J.W.M. 2003. Supply chain design: flexibility considerations. *Handbooks in OR & MS*, 11:133-194.
- BHALLA, A. & TERJESEN, S. 2013. Cannot make do without you: outsourcing by knowledge-intensive new firms in supplier networks. *Industrial Marketing Management*, 42:166-179.
- BIDZAKIN, K.J. 2009. *Assessing performance of micro and small scale Agribusiness in Northern Ghana: Non-Financial and Stochastic Frontier analysis*. Ghana: College of Agriculture and Natural Resources.
- BIZZI, L. & LANGLEY, A. 2002 Studying processes in and around networks. *Industrial Marketing Management*, 31:224-234.
- BLESS, C. & HIGSON-SMITH, C. 1995. *Fundamentals of social research in the social sciences: an African perspective*. 2nd ed. Cape Town: Juta.
- BLUNCH, N.J. 2008. *Introduction to structural equation modelling using SPSS and AMOS*. Thousand Oaks, California: Sage.

BORGATTI, S.P. & CROSS, R. 2003. A relational view of information seeking and learning in social networks. *Management Science*, 49(4):432-445.

BORGATTI, S.P. & HALGIN, D.S. 2011. On network theory. *Organisation Science: Article in Advance*, 1-14.

BOUGRAIN, F. & HAUDEVILLE, B. 2002. Innovation, collaboration and SMEs internal research capacities. *Research Policy*, 31:735-747.

BOYSEN, G. 2010. In J.P. Morgan's Report. 2012. The small and medium enterprise (SME) sector – catalyst for growth in South Africa. [Online]. Available at: https://www.jpmorgan.com/cm/BlobServer/JPM_Dalberg_SME-Catalyst-for-Growth.pdf. Accessed: 07/11/2014.

BOZARTH, C.C., DONALD, P.W., BARBARA, B.F. & JAMES, E.F. 2007. The impact of supply chain complexity on manufacturing plant performance. *Journal of Operations Management*, 27(1):78-93.

BRAUNSCHEIDEL, M.J. & SURESH, N.C. 2009. The organisational antecedents of a firm's supply chain agility for risk mitigation and response. *Journal of Operations Management*, 27:119-140.

BUCKINGHAM, R.A. 1991. The importance of information system studies in the university curriculum. *Education & Computing*, 7(1-2):133-135.

BURKE, R. 2006. *Small Business SMEs: guide to running business*. Hudson: Burke Publishing.

BURNS, A.C. & BUSH, R.F. 2006. *Marketing research*, 5th ed. Upper Saddle: NY.

BURNS, P. 2005. *Corporate entrepreneurship: building an SME organisation*. NY: Palgrave Macmillian.

BURT, D., PETCAVAGE, S. & PINKERTON, R. 2010. *Supply management*. 8th ed. Boston: McGraw-Hill.

BURT, D.N., DOBLER, D.W. & STARLING, S.L. 2003. *World class supply management: the key to supply chain management*. 7th ed. NY: McGraw-Hill

BUVIK, A. & HAUGLAND, S.A. 2005. The allocation of specific assets, relationship duration, and contractual coordination in buyer-seller relationships. *Scandinavian Journal of Management*, 21:41-60.

BUVIK, A. & REVE, T. 2001. Asymmetrical deployment of specific assets and contractual safeguarding in industrial purchasing relationships. *Journal of Business Research*, 51:101-113.

BYRNE, B.M. 2013. *Structural equation modelling with AMOS: basic concepts, application and programming*. 2nd ed. New York: Routledge: Taylor and Francis Group.

CABIGIOSU, A., ZIRPOLI, F. & CAMUFFO, A. 2013. Modularity, interfaces definition and the integration of external sources of innovation in automotive industry. *Research Policy*, 42:662-675.

CALDWELL, N., WALKER, H., HARLAND, C., KNIGHT, L., ZHENG, J. & WAKALEY, T. 2005. Promoting competitive markets: The role of public procurement. *Journal of Purchasing & Supply Management*, 11:242-251.

CALFEE, D. 2006. Getting engaged: An inclusive approach to strategy development. *Hand Book of Business Strategy*, 299-234.

CAO, M. & ZHANG, Q. 2010. Supply chain collaborative advantage: a firm's perspective. *International Journal Production Economics*, 128:358-367.

CAO, M. & ZHANG, Q. 2011. Supply chain collaboration: impact on collaborative advantage and firm performance. *Journal of Operations Management*, 29:163-180.

CAO, Q., GAN, Q. & THOMPSON, M.A. 2013. Organisational adoption of supply chain management system: a multi-theoretic investigation. *Decision Support Systems*, 55:720-727.

CARGAN, L. 2007. *Doing social research*. USA: Rowman & Littlefield Publishers.

CHAI, K.H., YAP, C.M. & WANG, Y.X. 2011. Network closure's impact on firms' competitive advantage: the mediating roles of knowledge processes. *Journal of Engineering & Technology Management*, 28:2-22.

- CHAKRABORTY, S., BHATTACHARYA, S. & DOBRZYKOWSKI, D.D. 2014. Impact of supply chain collaboration on value co-creation and firm performance: a healthcare service sector perspective. *Procedia Economics & Finance*, 11:676-694.
- CHAN, F.T.S., CHONG, A.Y.L. & ZHOU, L. 2012. An empirical investigation of factors affecting e-collaboration diffusion in SMEs. *International Journal of Production Economics*, 138:329-344.
- CHAN, H.K. & CHAN, F.T.S. 2010. Comparative study of adaptability and flexibility in distributed manufacturing supply chains. *Decision Support System*, 48:331-341.
- CHANDRA, C. & GRABIS, J. 2009. Role of flexibility in supply chain design and modeling – introduction to the special issue. *Omega*, 37:743-745.
- CHANG, C.W., CHIANG, D.M. & PAI, F.Y. 2012. Cooperative strategy in supply chain networks. *Journal of Industrial Marketing Management*, 41:1114-1124.
- CHAPMAN, P., MOORE, M.J. & THOMPSON, D. 2000. Building internet capabilities in SMEs. *Journal of Logistics Information Management*, 13(6):353-361.
- CHARTERINA, J. & LANDETA, J. 2010. The pool effect of dyad-based capabilities on seller firms' innovativeness. *European Journal of Innovation Management*, 13:172-196.
- CHE-HA, N., MAVONDO, F.T. & MOHD-SAID, S. 2014. Performance or learning goal orientation: implications for business performance. *Journal of Business Research*, 67:2811-2820.
- CHEN, C.L., LEE, J.Y., NG, D.K.S. & FOO, D.C.Y. 2011. Property integration for resources conservation network synthesis in palm oil mills. *Chemical Engineering Journal*, 169:07-215.
- CHEN, D.Q., PRESTON, D.S. & XIA, W. 2012. Enhancing hospital supply chain performance: a relational view and empirical test. *Journal of Operation Management*, 31:391-408.
- CHEN, I.J. & PAULRAJ, A. 2004. Towards a theory of supply chain management: the constructs and measurements. *Journal of Operations Management*, 22:199-150.

- CHEN, I.J., PAULRAJ, A. & LADO, A.A. 2004. Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22:505-523.
- CHEN, S.S. & CHEN, I.J. 2012. Corporate governance and capital allocations of diversified firms. *Journal of Banking & Finance*, 36:395-409.
- CHEN, W.H. 1999. The manufacturing strategy and competitive priority of SMEs in Taiwan: a case survey. *Asia Pacific Journal of Management*, 16:331-349.
- CHENG, H.L. & LIN, C.Y.Y. 2009. Do as the large enterprise do? Expatriate selection and overseas performance in emerging markets: the case of Taiwan SMEs. *International Business Review*, 18:60-75.
- CHIN, T.A., HAMID, A.B.A., RASLI, A. & BAHARUN, R. 2012. Adoption of supply chain management in SMEs. *Procedia – Social and Behavioral Sciences*, 65:614-619.
- CHIWARE, E.R.T. & DICK, A.L. 2008. The use of ICTs in Namibia's SMEs sector to access business information services. *The Electronic Library*, 26(2):145-157.
- CHOE, C. & MATSUSHIMA, N. 2013. The arm's length principle and tacit collusion. *International Journal of Industrial Organisation*, 31:119-130.
- CHOI, T.Y., DOOLEY, K.J. & RUNGTUSANATHAM, M. 2001. Supply networks and complex adaptive systems: control versus emergence. *Journal of Operations Management*, 19:351-366.
- CHOY, K.L., CHOW, H.K.H., TAN, K.H., CHAN, C.K., MOK, E.C.M. & WANG, Q. 2008. Leveraging the supply chain flexibility of third party logistics: hybrid knowledge-based system approach. *Expert Systems with Application*, 35:1998-2016.
- CHURCHILL, G.A. & IACOBucci, D. 2005. *Marketing research: methodological foundations*. 9th ed. OH: Thomson/South Western.
- CINGOZ, A. & AKDOGAN, A.A. 2013. Strategic flexibility, environmental dynamism, and innovation performance: an empirical study. *Procedia-Social & Behavioral Sciences*, 99:582-589.

- CLARO, D.P. & CLARO, P.B.O. 2010. Collaborative buyer-supplier relationships and downstream information in marketing channels. *Industrial Marketing Management*, 39:221-228.
- CLOVER, T.A & DARROCH, M.A.G. 2005. Owners' perceptions of factors that constrain the survival and growth of small, medium and micro agribusinesses in KwaZulu-Natal, South Africa. *Agrekon*, 44(2):1-20
- COCCA, P. & ALBERTI, M. 2010. A framework to assess performance measurement systems in SMEs. *International Journal of Productivity and Performance Management*, 59(2):186-200.
- COLES, J.W. & HESTERLY, W.S. 1998. The impact of firm-specific assets and the interaction of uncertainty: an examination of make or buy decisions in public and private hospitals. *Journal of Economic Behaviour & Organisation*, 36:383-409.
- COOPER, D.R. & SCHINDLER, P.S. 2003. *Business research methods*. New York: McGraw Hill.
- COOPER, D.R. & SCHINDLER, P.S. 2006. *Business research method*, 9th ed. NY: McGraw Hill.
- COUSINS, P.D. & MENGUC, B. 2006. The implications of socialisation and integration in supply chain management. *Journal of Operations Management*, 24:604-620.
- COUSSEMENT, K., DEMOULIN, N. & CHARRY, K. 2011. *Marketing research with SAS enterprise guide*. Surrey, England: Gower Publishing.
- COYLE, J.J., BARDI, E.J. & LANGLEY C.J. 2003. *The management of business logistics: a supply chain perspective*. 7th ed. Canada: Thomson Learning.
- CRAMER, D. & HOWITT, D. 2004. *The SAGE Dictionary of statistics: a practical resource for students in the social sciences*. Sage Publications: Thousand Oaks, California.
- CRESWELL, J.W. 2003. *Research design: qualitative, quantitative, and mixed methods approaches*. 2nd ed. Thousand Oaks, California: Sage.

- CRUCERU, A.F. & MOISE, D. 2014. Customer relationships through sales forces and marketing events. *Procedia-Social & Behavioral Sciences*, 109:155-159.
- CRUZ, J.M. & LIU, Z. 2011. Modelling and analysis of the multi-period effects of social relationship on supply chain networks. *European Journal of Operational Research*, 214:39-52.
- CUADROS, A.J. & DOMINQUEZ, V.E. 2014. Customer segmentation model based on value generation for marketing strategies formulation. *Estudios Gerenciales*, Online. Available: < <http://dx.doi.org/10.1016/j.estger.2014.02.005>>. Accessed: 11/03/2014.
- DANESE, P. 2013. Supplier integration and company performance: a configurationally view. *Omega*, 14:1029-1041.
- DANESE, P., ROMANO, P. & FORMENTINI, M. 2013. The impact of supply chain integration on responsiveness: the moderating effect of using an international supplier network. *Transportation Research Part*, 49:125-140.
- DAS, K. 2011. Integrating effective flexibility measures into a strategic supply chain planning model. *European Journal of Operational Research*, 211:170-183.
- DAVIES, J., HIDES, M. & POWELL, J. 2002. Defining the development needs of entrepreneurs in SMEs. *Education & Training*, 44(8/9):406-412.
- DAVIES, W. 2000. Understanding strategy. *Strategy & Leadership*, 28(5):25-30.
- DAY, A. 1998. Getting logistics into the boardroom. *International Journal of Physical Distribution and Logistics Management*, 28(10):661-665.
- DE MAESENEIRE, W. & CLAEYS, T. 2012. SMEs, foreign direct investment and financial constraints: the case of Belgium. *International Business Review*, 21:408-424.
- DEAKINS, D. & FREEL, M. 1998. Entrepreneurial learning and the growth process in SMEs. *The Learning Organisation*, 5(3):144-155.
- DEEPEN, J.M. 2007. *Logistics outsourcing relationship: measurement, antecedents and effects of logistics outsourcing performance*. New York: Physical-Verlag.

- DEITZ, G.D., TOKMAN, M., RICHEY, R.G. & MORGAN, R.M. 2010. Joint venture stability and cooperation: direct, indirect and contingent effects of resource complementarity and trust. *Industrial Marketing Management*, 29(5):862-873.
- DELIGONUL, S., ELG, U., CAVUSGIL, E. & GHOURI, P.N. 2013. Developing strategies supplier networks: an institutional perspective. *Journal of Business Research*, 66:506-515.
- DELPORT, C.S.L. 2005. Quantitative data-collection methods. In DE VOS, A.S., STRYDOM, H., FOUCHE, C.B. & DELPORT C.S.L., ed. *Research at grass roots: for the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. pp.159-190.
- DEPARTMENT OF TRADE AND INDUSTRY. 2003. SMME definitions. Pretoria: DTI.
- DEPARTMENT OF TRADE AND INDUSTRY. 2005. SMME definitions. Pretoria: DTI.
- DEQUIEDT, V. & MARTIMORT, D. 2004. Delegated monitoring versus arm's-length contracting. *International Journal of Industrial Organisation*, 22:951-981.
- DEROS, B.M., YUSOF, S.M. & SALLEH, A.M. 2006. A benchmarking implementation framework for automotive manufacturing SMEs. *International Journal of Benchmarking*, 13(4):396-430.
- DEVARAJ, S., VAIDYANATHAN, G. & MISHRA, A.N. 2012. Effect of purchase volume flexibility and purchase mix flexibility on e-procurement performance: an analysis of two perspectives. *Journal of Operations Management*, 30:509-520.
- DIAMANTOPOULOS, A. & SIGUAUW, J.A. 2000. Introducing LISREL. London: Sage.
- DIETRICH, B., ETTL, M., LEDERMAN, R.D. & PETRIK, M. 2012. Optimising the end-to-end value chain through demand shaping and advanced customer analytics. *Computer Aided Chemical Engineering*, 31:8-18.
- DONE, A., VOSS, C. & RYTTER, N.G. 2011. Best practice interventions: short-term impact and long-term outcomes. *Journal of Operations Management*, 29:500-513.
- DOREIAN, P. & MRVAR, A. 2009. Partitioning signed social networks. *Social Networks*, 33:1-11.

DROGE, C., JAYARAM, J. & VICKERY, S.K. 2004. The effects of internal versus external integration practices on time-based performance and overall firm performance. *Journal of Operations Management*, 22:557-573.

DROGE, C., VICKERY, S. & JACOBS, M.A. 2012. Does supply chain integration mediate the relationships between product/process strategy and service performance? An empirical study. *International Journal of Production Economics*, 137:250-262.

DUAN, H., HAN, X. & YANG, H. 2009. An analysis of causes for SMEs financing difficulty. *International Journal of Business and Management*, 4(6):73-75.

DUCLOS, L.K., VOKURKA, R.J. & LUMMUS, R.R. 2003. A conceptual model of supply chain flexibility. *Industrial Management & Data System*, 103(6):446-456.

DYER, J.H. & SINGH, H. 1998. The relational view: cooperative strategy and sources or interorganisational competitive advantage. *The Academy of Management Review*, 23(4):600-679.

EHLERS, MB. & LAZENBY, JAA. 2007. Strategic Management. 2nd ed. Pretoria: Van Schaik Publishers.

EISINGERICH, A.B. & BELL, S.J. 2007. Maintaining customer relationships in high credence services. *Journal of Services Marketing*, 21(4):253-262.

ELG, U. 2008. Inter-firm market orientation and the influence of network and relational factors. *Scandinavian Journal of Management*, 24:55-68.

ELLEGAARD, C. 2006. Small company purchasing: a research agenda. *Journal of Purchasing & Supply Management*, 12:272-283.

EMFULENI LOCAL MUNICIPALITY. 2008. Annual report, 1 July 2007 to 31 June 2008. Vanderbijlpark.

ESTEVEES, M.E., SANTOS, J.R. & ANUNCIACAO, P.F. 2012. Sustainability in the information society: a proposal of information system requirements in view of the DPOBE model for organizational sustainability. *Procedia Technology*, 5:599-606.

- ETZOLD, V. & BUSWICK, T. 2008. Metaphors in strategy. *Business strategy series*, 9(5):279-284.
- FAHY, J. 2002. A resource-based analysis of sustainable competitive advantage in a global environment. *International Business Review*, 11:57-78.
- FALKENA, H. 2000. *SMEs access to finance in South Africa: A supply side Regulatory Review*. Report by the Task group of the Policy Board of Financial Services and Regulations. Cape Town: Kluwer Publishers.
- FANTAZY, K.A., KUMAR, V. & KUMAR, U. 2009. An empirical study of the relationships among strategy, flexibility and performance in the supply chain context. *An International Journal*, 15(2):177-188.
- FARHANGHI, A.A., ABBASPOUR, A. & GHASSEMI, A. The effect of information technology on organisational structure and firm performance: an analysis of consultant engineers firms (CEF) in Iran. *Procedia – Social & Behavioral Sciences*, 81:644-649.
- FATOKI, O. O & GARWE, D. 2010. Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management*, 4(5):729-738.
- FAUST, K. 2010. A puzzle concerning triads in social networks: graph constraints and the triad census. *Social Networks*, 32:221-233.
- FAWCETT, S.E., STANLY, L.L., & SMITH, S.R. 1997. Developing a logistics capability to improve the performance of international operations. *Journal of Business Logistics*, 20(1):33-58.
- FINK, M., HARMS, R. & KRAUS, S. 2008. Cooperative internationalization of SMEs: self-commitment as a success factor for international entrepreneurship. *European Management Journal*, 26:429-440.
- FJELDSTAD, Q.D. & KETELS, C.H.M. 2006. Competitive advantage and the value network configuration: making decisions at a Swedish life insurance company. *Long Range Planning*, 39:109-131.

- FLYNN, B.B., HUO, B. & ZHAO, X. 2010. The impact of supply chain integration on performance: a contingency and configuration approach. *Journal of Operations Management*, 28:58-71.
- FOLINAS, D., MANTHOU, V., SIGALA, M. & VLACHOPOULOU, M. 2004. E-volution of a supply chain: cases and best practices. *Internet Research*, 14(4):274-283.
- FORSLUND, H. & JONSSON, P. 2007. Dyadic integration of the performance management process: a delivery service case study. *International Journal of Physical Distribution & Logistics Management*, 37(7):546-567.
- FOUCHE, C.B. & DELPORT, C.S.L. 2005. Introduction to the research process. In DE VOS, A.S., STRYDOM, H., FOUCHE, C.B. & DELPORT C.S.L., ed. *Research at Grass roots: For the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. pp.71-85.
- FOUCHE, C.B. & DE VOS, A.S. 2005. Problem formulation. In DE VOS, A.S., STRYDOM, H., FOUCHE, C.B. & DELPORT C.S.L., ed. *Research at grass roots: for the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. pp.100-110.
- FRANZEN, M.D. 2000. *Reliability and validity in Neuropsychological assessment*. 2nd ed. New York: Plenum Publishers.
- GARAVELLI, A.C. 2003. Flexibility configurations for the supply chain management. *International Journal of Production Economics*, 85(2):141-153.
- GARENGO, P., BIAZZO, S. & BITITCI, U.S. 2005. Performance measurement systems in SMEs: a review for a research agenda. *International Journal of Management Reviews*, 7(1):25-47.
- GEBAUER, H., WORCH, H. & TRUFFER, B. 2012. Absorptive capacity, learning processes and combinative capabilities as determinants of strategic innovation. *European Management Journal*, 30:57-73.

- GEBREKIDAN, D.A. & AWUAH, G.B. 2002. Inter-organisational cooperation: a new view of strategic alliances. The case of Swedish firms in the international market. *Industrial Marketing Management*, 31:679-693.
- GELINAS, R. & BIGRAS, Y. 2004. The characteristics and features of SMEs: favourable or unfavourable to logistics integration? *Journal of Small Business Management*, 42(3):263-278.
- GILMORE, A., CARSON, D. & ROCKS, S. 2006. Networking in SMEs: evaluating its contribution to marketing activity. *International Business Review*, 15:278-293.
- GOLICIC, S.L. & DAVIS, D.F. 2012. Implementing mixed methods research in supply chain management. *International Journal of Physical Distribution & Logistics Management*, 42(8/9):726-741.
- GONG, Z. 2008. An economic evaluation model of supply chain flexibility. *European Journal of Operational Research*, 184:745-758.
- GOSLING, J., PURVIS, L. & NAIM, M.M. 2009. Supply chain flexibility as a determinant of supplier selection. *International Journal of Production Economics*, 1:1-11.
- GOSLING, J., PURVIS, L. & NAIM, M.M. 2010. Supply chain flexibility as a determinant of supplier selection. *International Journal of Production Economics*, 128:11-21.
- GRAVETTER, F.J. & FORZANO, L.B. 2003. *Research method for the behavioural sciences*. Belmont: Wadsworth Thomson Learning
- GRAVETTER, J.F. & FORZANO, L.B. 2012. *Research methods for the behavioral sciences*. 4th ed. Belmont, CA. USA: Cengage Learning.
- GREEN, K.W., WHITTEN, D. & INMAN, R.A. 2012. Aligning marketing strategies throughout the supply chain to enhance performance. *Industrial Marketing Management*, 41:1008-1018.
- GU, J.W. & JUNG, H.W. 2013. The effects of IS resources, capabilities and qualities on organisational performance: an integrated approach. *Information & Management*, 50:87-97.

- GUERRERO, E.G. & KIM, A. 2013. Organisational structure, leadership and readiness for change and the implementation of organizational cultural competence in addiction health services. *Evaluation & Program Planning*, 40:74-81.
- GUPTA, P., SEETHARAMANA, A. & RAJB, J.R. 2013. The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management*, 33:861-874.
- GUPTA, A., MARANAS, C.D. & MCDONALD, C.M. 2000. Mid-term supply chain planning under demand uncertainty: customer demand satisfaction and inventory management. *Computers & Chemical Engineering*, 24(12):2613-2621.
- HAAN, J., KISPERSKA-MORON, D. & PLACZEK, E. 2007. Logistics Management and firm size: a survey among polish small and medium enterprises. *International Journal of Production Economics*, 108(1-2):119-126.
- HAIR, J.F., BUSH, R.P. & ORTINAU, D.J. 2000. *Marketing research: a practical approach for the new millennium*. Boston: Irwin/McGraw-Hill.
- HAIR, J.F., CELSI, M.W., MONEY, A.H., SAMOUEL, P. & PAGE, M.J. 2011. *Essentials of business research methods*. 2nd ed. Armonk, New York: M.E. Shape Publishers.
- HAIR, J.F., HULT, G.T.M., RINGLE, C.M & SARSTEDT, M. 2014. *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks, California: Sage.
- HAKANSSON, H. & FORD, D. 2002. How should companies interact in business networks? *Journal of Business Research*, 55:133-139.
- HALL, G. 1995. *Surviving and prospering in the small firm sector*. London: Routledge.
- HALLEY, A. & GUILHON, A. 1997. Logistics behaviour of small enterprises: performance, strategy and definition. *International Journal of Physical Distribution & Logistics Management*, 27(8):475-495.
- HAMMERVOLL, T. 2011. Honeymoons in supply chain relationships: the effects of financial capital, social capital and psychological commitment. *International Journal of Logistics Management*, 22(2):264-279.

- HAMMERVOLL, T. 2012. Managing interaction for learning and value creation in exchange relationships. *Journal of Business Research*, 65:128-136.
- HANSEN, H., SAMUELSEN, B.M. & SILSETH, P.R. 2008. Customer perceived value in B-t-B service relationships: investigating the importance of corporate reputation. *Industrial Marketing Management*, 37:206-217.
- HARLAND, C.M., CALDWELL, N.D., POWELL, P. & ZHENG, J. 2007. Barriers to supply chain information integration: SMEs adrift of eLands. *Journal of Operations Management*, 25(6):1234-1254.
- HARTMANN, E. & GRAHL, A. 2012. Logistics outsourcing interfaces: the role of customer partnering behaviour. *International Journal of Physical Distribution & Logistics Management*, 42(6):526-543.
- HATALA, J.P. & LUTTA, J.G. 2009. Managing information sharing within an organisational setting: a social network perspective. *Performance Improvement Quarterly*, 21(4):5-33.
- HATCHER, L. & O'ROURKE, N. 2013. *A step-by-step approach to using SAS for factor analysis and structural equation modelling*. 2nd ed. Heidelberg, Germany: SAS Institute.
- HEIKKILA, J. 2002. From supply to demand chain management: efficiency and customer satisfaction. *Journal of Operations Management*, 20(6):747-767.
- HENFRIDSSON, O. & LIND, M. 2014. Information systems strategizing sub-communities, and the emergence of a sustainability strategy. *The Journal of Strategic Information Systems*, 23:11-28.
- HILL, C.W. & JONES, D.R. 2001. *Strategic management*. Boston: Houghton Mifflin.
- HILL, J. & WRIGHT, L.T. 2001. A qualitative research agenda for small to medium-sized enterprises. *Marketing Intelligence & Planning*, 19(6):432-443.
- HOBBS, B. & ANDERSEN, B. 2001. Different alliance relationships for project design and execution. *International Journal of Project Management*, 19:465-469.

- HOBERG, K. & THONEMANN, U.W. 2014. Modeling and analyzing information delays in supply chains using transfer functions. *International Journal of Production Economics*, 156:132-145.
- HONG, P. & JEONG, J. 2006. Supply chain management practices of SMEs: from a business growth perspective. *Journal of Enterprise Information Management*, 19(3):292-302.
- HOOVER, D., COUGHLAN, J. & MULLEN, M.R. 2008. Structural equation modelling: guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6:53-60.
- HORN, P., SCHEFFLER, P. & SCHIELE, H. 2014. Internal integration as a pre-condition for external integration in global sourcing: a social capital perspective. *International Journal of Production Economics*, 153:54-65.
- HORRINGTON, D. 2009. *Confirmatory factor analysis*. Oxford University Press: New York.
- HOUSER, J. 2012. *Nursing research: reading, using and creating evidence*. 2nd ed. Sudbury, USA: Jones & Bartlett Learning.
- HU, J. & TSAI, Y. 2007. Paradigms of derived exchange value effects in market network. *Industrial Marketing Management*, 36:363-650.
- HU, L.T. & BENTLER, P.M. 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, 6:1-55.
- HUANG, C.C., WANG, Y.M., WU, T.W. & WANG, P.A. 2013. An empirical analysis of the antecedents and performance consequences of using the moodle platform. *International Journal of Information & Education Technology*, 3(2):217-221.
- HUGGINS, R. 2001. Inter-firm network policies and firm performance: evaluating the impact of initiatives in the United Kingdom. *Research Policy*, 30(3):443-458.
- HUGO, W.M.J., BABENHORST-WEISS, J.A. & VAN ROOYEN, D.C. 2002. *Purchasing and Supply Management*. 4th ed. Pretoria: Van Schaik Publishers.

HUSSEINI, S.M.M., O'BRIEN, C. & HOSSEINI, S.T. 2006. A method to enhance volume flexibility in JIT production control. *International Journal of Production Economics*, 104(2):653-665.

HUSSINGER, K. 2010. On the importance of technological relatedness: SMEs versus large acquisition targets. *Technovation*, 30:57-64.

HUTTINGER, L., SCHIELE, H. & VELDMAN, J. 2012. The drivers of customer attractiveness, supplier satisfaction and preferred customer status: a literature review. *Industrial Marketing Management*, 41:1194-1205.

IBEH, K. & KASEM, L. 2011. The networks perspective and the internationalization of small and medium size software firms from Syria. *Industrial Marketing Management*, 40:356-367.

IFC *see* INTERNATIONAL FINANCE CORPORATION

INTERNATIONAL FINANCE CORPORATION (IFC). 2004. Investing in a sustainable private sector. [Online]. Available at: <<http://www.ifc.org/sustainability/>>. Accessed: 03/07 2013.

JACK, E.P. & RATURI, A. 2002. Sources of volume flexibility and their impact on performance. *Journal of Operations Management*, 20(5):519-548.

JAIPURIA, S. & MAHAPATRA, S.S. 2014. An mproved demand forecasting method to reduce bullwhip effect in supply chains. *Expert Systems with Applications*, 41:2395-2408

JANG, J. 2014. Supply chain agility: securing performance for Chinese manufacturers. *International Journal of Production Economics*, 150:104-113.

JAP, S.D. 2001. Perspectives on joint competitive advantages in buyer-supplier relationships. *International Journal of Research in Marketing*, 18:19-35.

JARVENSIVU, T. & MOLLER, K. 2009. Metatheory of network management: a contingency perspective. *Industrial Marketing Management*, 38:654-661.

JAYARAM, J. & TAN, K.C. 2010. Supply chain integration with third-party logistics providers. *International Journal of Production Economics*, 125:262-271.

- JAYARAM, J. & XU, K. 2013. The relative influence of external versus internal integration on plant performance in China. *International Journal of Production Economics*, 146:59-69.
- JING, T. & ZHONGHUA, Y. 2012. Specific asset investment in industry and university research. *Physical Procedia*, 24:518-523.
- JOHNSON, B. & CHRISTENSEN, L. 2012. *Educational research: quantitative, qualitative and mixed approaches*. 4th ed. Thousand Oaks, California: Sage.
- JONES, O. & TILLEY, F. 2003. *Competitive advantage in SMEs: organising for innovation and change*. San Francisco: Wiley & Sons.
- JUTTNER, U., CHRISTOPHER, M. & BAKER, S. 2007. Demand chain management-integrating marketing and supply management. *Industrial Marketing Management*, 36(3):377-392.
- KALE, P., SINGH, H. & PERLMUTTER, H. 2000. Learning and protection of proprietary assets in strategic alliances: building relational capital. *Strategic Management Journal*, 21:217-237.
- KANG, M., WU, X., HONG, P. & PARK, Y. 2012. Aligning organisational control practices with competitive outsourcing. *Journal of Business Research*, 65:1195-1201.
- KARJALAINEN, K. & KEMPPAINEN, k. 2008. The involvement of small-and medium-size enterprises in public procurement: impact of resource perceptions, electronic systems and enterprise size. *Journal of Purchasing & Supply Management*, 14:230-240.
- KAYA, O. 2013 Dynamic pricing of durable products with heterogeneous customers and demand interactions over time. *Computers & Industrial Engineering*, 65(4):679-688.
- KENNY, B & FAHY, J. 2011. SMEs networking capability and international performance. In Baxter, R. & Woodside, A.G., ed. *Inter-firm networks: theory, strategy and behaviour*. Bingley, UK: Emerald Group Publishing. pp.199-376.
- KERN, D. 2011. *Essays on purchasing and supply chain management*. Heidelberg, Germany: Gabler.

KESEN, S.E., KANCHANAPIBOON, A. & DAS, S.K. 2010. Evaluating supply chain flexibility with order quantity constraints and lost sales. *International Journal of Production Economics*, 126:181-188.

KESEN, S.E., KANCHANAPIBOON, A. & DAS, S.K. 2010. Evaluating supply chain flexibility with order quantity constraints and lost sales. *International Journal of Production Economics*, 126:181-188.

KETCHEN, D.J. & GIUNIPERO, L.C. 2004. The intersection of strategic management and supply chain management. *Industrial Marketing Management*, 33:51-56.

KETCHEN, D.J. & HULT, G.T.M. 2007. Bridging organisational theory and supply chain management: the case of best value supply chains. *Journal of Operational Management*, 25:573-580.

KHALIL, O. & WANG, S. 2002. Information technology enabled meta-management for virtual organisation. *International Journal of Production Economics*, 75(1-2):127-134.

KHODAKARAMI, F. & CHAN, Y.E. 2014. Exploring the role of customer relationship management (CRM) systems in customer knowledge creation. *Information & Management*, 51:27-42.

KHOSROW-POUR, M. 2006. *Emerging trends and challenges in information technology management*. British Cataloging in Publications Data: USA.

KILLEN, C.P., JUGDEV, K., DROUIN, N. & PETIT, Y. 2012. Advancing project and portfolio management research: applying strategic management theories. *International Journal of Project Management*, 30:525-538.

KIM, D., CAVUSGIL, S.T. & CAVUSGIL, E. 2013. Does IT alignment between supply chain partners enhance customer value creation? An empirical investigation. *Industrial Marketing Management*, 42:880-889.

KIM, H.S., KIM, Y.G. & PARK, C.W. 2010. Integration of firm's resource and capability to implement enterprise CRM: a case study of retail bank in Korea. *Decision Support Systems*, 48:313-322.

- KIM, K., CHO, T.Y., YAN, C.T. & DOOLEY, K. 2011. Structural investigation of supply networks: a social network analysis approach. *Journal of Operations Management*, 29:194-211.
- KIM, S.W. 2009. An investigation on the direct and indirect effect of supply chain integration on firm performance. *International Journal of Production Economics*, 119:328-346.
- KLINE, R.B. 2005. *Principles and practice of structural equation modelling*. 2nd ed. New York: The Guilford Press.
- KNC & ASSOCIATES. 2002. Access to finance for SMEs: presentation to APDF conference. [Online]. Available at: <http://www.smesurvey.co.za.html>. Accessed: 03/19/2013.
- KOBELSKY, K., LAROSILIERE, G. & PLUMMER, E. 2014. The impact of information technology on performance in the not-for-profit sector. *International Journal of Accounting Information Systems*, 15:47-65.
- KOCOGLU, I., IMAMOGLU, S.Z., INCE, H. & KESKIN, H. 2011. The effect of supply chain integration on information sharing: enhancing the supply chain performance. *Procedia Social & Behavioral Sciences*, 24:1630-1649.
- KOHN, J.W., MCGUINNIS, M.A. & KARA, A. 2011. A structural equation model assessment of logistics strategy. *The International Journal of Logistics Management*, 22(3):284-305.
- KOSSAI, M. & PIGET, P. 2014. Adoption of information and communication technology and firm profitability: Empirical evidence from Tunisian SMEs. *Journal of High Technology Management Research*, 25:9-20.
- KRACKHARDT, D. & KILDUFF, M. 2002. Structure, culture and simmelian ties in entrepreneurial firms. *Social Networks*, 24:279-290.
- KROON, J & MOOLMAN, P. 1992. *Entrepreneurship*. Potchefstroom, South Africa: Central Publications, Potchefstroom University for Higher Education.
- KRUGER, D.J., DE VOS, A.S., FOUCHE, C.B. & VENTER, L. 2005. Quantitative data analysis and interpretation. In DE VOS, A.S., STRYDOM, H., FOUCHE, C.B. & DELPORT

C.S.L., ed. *Research at grass roots: for the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. pp.217-244.

KRUSE, G. 2007. Cash is king – and don't you forget it. *Journal of Operations Management*, 33(6):13-17.

KU, K.C., GURUMURTHY, C.K. & KAO, H.P. 2007. Inter-firms collaboration of joint venture in IC foundry business. *Technovation*, 27:296-305.

KUMAR, R.S. & SUBRAHMANYA, M.H.B. 2010. Influence of subcontracting on innovation and economic performance of SMEs in Indian automobile industry. *Technovation*, 30:558-569.

KUO, Y.F., WU, C.M. & DENG, W.J. 2009. The relationships among service quality, Perceived value, customer satisfaction and post-purchased intention in mobile value-added services. *Computers in Human Behavior*, 25:887-896.

KURATKO, D.F & HODGETTS, R.M. 1995. *Entrepreneurship: a contemporary approach*, 3rd ed. Orlando: Dryden Press.

KUSNADI, Y. 2011. Do corporate governance mechanisms matter for cash holdings and firm's value? *Pacific-Basin Finance Journal*, 19:554-570.

LADZANI, M, W. 2006. *An exploration of factors that lead to failure of small businesses in the Kagiso township*. University of Pretoria.

LAFORET, S. 2013. Organisational innovation outcomes in SMEs: effect of age, size, and sector. *Journal of World Business*, 48:490-502.

LAI, H.C., CHIU, Y.C. & LIAW, Y.C. 2010. Can external corporate venturing broaden firm's technological scope? The role of complementary assets. *Journal of Engineering & Technology Management*, 27:183-196.

LAI, X., XIE, M., TAN, K.C. & YANG, B. 2008. Ranking of customer requirements in a competitive environment. *Computers & Industrial Engineering*, 54(2):202-214.

LAM, C.Y. & IP, W.H. A customer satisfaction inventory model for supply chain integration. *Expert System with Application*, 38:875-883.

- LANE, N. & PIERCY, N. 2004. Strategic customer management: designing a profitable future for sales organisation. *European Management Journal*, 22(6):659-668.
- LEAVY, B. 2006. Supply chain effectiveness: strategy and integration. *Handbook of Business Strategy*, 7(1):331-336.
- LEE, H., KIM, M.S. & KIM, K.K. 2014. Inter-organisational information systems visibility and supply chain performance. *International Journal of Information Management*, 34:285-295.
- LEE, J. & HABTE-GIORGIS, B. 2004. Empirical approach to the sequential relationships between firm strategy, export activity, and performance in U.S manufacturing firms. *International Business Review*, 13:101-129.
- LEE, J.Y., PARK, Y.R., GHOURI, P.N. & PARK, B.I. 2013. Innovative Knowledge Transfer Patterns of Group-Affiliated Companies: the effects on the performance of foreign subsidiaries. *Journal of International Management*. [Online]. Available at: <<http://dx.doi.org/10.1016/j.intman.2013.04.002>>. Accessed: 10/07/2013.
- LEE, R.P.L., RUAN, D. & LAI, G. 2005. Social structure and support networks in Beijing and Hong Kong. *Social Network*, 27:245-274.
- LEE, R.P.L., RUAN, D. & LAI, G. 2005. Social structure and support networks in Beijing and Hong Kong. *Social Network*, 27:245-274.
- LEE, S., PARK, G., YOON, B. & PARK, J. 2010. Open innovation in SMEs – an intermediated network model. *Research Policy*, 39:290-300.
- LEEDY, P.D. & ORMROD, J.E. 2005. *Practical research: planning and design*. NY: Pearson Merrill: Prentice Hall.
- LEI, P.W. & WU, Q. 2007. Introduction to structural equation modeling: issues and practical considerations. *Educational Measurement*, 26(3):33-43.
- LEMMETYINEN, K. & MERILAINEN, A. 2011. Destination network management: a conceptual analysis. *Tourism Review*, 66(3):25-31.

- LEMOINE, O.W. & SKJOETT-LARSEN, T. 2004. Reconfiguration of supply chains and implications for transport. *International Journal of Physical Distribution & Logistics Management*, 34(10):793-810.
- LI, G., YANG, H., SUN, L. & SOHAL, A.S. 2009. The impact of IT implementation on supply chain integration and performance. *International Journal of Production Economics*, 120:125-138.
- LI, H.L. & TANG, M.J. 2010. Vertical integration and innovation performance: the effects of external knowledge sourcing modes. *Technovation*, 30:401-410.
- LI, S., RAGU-NATHAN, B., RAGU-NATHAN, T.S. & RAO, S.S. 2006. The impact of supply chain management practices on competitive advantages and organisational performance. *Omega*, 34:107-124.
- LI, W., HUMPHREYS, P.K., YEUNG, A.C.L. & CHENG, T.C.E. 2012. The impact of supplier development on buyer competitive advantage: a path analytic model. *International Journal of Production Economics*, 135:353-366.
- LIAO, T.S. & RICE, J. 2010. Innovation investments, markets engagement and financial performance: a study among Australian manufacturing SMEs. *Research Policy*, 39:117-125.
- LICHTENTHALER, U. 2008. Relative capacity: retaining knowledge outside a firm's boundaries. *Journal of Engineering & Technology Management*, 25:200-212.
- LIN, H.M., HUANG, H.C., LIN, C.P. & HSU, W.C. 2012. How to manage strategic alliances in OEM-based industrial clusters: Network embeddedness and formal governance mechanisms. *Industrial Marketing Management*, 41:449-459.
- LIN, Y., WANG, Y. & YU, C. 2010. Investigating the drivers of the innovation in channel integration and supply chain performance: a strategy orientated perspective. *International Journal of Production Economics*, 127:320-332.
- LING-YEE, L. & OGUNMOKUN, G.O. 2008. An empirical study of manufacturing flexibility of exporting firms in China: How do strategic and organisational contexts matter? *Industrial Marketing Management*, 37:738-751.

- LIU, H., KE, W., WEI, K.K. & HUA, Z. 2013. The impact of IT capabilities on firm performance: the mediating roles of absorptive capacity and supply agility. *Decision Support Systems*, 54:1452-1462.
- LO, S.M. & POWER, D. 2010. An empirical investigation of the relationship between product nature and supply chain strategy. *Supply Chain Management: An International Journal*, 15(2):139-153.
- LOECHER, U. 2000. Small and medium-sized enterprises – delimitation and the European definition in the area of industrial business. *European Business Review*, 12(5):261-264.
- LONGENECKER, J.G., MOORE, C.W. & PETTY, J.W. 2003. *Small business management: an entrepreneurial emphasis*. 12th ed. Ohio: South-Western.
- LOPEZ-GAMERO, M.D., MOLINA-AZORIN, J.F. & CLAVER-CORTES, E. 2009. The whole relationship between environmental variables and firm performance: competitive advantage and firm resources as mediator variables. *Journal of Environmental Management*, 90:3110-3121.
- LORENTZ, H., KITTIPANYA-NGAM, P. & SRAI, J.S. 2013. Emerging market characteristics and supply network adjustments in internationalising food supply chains. *International Journal of Production Economics*, 145:220-232.
- LOTFI, Z., SAHRAN, S., MUHTAR, M. & ZADEH, A.T. 2013. The relationships between supply chain integration and product quality. *Procedia Technology*, 11:471-478.
- LOUW, L. & VENTER, P. 2006. *Strategic Management: winning in the Southern African workplace*. Cape Town: Oxford.
- LOVE, P.E.D., MATTHEWS, J., SIMPSON, I., HILL, A. & OLATUNJI, O.A. 2014. A benefits realisation management building information modeling framework for asset owners. *Automation in Construction*, 37:1-10.
- LUI, J., MANTIN, B. & WANG, H. 2014. Supply chain coordination with customer returns and refund-dependent demand. *International Journal of Production Economics*, 148:81-89.

- LUMMUS, R.R., KRUMWIEDE, D.W. & VOKURKA, R.J. 2001. The relationship of logistics to supply chain management: developing a common industry definition. *Industrial Management & Data Systems*, 101(8):426-432.
- LYNCH, D.F., KELLER, S.B., & OZMENT, J. 2000. Effects of logistics capabilities and strategy on firm performance. *Journal of Business Logistics* 22(2):47-67.
- MACFIE, B.P. & NUFRIO, P.M. 2006. *Applied statistics for public policy*. Library Congress Cataloging-in-Publication Data: USA.
- MADHOK, A. 1998. The nature of multinational firm boundaries: transaction costs, firm capabilities and foreign market entry mode. *International Business Review*, 7:259-290.
- MADRIA, S.K. 2001. Data warehousing. *Data & Knowledge Engineering*, 39:215-217.
- MAHEMBE, E. 2011. National credit R\regulator: literature review on small and medium enterperises' access to credit and support in South Africa. Pretoria, South Africa: Underhill Corporation Solution (UCS)..
- MALHOTRA, N.K. 2004. *Marketing research: an applied orientation*. 4th ed. NJ: Prentice-Hall.
- MALTHOUSE, E.C., HAENLEIN, M., SKIERA, B., WAGE, E. & ZHANG, M. 2013. Managing customer relationships in the social media era: introducing the social CRM House. *Journal of Interactive Marketing*, 27:270-280.
- MAREE, K. & PIETERSON, J. 2007. Surveys and the use of questionnaires. In MAREE, K., ed. *First steps in research*. Pretoria: Van Schaik Publishers. pp.155-169.
- MAREE, K. 2007. *First steps in research*. Pretoria: Van Schaik Publishers.
- MARKHAM, T.F. & WESTBROOK, R. 2001. Arcs of integration: an international study of supply chain strategies. *Journal of Operations Management*, 19:185-200.
- MARRIAM, S.B. 2009. *Qualitative research: a guide to design and implementation*. San Francisco, CA: John Wiley.
- MARTELO, S., BARROSO, C. & CEPEDA, G, 2013. The use of organisational capabilities to increase customer value. *Journal of Business Research*, 66(10):2042-2050.

- MARTIN, W.E. & BRIDGMON, K.D. 2012. *Quantitative and statistical research methods: from hypothesis to results*. San Francisco, CA: John Wiley.
- MARTINS, J.H., LOUBSER, M., & VAN WYK, H. 1996. *Marketing research: a South Africa approach*. Pretoria: National Book Printers.
- MARTINSEN, U. & BJORKLUND, M. 2012. Matches and gaps in the green logistics market. *International Journal of Physical Distribution & Logistics Management*, 42(6):562-583.
- MASON, S.J., RIBERA, P.M., FARRIS, J.A. & KIRK, R.G. 2003. Integrating the warehousing and transportation functions. *Transportation Research Part E*, 39:141-159.
- MAYER-HAUG, K., READ, S., BRINCHMANN, J., DEW, N. & GRICHNIK, D. 2013. Entrepreneurial talent and venture performance: a meta-analytic investigation of SMEs. *Research Policy*, 42:125-1273.
- MAYFIELD, J. & MAYFIELD, M. 2008. The creative environment's influence on intent to turnover: a structural equation model and analysis. *Management Research News*, 31:41-56.
- MBONYANE, B.L. 2006. *An exploration of factors that lead to failure of small businesses in the Kagiso Township*. College of economics and management. South Africa: UNISA.
- MCCARTAN-QUIN, D & CARSON, D. 2003. Issues which impact upon marketing in the small firms. *Small Business Economics*, 21(2):201-213.
- MCDANIEL, C. & GATES, R. 2002. *Marketing research: the impact of the internet*. 5th ed. Cincinnati, OH: South-Western.
- MCDUGALL, G.H.G. & LEVESQUE, T. 2000. Customer satisfaction with services: putting perceived value into the equation. *Journal of Services Marketing*, 14(5):392-410.
- MCKINNON, A. 2009. The present and future land requirements of logistical activities. *Land Use Policy*, 26:293-301.
- MEADE, L. & SARKIS, J. 1998. Strategic analysis of logistics and supply chain management systems using the analytical network process. *Logistics & Transportation*, 34(3):201-215.

MENTZER, J.T., FLINT, D.J. & HULT, T.M. 2001. Logistics Service Quality as a Segment-Customised process. *Journal of Marketing*, 65:82-104.

MERSCHMANN, U. & THONEMANN, U.W. 2009. Supply chain flexibility, uncertainty and firm performance: an empirical analysis of German manufacturing firms. Department of Supply Chain Management & Management Science, 1-39. [Online]. Available at: <<http://ssrn.com/abstract=1567612>>. Accessed: 22/19/2014.

MERSCHMANN, U. & THONEMANN, U.W. 2011. Supply chain flexibility, uncertainty and firm performance: an empirical analysis of German manufacturing firms. *International Journal of Production Economics*, 130:43-53.

METTERNICH, J., BOLLHOFF, J., SEIFERMANN, S. & BECK, S. 2013. Volume and mix flexibility evaluation of lean production systems. *Procedia, CIRP*, 9:79-84.

MING, Y., GRABOT, B. & HOUE, R. 2014. A typology of the situations of cooperation in supply chains. *Computers & Industrial Engineering*, 67:56-71.

MIOCEVIC, D. & CRNJAK-KARANOVI, B. 2012. The mediating role of key supply relationship management practices on supply chain orientation – the organizational buying effectiveness link. *Industrial Marketing Management*, 41:115-124.

MONCZKA, R.M., HANDFIELD, R.B., GIUNIPERO, L.C., PATTERSON, J.L. & WATERS, D. 2010. *Purchasing and supply chain management*. Christon House, United Kingdom: Cengage Learning EMEA.

MOON, K.K-L., YING, C.Y. & NGAI, E.W.T. 2012. An instrument for measuring supply chain flexibility for the textile and clothing companies. *European Journal of Operational Research*, 222:191-203.

MOQBEL, M. 2012. The effect of the use of social networking sites in the workplace on job performance. DPhil. Thesis. Texas A&M International University.

MORABITO, V., THEMISTOCLEOUS, M. & SERRANO, A. 2010. A survey on integrated IS and competitive advantage. *Journal of Enterprise Information*, 23(2):201-214.

MORITA, H. & SERVATKA, M. 2013. Group identity and relation-specific investment: an experimental investigation. *European Economic Review*, 58:95-109.

MOSER, R. 2007. *Strategic purchasing and supply management: a strategy-based selection of suppliers*. Frankfurt, Germany: DUV Publishers.

MOUTON, J. & MARAIS, H.C. 1990. *Basic concepts in the methodology of the social sciences*. Pretoria: Human Science Research Council.

MOUZAS, S. & FORD, D. 2009. The constitution of networks. *Industrial Marketing Management*, 38:495-503.

MOUZAS, S., HENNEBERG, S. & NAUDE, P. 2008. Developing network insight. *Industrial Marketing Management*, 37:167-180.

MUSA, Z. & ABDULLAH, R. 2014. The effect of trust and information sharing on relationship commitment in supply chain management. *Procedia – Social & Behavioral Sciences*, 130:266-272.

MUTULA, S.M. & BRAKEL, P.V. 2006. E-readiness of SMEs in the ICT sector in Botswana with respect to information access. *The Electronic Library*, 24(3):402-417.

NABHANI, F. & SHOKRI, A. 2007. Application of six sigma in a food distribution SME to improve supply chain management. Proceedings of the World Congress on Engineering held in Middlesbrough on 2 to 4 July 2007. Middlesbrough: UK, pp. 1162-1170.

NARASIMHAN, R. & KIM, S.W. 2002. Effect of supply chain integration on the relationship between diversification and performance: evidence from Japanese and Korean firms. *Journal of Operations Management*, 20:303-323.

NARASIMHAN, R. & TALLURI, S. 2009. Perspectives on risk management in supply chains. *Journal of Operations Management*, 27(2):114-118.

NARASIMHAN, R., TALLURI, S. & DAS, A. 2004. Exploring flexibility and execution competencies of manufacturing firms, *Journal of Operations Management*, 22:91-106.

NEL, P.A., RADEL, F.E., & LOUBSER, M. 1988. Researching the South Africa market. Pretoria: Unisa.

NEUMAN, W. L. 2000. *Social research methods: qualitative and quantitative approaches*, 4th Ed. Boston: Allyn and Bacon, pp. 98-132.

NEUMAN, W.L. 2005. Social research methods: qualitative and quantitative approaches. 5th ed. Boston: Allyn & Bacon.

New Dictionary of Social work. 1995. Questionnaire. Revised edition. Pretoria: State Printers.

NICHTER, S. & GOLDMARK, L. 2009. Small firm growth in developing countries. *World Development*, 37(9):1453-1464.

NICKLES, T., MUELLER, J. & TAKACS T. 1998. Strategy, information technology and the supply chain. Managing information technology for success, not just survival. In Gattorna, J. ed. 1998. Strategic supply chain management: Best Practice in Supply Chain Management. Brookfield, VT: Gower. pp 494-508.

NIELSEN, A.E. & THOMSEN, C. 2009. CSR communication in small and medium-sized enterprises: a study of the attitudes and beliefs of middle managers. *International Journal of Corporate Communications*, 14(2):176-189.

NIEMAN, G. 2001. *Small business management*. Pretoria: Van Schaik Publishers.

NIEMAN, G. 2006. *Small business management. A South African approach*. Pretoria: Van Schaik Publishers.

NIEMAN, G.H. & NIEUWENHUIZEN, C. 2009. *Entrepreneurship: A South African perspective*. Pretoria: Van Schaik Publishers.

NIEUWENHUIZEN, C. 2011. Entrepreneurship. In Strydom, J., ed. *Principles of business management*. Cape Town: Oxford University Press Southern Africa. pp. 355-373.

NTSIKA ENTERPRISES PROMOTION AGENCY. 2002. State of Small Business Development in South Africa Annual Review. [Online]. Available at: <http://www.ntsika.org.za>. Accessed: 14/06/2013.

NYAGA, G.N., WHIPPLE, J.M. & LYNCH, D.F. 2010. Examining supply chain relationships: do buyer and supplier perspectives on collaborative relationships differ? *Journal of Operations Management*, 28:101-114.

- O'REGAN, N. & GHOBADIAN, A. 2004. Testing the homogeneity of SMEs: The impact of size on managerial and organisational processes. *European Business Review*, 16(1):64-67.
- OH, S., RYU, K. & JUNG, M. 2013. Reconfiguration framework of a supply network based on flexibility strategies. *Computers & Industrial Engineering*, 65:156-165.
- OKE, A., BURKE, G. & MYERS, A. 2007. Innovation types and performance in growing UK SMEs. *International Journal of Operations & Production Management*, 27(7):735-753.
- OLAVARRIETA, S. & ELLINGER, A.E. 1997. Resource-based theory and strategic logistics research. *International Journal of Physical Distribution and Logistics Management*, 27(10):559-587.
- OTERO, M., PASTOR, A., PORTELA, J.M., VIGUERA, J.L. & HUERTA, M.M. 2013. The standardization of supporting tools: advantage competitive for collaborative networks. *Procedia Engineering*, 63:12-19.
- OVERBY, J.W. & SERVAIS, P. 2005. Small and medium-sized firms import behaviour: the case of Danish industrial purchasers. *Journal of Industrial Marketing Management*, 34:71-83.
- OZBAS, O. 2005. Integration, organisational processes, and allocation of resources. *Journal of Financial Economics*, 75:201-242.
- OZCAN, S. & NAZRUL, I. 2014. Collaborative networks and technology clusters – the case of nanowire. *Technological Forecasting & Social Change*, 82:115-131.
- PADMORE, J., TAYLOR, N. & FRECKNALL-HUGHES, J. 2006. Marketing in small and medium sized enterprises. *International Journal of SMEs Behaviour & Research*, 12(6):361-387.
- PALLANT, J. 2007. *SPSS survival manual: a step by step guide to data analysis using SPSS for windows*. 3rd ed. New York: McGraw Hill.
- PALMA-MENDOZA, J.A., NEAILEY, K. & ROY, R. 2014. Business process re-design methodology to support supply chain integration. *International Journal of Information Management*, 34:167-176.

- PARK, B.I. 2011. Knowledge transfer capacity of multinational enterprises and technology acquisition in international joint ventures. *International Journal of Business Review*, 20:75-87.
- PASANEN, M. & LAUKKANEN, T. 2006. Team-managed growing SMEs: a distinct species? *Management Research News*, 29(11)684-700.
- PASANEN, M. 2006. *SMEs growth strategies: a comparison of young and long-lived firms*. Kuopio University Publications H. Business and Information Technology 1. Kuopio: University of Kuopio.
- PAULRAJ, A., CHEN, I.J. & FLYNN, J. 2006. Levels of strategic purchasing: impact on supply integration and performance. *Journal of Purchasing & Supply Management*, 12:107-122.
- PEPPARD, J., GALLIERS, R.D. & THOROGOOD, A. 2014. Information systems strategy as practice: micro strategy and strategizing for IS. *The Journal of Strategic Information Systems*, 23:1-10.
- PERKS K., & BOUNCKEN R. 2004.. Home page. University of Brighton [Online]. Available at: <<http://www.strategicmanagement/perks.html>> Accessed: 6/09/2013.
- PIENAAR, W.J. & VOGT, J.J. 2012. *Business logistics management: a supply chain perspective*. 4th ed. Cape Town, SA: Oxford.
- POZO, M.D., MANUEL, C., GONZALEZ-ARANGUENA, E. & OWEN, G. 2011. Centrality in directed social networks. A game theoretic approach. *Social Network*, 33:191-200.
- PRAJOGO, D. & OLHAGER, J. 2012. Supply chain integration and performance: the effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, 135:514-522.
- PUNCH, K.F. 2005. *Introduction to social research: quantitative and qualitative approaches*. 2nd ed. London: Sage.
- PUSTEJOVSKY, J.E. & SPILLANE, J.P. 2009. Question-order effects in social network name generators. *Social Networks*, 31:221-229.

- RABINOVICH, E., KNEMEYER, A.M. & MAYER, C.M. 2007. Why do internet commerce firms incorporate logistics service providers in their distribution channels? The role of transaction costs and network strength. *Journal of Operations Management*, 25:661-681.
- RAE, D. 1999. *The entrepreneurial spirit: Learning to unlock value*. Dublin, Ireland: Blackhall Publishing.
- RAGOWSKY, A., AHITUV, N. & NEUMANN, S. 1996. Identifying the value and importance of an information system application. *Information & Management*, 31(2):89-102.
- RAJAGURU, R & MATANDA, J.M. 2013. Effect of inter-organisational compatibility on supply chain capabilities: exploring the mediating role of inter-organisational information systems (IOIS) integration. *Industrial Marketing Management*, 42:620-632.
- RAMIREZ-ORTIZ, M.G., CABALLERO-HOYOS, J.R. & RAMIREZ-LOPEZ, M.G. 2004. The social networks of academic performance in a student context of poverty in Mexico. *Social Networks*, 26:175-188.
- RAMOS, C. & FORD, I.D. 2011. Network pictures as a research device: developing a tool to capture actors' perceptions in organisational networks. *Industrial Marketing Management*, 40:447-464.
- RAPP, A., TRAINOR, K.J. & AGNIHOTRI, R. 2010. Performance implications of customer-linking capabilities: examining the complementary role of customer orientation and CRM technology. *Journal of Business Research*, 63:1229-1236.
- RAY, S. & JEWKES, E.M. 2004. Customer lead time management when both demand and price are lead time sensitive. *European Journal of Operational Research*, 153(3):769-781.
- RAYMOND, L. & CROTEAU, A.M. 2006. Enabling the strategic development of SMEs through advanced manufacturing systems: A configurational perspective. *Industrial Management & Data Systems*, 106(7):1012-1032.
- REPUBLIC OF SOUTH AFRICA. 2003. The National Small Business Amendment Act (26 of 2003). Pretoria: *Government Gazette*.

- REXHAUSEN, D., PIBERNIK, R. & KAISER, G. 2012. Customer-facing supply chain practices – the impact of demand and distribution management on supply chain success. *Journal of Operations Management*, 30:269-281.
- RICHARDSON. 1995. Logistics help for the challenged. *Journal of Transportation & Distribution*, 36(1):4-60.
- ROBINS, G., PATTISION, P., KALISH, Y. & LUSHER, D. 2007. An introduction to exponential random graph models for social networks. *Social Networks*, 29:173-191.
- ROBINS, R.W., FRALEY, R.C. & KRUEGER, R.F. 2007. *Handbook of research methods in personality psychology*. New York: The Guilford Press.
- RODEN, S. & LAWSON, B. 2014. Developing social capital in buyer-supplier relationships: the contingent effect of relationship-specific adaptations. *International Journal of Production Economics*, 151:89-99.
- ROGERSON, C.M. 2000. Successful SMEs in South Africa: the case of clothing producers in the Witwatersrand. *Development Southern Africa*, 17(5):687-716.
- ROMANO, P. & DANESE, P. 2011. Performance measurement systems and downstream integration: a study on their combined impact on supply network efficiency. *E-business, Management & Economics*, 3:60-64.
- ROSEIRA, C., BRITO, C. & FORD, D. 2013. Network pictures and supplier management: an empirical study. *Industrial Marketing Management*, 42:234-247.
- ROSEIRA, C., BRITO, C. & HENNEBERG, S.C. 2010. Managing interdependencies in supplier networks. *Industrial Marketing Management*, 39:925-935.
- ROYLE, J. & LAING, A. 2014. The digital marketing skills gap: developing a Digital Marketer Model for the communication industries. *International Journal of Information Management*, 34(2):65-73.
- RUIZ-SANTOS, C., RUIZ-MERCADER, J. & MCDONALD, F. 2003. The use of contractual working time flexibility by Spanish SMEs. *Personnel Review*, 32(2):164-186.

- RWIGEMA, H & VENTER, R. 2004. *Advanced entrepreneurship*. New York: Oxford University Press.
- RWIGEMA, H.B. 2006. Corporate level strategy: the quest for shareholder value. In Louw, L. & Venter, P., ed. *Strategic Management: winning in the Southern African workplace*. Cape Town: Oxford. pp.208-242.
- SAFAVI, N.S., ZAKARIA, N.H. & AM, M. 2014. The risk analysis of system selection and business process re-engineering towards the success of enterprise resource planning project for small and medium enterprise. *World Applied Sciences Journal*, 31(9):1669-1676.
- SALMELA, E. & LUKKA, A. 2004. Value added logistics in supply and demand chains. (A research report 153 for the E-Business between global company and its local SMEs supplier network 2004). Lappeenranta University of Technology (Internet document).
- SAMADDAR, S. & KADIYALA, S.S. 2006. An analysis of interorganisational resources sharing decisions in collaborative knowledge creation. *European Journal of Operational Research*, 170:192-210.
- SANCHEZ, A.M. & PEREZ, M.P. 2005. Supply chain flexibility and firm performance: A conceptual model and empirical study in the automotive industry. *International Journal of Operations & Production Management*, 25(7):681-700.
- SAVIOZ, P. & BLUM, M. 2002. Strategic forecast tool for SMEs: how the opportunity landscape interacts with business strategy to anticipate technological trends. *Technovation*, 22:91-100.
- SCHAARSCHMIDT, M. & KILLIAN, T. 2014. Impediments to customer integration into the innovation process: a case study in the telecommunications industry. *European Management Journal*, 32:350-361.
- SCHUMACKER, R.E. & LOMAX, R.G. 2010. A beginner's guide to structural equation modeling. 3rd ed. NY:Routledge Taylor & Francis Group.
- SCHUTZ, P. & TOMASGARD, A. 2011. The impact of flexibility on operational supply chain planning. *International Journal of Production Economics*, 134:300-311.

- SEKARAN, U. & BOUGIE, R. 2010. *Research methods for business: a skill building approach*. 5th ed. San Francisco, CA: John Wiley.
- SHAFEEK S, 2009. Enhancing the strategy for developing small ‘growth potential’ firms in the Eastern Cape. [Online]. Available at: <<http://www.accademicjournals.org/AJBM>>. Accessed: 23/07/2013.
- SHANG, K. & MARLOW, P.B. 2005. Logistics capability and performance in Taiwan’s major manufacturing firms. *Transportation Research Part E*, 41:217-234.
- SHARMA, A.K. 2005. *Test book of correlations and regression*. New Delhi, India: Discovery Publishing House.
- SHI, N., SONG, H & POWELL, W.B. 2014. The dynamic fleet management problem with uncertain demand and customer chosen service level. *International Journal of Production Economics*, 148:110-121.
- SHY, O. & STENBACKA, R. 2013. Investment in customer recognition and information exchange. *Information Economics & Policy*, 25:92-106.
- SIMPSON, B., MARKOVSKY, B. & STEKETEE, M. 2011. Power and the perception of social networks. *Social Networks*, 33:166-171.
- SIMPSON, M. & DOCHERTY, A.F. 2004. E-commerce adoption support and advice for UK SMEs. *Journal of Small Business and Enterprise Development*, 11(3):315-328.
- SINGH, Y.K. & BAJPAI, R.B. 2008. *Research methodology: techniques and trends*. New Delhi: S.B. Nangia.
- SIU, W.S., LIN, T., FANG, W. & LIU, Z.C. 2006. An institutional analysis of the new product development process of small and medium enterprises (SMEs) in China, Hong Kong and Taiwan. *Industrial Marketing Management*, 35:323-335.
- SKINTZI, G., IOANNOU, G. & PRASTACOS, G. 2008. Investigating warehousing policies. *International Journal of Product Economics*, 112:955-970.

- SKOK, W., KOPHAMEL, A. & RICHARDSON, I. 2001. Diagnosing information systems: importance-performance maps in the health club industry. *Information & Management*, 7:409-419.
- SLOOF, R., SONNEMANS, J. & OOSTERBEEK, H. 2004. Specific investments, holdup, and the outside option principle. *European Economic Review*, 48:1399-1410.
- SOHAL, A.S., NETTO, B.D., FITZPATRICK, P. & NOORI, H. 2001. The roles and responsibilities of production/operations managers in SMEs: evidence from Canada. *Technovation*, 21:437-448.
- SOK, P., O'CASS, A. & SOK, K.M. 2013. Achieving superior SME performance: overarching role of marketing innovation, learning capabilities. *Australasian Marketing Journal*, 21:161-167.
- SONI, U., JAIN, V. & KUMAR, S. 2014. Measuring supply chain resilience using a deterministic modeling approach. *Computers & Industrial Engineering*, 74:11-25.
- SOONTIENS, W. 2002. Managing international trade: an analysis of South Africa SMEs and regional exports. *Management Decisions*, 40(7):710-719.
- SPEKMAN, R.E. & CARRAWAY, R. 2006. Making the transition to collaborative buyer-seller relationships. *Industrial Marketing Management*, 35:10-19.
- STEFANOVIC, D., STEFANOVIC, N. & RADENKOVIC, B. 2009. Supply network modelling and simulation methodology. *Simulation Modelling Practice and Theory*, 17:743-766.
- STEGEER-JENSEN, K. & SVENSSON, C. 2004. Issues of mass customization and supporting IT-solutions. *Computers in Industry*, 53:83-103.
- STEINTHORSSON, R.S. & DERHOLM, A.S. 2002. Strategic management as multi-contextual sensemaking in intermediate organisations. *Scandinavian Journal of Management*, 18:233-248.
- STERLING, J. 2003. Translating strategy into effective implementation: Dispelling the myths and highlighting what works. *Strategy & Leadership*, 31(3):27-34.

- STOKES, D. & WILSON, N. 2006. *Small business management and entrepreneurship*. 5th ed. South-Western Cengage Learning: USA.
- STOREY, J., EMBERSON, C. & READE, D. 2005. The barriers to customer responsive supply chain management. *International Journal of Operations & Production Management*, 25(3):242-260.
- STRYDOM, H. 2005. Sampling and sampling methods. In De Vos, A.S., Strydom, H., C.B. & Delport C.S.L. eds. *Research at Grass roots: for the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. pp.192-204.
- STRYDOM, H., FOUCHE, C.B. & DELPORT C.S.L., ed. 2005. *Research at grass roots: for the social sciences and human service profession*. 3rd ed. Pretoria: Van Schaik Publishers. 192-203.
- STUART, F.J., VERVILLE, J. & TASKIN, N. 2012. Trust in buyer-supply relationships: supplier competency, interpersonal relationships and performance outcomes. *Journal of Enterprise Information Management*, 25(4):392-412.
- SUBRAHMANYA, M.H.B. 2008. Industrial subcontracting and structure in Japan: evolution and recent trends. *Journal of Management History*, 14(1):23-38
- SWAFFORD, P.M., GHOSH, S. & MURTHY, N. 2006. The antecedents of supply chain agility of a firm: scale development and model testing. *Journal of Operations Management*, 24:170-188.
- SWAFFORD, P.M., GHOSH, S. & MURTHY, N. 2008. Achieving supply chain agility through IT integration and flexibility. *International Journal of Production Economics*, 116:288-297.
- SWIERCZEK, A. 2013. The impact of supply chain integration on the snowball effect in the transmission of disruptions: an empirical evaluation of the model. *International Journal of Production Economics*, [Online]. Available at < <http://dx.doi.org/10.1016/j.ijpe.2013.08.010> > Accessed: 25/03/2014.
- SWIERCZEK, F.W. & DHAKAL, G.P. 2004. Learning and its impact on the performance of manufacturing joint ventures in developing countries. *Technovation*, 24:53-62.

- TABACHNICK, B.G. & FIDELL, L.S. 2007. *Using multivariate statistics*. 5th ed. New York: Allyn and Bacon.
- TACHIZAWA, E.M. & GIMENEZ, C. 2010. Supply flexibility strategies in Spanish firms: results from a survey. *International Journal of Production Economics*, 124:214-224.
- TAPPEN, R.M. 2011. *Advance nursing research from theory to practice*. Sudbury, M.A.: Jones & Bartlett Learning.
- TASSABEHJI, R. & MOORHOUSE, A. 2008. The changing role of procurement: Developing professional effectiveness. *Journal of Purchasing and Supply Management*, 14:55-68.
- TERPSTRA, M. & VERBEENTEN, F.H.M. 2014. Customer satisfaction: cost driver or value driver? Empirical evidence from financial services industry. *European Management Journal*, 32(3):499-508.
- THAKKAR, J., KANDA, A. & DESHMUKH, S.G. 2008. A conceptual role interaction model for supply chain management in SMEs. *Journal of Small Business & Enterprise Development*, 15(1):74-95.
- THAKKAR, J., KANDA, A. & DESHMUKH, S.G. 2008. Supply chain management in SMEs: development of constructs and propositions. *Asia Pacific Journal of Marketing & Logistics*, 20(1):97-131.
- TIDD, J. & IZUMIMOTO, Y. 2002. Knowledge exchange and learning through international joint ventures: an Anglo-Japanese experience. *Technovation*, 22:137-145.
- TIEMESSEN, H.G.H., FLEISCHMANN, M., VAN HOUTUM, G.J., VAN NUNEN, J.A.E.E. & PRATSINI, E. 2013. Dynamic demand fulfillment in spare parts networks with multiple customer classes. *European Journal of Operational Research*, 228(2):367-380.
- TOIVONENA, R., KOVANENA, L., KIVELAA, M., ONNELAB, J.P., SARMAKIA, J. & KASKIA, K. 2009. A comparative study of social network models: network evolution models and nodal attribute models. *Social Networks*, 31:240-254.
- TOWN, J.S. 2000. Performance or measurement? *Performance Measurement and Metrics*, 1(1):43-54.

- TRAINOR, K.J., RAPP, A., BEITELSPACHER, L.S. & SCHILLEWAERT, N. 2011. Integrating information technology and marketing: an examination of the drivers and outcomes of e-marketing capability. *Industrial Marketing Management*, 40:162-174.
- TREDOUX, C. & DURRHEIM, K. 2002. *Numbers, hypotheses and conclusions: a course in statistics for social sciences*. Cape Town: University of Cape Town Press.
- TRKMAN, P. & MCCORMACK, K. 2009. Supply chain risk in turbulent environments: a conceptual model for managing supply chain network risk. *International Journal of Production Economics*, 119:247-258.
- TU, Y. & YANG, Z. 2013. An enhanced customer relationship management classification framework with partial focus feature reduction. *Expert System with Applications*, 40:2137-2146.
- TUSTIN, D.H., LIGTHELM, A.A., MARTINS, J.H. & VAN WYK, H. 2005. *Marketing research in practice*. Pretoria: Unisa Press.
- TYBOUT, J. R. March 2000. Manufacturing firms in developing countries: How well do they do and why? *Journal of Economic Literature*, 38(1):1-61.
- TZABBAR, D.T., AHARONSON, B.S. & AMBURGEY, T.L. 2013. When does tapping external sources of knowledge result into knowledge integration? *Research Policy*, 42:481-494.
- YUAN, L., ZHONGFENG, S. & YI, L. 2010. Can strategic flexibility help firms profit from product innovation? *Technovation*, 30(5-6):300-309.
- UNITED NATIONS. 1999. Human Development Report 2003. [Online]. Available at: <http://www.undp.org/hdr2003/indicator/cty_f_ZAF.html>. Accessed: 01/08/2013.
- VAALAND, T.I. & HEIDE, M. 2007. Can the SME survive the supply chain challenge? *International Journal of Supply Chain Management*, 12(1)20-31.
- VAN DER VAART, T. & VAN DONK, D.P. 2008. A critical review of survey-based research in supply chain integration. *International Journal of Production Economics*, 111:42-55.

- VAN DONK, D.P. & VAN DER VAART, T. 2005. A case of shared resources, uncertainty and supply chain integration in the process industry. *International Journal of Production Economics*, 96:97-108.
- VAN HOOFF, B. & THIELL, M. 2014. Collaboration capacity for sustainable supply chain management: small and medium-sized enterprises in Mexico. *Journal of Cleaner Production*, 67:239-248.
- VAN WEELE, A.J. 2010. *Purchasing and supply chain management*. 5th ed. Cengage Learning EMEA: Christon House, United Kingdom.
- VERA, J. & TRUJILLO, A. 2013. Service quality dimensions and superior customer perceived value in retail banks: an empirical study on Mexican consumers. *Journal of Retailing and Consumer Services*, 20:579-586.
- VERDECHO, M.J., ALFARO-SAIZ, J.J., RODRIGUEZ-RODRIGUEZ, R. & ORTIZ-BAS, A. 2012. A multi-criteria approach for managing inter-enterprise collaborative relationships. *Omega*, 40:249-263.
- VERHOEF, P.C., FRANSES, P.H. & HOEKSTRA, J.C. 2000. The effect of relational constructs on relationship performance: does duration matter? *Journal of Economic Literature (JEL)*, 31:1-54.
- VICKERY, S.K., JAYARAM, J., DROGE, C. & CALANTONE, R. 2003. The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships. *Journal of Operations Management*, 21:523-539.
- VINZI, V.E., CHIN, W.W., HENSELER, J. & WANG, H. 2010. *Handbook of partial least squares: concepts, methods and application*. Heidelberg, Germany: Springer-Verlag.
- VOORTMAN, C. 2004. *Global logistics Management*. Lansdowne, Cape Town: Juta.
- VUKSIC, V.B., BACH, M.P & POPOVIC. 2013. Supporting performance management with business process management and business intelligence: a case analysis of integration and orchestration. *International Journal of Information Management*, 33(4):613-619.
- WADHWA, R.S. 2012. Flexibility in manufacturing automation: a living lab case study of Norwegian metalcasting SMEs. *Journal of Manufacturing System*, 31:444-454.

- WAGNER, S.M., EGGERT, A. & LINDEMANN, E. 2010. Creating and appropriating value in collaborative relationships. *Journal of Business Research*, 63:840-848.
- WAGNER, B.A., FILLIS, I. & JOHANSSON, U. 2003. E-business and e-supply strategy in small and medium sized businesses (SMEs). *Journal of Supply Chain Management*, 8(4):343-354.
- WAGNER, S.M. 2006. A firm's responses to deficient suppliers and competitive advantage. *Journal of Business Research*, 59:686-695.
- WANG, S. & NOE, R.A. 2010. Knowledge sharing. A review and directions for future research. *Human Resource Management Review*, 20:115-131.
- WAREHAM, J., MATHIASSEN, L., RAI, A., STRAUB, D. & KLEIN, R. 2005. The business value of digital supply networks: a program of research on the impacts of globalisation. *Journal of International Management*, 11:201-227.
- WHIPPLE, J.M., LYNCH, D.F. & NYAGA, G.N. 2010. A buyer's perspective on collaborative versus transactional relationships. *Industrial Marketing Management*, 39:507-518.
- WICKHAM, P. A. 2001. *Strategic entrepreneurship*. London: Pitman
- WIELAND, A. & WALLENBURG, C.M. 2013. The influence of relational competencies on supply chain resilience: a relational view. *International Journal of Physical Distribution & Logistics Management*, 43(4):300-320.
- WINDAHL, C. & LAKEMON, N. 2006. Developing integrated solutions: the importance of relationships within the network. *Industrial Marketing Management*, 35:806-818.
- WILLIAMS, B.D., ROH, J., TOKAR, T. & SWINK, S. 2013. Leveraging supply chain visibility for responsiveness: the moderating role of internal integration. *Journal of Operations Management*, 31:543-554.
- WONG, C.W.Y., WONG, C.Y. & BOON-ITT, S. 2013. The combined effects of internal and external supply chain integration on production innovation. *International Journal of Production Economics*, 146:566-574.

WONG, C.Y. & KARIA, N. 2010. Explaining the competitive advantage of logistics service providers: a resource-based view approach. *International Journal of Production Economics*, 128:51-67.

WONG, C.Y., BOON-ITT, S. & WONG, C.W.Y. 2011. The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management*, 29:604-615.

WOTHKE, W. 2010. Introduction to structural equation modelling course note. *American Institute of Research*, 1-63.

WU, F., YENIYURT, S., KIM, D. & CAVUSGIL, S.R.T. 2006. The impact of information technology on supply chain capabilities and firm performance: a resources-based view. *Industrial Marketing Management*, 35:493-504.

WU, H. & SHANGGUAN, X. 2012. Regional logistics information resources integration patterns and countermeasures. *Physics Procedia*, 25:1601-1615.

WU, I.L., CHUANG, C.H. & HSU, C.H. 2014. Information sharing and collaborative behaviors in enabling supply chain performance: a social exchange perspective. *International Journal of Production Economics*, 148:122-132.

WU, I.L., CHUANG, C.H. & HSU, C.H. 2014. Information sharing and collaborative behaviours in enabling supply chain performance: a social exchange perspective. *International Journal of Production Economics*, 148:122-132.

XU, H., KOH, L. & PARKER, D. Business processes inter-operation for supply network coordination. *International Journal of Production*, 122:188-199.

YANG, J.C. 2006. The efficiency of SMEs in the global market: measuring the Korean performance. *Journal of Policy Modeling*, 28:861-876.

YAO, Z., YANG, Z., FISHER, G.J., MA, C. & FANG, E. 2013. Knowledge complementarity, knowledge absorption effectiveness, and new product performance: the exploration of international joint ventures in China. *International Journal of Business Review*, 22:216-227.

- YEH, Y.H., SHU, P.G. & SU, Y.H. 2012. Related-party transactions and corporate governance: the evidence from the Taiwan stock market. *Pacific-Basin Finance Journal*, 20:755-776.
- YEUNG, K., LEE, P.K.C., YEUNG, A.C.L. & CHENG, T.C.E. 2013. Supplier partnership and cost performance: the moderating role of specific investments and environmental uncertainty. *International Journal of production Economics*, 144:546-559.
- YOON, H.D. 2001. The logistical competitiveness of SMEs and global supply chain. *Journal of Operational Research Society*: 163-170, June.
- YU, W., JACOBS, M.A., SALISBURY, W.D. & ENNS, H. 2013. The effect of supply chain integration on customer satisfaction and financial performance: an organisational learning perspective. *International Journal of Production Economics*, 146:346-358.
- YUNG, W.K.C. & CHAN, T.H. 2003. Application of value delivery system (VDS) and performance benchmarking in flexible business process reengineering. *International Journal of Operation & Production Management*, 23(3):300-315.
- ZACHARIA, Z.G. & MENTZER, J.T. 2004. Logistics salience in a changing environment. *Journal of Business Logistics*, 25(1):187-202.
- ZEIMPEKIS, V. & GIAGLIS, G.M. 2006. Urban dynamic real-time distribution services: Insights from SMEs. *Journal of Enterprise Information Management*, 19(4):367-388.
- ZELEALEM, T.T. & PANSIRI, J. 2006. Perceive managerial problems in SMEs: evidence from Botswana. *Development & Learning in Organizations*, 20(5):15-17.
- ZANG, S.L., XIE, X.M. & TAM, C.M. 2010. Relationship between cooperation network and innovation performance of SMEs. *Technovation*, 30:181-194.
- ZHA, X. & CHEN, M. 2009. Competitive Intelligence Monitoring in the risk prevention of SMEs. *Journal of Service Science & Management*, 3:230-235.
- ZHANG, Q., VONDEREMBSE, M.A. & SU LIM, J. 2003. Manufacturing flexibility: Defining and analysing relationships among competence, capability, and customer satisfaction. *Journal of Operational Management*, 21:173-191.

ZHAO, X., HUO, B., SELEN, W. & YEUNG, J.H.Y. 2011. The impact of internal integration and relationship commitment on external integration. *Journal of Operations Management*, 29:17-32.

ZHAO, Y., CARVUGIL, E. & CAVUSGIL, S.T. 2013. An investigation of the black-box supplier integration in new production development. *Journal of Business Research*, 67:1058-1064.

ZHENG, Y., ZHAO, K. & STYLIANOU, A. 2013. The impacts of information quality and system quality on users' continuance intention in information exchange virtual communities: an empirical investigation. *Decision Support Systems*, 56:513-524.

ZIKMUND, W.G. 1999. *Business research methods*. 6th ed. Fort Worth, TX: Harcourt Brace.

ZIKMUND, W.G. 2000. *Business research methods*. 6th ed. Fort Worth, TX: Dryden Press.

ZIKMUND, W.G. 2010. *Business research methods*. 7th ed. Fort Worth, TX: Dryden Press.

APPENDIX A: REQUEST TO CONDUCT RESEARCH

VAAL UNIVERSITY OF TECHNOLOGY



FACULTY OF MANAGEMENT SCIENCES

PERMISSION TO CONDUCT RESEARCH

Permission is hereby requested to conduct research at your organisation. Details of the researcher, supervisor and research project are as follows:

- Researcher/Student:** Osayuwamen Omoruyi
- Supervisor/Promoter:** Prof. R. Dhurup and Prof. R.D. Poore
- Purpose of research:** The objective of this study is to examine the influence of supply chain networks, flexibility and integration on the performance of SMEs.
- Duration of Research:** 10 minutes
- Procedures to be followed:** Respondents/participants at your organisation will be requested to complete a questionnaire independently and honestly within the allocated timeframe. By completing the questionnaire it is assumed that the respondent/participant is aware of the purpose of the study and has given consent to participate in the study.
- Risk Involved:** The risk involved in participating in this research is minimal. If any of the questions are found embarrassing, offensive or of a sensitive nature, the respondent may choose not to answer them. However, the answers to the questionnaires are confidential (see confidential section).

Benefits Involved: The information that is obtained from the study will be used for academic purposes only. It is expected to contribute to the body of knowledge and create opportunities for further research.

Confidentiality: Questionnaires are completed anonymously, and the researcher and his/her statistician are the only persons who will see the results of the questionnaires. The researcher will not have knowledge of which scores belongs to which person as aggregate scores will be analysed. The data from this study will be presented in the dissertation/thesis. However, at no time will the name of the organisation, respondent or any identifying information be reported in the presentation of this research unless permission is obtained in writing to do so.

Participants Withdrawal: Participation in this study is completely voluntary and participants are free to withdraw or terminate at any time.

Contact Person: Osayuwamen Omoruyi (071 775 2480).

Signature and Acknowledgement: My signature below indicates that I have read the above information and have had the opportunity to ask questions about my participation. I understand that the information gathered from these questionnaires will be used for the purpose of research only. I acknowledge having received a copy of this agreement.

Name of principal: _____

Signature of principal: _____

Date: _____

Company Stamp if available:

APPENDIX B: QUESTIONNAIRE

Please answer the following questions by marking the appropriate answer(s) with an X.
This questionnaire is strictly for research purpose only.

SECTION A: COMPANY PROFILE

1. Number of years operating in business

2 to 4		5 to 7		8 to 10		11 or more	
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2. Annual sales (R)

Less than R1 million	R1m to less than R5 million	R5m to less than R10	R10m to less than R20	R20m or more

3. Physical assets (R)

Less than R4 million	R4m to less than R8 million	R8m to less than R12 million	R12m to less than R16 million	R16 or more

4. Number of employees

Fewer than 50		50 to 99		100-199		200 or more	
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5. Type of Industry

5.1	Agriculture, hunting, forestry and fishing	
5.2	Mining and quarrying	
5.3	Manufacturing	
5.4	Rubber and plastics	
5.5	Electricity, gas and water supply	
5.6	Construction	
5.7	Wholesale and retail trade (repair of motor vehicles, motor cycles, personal and household goods, hotels and restaurants)	
5.8	Transport, storage and communication	
5.9	Community, social and personal services	
5.10	Private households, extraterritorial organisations, representatives of foreign governments.	
5.11	Others (please specify)	

6. Please indicate under what capacity you run your business (job title)

Manager		Owner	
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7. Please indicate your highest academic qualification

Junior certificate	Senior certificate	National Diploma	Degree	Postgraduate qualification	Other (specify)

SECTION B: SUPPLY CHAIN NETWORKS

Please indicate to what extent you agree disagree with each statement regarding supply chain networks in your organisation								
		Strongly disagree	Disagree	Slightly disagree	neutral	Slightly agree	agree	Strongly agree
1	Supply chain networks allows efficient use of our resources	1	2	3	4	5	6	7
2	Supply chain networks lead to sound economic use of our firm	1	2	3	4	5	6	7
3	Supply chain networks allows effective use of our firm's knowledge base	1	2	3	4	5	6	7
4	There is high complementarities (combination of skills) between the resources	1	2	3	4	5	6	7
5	There is high similarity/overlap between the core capabilities of each partner	1	2	3	4	5	6	7
6	The organisational cultures of our network partners are incompatible with each other	1	2	3	4	5	6	7
7	The management style of our network partners are compatible	1	2	3	4	5	6	7
8	We strive to achieve synergy through working together.	1	2	3	4	5	6	7

SECTION C: SUPPLY CHAIN FLEXIBILITY

Please indicate to what extent you agree/disagree with the following statement on the influence of supply chain flexibility in your organisation		Strongly disagree	Disagree	Slightly disagree	neutral	Slightly agree	agree	Strongly agree
1	Our organisation has the ability to reduce lead-times	1	2	3	4	5	6	7
2	Our organisation has the ability to reduce product development cycle times	1	2	3	4	5	6	7
3	Our organisation has the ability to increase frequency of new product introductions	1	2	3	4	5	6	7
4	Our organisation has the ability to increase level of customisation	1	2	3	4	5	6	7
5	Our organisation has the ability to adjust worldwide delivery capacity/capability	1	2	3	4	5	6	7
6	Our organisation has the ability to improve the level of customer service	1	2	3	4	5	6	7
7	Our organisation has the ability to improve delivery reliability	1	2	3	4	5	6	7
8	Our organisation has the ability to improve responsiveness to changing market needs	1	2	3	4	5	6	7

SECTION D: SUPPLY CHAIN INTEGRATION

Please indicate to what extent you agree/disagree with the following statements in terms of supply chain integration in your organisation								
	Internal integration across the supply chain	Strongly disagree	disagree	Slightly disagree	neutral	Slightly agree	Agree	Strongly agree
1	Our organisation has data integration among internal functions through information network	1	2	3	4	5	6	7
2	Our organisation has system-wide information system integration among internal functions	1	2	3	4	5	6	7
3	Our organisation has real-time searching of the level of inventory	1	2	3	4	5	6	7
4	Our organisation has real-time searching of the logistics-related operating data	1	2	3	4	5	6	7
5	Our organisation has data integration in production process	1	2	3	4	5	6	7
6	Our organisation has integrative inventory management	1	2	3	4	5	6	7
7	Our organisation has construction of system-wide interaction system between production	1	2	3	4	5	6	7
8	Our organisation utilise periodic interdepartmental meetings among internal function	1	2	3	4	5	6	7

SECTION E: SMES PERFORMANCE

Organisational performance								
Please rate your organisation's performance as compared to the industry average.								
		Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	agree	Strongly agree
1	Our organisation has a high level of return on investment.	1	2	3	4	5	6	7
2	Our organisation has a high level of profitability.	1	2	3	4	5	6	7
3	Our organisation a high level profit growth.	1	2	3	4	5	6	7
4	Our organisation has a high level of return on sales.	1	2	3	4	5	6	7
5	Our organisation has a high level of market share growth.	1	2	3	4	5	6	7
6	Our organisation has a high level of sales volume growth.	1	2	3	4	5	6	7
7	Our organisation has a high level of sales (in Rands) growth.	1	2	3	4	5	6	7

Thank you

APPENDIX C: CFA RESULTS

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	70	755.885	281	.000	2.690
Saturated model	351	.000	0		
Independence model	26	8035.600	325	.000	24.725

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.079	.875	.844	.701
Saturated model	.000	1.000		
Independence model	.557	.202	.138	.187

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.906	.891	.939	.929	.938
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.865	.783	.811
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	474.885	397.070	560.355
Saturated model	.000	.000	.000
Independence model	7710.600	7421.895	8005.670

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.890	1.187	.993	1.401
Saturated model	.000	.000	.000	.000
Independence model	20.089	19.276	18.555	20.014

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.065	.059	.071	.000
Independence model	.244	.239	.248	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	895.885	906.019	1175.462	1245.462
Saturated model	702.000	752.815	2103.880	2454.880
Independence model	8087.600	8091.364	8191.443	8217.443

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.240	2.045	2.453	2.265
Saturated model	1.755	1.755	1.755	1.882
Independence model	20.219	19.497	20.957	20.228

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	170	180
Independence model	19	20

Standardized Regression Weights: (Group number 1 - Default model)

	Estimate
SCN7 <--- SCN	.633
SCN6 <--- SCN	.700
SCN5 <--- SCN	.743
SCN4 <--- SCN	.857
SCN3 <--- SCN	.879

	Estimate
SCN2 <--- SCN	.785
SCN1 <--- SCN	.617
SCF8 <--- SCF	.648
SCF6 <--- SCF	.729
SCF5 <--- SCF	.816
SCF4 <--- SCF	.789
IAS8 <--- IAS	.634
IAS7 <--- IAS	.707
IAS6 <--- IAS	.821
IAS5 <--- IAS	.801
IAS4 <--- IAS	.777
IAS3 <--- IAS	.771
IAS2 <--- IAS	.674
IAS1 <--- IAS	.659
SBP7 <--- SBP	.813
SBP6 <--- SBP	.854
SBP5 <--- SBP	.904
SBP4 <--- SBP	.904
SBP3 <--- SBP	.838
SBP2 <--- SBP	.799
SBP1 <--- SBP	.732

APPENDIX D: SEM AND PATH ANALYSIS

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	78	669.122	273	.000	2.451
Saturated model	351	.000	0		
Independence model	26	8035.600	325	.000	24.725

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.196	.891	.860	.693
Saturated model	.000	1.000		
Independence model	.557	.202	.138	.187

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.917	.901	.949	.939	.949
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.840	.770	.797
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	396.122	324.009	475.924
Saturated model	.000	.000	.000
Independence model	7710.600	7421.895	8005.670

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.673	.990	.810	1.190
Saturated model	.000	.000	.000	.000
Independence model	20.089	19.276	18.555	20.014

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.060	.054	.066	.002
Independence model	.244	.239	.248	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	825.122	836.414	1136.651	1214.651
Saturated model	702.000	752.815	2103.880	2454.880
Independence model	8087.600	8091.364	8191.443	8217.443

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.063	1.883	2.262	2.091
Saturated model	1.755	1.755	1.755	1.882
Independence model	20.219	19.497	20.957	20.228

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	187	198
Independence model	19	20

HYPOTHESIS

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
IAS	<---	SCN	.253	.049	5.219	***	Accepted at p <0.001
IAS	<---	SCF	.479	.065	7.408	***	Accepted at p <0.001
SBP	<---	SCN	.156	.051	3.085	.002	Accepted at p<0.05
SBP	<---	SCF	.456	.074	6.140	***	Accepted at p<0.001
SBP	<---	IAS	.150	.071	2.102	.036	Accepted at p< 0.05
SCN7	<---	SCN	1.000				