

**The management of the logistical supply chain drivers in  
Sowetan small businesses**

**by**

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## Declaration

I declare that this dissertation entitled “The management of the logistical supply chain drivers in Sowetan small businesses” is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references. I further declare that I have not submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.



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SIGNATURE  
(Ms Themari Eicker)

21/10/2016

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DATE

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## **Abstract:**

The performance of small businesses contribute substantially to the South African economy. In recent years the South African Government has prioritised the development of township retail industries by implementing numerous initiatives. The primary objective of this study was to determine how formal independent small retail businesses in Soweto manage their logistical supply chain drivers, namely facilities, inventory and transportation, in terms of responsiveness and cost-efficiency in order to survive. The logistical supply chain drivers should not only be managed as a cohesive unit, but also be aligned with the orientation of the selected supply chain strategy, in terms of responsiveness and cost-efficiency. During 2014, a quantitative survey was conducted among 650 formal independent small Sowetan businesses of which the responses of 556 retailers were analysed in terms of responsiveness and cost-efficiency. The study also investigated the role of the relevant industry group in the management of the logistical supply chain drivers by the business owners. The data was analysed and tested by the Kruskal-Wallis test, the Pearson Chi-square test and factor analyses were performed. Two binary logistic regression models were developed to determine the influence of the management of the logistical supply chain drivers on the small retailers' odds of survival. The results showed that the small retailers manage facilities and inventory focused more towards responsiveness, whereas transportation is managed focused on either cost-efficiency or responsiveness. The study concluded that *age* and *growth in income* can predict the odds of survival for small businesses.

## **Keywords:**

Responsiveness, cost-efficiency, logistical supply chain drivers, facilities, inventory, transportation small retailers, Soweto, townships.

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# Chapter 1

## Introduction to the study

### 1.1 Introduction

This study focuses on the way in which formal independent small retail businesses manage the logistical supply chain drivers of transportation, facilities and inventory based on their selected supply chain strategy. At the end of the study recommendations are made to assist small retail business owners or managers in the South Western Township (hereafter referred to as Soweto) in managing the logistical supply chain drivers in order to survive. This chapter provides background information on selected key concepts in the discipline of supply chain management (SCM) that are relevant to this study, as well as a description of formal independent small retail businesses operating within the boundaries of the Soweto township. The discussion is structured to include the problem statement, research questions, research objectives and research methodology used to conduct this study.

### 1.2 Background: SCM key concepts related to this study

Globalisation and the rapid development of technologies have led to a shift from businesses competing against each other to supply chains competing against each other (Simon, Serio, Pires & Martins, 2015:28; Alfalla-Luque, Mendina-Lopez & Dey, 2013:800; Qrunfleh and Tarafdar, 2013:571). Therefore, to operate successfully and achieve a competitive advantage in today's business environment, businesses are compelled to become more involved with their customers and suppliers (Wisner, Tan & Leong, 2016:8). Success depends on building relationships and processes beyond the boundaries of a business in order to assist in the design, production and delivery of goods and services according to customers' demands (Fawcett, Ellram & Ogden, 2007:6). Fawcett et al. (2007:6) further explain that developing such relationships and processes within the supply chain will enable businesses to enhance their capabilities. A generic supply chain for products consists of three or more businesses, called supply chain members and are linked through the upstream and downstream flow of products, information and finances. The different supply chain members must be managed

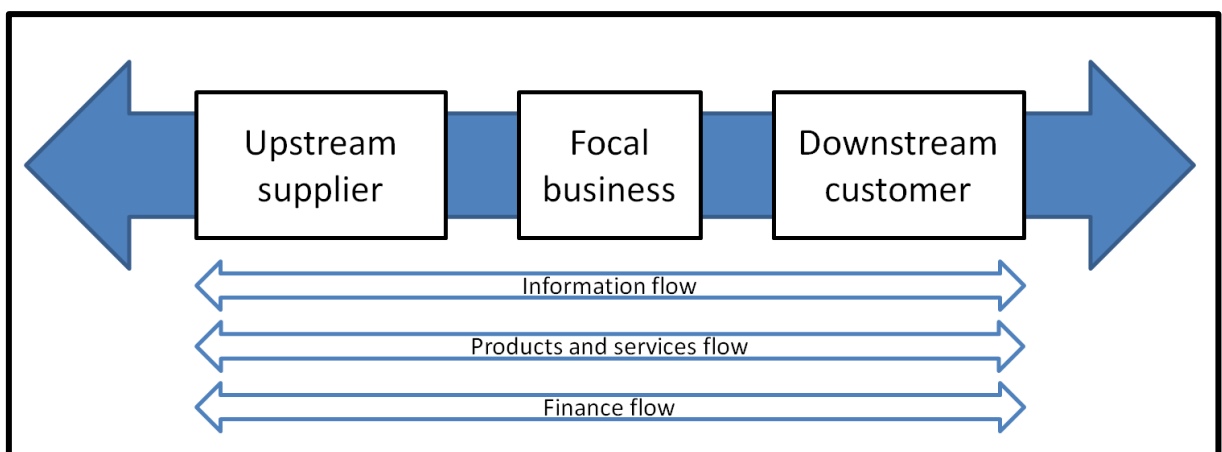
as a coordinated and cohesive singular competing unit in order to satisfy the needs of end-customers (Monczka, Handfield, Giunipero & Patterson, 2016:13; Wisner et al., 2016:8; Alfalla-Luque et al., 2013:800). A generic supply chain for services entails a network of service providers, customers and the supporting units that perform the functions required to produce services, to transform resources into supporting and core services, and to deliver services to downstream customers (Sakhuj and Jain, 2012:216).

The following section will provide an overview of SMC by explaining the way in which the different supply chain members interact within a generic supply chain, whereafter the discussion will continue on the different members of a generic supply chain with regard to this study.

### 1.2.1 A generic supply chain

All customers, whether they are end-customers (final customers who use or consume the end product) or supply chain members, receive products or services via some kind of supply chain. The different flows of products and services, information and finances between the different supply chain members are depicted in figure 1.1.

**Figure 1.1 A generic supply chain with the upstream and downstream flows**



Source: Wisner et al. (2016:8); Fawcett et al. (2007:7)

Referring to the generic supply chain in figure 1.1, both the downstream customer and upstream supplier can trigger the three flows within the chain. Although a basic supply chain with only three members (the upstream supplier, the focal business and the downstream customer), is depicted in figure 1.1, it is important to note that supply chains are usually

more complex, with numerous members and interconnections (Wisner et al., 2016:8). A supplier can trigger the three flows by anticipating a customer's demand (also referred to as a push-based process), whereas a customer can trigger the three flows by requiring a product or service (also referred to as a pull-based process) (Chopra and Meindl, 2016:22). The information of a customer's order will trigger the downstream flow of products and services from a supplier, as well as the upstream flow of finances from the customer (Taylor, 2004:26). In the event that the customer is not satisfied, a reverse flow is activated whereby the product is returned to the supplier; the product then flows back (upwards) and a refund is made to the customer (Kilic, Cebeci & Ayhan, 2015:120). When a customer is dissatisfied with a service, he or she can either demand a refund or request that the service be rectified.

### **1.2.2 The different supply chain members within a generic Sowetan retail supply chain**

For the purpose of this study, a clear distinction between the different supply chain members within a generic Sowetan retail supply chain is required. This section provides a description of each supply chain member in terms of this study.

#### **1.2.2.1 The focal business**

The focal business in this study refers to any formal independent small retail business operating within the boundaries of Soweto. For the purpose of this study the definition of a small business as defined by the National Small Business Amendment Act of 2004 is accepted. It reads that a small business is "a separate and distinct business entity, together with its branches or subsidiaries, if any, including co-operative 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 subsector of the economy and which can be classified as a micro-, a very small, a small or medium enterprise" (South Africa, 2004). A small business can form part of a supply chain, either as a supplier, manufacturer, distributor or customer, and is not always the focal business within the supply chain (Koh, Demirbag, Bayraktar, Tatoglu & Zaim, 2007:103). In this study, formal independent small retail businesses, for example restaurants, general stores, grocery stores, automotive stores, hardware stores, hairdressers and undertakers are viewed as focal businesses within the supply chain.

### **1.2.2.2 The downstream customers**

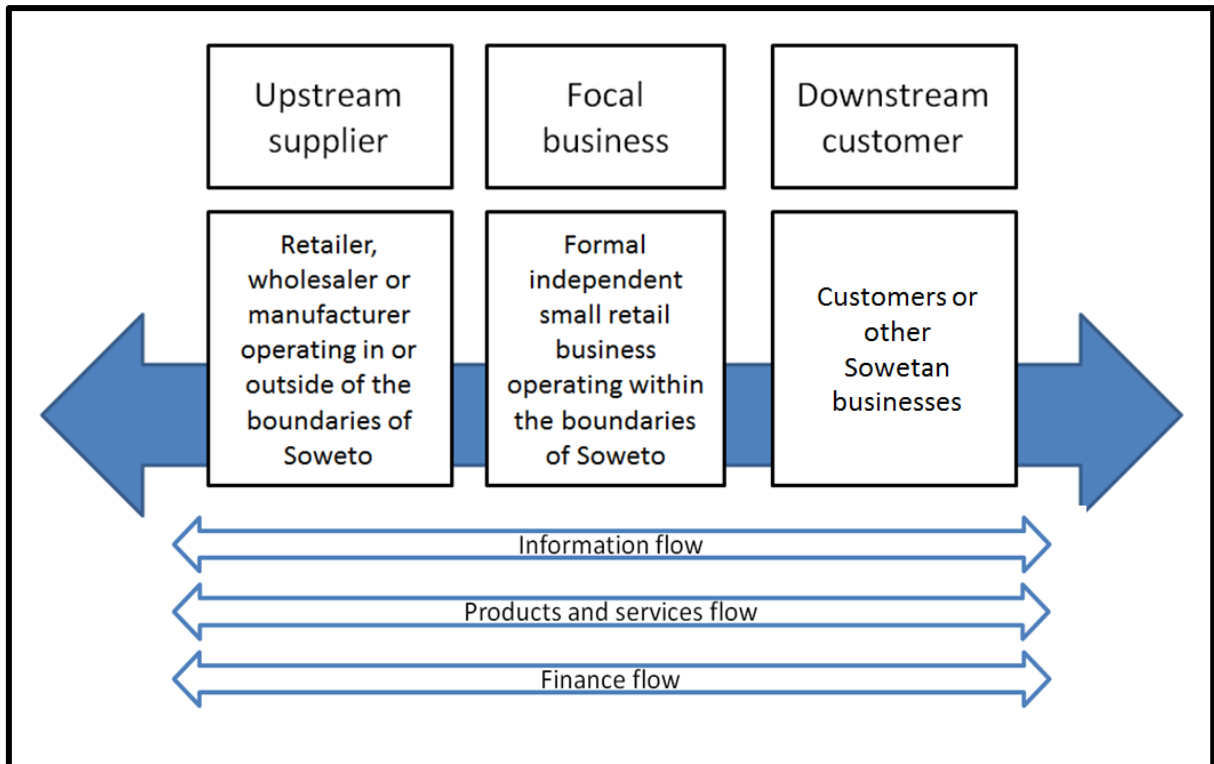
For the purpose of this study a downstream customer refers to a customer who purchases from the formal independent small retail businesses operating within the boundaries of Soweto, irrespective of whether the customer purchases the product or service for own consumption (for example, a customer who purchases bread to eat or receives a haircut), or to resell to another downstream customer (for example, another retailer purchasing inventory), or to use within the customer's own business (for example, a customer who purchases a hammer to use in his or her plumbing business).

### **1.2.2.3 The upstream suppliers**

In this study an upstream supplier refers to a supplier from whom the formal independent small retail businesses in Soweto purchase inventory or a service. A supplier can be another retailer, a wholesaler or a manufacturer who operates in or outside the boundaries of Soweto. The formal independent small retail business purchases inventory from an upstream supplier with the purpose of reselling the inventory in its own store, or purchases a service that will assist the business in conducting its trade. An example could be the purchasing of washing powder from another retailer to resell to a customer, or paying a supplier to install a refrigerator.

Taking into consideration the generic supply chain with the upstream and downstream flows (figure 1.1), as well as the earlier discussion on the different supply chain members with regard to this study, a simplified supply chain for formal independent small retail businesses operating in Soweto is depicted in figure 1.2.

**Figure 1.2 A simplified supply chain for formal independent small retail businesses operating in Soweto**



Source: Compile by the researcher

Small businesses can use SCM to improve customer service and reduce costs, such as inventory and transportation costs (Surowiec, 2015:433). Due to the strategic role that SCM plays in enhancing a competitive advantage, the formulation of relevant supply chain strategies is cardinal (see section 1.2.3) (Surowiec, 2015:433; Qrunfleh and Tarafdar, 2013:571). The supply chain strategy forms part of a business' functional level strategies and should define how supply chain operations will support the competitive strategy (Chopra and Meindl, 2016:32-33). Before the different supply chain strategies are discussed, is it important to indicate where these strategies are positioned within a business.

### **1.2.3 The influence of business strategies on supply chain management**

Selecting appropriate business strategies is not a luxury, but a necessity for the sustainable development for all businesses, including small businesses (Leitner and Guldenberg, 2010:185). Three interrelated and interdependent levels of strategies exist within a business structure, namely the corporate level, competitive level and functional level (West, Ford & Ibrahim, 2015:34; Shaw, 2012:30; Thompson and Martin, 2010:28). Although various terms

are used to refer to these strategic levels in the literature, the discussion that follows will refer to corporate, competitive and functional levels.

### **1.2.3.1 The different strategic levels**

The corporate level strategy provides the strategic direction for the entire business, mainly through the mission and vision statements encapsulating the long-term goals of the entire business (Salavou, 2015:81). Competitive strategies, as the second level of strategies, are concerned with the creation and maintenance of a sustainable competitive advantage by identifying a unique position within the market in an effort to outperform rivals (Salavou, 2015:81; Jooste, Strydom, Berndt & Du Plessis, 2012:230; Thompson and Martin, 2010:28; Louw and Venter, 2011:19). Competitive strategies are translated into functional strategies, which represent the third level of strategies within a business structure. These functional strategies specify the necessary actions to support the competitive strategies. Functional strategies include, for example the marketing strategy, production strategy, supply chain strategy, finance strategy and the human resource strategy (West et al., 2015:34). The corporate, competitive and functional strategies should be aligned, coherent and congruent with each other in order to ensure business success (Chopra and Meindl, 2016:32-33; Hines, 2013:41).

### **1.2.3.2 The different strategic levels of a small business**

As most large businesses provide more than one product or service to one or more market segments, managers can structure each product and service into a strategic business unit (SBU). Since each SBU is responsible for developing, manufacturing and marketing their product or service, each SBU will have a specific competitive strategy with its relevant functional strategies. A functional strategy is concerned with the short-term goals of each functional area within each SBU (Salavou, 2015:81).

Aykan, Aksoylu & Sönmez (2013:939) state that small businesses differ from larger businesses with regard to managerial and organisational structure, mainly because of the variances resulting from financial aspects, production or service sourcing, internal capabilities and competitive power. Therefore, the strategies deployed by small and large

businesses will also differ. Since small businesses generally compete with only one product or service, or in one market segment, they do not have different SBUs within their business structures (Thompson and Martin, 2010:28) and so, the corporate and competitive strategies will be synonymous. Consequently, small businesses will usually have only one competitive strategy with several functional strategies for the entire business (Thompson and Martin, 2010:28).

The supply chain strategy as a functional strategy defines how operations in the supply chain will support the overall competitive strategy (Ambe, 2012:126). The strategy stipulates the specific plan of action that will be used to integrate suppliers, manufacturers, warehouses and stores, to ensure that inputs (raw materials, semi-finished products or finished products) are purchased; products are produced and then distributed in the correct quantities, at the right time, and to the right location. The plan of action is followed in order to minimise system-wide costs (being cost-efficient), while satisfying customers' service-level requirements (being effective) (Qrunfleh and Tarafdar, 2013:571). In the literature the concepts, "effectiveness" and "efficiency", are often used interchangeably, but for this study a distinction will be made between these concepts. "Effectiveness" will refer to the extent to which a customer's needs are met (this will subsequently be referred to as responsiveness), while "efficiency" will refer to whether the customer's needs are met economically (will be referred to as cost-efficiency from here on) (Lai and Cheng, 2003:153). Soni and Kodali (2011:73-74) examined the literature regarding supply chain strategies and concluded that most authors describe a supply chain strategy as being orientated either towards responsiveness or cost-efficiency.

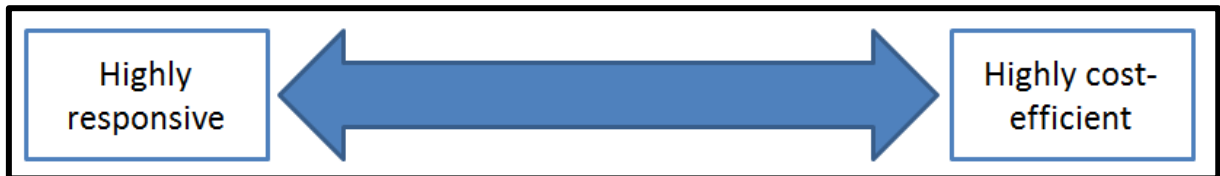
### **1.2.3.3 Responsive and cost-efficient supply chain strategies**

Supply chain responsiveness refers to the flexibility required by the supply chain to react to the demand of a customer; while cost-efficiency refers to the cost incurred when reacting to this demand (Lee, 2002:113-114). Several factors (such as the product characteristics; the level of demand and supply uncertainties placed on the supply chain; customer's buying behaviour; the position of the supply chain member within the supply chain; order winners and order qualifiers; and the production process) need to be considered before an appropriate supply chain strategy can be selected (see detailed discussion in section 2.4).



Supply chain strategies can be depicted by the responsiveness/cost-efficiency continuum shown in figure 1.3. A supply chain strategy focused on responsiveness will tend to operate towards the *highly responsive* side of the continuum, whereas a supply chain strategy focused on cost-efficiency will tend to operate towards the *highly cost-efficient* side of the continuum.

**Figure 1.3 The responsiveness/cost-efficiency continuum**



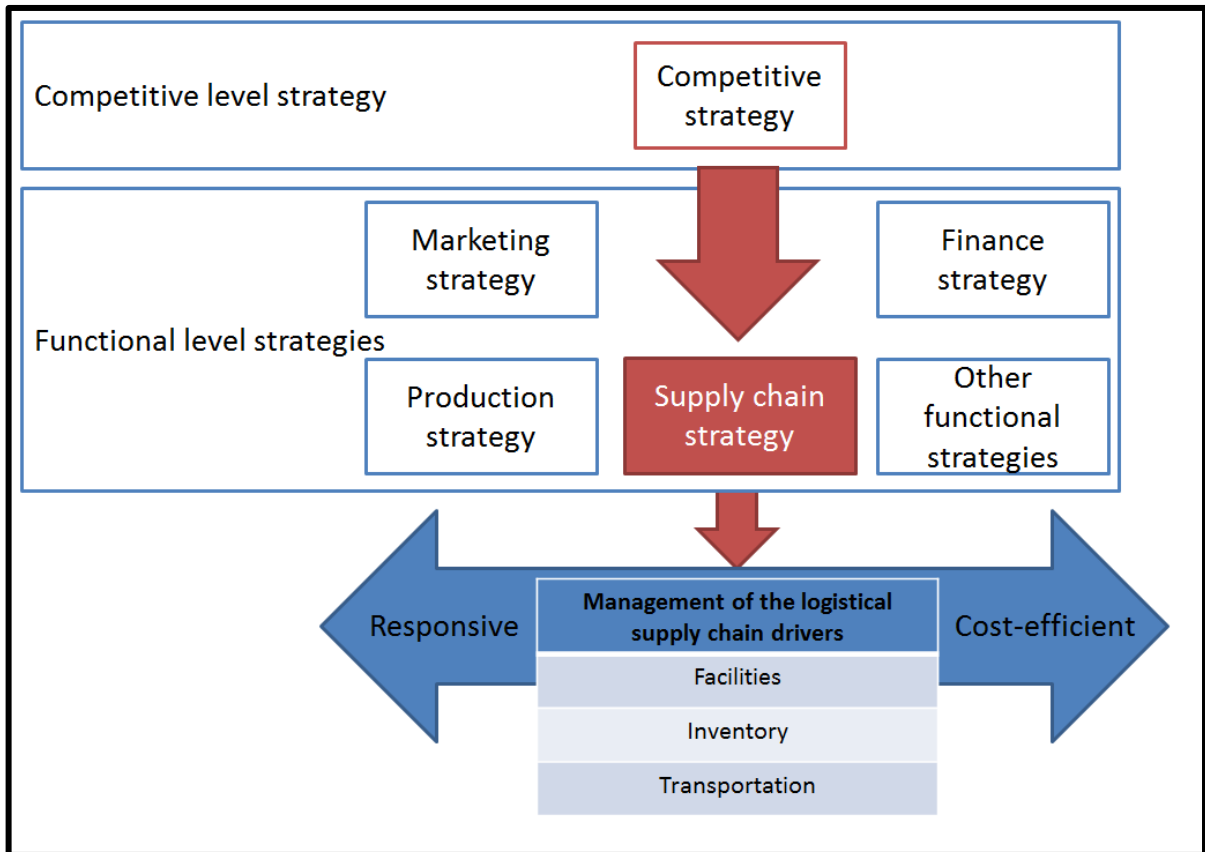
Source: Adapted from Chopra and Meindl (2016:39); Hines (2013:61)

For every strategic choice a manager makes to increase responsiveness, additional costs will be involved, thereby lowering the business' cost-efficiency (Chopra and Meindl, 2016:38). The following example illustrates the trade-off between responsiveness and cost-efficiency: if a courier business needs to purchase an additional delivery vehicle to decrease the time customers have to wait for a product, the additional vehicle would increase the courier's responsiveness (as the number of deliveries made per day would increase), but would decrease its cost-efficiency. However, if a manager makes the strategic choice to increase cost-efficiency, responsiveness would be jeopardised. For example, if the courier sells a delivery vehicle to save on fuel and maintenance costs, responsiveness would be reduced. Therefore, businesses have to decide between the levels of responsiveness and cost-efficiency, and manage the supply chain accordingly (Chopra and Meindl, 2016:59).

Chopra and Meindl (2016:56) explain that obtaining the correct level of responsiveness and cost-efficiency (as stipulated by the specific supply chain strategy), depends on the unique interaction of the different elements within the supply chain, known as the supply chain drivers. These authors identify six supply chain drivers that are divided into two categories, namely the logistical supply chain drivers (facilities, inventory and transportation) and the cross-functional supply chain drivers (information, sourcing and pricing). *Although all six drivers should be managed effectively in order to obtain the correct level of responsiveness and cost-efficiency, this study will focus only on the three logistical supply chain drivers.*

Figure 1.4 provides an illustration of the link between the competitive strategy, the supply chain strategy, the responsiveness/cost-efficiency continuum, as well as the three logistical supply chain drivers for a small business.

**Figure 1.4 Linking the competitive and supply chain strategies**



Source: Compiled by the researcher

It follows from figure 1.4 that the supply chain strategy, as a functional strategy, must align with the competitive strategy and assume a specific place on the responsiveness/cost-efficiency continuum. The position of the supply chain strategy on this continuum determines whether the logistical supply chain drivers are managed more responsively or more cost-efficiently.

### 1.3 Problem statement

Over the years small businesses have been studied extensively. They have been described as the “backbone”, “fuel” and “locomotive” of many economies around the world, due to their contribution towards the income and prosperity of individuals and communities (Aykan et

al., 2013:939; Katz and Green, 2012:14; Mboniyane and Ladzani, 2011:550; Abor and Quartey, 2010:218). In South Africa too, small businesses are seen as a way to create employment and to ensure a more equal distribution of income to citizens; to promote the general economic welfare of citizens; to improve local markets and to assist in allocating scarce resources. Since small businesses can enhance the economic growth of a country, any research conducted in this field will not only benefit the businesses, but also promote the economic growth of the country (Nkosi, Bounds & Goldman, 2013:1). In the National Development Plan of 2030, the continued commitment of the South African government to prioritise the development of small businesses, is reflected in their ambitious goal for the small business sector to create 90% of the employment opportunities within South Africa by 2030 (South Africa, National Planning Commission, 2012). To achieve this goal, the South African government realised that small businesses should not only be developed, but that the owners and managers must be equipped with the necessary managerial skills (South Africa, National Planning Commission, 2012). One of the focus areas of the National Development Plan of 2030 is the development of small businesses in townships and the development of the owners and managers of these businesses (South Africa, National Planning Commission, 2012).

Over the past two decades several studies have been conducted on the previously disadvantaged townships of South Africa and particularly on their development. These studies focused on key issues, such as challenges faced by township entrepreneurs and the support of the government for them (Olawale and Garwe, 2010); the status of township businesses and entrepreneurs within Gauteng (Strydom, 2015); the survival of formal small businesses in Soweto (Badenhorst-Weiss and Cilliers, 2014); the unique market offering by formal independent retail and wholesale small businesses in Soweto (Badenhorst-Weiss, Cilliers & Eicker, 2014); and the skills required for the management of black-owned small enterprises in Soweto (Nkosi et al., 2013). The continuous study of these businesses can be ascribed to the drastic changes in the business environment of the townships. Townships have been transformed from unplanned business infrastructures to state-of-the-art shopping malls; thereby influencing the way in which these businesses are operated and managed (Nkosi et al., 2013:4).

During the apartheid years, townships were characterised by rows of uniform houses and a lack of infrastructure, such as roads, sanitation, water and electricity (World Bank, 2014:4). Townships had only basic retail infrastructure, such as the production of goods and services, because of restricted economic activities within the townships post-1994 (Strydom, 2011:151). Soweto's retail sector was clustered in small formal neighbourhood centres and the majority of businesses were classified as general retailers, which included spaza shops (retailers operating from a room in a house), shebeens (retailers selling beer and other liquor) and hawkers (retailers selling mainly perishable products) (Strydom, 2011:152).

In the post-apartheid period (after 1994), the new South African government immediately prioritised the development of black-owned businesses as part of developing the South African small business economy, which included the development of small businesses in townships (Rogerson and Rogerson, 1997:33). In 2001 Soweto was incorporated into the Greater Johannesburg Metropolitan area and the priority of the City of Johannesburg to fully integrate Soweto and to stimulate its economic activity were the reasons for formulating the Soweto Retail Strategy in 2005 and The 5 Year Soweto Economic Development Plan 2008 – 2013.

In 2005 the Soweto Retail Strategy reported that the total demand for retail goods by residents of Soweto was R4.2 billion, but of this, only R1.05 billion was spent at retail businesses operating within Soweto (City of Johannesburg, 2005:2). The Soweto Retail Strategy aimed to provide retail businesses with a business environment in which these businesses could operate effectively, and to increase the amount spent at Sowetan retail businesses to R2.1 billion within five years (City of Johannesburg, 2005:2-3). The Soweto Retail Strategy included the development of 70 000 square meters of retail space between 2004 and 2009. This space had to consist of large retail and smaller neighbourhood shopping centres. It was deemed important to balance the development of shopping centres, individual street-front shops (a shop with its entrance facing the street), and the informal sector's retail activities (City of Johannesburg, 2005:4).

In 2008 the City of Johannesburg implemented a second initiative aimed at developing Soweto, namely The 5 Year Soweto Development Plan 2008 – 2013 (also referred to as the Soweto Development Plan). The purpose of this plan was to provide Soweto with a

framework to build the township into a productive and competitive regional economy (City of Johannesburg, 2008:4). Subsequently, public, private and community sectors within Soweto were provided with an outline of priorities, and businesses were informed on how to structure their efforts and investments in order to build such an economy. During this time the disposable income of township consumers increased and retailers redirected their growth strategies towards the new and expanding township markets (Tustin and Strydom, 2006:48). Therefore, the four large shopping centres that were built between 2005 and 2007 (Grant, 2010:601; Zondi, 2011:4) housed well-known national retail chains to address the increase in consumer needs (Tustin and Strydom, 2006:49). The development of the retail industry in Soweto has had a positive impact on the township and its citizens in terms of increasing employment opportunities and stimulating economic growth (Gauteng Quarterly Bulletin, 2012:26).

Although Soweto has moved from unplanned, scattered, formal and informal businesses to a township with modern shopping centres by 2012, research done by Strydom (2013:2870) to determine the patronage of Sowetan retailers, established that high-value items were still mainly bought outside the township by the high-income group. The individuals who shopped within the boundaries of the township formed part of the middle- to lower-income groups. It therefore seems that the retailers located within Soweto have mainly been serving price-sensitive customers within the boundaries of this township (Strydom, 2011:2870).

In 2014 the Gauteng Department of Economic Development (2014:4) announced a revitalisation strategy aimed to further develop the economies of townships through a Township Economy Revitalization Action Plan. Although the Gauteng Department of Economic Development acknowledged that government had implemented numerous initiatives and development plans aimed at developing townships into liveable and vibrant economic centres, they stated that townships were unfortunately still characterised by low levels of entrepreneurial activities, low survival rate for small businesses and a lack of business skills by the owners or managers of these businesses (Gauteng Department of Economic Development, 2014: 4-5).

In 2014, the World Bank conducted a study in the Diepsloot township in order to understand, among others, the structure of a township's economy. This study found that the

difficult economic conditions under which entrepreneurs operated, could be attributed primarily to the high unemployment rate and the underdeveloped linkages between local supply chains and formal supply chains or production networks (World Bank, 2014:10). The World Bank (2014:19) also found that the weak linkages of township businesses with formal supply chains were preventing the business environment of townships from reaching their full potential. Three quarters of the total spending within townships were on products produced outside the township and retailed through a formal or informal supply chain (World Bank, 2014:13). The report stressed that supply chains had to be strengthened for township economies to improve (World Bank, 2014:22-23).

When considering the main issues highlighted throughout section 1.3, namely the limited success of the Gauteng Department of Economic Development in developing the economies of townships; the lack of owners' business skills; the low levels of entrepreneurial activities within townships; the low survival rate of township businesses; and the underdevelopment of the linkages between local and formal supply chains, along with the strategic importance of SCM as discussed in section 1.2; the research problem of this study can be identified as how small business owners can increase their odds of survival by using SCM. The primary research question (PRQ) is therefore formulated as follows:

PRQ:           How can formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive?

Based on the primary research question the following secondary research questions (SRQ) are posed:

SRQ 1:       How do small businesses achieve a strategic fit between their competitive and supply chain strategies?

SRQ 2:       How, according to the literature, are the three logistical supply chain drivers managed by small businesses in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy?

- SRQ 3: How do formal independent small retail businesses operating within Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency?
- SRQ 4: Does the industry group in which the Sowetan formal independent small retail businesses operate, influence the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency?
- SRQ 5: Can the management of the logistical supply chain drivers increase the odds of the formal independent small retail businesses operating within Soweto to survive?

In the next section the primary and secondary research objectives of this study are clarified.

#### **1.4 Research objectives**

The research objectives of the study are divided into primary (PRO) and secondary research objectives (SRO). The primary research objective of the study is:

- PRO: To determine how formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive.

The secondary research objectives are:

- SRO 1: To discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies.
- SRO 2: To establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy.
- SRO 3: To determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency.

SRO 4: To investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency.

SRO 5: To determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive.

In the next section the research methodology for the study is discussed.

## **1.5 Research methodology**

The research design is the blueprint for solving the research problem and achieving the research objectives. In order to address the research problem and achieve the research objectives of this study, a literature study (phase one) and empirical research (phase two) were conducted.

### **1.5.1 Phase one: literature study**

Phase one of this study is presented as a comprehensive literature review and is divided into two sections, namely the different competitive and supply chain strategies that small businesses can select from, and the management of the three logistical supply chain drivers. Secondary data, such as textbooks, conference papers, governmental reports and journal articles by authors specialising in the relevant fields, were reviewed. In 2014 the World Bank did an intensive study on the economies of South African townships. As this study is regarded by the Gauteng Department of Economic Development (2014:9) as the most intensive study on South African townships to date, the findings of the World Bank is presented throughout this study to elucidate the environment in which these township businesses operate and how township businesses are typically managed.

The findings of the literature study are discussed in chapters 2 and 3. Chapter 2 provides the theoretical foundation of the different competitive and supply chain strategies that small businesses can select from, and examines how a strategic fit can be achieved between these



strategies. In chapter 3 the focus shifts to the management of the logistical supply chain drivers in terms of obtaining the desired level of responsiveness and cost-efficiency, depending on the orientation of the selected supply chain strategy.

### **1.5.2 Phase two: empirical research**

Phase two of the study required empirical research to be conducted. A short description of the empirical research methodology for the study is provided below. A more detailed discussion of the research methodology is provided in chapter 4.

#### **1.5.2.1 Research design**

In general, the research design is considered to be a plan or blueprint of how the research problem and objectives will be addressed and for this study a descriptive research approach was followed (Saunders, Lewis & Thornhill, 2012:159).

#### **1.5.2.2 Questionnaire and pre-testing**

Quantitative research usually involves the collection of primary data from a large number of individuals with the intention of projecting the results to a wider population (Quinlan, Babin, Carr, Griffin & Zikmund, 2015:399). The data of this study was collected by means of interviewer-administrated surveys. These surveys were personal face-to-face interviews that involved asking respondents questions and recording their answers. As proposed by Cooper and Schindler (2014:225), respondents were selected to form part of a sample and were interviewed in person by trained interviewers. The questionnaire used in the survey consisted of close-ended questions using both nominal and ordinal measurement scales. Other specialised researchers in the field of business management, as well as a statistician, evaluated the questionnaire in order to identify possible shortcomings and provided valuable feedback.

### 1.5.2.3 Survey population and data collection

A list of 650 formal independent small businesses operating within the boundaries of Soweto was compiled by The Bureau of Market Research (BMR) in 2012<sup>1</sup>. This list was used as the sample frame for this study. “Formal” small businesses are defined as businesses that operate within purpose-built shops and form part of the registered business infrastructure of South Africa; they pay taxes and other levies to different levels of government (Strydom, 2015:464; Ligthelm, 2013:59; Du Plessis, Strydom & Jooste, 2012:56). The majority of small businesses operating within Soweto are classified as formal businesses (Njiro, Mazawai & Urban, 2010:3) and the focus of many previous studies conducted within townships was primarily on these formal businesses (Strydom, 2015; Badenhorst-Weiss et al., 2014; Nkosi et al., 2013; Strydom, 2013; Olawale and Garwe, 2010). According to Ligthelm (2013:73), informal small businesses operating within townships are not regarded as the foundation of successful and productive township small businesses. Due to these reasons, the focus of this study is only on formal small businesses operating within Soweto.

The initial purpose of the 2014 Soweto study was to conduct a longitudinal study based on the data gathered by the BMR in the 2012 Soweto study. Therefore the following businesses were excluded from the 2014 Soweto study as they were also excluded from the 2012 Soweto study: branches of chain stores, franchises, street vendors on pavements, home-based businesses (such as spazas and tuck shops), professional and business services and transport businesses (passenger busses and taxis). The BMR coordinated the fieldwork for the collection of the 2014 data. In terms of sample selection, the fieldworkers were instructed that if a business had closed down during the two year period since the previous survey in 2012, any business in the same residential area that complied with all the requirements could be included as a substitute (see section 4.3.5.1). All the data was gathered by five fieldworkers within 7 weeks (July – August 2014). As each formal independent small business in the survey population had the same probability of being

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<sup>1</sup> The Bureau was founded as a research institute operating within the University of South Africa (Unisa) and is involved in socioeconomic research and investigation, and maintains a database in a variety of fields (Unisa Website, 2015).

selected, the sampling method used in this study can be classified as probability sampling using a stratified sampling method (see section 4.3.5.1).

#### **1.5.2.4 Data analysis**

Cooper and Schindler (2014:655) explain that data analysis is a process that helps to understand the data. In this study the researcher performed the statistical analyses, using the SPSS statistical programme (version 23); after which the data was analysed and the findings used to provide recommendations to the small retail businesses on how to manage their logistical supply chain drivers in order to increase their odds of survival (see chapter 7). Before any analyses were done, the data was filtered to include only formal independent small businesses operating in the **retail sector**, as this study is focused only on formal independent small **retail** businesses. The 650 formal independent small businesses were divided into different industries that operated in the different categories identified in the 2014 Standard Industrial Classification (SIC) to distinguish between the manufacturing, construction, wholesale and retail businesses. Eventually, 556 relevant retail businesses operating within six different retail groups, were identified. The retail groups are: grocery stores (209); hardware stores (42); general stores (88); retail services, such as hairdressers and undertakers (142); eating and drinking places (39); and sale, maintain and repair of vehicles and retail auto (36).<sup>2</sup> Both descriptive and inferential analyses were conducted on the data obtained from the 556 respondents. These analyses included frequency distributions, the Kruskal-Wallis test, the Pearson Chi-Square test, principal component analyses (factor analyses) and two binary logistic regression models. Table 1.1 provides a summary of the empirical research methodology used during this study.

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<sup>2</sup> When reporting on the results of the retail group termed 'sale, maintain and repair of vehicles and retail auto' in chapters 5 and 6, this group will be referred to as 'retail auto'.

**Table 1.1 Summary of the empirical research methodology used during this study**

<b>Empirical research aspect</b>	<b>Description of empirical research aspect</b>
Survey area	Defined business areas in Soweto.
Survey population	Formal independent small businesses located within business areas/stands across Soweto. These included businesses situated in shopping malls, large shopping areas (outside shopping malls), smaller shopping areas, stand-alone businesses and industrial areas with 2-5, 6-10 and 10 plus surrounding businesses.
Primary data collection method	Quantitative data collected by interviewer-administrated surveys. Personal face-to-face interviews with the owners or managers of the small businesses.
Sample frame	List of 650 formal independent small businesses operating within the boundaries of Soweto compiled in 2012 by the BMR.
Sample size	650 formal independent small businesses.
Sampling method	Probability sampling using a stratified sampling method
Research instrument	Structured interviewer-completed questionnaires consisting of close-ended questions, using nominal and ordinal measurement scales (refer to appendix A).
Collecting coding and capturing of data	Fieldwork was coordinated by the BMR and gathered in the period July – August 2014. Data was captured on Excel and SPSS (version 23).
Analysis of data	Both descriptive and inferential analyses.
Ethical considerations	Fieldwork was conducted within the directives of the ethical policy of the University of South Africa (refer to appendix B for the ethical clearance certificate).

Source: Compiled by the researcher

## **1.6 Contribution of the study**

Considering the challenges that small businesses in townships face (as discussed in section 1.3) and the increasing importance of SCM (as discussed in section 1.2), the contribution of the study can be stated as follows:

This study provides the owners or managers of formal independent small retail businesses with information on how to increase the odds of their small businesses' survival through SCM. The knowledge provided to the owners or managers specifically focuses on the management of the small retailers' three logistical supply chain drivers, based on the orientation of the selected supply chain strategy. Increasing the odds of survival for formal independent small retail businesses operating within Soweto, will contribute to both the economic development of townships and to South Africa's overall economic growth.

## **1.7 Outline of the chapters**

This dissertation consists of seven chapters. Chapter 1 served as an outline for the research and provided background information on the research topic. The research problem was identified and the research questions and objectives were formulated. The chapter also provided a brief overview of the research design and methodology used to conduct the research.

Chapter 2 provides an in-depth literature review of the different competitive and supply chain strategies. The chapter starts by explaining the importance of a strategic fit between the competitive and supply chain strategies, and considers how this strategic fit can be achieved. Porter's generic competitive strategy framework is identified as the best framework for small businesses to use when selecting a competitive strategy. The different supply chain strategies are reviewed in terms of their orientation towards responsiveness or cost-efficiency, based on: product characteristics; the level of demand and supply uncertainties placed on the supply chain; customer's buying behaviour; the position of the supply chain member within the supply chain; order winners and order qualifiers; and the production process.

Chapter 3 focuses on the literature regarding the management of the three logistical supply chain drivers, namely transportation, facilities and inventory, in terms of responsiveness and cost-efficiency. The chapter begins by providing an overview of logistics in general, and specifically within South Africa as a developing country. The focus is then shifted to the management of logistics within small businesses, before each logistical supply chain driver is discussed individually. Each logistical supply chain driver is discussed in terms of the different decision components that managers need to consider, since these decision components influence the level of responsiveness and cost-efficiency that the particular supply chain driver can achieve.

Chapter 4 describes the research methodology decided on to answer the primary research question. The chapter begins by identifying the need for research, after which the discussion focuses on the research process. This process formed the foundation for establishing the research questions; the research objectives; the research design and the identification of data sources; the development of the sample plan; and the design of the research instrument. The discussion also elaborates on how the data was collected, coded and captured, as well as on the different statistical techniques that were used for analysing the data.

In chapter 5 the empirical findings on the data gathered from the responses of the 556 formal independent small retail businesses operating within Soweto with regard to the three logistical supply chain drivers, are discussed. Both the descriptive and inferential statistical results are examined. The descriptive findings are presented in frequency distributions and the inferential statistical findings by using the Kruskal-Wallis test or the Pearson Chi-Square test.

In chapter 6 two binary logistic regression models are developed in order to predict the odds of survival for the formal independent small retail businesses operating within Soweto in terms of age and growth. Twelve independent variables are identified using principal component analyses.

Chapter 7 completes the study by drawing conclusions on how the small retailers operating within Soweto manage their three logistical supply chain drivers in terms of responsiveness

and cost-efficiency and proposes recommendations on the management of the three logistical supply chain drivers by the small retailers in order to increase their odds of survival. These conclusions and recommendations are based on the two literature chapters (chapters 2 and 3) and the empirical results reported on in chapters 5 and 6. Each chapter is reviewed by identifying the secondary research objective(s) addressed within the specific chapter, the steps taken by the researcher to address the secondary research objective(s) and the findings (literature or empirical) made within the chapter. Thereafter, recommendations on how the formal independent small retail businesses can manage their logistical supply chain drivers (based on the orientation of their supply chain strategy) in order to survive, are made. The chapter concludes by reflecting on the limitations of the study and identifying areas for future research.

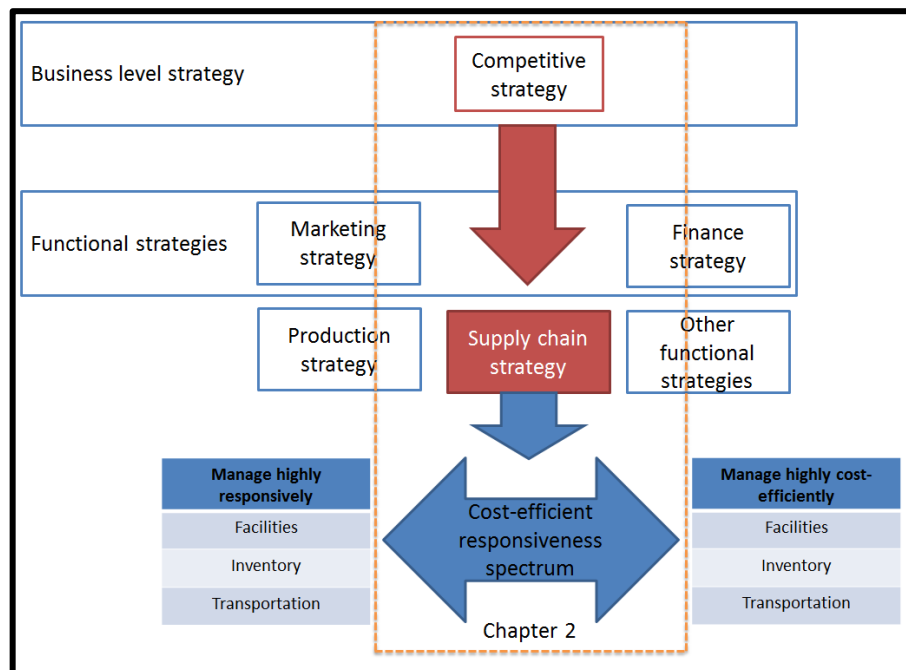
## Chapter 2

### Selecting appropriate competitive and supply chain strategies

#### 2.1 Introduction

In chapter 1 the primary research question was formulated as follows: How can formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive? As stated in chapter 1, selecting the appropriate strategies for sustainable development is not a luxury but a necessity for all businesses, including small businesses (Leitner and Güldenber, 2010:185). Due to the importance of these strategies it is essential to construct a theoretical foundation of the different competitive and supply chain strategies from which to launch this study. This will include a discussion on the different competitive and supply chain strategies which are appropriate to small businesses, as well as a discussion on how a strategic fit can be achieved between these strategies. Figure 2.1 illustrates the main topics for discussion in this chapter.

**Figure 2.1 Illustration of the literature covered in chapter 2**



Source: Compiled by researcher



Referring to figure 2.1, the chapter starts by clarifying how a strategic fit can be achieved between the competitive and functional strategies (section 2.2). Michael Porter's (2008) generic competitive strategy framework forms the basis for the discussion on the different competitive strategies in section 2.3. In section 2.4 the different supply chain strategies, in terms of their orientation towards responsiveness or cost-efficiency, are discussed. The eight literature findings from this chapter are numbered LF1 to LF8. The chapter concludes by identifying the competitive and supply chain strategies from which a small business can select the most appropriate.

## **2.2 Achieving a strategic fit between a competitive strategy and a supply chain strategy**

In section 1.2.3.2 it was established that small and large businesses differ in terms of their managerial and organisational structures, and therefore the strategies deployed within them will also differ in terms of scope and complexity (Burns, 2011:18). It was concluded in section 1.2.3.2 that small businesses generally only have one competitive strategy with relevant functional strategies for the entire business. In order for any business to succeed, all its interrelated functional strategies related to marketing, production, finance and supply chain, must support the competitive strategy (Qrunfleh and Tarafdar, 2013:573; Hoejmoose, Brammer & Millington, 2012:589; Borella and Padula, 2010:47). In the literature, the alignment of the goals of the interrelated functional strategies with the goals of the selected competitive strategy, is referred to as a strategic fit or strategic alignment (Soni and Kodali, 2011:71). Although all functional strategies must be aligned with the competitive strategy, this study focuses on the alignment of the supply chain strategy with the competitive strategy (Wagner, Grosse-Ruyken & Erhun, 2012:1).

As mentioned in section 1.2.3.2, a supply chain strategy defines the specific plan of action that is followed in order to integrate suppliers, manufacturers, warehouses and stores. This plan of action ensures that inputs (raw materials, semi-finished products or finished products) are purchased; products are produced and distributed (in the right quantities, at the right time and to the right location); and system-wide costs are minimised (being cost-efficient), while customers' service level requirements are satisfied (being effective)

(Qrunfleh and Tarafdar, 2013:571). A competitive strategy involves all activities necessary to satisfy customers' needs and to gain a competitive advantage within a specific market (Ehlers and Lazenby, 2010:178; Thompson and Martin, 2010:785; Soni and Kodali, 2011:71).

Based on their extensive research on how a strategic fit can be achieved between the competitive and supply chain strategies, Chopra and Meindl (2016:33) recommend that the following three aspects should be in place before a strategic fit can be achieved:

- **Overall coordinated strategy:** The functional strategies and the competitive strategy must form an overall coordinated strategy. The functional strategies must support each other and enable the business to achieve its competitive strategic goal.
- **Implementation of functional strategies:** The different functional areas of a business (such as marketing, production, finance and supply chain) should structure their processes and resources in such a manner that their respective functional strategies can be successfully implemented.
- **Supply chain design:** The supply chain strategy should be aligned with the overall supply chain design. For example, if the overall supply chain (referring to all the members within the specific supply chain) is orientated towards meeting customers' needs responsively, the supply chain strategy should also be orientated towards responsiveness. On the other hand, if the overall supply chain design is orientated towards meeting customers' needs at the lowest possible cost, the supply chain strategy should also be orientated towards cost-efficiency.<sup>LF1</sup>

Many businesses have failed due to a lack of strategic fit and/or because the supply chain design, resources and processes did not provide the necessary capabilities to support the desired strategic fit (Chopra and Meindl, 2016:33; Borella and Padula, 2010:44). The following example will illustrate how a lack of strategic fit can lead to failure: A small plumbing business aims to create a competitive advantage by claiming the ability to assist customers within two hours after receiving report of a problem. This business is focused on providing a faster service than its competitors, and has chosen to focus on being responsive as its competitive advantage. However, if the same business had only one vehicle in order to save on transportation costs, its competitive and supply chain strategy goals would obviously

not align (since having only one vehicle would make it difficult to assist customers within two hours). Managers should therefore ensure that their supply chains have the capabilities in terms of responsiveness and cost-efficiency, in order to satisfy the targeted customers' needs as specified in the competitive strategy (Chopra and Meindl, 2016:35-37; Nel, 2010:78).

To provide more detail on how small businesses can achieve a strategic fit between their competitive and supply chain strategies, these strategies are considered individually in the subsequent sections. Section 2.3, first considers the importance of a competitive advantage, and secondly, reflects on how a competitive strategy can create a competitive advantage.

### **2.3 Competitive advantage and competitive strategies**

The purpose of a competitive strategy is to guide a business in dealing with competition. Competition is healthy and can directly result in improving the efficiency of a business, mainly by reducing costs and/or increasing sales (Jooste et al., 2012:231; Porter, 2008:1). In general, a competitive strategy is concerned with creating a competitive advantage for each strategic business unit (SBU) within a larger business (Salavou, 2015:81; Soni and Kodali, 2011:73). Small businesses generally do not have different SBUs and compete in the market with only one competitive strategy (see section 1.2.3.2). The success of any business, including a small business, relies among others, on identifying a competitive advantage; and before managers can select the appropriate competitive strategy, the competitive advantage should be identified (Hatten, 2012:11; Jooste et al., 2012:231).

A competitive advantage is that differentiating factor (or a combination of factors) that drives customers to purchase from a specific business rather than from their competitors (Scarborough, 2011:89; Porter, 2008:1; Kotler, 1997:53). Therefore, managers must manage processes and valuable resources (which include tangible and intangible assets) in order to create a unique set of core capabilities that competitors do not have and will find difficult to duplicate (Adeniran and Johnston, 2012:4090; Thompson and Martin, 2010:785). The core capabilities of small businesses relate to the advantages of being small; and to ensure success, small businesses should use their size as a source of competitive advantage, for

example by cultivating close relationships with their customers (Hatten, 2012:11). All businesses, regardless of their size, should consider their products, their services, the manner in which they sell these products or services, and the prices they charge, before deciding on a competitive advantage (Scarborough, 2011:89-90). Scarborough (2011:99) explains that in order to identify a source of competitive advantage, managers should have thorough knowledge of the market environment or industry, as well as the customers and competitors operating in these areas.

After selecting a competitive advantage, it must be sustained by developing and maintaining a set of core capabilities which will enable the business to better serve its selected customers over a significant period of time (Jooste et al., 2012:230; Scarborough, 2011:89; Thompson and Martin, 2010:791). When the processes and resources of a business are rare and hard to imitate, a sustainable competitive advantage can be obtained; and only then can a superior financial performance (over the long run) be achieved (Banker, Mashruwala & Tripathy, 2014:873).

### **2.3.1 Porter's generic competitive strategy framework**

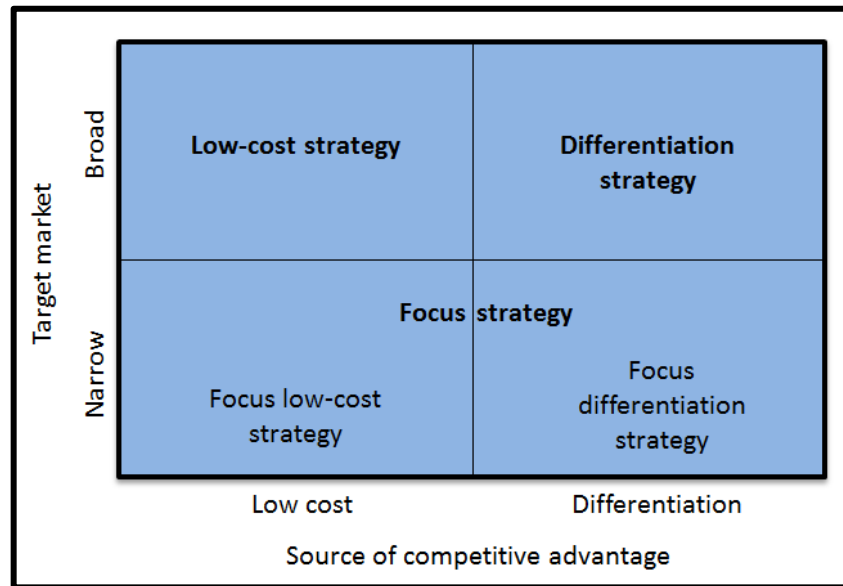
Porter's generic competitive strategy framework is the dominant framework for competitive strategies within strategic management (Salavou, 2015:81; Lazenby, 2014:160; Hsieh and Chen, 2011:14; Ehlers and Lazenby, 2010:179). Leitner and Güldenber (2010:171) state that Porter designed this framework with both large and small businesses in mind. Although developed in 1980, recent research indicates that Porter's strategy framework is still relevant in the modern business environment (Banker et al., 2014:873). It remains one of the most commonly used competitive strategy frameworks in empirical literature with regard to small businesses (Leitner and Güldenber, 2010:170). Although concerns (Salavou, 2015:86; Hsieh and Chen, 2011:13) about the simplicity of Porter's framework have been raised, it still captures the essence of more complex competitive strategies, as it forms the foundation on which these complex strategies were developed. Considering the influence of Porter's framework on the development of competitive strategies, Porter's framework will form the foundation for this study.

### 2.3.2 Porter's three competitive strategies

Porter's competitive strategy framework consists of three generic competitive strategies: the differentiation-, low-cost- and focus competitive strategy. These strategies remain among the most widely cited and tested in businesses by both academia and practitioners (Salavou, 2015:81; Parnell, 2013:215; González-Benito and Suárez-González, 2010:1028; Leitner and Guldenberg, 2010:170; Porter, 1985:11). Porter classifies these strategies according to two dimensions, namely the scope of the target market and the source of the competitive advantage (González-Benito and Suárez-González, 2010:1027; Porter, 1985:11). The first dimension refers to whether the target market in which a business competes is narrow or broad, while the second dimension refers to the source of the competitive advantage. A business can be focused, either on providing a product or service at the lowest possible cost (low-cost), or on differentiating the product or service from its rivals' offering. For each source of a competitive advantage, the investment in the resources, organisational structure and control procedures will differ.

Based on the differences in investments, Porter believes that combining generic competitive strategies will be ineffective. Investments focused on achieving a competitive advantage by providing products and services at a low-cost, will differ from those made by the differentiation of products and services (Leitner and Guldenberg, 2010:170). Therefore, Porter reasons that only strategic purity (competing with one clearly defined strategy) can lead to business success (Salavou, 2015:82; González-Benito and Suárez-González, 2010:1028). Any business competing with two generic competitive strategies is viewed by Porter as "stuck in the middle" with no strategic direction and is bound to perform poorly (Salavou, 2015:82; Leitner and Guldenberg, 2010:170; Porter, 1985:16-17). For example, a small bakery that differentiates its bread from a competitor's by adding expensive imported herbs and spices, will most probably not be able to price this bread lower. This bakery cannot compete by both differentiating their bread and by pricing their bread lower than a competitor's. A decision must therefore be made to compete with either a differentiation or a low-cost competitive strategy. Figure 2.2 illustrates Porter's three generic competitive strategies (differentiation, low-cost and focus) in terms of the scope of the target market and the source of the competitive advantage.

**Figure 2.2 Porter's three generic competitive strategies**



Source: Salavou (2015:82); Lazenby (2014:160); Thompson, Gamble & Strickland (2004:113); Porter (1985:12)

From figure 2.2 it follows that a business must decide to target either a narrow or a broad market, and it must choose to obtain a competitive advantage by providing products and services at a low cost, or by differentiating the product or service from a competitor's offering. A business can compete in a broad target market with either a differentiation or a low-cost competitive strategy; or select to compete in a narrow target market with a focus competitive strategy. If a business is unable to compete in a broad target market (and this is often the case in small businesses), a focus competitive strategy may be the best approach (Hsieh and Chen, 2011:15).

Small businesses tend to be more successful when competing in a narrow target market with a focus competitive strategy, as they often have limited resources (Parnell, 2013:217; Teeratansirikool, Siengthai, Badir & Charoenngam, 2013:170; Jooste et al., 2012:244; Box and Miller, 2011:58; Leitner and Guldenberg, 2010:171). Since small businesses are usually unable to take on full-scale battles with competitors, they should rather implement a focus competitive strategy in order to obtain a competitive advantage (Jooste et al., 2012:244). Lazenby (2014:167) and Parnell (2013:217) explain that when small businesses compete in a narrow target market (defined either geographically, by products or services, or by customer type), they are more likely to succeed and maintain a competitive advantage than when

competing in a broad target market. Larger businesses usually overlook specific market segments that do not fall within the mainstream market; thereby enabling smaller businesses to compete (Scarborough, 2011:249). It can therefore be concluded that a focus strategy will allow small businesses to compete against larger businesses by focusing only on a specific target market. As this study is focused on small retail businesses, specifically operating within the boundaries of Soweto, it can be concluded from the literature that Porter's focus competitive strategy is the most appropriate competitive strategy for these small businesses.<sup>LF2</sup>

### **2.3.3 The focus competitive strategy**

A focus competitive strategy aims to create a sustainable competitive advantage by focusing only on customers' needs within a specific market segment (target market) usually with a limited product range (Salavou, 2015:82; Louw and Venter, 2011:301). With a focus competitive strategy a narrow target market is selected within an industry, and a specialised strategy is developed to serve the needs of customers in that specific target market (Hsieh and Chen, 2011:14-15). From figure 2.2 it follows that the focus competitive strategy concentrates on a narrow target market with either differentiation or low-cost as the source of the competitive advantage. A focus differentiation strategy entails that a small business will focus on a specific segment in the market where customers require unique and different products; whereas a focus low-cost strategy entails that a small business will focus on a specific segment in the market where customers' needs are less costly to satisfy (Salavou, 2015:82; Louw and Venter, 2011:301). Managers of small businesses should ensure that the selected market segment is large enough to be profitable and that it offers opportunities for growth (Lazenby, 2014:168-169). The two sources of competitive advantage, when using the focus competitive strategy, are discussed below.

#### **2.3.3.1 Focus differentiation competitive strategy**

Differentiation as a source of competitive advantage for a focus competitive strategy can be defined as the activities that small businesses undertake to add value to products and services in order to distinguish them from the competition (Thompson and Martins, 2010:198). These differences should be unique and valued by customers (Teeratansirikool et

al., 2013:170; Hsieh and Chen, 2011:14). The more unique the product or service, the more sustainable the competitive advantage becomes (Thompson and Martin, 2010:202). Products and services must be differentiated to such an extent that customers will be willing to pay more for these offerings (Jooste et al., 2012:231). The purpose of differentiating a product or service is to generate brand or customer loyalty that will establish price-inelastic demand (Salavou, 2015:82; Hsieh and Chen, 2011:14); which means that an increase in price will have a minimal effect on the quantity demanded by customers. Price-inelastic demand leads to higher profit margins, as customers are not sensitive to price increases and will not refrain from purchasing the product or service when the price escalates (Salavou, 2015:82). Businesses competing with a focus differentiation strategy can enjoy success, as long as the unique features of the product or service are constantly upgraded to create new differentiating features (Porter, 2008:14).

**a) Factors that influence the success of the focus differentiation competitive strategy**

Louw and Venter (2011:299) identify several factors that influence the success of differentiating products or services, namely whether a business has a clear understanding of its customers' and competitors' behaviour, knowing what customers deem as valuable and to what extent customers are willing to pay for the differentiated products or services. Both the market environment and the characteristics of the product or service must be considered before managers can decide to use differentiation as a source of competitive advantage. Differentiation is best suited when:

- the market is characterised by diverse customer needs,
- there are a small number of competitors in the market who follow a similar strategy,
- the entry barriers to the market are high,
- customers are less price-sensitive,
- brand loyalty exists and customers will not readily change to a different brand,
- customers value the unique characteristics and features of the product or service (Lazenby, 2014:166).

Therefore, differentiation is best suited for a dynamic and uncertain environment that involves new technologies, and unpredictable customer demand and competitor behaviour.



In a dynamic and uncertain environment, managers should emphasise flexibility to ensure that the business can adapt to change (Parnell, 2013:217; Hsieh and Chen, 2011:14). Leitner and Güldenbergl (2010:169) studied the performance of small businesses that implemented Porter's generic competitive strategies and found that for these businesses, the most suitable competitive advantage was the ability to respond flexibly to market needs. Many researchers (Parnell, 2013:217; Bressler, 2012:3; Box and Miller, 2011:58; Leitner and Güldenbergl, 2010:171) agree that due to the limited resources and flexibility of small businesses, they should compete by employing a focus differentiation strategy. Therefore, when competing against large businesses, a small businesses' competitive advantage more often lies in its ability to be flexible, rather than to gain on economies of scale.

#### **b) Methods to differentiate products and services**

According to Porter (2008:14), numerous methods can be used by small businesses to differentiate their products and services. These methods mainly include superior quality, branding, distribution channels and other unique characteristics, such as the latest technology (Hsieh and Chen, 2011:14; Thompson and Martin, 2010:197; Flint and Golicic, 2009:845). The *quality* of a product or service is usually evaluated through performance, durability and reliability, and these characteristics are difficult to evaluate when a customer is purchasing the product or service (Thompson and Martin, 2010:197). Having a reputation for high quality products and services is a method of creating a competitive advantage (Su, Linderman, Schroeder & Van de Ven, 2014:429). Customers evaluate the quality of the product, based on their perception of the product. If the product appears to be of high quality, customers usually assume that the performance, durability and reliability will be of an acceptable standard - and as a result they are willing to pay a higher price (Jooste et al., 2012:232). Services can be differentiated in terms of quality through superior staff skills, friendliness and helpfulness (Lazenby, 2014:165). A small business can differentiate its offering from the competition by ensuring that their products and services are of a higher quality, for example, a small retail clothing store that specialises in creating traditional African wear and uses only 100% cotton. Such a store differentiates itself from its competition by its use of high quality material.

*Branding* is another method of differentiation. This entails that businesses name their products or services in order to gain an identity and project an image, and to ultimately position such offerings in the minds of customers (Louw and Venter, 2011:300). Through branding, competitive products or services are distinguished from others and are provided with specific symbolic value. Thus, the competitive advantage achieved lies in the image of the product or service (Flint and Golicic, 2009:845). For example, a small plumbing business known for its ability to fix complex plumbing problems, is likely to be the first choice of customers when they experience a plumbing problem. By providing excellent service and being able to repair the majority of problems, such a business can build a good reputation and so differentiate itself from its competitors.

The *distribution channel* can also be used to differentiate a business from its rivals. Businesses can select a distribution channel that is focused on providing customers with products swiftly, or providing products at the lowest possible cost. A business can gain a competitive advantage by employing either a more responsive or a more cost-efficient distribution channel (Thompson and Martin, 2010:197; Flint and Golicic, 2009:845). For example, if a small courier business strives to differentiate itself by providing customers with the shortest possible delivery time, the courier must ensure that its distribution channel is equipped to be responsive, which can be achieved by selecting the fastest mode of transport.

*Unique characteristics* as a way to differentiate a business from its competitors, refer to products or services that have distinguishable characteristics or features compared to those offered by competitors. The unique characteristics of the product or service may even justify a higher price (Jooste et al., 2012:235). However, maintaining a sustainable competitive advantage through unique characteristics (and features) is difficult, as competitors are quick to imitate such unique features (Jooste et al., 2012:234; Thompson and Martin, 2010:197). With reference to the previous example of the small bakery that adds expensive imported herbs and spices to its bread (section 2.3.2); it is almost certain that some competitors will promptly imitate the unique product.

Small businesses can use one or a combination of the above methods of differentiation to create a competitive advantage. In the next section the second source of competitive advantage for a focus competitive strategy, namely low-cost, is discussed.

### **2.3.3.2 Focus low-cost competitive strategy**

Low-cost as a source of competitive advantage in a focus competitive strategy can be defined as providing products or services more cost-efficiently than competitors. Businesses that select a focus low-cost competitive strategy, seek above-average returns over their competitors by lowering overall costs and pricing products or services lower than their opponents (Salavou, 2015:82). Gaining a competitive advantage through lower prices is usually associated with standardised or functional products or services, and exploits scale and cost advantages. Small businesses that compete with lower priced products or services could increase sales by targeting price-sensitive customers with no brand loyalty, or customers with low switching costs (Hsieh and Chen, 2011:14). According to Lazenby (2014:163), low-cost, as a source of a competitive advantage, is best suited to a market environment:

- that is stable and predictable,
- where new competitors enter the market with lower priced products,
- that has opportunities to reduce cost through economies of scale,
- where buyers have more bargaining power over the businesses that are selling the products.

Lower prices can also be achieved by managing the internal processes of a business more efficiently than its competitors. This can be done by eliminating unnecessary activities and managing high-cost production processes more efficiently (Ehlers and Lazenby, 2010:181). Furthermore, Jooste et al. (2012:239) state that a low-cost strategy is based on the interplay of production costs, profit margins and market shares. This means that to ensure profitability in the case of a manufacturing small business, the business should either have lower profit margins, with a higher market share, or lower production costs with higher profit margins. In the case of a small retail business, profitability could be ensured through

lower profit margins with a higher market share, or lower inventory carrying costs with higher profit margins.

Cost drivers are factors that, when combined, determine the cost of a specific activity within a business. The management of these cost drivers forms an important part of the success of the focus low-cost competitive strategy (Porter, 2008:70). Cost drivers include economies of scale; no-frills products or services; low-cost distribution; location cost advantages; experience and learning-curve effects; and technological advances (Jooste et al., 2012:240-241; Box and Miller, 2011:55; Hsieh and Chen, 2011:14). These cost drivers are discussed briefly.

*Economies of scale* arise when a business can perform activities more efficiently in larger numbers. Economies of scale exist in a manufacturer when the average cost of a product is lower at a higher level of production (Celli, 2015:110). For example, the more units a business produces, the more the cost per unit declines. In a retail business, economies of scale exist when the average cost of goods (usually inventory) is lower when a larger quantity of goods is purchased. Thus, economies of scale can be employed to keep costs low and so create a source of competitive advantage by providing products and services at a lower-cost. Economies of scale are more difficult to obtain by small businesses because of their limited resources (Celli, 2015:110; Parnell, 2013:217).

Removing all nonessential items and accessories from products to create *no-frills products and services*, is a basic approach to a competitive strategy focused on low-cost (Porter, 2008:13). By removing these nonessentials, costs are kept to the minimum, which is in line with the low-cost strategy. For example, a small fast food business that does not offer free delivery can sell food at a lower price, since no delivery costs are incurred (lower transportation costs).

The *distribution channel* that a business employs to distribute products to customers, impacts the cost of the product directly. Costs can be kept down when a low-cost distribution channel is selected (Lazenby, 2014:162). The small fast food business mentioned above, could keep, for example, transportation costs (as part of distribution costs) low by rather making deliveries with a motorcycle that requires less fuel, than a van.

The *location of a business* impacts the logistical costs, such as transportation, facilities and inventory costs. Businesses closer to upstream suppliers normally have lower inbound logistical costs, but higher outbound logistical costs, and vice versa (Jooste et al., 2012:420-241). When implementing a focus low-cost strategy, the location of the business should be considered in order to minimise all logistical costs. For example, a small general retail store that relies on the deliveries from wholesalers, might pay less for the delivery service if it was located close to the wholesaler.

*Experience and the learning-curve effect* can positively influence a focus low-cost strategy. When employees learn how to use technology better over time, costs can decrease due to their improved experience (Banker et al., 2014:873; Hsieh and Chen, 2011:14). For example, if a small bakery employs an inexperienced baker, his or her increased experience over time could result in higher efficiency (less wasted ingredients) and increased production (making the dough faster), which could ultimately lower costs.

By investing in *cost-saving technology*, the cost per unit can be reduced significantly (Banker et al., 2014:873). Reducing costs through technological advances is often associated with manufacturing activities, but cost-saving technology only provides a temporary cost advantage, as competitors can easily obtain the same technology (Banker et al., 2014:875). For example, if a small business that performs basic financial transactions purchases a financial software program with appropriate financial functions, it could eliminate the need for a bookkeeper (leading to cost-savings in terms of the bookkeeper's salary) and ultimately this could lead to a reduction in the price of the product or service, since some of the fixed costs of the business would decline.

When small business owners or managers select the focus competitive strategy, regardless of whether the source of competitive advantage is differentiation or low-cost, they must be aware of the possible drawbacks in employing a focus competitive strategy.

### **2.3.3.3 Drawbacks of a focus competitive strategy**

In this section some drawbacks that owners or managers of small businesses must consider before implementing a focus competitive strategy, are noted below.

- Although a focus competitive strategy may provide a business with an initial competitive advantage, it is unlikely to provide a basis for sustainable long-term growth as it is easy for a competitor, especially a larger competitor with more resources, to duplicate the specific competitive advantage (Jooste et al., 2012:247).
- Markets need to keep up with the changing needs and preferences of customers. Such changes could influence a small business competing with a focus strategy negatively, as customers in the specific market segment may prefer to purchase products or services from other popular large suppliers in a broader target market (Burns, 2011:179).
- The risk of a competitor entering the market with a lower price or a more unique product or service, may change the preference of customers in the specific market segment and customers would more likely purchase the less expensive or more unique product (Burns, 2011:179).
- A small business succeeding in a specific market segment may attract competitors (small or large) to the market segment, consequently increasing competition (Scarborough, Wilson & Zimmerer, 2009:79).
- A business competing with a focus competitive strategy serves a narrow market segment and would usually purchase small quantities of inputs. The smaller the quantity purchased, the less the small business' bargaining power and the less the cost advantage gained through economies of scale (Butler, 2006:261).

#### **2.3.3.4 Comparison between focus differentiation and focus low-cost competitive strategies**

Although both focus differentiation and focus low-cost competitive strategies are deployed in a narrow target market, these strategies differ in terms of the source of competitive advantage, the market environment, the type of products or services, as well as customer demand. The differences between these strategies are listed in table 2.1. The focus differentiation competitive strategy is best suited for businesses that provide innovative products characterised by uncertain and unpredictable customer demand within an unstable and dynamic market environment; whereas a focus low-cost competitive strategy is best

suitable for businesses that provide functional products characterised by certain and predictable customer demand within a stable and stationary market environment.

**Table 2.1 Comparison between focus differentiation and focus low-cost strategies**

	<b>Focus differentiation</b>	<b>Focus low-cost</b>
<b>Target market</b>	Narrow	Narrow
<b>Source of competitive advantage</b>	Differentiating products through unique product or service characteristics and features	Providing products or services at the lowest possible cost
<b>Market environment</b>	Unstable Dynamic	Stable Stationary
<b>Type of product or service</b>	Innovative	Functional
<b>Customer demand</b>	Uncertain Unpredictable	Certain Predictable

Source: Jooste et al. 2012:244-248; Louw and Venter (2011:301-303); Ehlers and Lazenby (2010:188); Thompson et al. (2004:113)

Considering the differences in table 2.1, as well as the definitions of supply chain responsiveness and cost-efficiency (section 1.2.3.3), and the discussion of the focus differentiation and focus low-cost competitive strategies (sections 2.3.3.1 and 2.3.3.2); it can be stated that a focus differentiation competitive strategy will promote supply chain responsiveness<sup>LF3</sup>, and a focus low-cost competitive strategy will promote supply chain cost-efficiency<sup>LF4</sup> (Banker et al., 2014:874, 875; Hines, 2013:40,62-63).

As this study concerns small businesses operating in Soweto, competitive strategies need to be examined from the perspective of these businesses. In 2012 a study was conducted on small businesses operating in Soweto. Badenhorst-Weiss and Cilliers (2014) investigated the sustainability of independent small wholesalers and retailers operating within Soweto, by identifying their main source of competitive advantage, the different market strategies they employed, as well as the unique value package they offered their customers. The authors found that expanding and older independent small wholesalers and retailers achieved a

competitive advantage through differentiating themselves within the business environment of Soweto in terms of: price; their relationship with customers; trading hours; personal attention to customers; the quality of their products; brands; and offering a variety of products (Badenhorst-Weiss and Cilliers, 2014:18-19). Another publication based on the 2012 Soweto study, confirmed the finding of Badenhorst-Weiss and Cilliers that independent small wholesalers and retailers in Soweto should compete by implementing a focus differentiation competitive strategy (Badenhorst-Weiss, Cilliers & Eicker, 2014:375-376). Based on the findings of these two studies, it seems that it would be to the advantage of small Soweto businesses to compete using a focus differentiation competitive strategy.<sup>LF2</sup>

Once the most appropriate competitive strategy has been selected, the different functional strategies (including the supply chain strategy) can be designed.

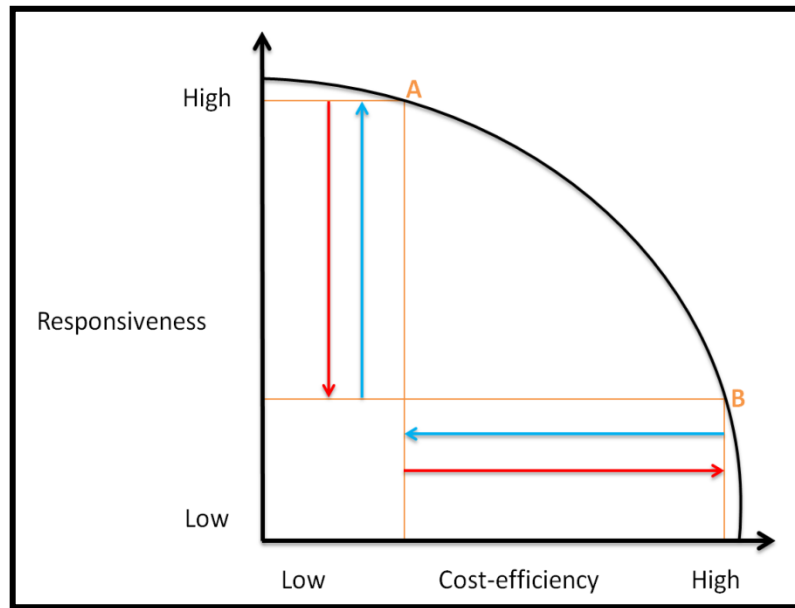
## **2.4 Supply chain strategies**

In section 1.2 it was stated that competition has moved from businesses competing against each other to supply chains competing against one another. Supply chains compete, based either on satisfying customers' needs as fast as possible (responsively), or at the lowest possible cost (cost-efficiently) (Simon et al., 2015:28; Alfalla-Luque et al., 2013:800; Hines, 2013:258; Qrunfleh and Tarafdar, 2013:571; Ambe, 2012:126; Chi, Kilduff & Gargeya, 2009:649). Each supply chain member should manage their business in order to achieve the overall goal of the entire supply chain in terms of responsiveness and cost-efficiency. For example, a retailer that forms part of a responsive supply chain should aim to satisfy customers' needs as fast as possible; whereas a retailer operating within a cost-efficient supply chain, should aim to satisfy customers' needs at the lowest possible cost (Monczka et al., 2016:635; Simon et al., 2015:28; Storsjö, Martins & Zanoni, 2015:2; Goldsby, Iyengar & Rao, 2014:143; Qrunfleh and Tarafdar, 2013:573). Therefore, when selecting a supply chain strategy, a trade-off between the level of responsiveness and cost-efficiency at which the business operates, needs to be made and this should be aligned with the overall level of responsiveness or cost-efficiency of the entire supply chain (Chopra and Meindl, 2016:38).<sup>LF5</sup>

This trade-off between the level of responsiveness and cost-efficiency is illustrated in figure 2.3.



**Figure 2.3 Trade-off between the level of responsiveness and cost-efficiency**



Source: Adapted from Chopra and Meindl (2016:38)

At point A in figure 2.3 the level of responsiveness is high and the level of cost-efficiency is low; this can be referred to as a supply chain strategy that is focused more on responsiveness. This is in contrast to point B, where the level of responsiveness is low and the level of cost-efficiency is high; therefore, a supply chain strategy that is focused more on cost-efficiency. As one moves from point A to B (see the red arrows), the level of responsiveness decreases as the level of cost-efficiency increases; whereas moving from point B to A (see the blue arrows), the level of responsiveness increases while the level of cost-efficiency decreases. Clearly, a trade-off exists between responsiveness and cost-efficiency, because whichever one of these two (responsiveness or cost-efficiency) increases, the other will decrease.

The appropriate level of responsiveness and cost-efficiency is determined by the selected supply chain strategy. Although numerous supply chain strategies exist, the basic orientation of the strategy would be on either improving (or maintaining a certain level of) responsiveness or cost-efficiency (Soni and Kodali, 2011:73). As this study is focused on how formal independent small retail businesses in Soweto should manage their three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of their supply chain strategy, the different supply chain strategies discussed in section 2.4.1 is limited to the basic orientation followed in these strategies. The different supply chain

strategies, based on their orientation towards responsiveness and cost-efficiency that will be discussed is tabularised below.

**Table 2.2 Supply chain strategies - classified according to their orientation**

Supply chain strategies orientated towards responsiveness	Supply chain strategies orientated towards cost-efficiency
<ul style="list-style-type: none"> <li>• Responsive supply chain strategy</li> <li>• Fully flexible supply chain strategy</li> <li>• Agile supply chain strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient/cost-efficient supply chain strategy</li> <li>• Lean supply chain strategy</li> <li>• Risk-hedging supply chain strategy</li> <li>• Collaborative replenishment supply chain strategy</li> </ul>

Source: Compiled by researcher

### 2.4.1 Different supply chain strategies

Supply chain strategies have evolved since the introduction of supply chain management in 1982 (Hines, 2013:70-71). As no universal or industry-specific supply chain strategy exists, several factors should be considered when selecting an appropriate strategy (Hines, 2013:7). These factors include: product characteristics; the level of demand and supply uncertainty placed on the supply chain; customers' buying behaviour; the position of the supply chain member within the supply chain; order winners and order qualifiers; and the production process.<sup>LF6</sup> These factors are discussed in the following subsections.

#### 2.4.1.1 Selecting a supply chain strategy based on product characteristics

In 1997 Marshall Fisher introduced his influential framework on how to select the most appropriate supply chain strategy, based primarily on whether the product can be classified as either a functional or an innovative product. These products differ in terms of customer demand, profit margins, product life cycles, and the level of competition within the market.

Functional products satisfy basic customer needs and include staple products usually sold at retail outlets, as well as maintenance, repair and operating items (Wisner et al., 2016:112; Fisher, 1997:106). Typical examples of such products would include bread and table salt, but also the service of a motor vehicle. Customer demand for functional products is usually stable and predictable, mainly due to the type of need (basic need) that the product satisfies

(Fawcett et al., 2007:228). Since the stable and predictable demand for functional products attracts large numbers of competitors, these products are characterised by low-profit margins, long life-cycles and high levels of competition (Wisner et al., 2016:112; Hong and Jeong, 2006:296; Lee, 2002:106; Fisher, 1997:106). The fact that customers are price-sensitive towards functional products implies that the ideal supply chain strategy for these products is a cost-efficient strategy which is focused on keeping costs low by advocating economies of scale and optimisation techniques (see section 2.3.3.2). Economies of scale and optimisation techniques are aimed at ensuring the best capacity utilisation throughout the production and distribution processes (Monczka et al., 2016:636; Qrunfleh and Tarafdar, 2013:573; Fawcett et al., 2007:228).

Innovative products consist of new products, such as the latest fashion items or technological devices (Wisner et al., 2016:112). In contrast to functional products, customer demand for innovative products is unstable and unpredictable; and they are characterised by high-profit margins, short life-cycles and lower levels of competition (Fawcett et al., 2007:228; Lee, 2002:106; Fisher, 1997:106). Therefore, serving a market with innovative products necessitates flexibility in order to meet customers' unstable and unpredictable demands. As a result, the ideal supply chain strategy for innovative products would be a responsive strategy that is focused on flexibility and speed. This strategy will enable the business to adapt rapidly to market changes, but it will wait until a customer's need becomes known, before reacting to it (Morita, Machuca, De los Rios & Flynn, 2015:2; Qrunfleh and Tarafdar, 2013:573; Wieland and Wallenburg, 2012:890; Merschmann and Thonemann, 2011:43; Fawcett et al., 2007:228). For example, a small restaurant should have all the ingredients to prepare the meals listed on its menu on hand, but only once a customer orders an item, will the demand become known and will the restaurateur act on the demand. Considering the differences between functional and innovative products, Fisher (1997:106) argues that a *cost-efficient supply chain strategy* is best suited for functional products, and a *responsive supply chain strategy* for innovative products. Figure 2.4 illustrates Fisher's framework in terms of matching the appropriate type of supply chain (cost-efficient or responsive) with the product classification (functional or innovative).

**Figure 2.4 Matching the type of product with a specific supply chain**

	Functional products	Innovative products
Cost-efficient supply chain	Match	Mismatch
Responsive supply chain	Mismatch	Match

Source: Fisher (1997:109)

The main shortcoming of Fisher’s framework is that only the uncertainty that customer demand places on the supply chain is considered when selecting a strategy, and not the uncertainties involving the supply process, such as the ability of a contractor to supply a product or service (Lee, 2002:107). In an attempt to address the limitations of Fisher’s framework, Lee (2002) developed an “uncertainty framework” to assist managers in the selection of supply chain strategies. This framework includes the uncertainties that both the customer and the supplier place on the supply chain.

**2.4.1.2 Selecting a supply chain strategy based on customer and supplier uncertainties**

Lee agrees with Fisher that customer demand is influenced by the type of product required, but argues that the uncertainties that the supply chain’s capabilities place on the chain (such as technology and the reliability of suppliers), should also be considered when selecting the most appropriate supply chain strategy (Chopra and Meindl, 2016:36; Qrunfleh and Tarafdar, 2013:573). In terms of supply uncertainties and the capabilities of a supply chain, a supply process can be classified either as stable or evolving (Lee, 2002:107). A product with predictable customer demand and a stable or evolving supply process cannot be managed in the same way as a product with unpredictable customer demand and a stable or evolving supply process; different supply chain strategies are required (Lee, 2002:105).

Within a stable supply process mature technology is usually implemented, limited capacity constraints exist and dependable lead-times are present. A stable supply process tends to be highly automated, simple and manageable, and has an established supplier base where long-term supply contracts can be formed (Lee, 2002:107). On the other hand, an evolving supply process is often subjected to breakdowns, has capacity constraints, has undependable lead-times and usually implements technology that is rigid or still in the developmental stage. The supplier base in an evolving supply process is typically small, inexperienced and unreliable,

since the suppliers are also going through the developing stages of a product or process (Lee, 2002:107). For each combination of demand and supply uncertainty, a different supply chain strategy should be selected. Using his uncertainty framework, Lee (2002:114) identifies four supply chain strategies; as illustrated in figure 2.5.

**Figure 2.5 Supply chain strategies based on demand and supply uncertainty**

		Demand uncertainty	
		Low	High
		Functional product	Innovative product
Supply uncertainty	Low	Efficient supply chain strategy	Responsive supply chain strategy
	Stable supply process		
	High	Risk-hedging supply chain strategy	Agile supply chain strategy
	Evolving supply process		

Source: Lee (2002:114)

Businesses with products that are characterised by low demand uncertainty and low supply uncertainty, should select an *efficient supply chain strategy*. The low uncertainties that the supply chain faces, allow the business to focus its efforts on reducing cost, for example by capacity utilisation, bulk purchasing and waste elimination (Qrunfleh and Tarafdar, 2013:573). When products with low demand and high supply uncertainties are involved, a business would benefit from selecting a *risk-hedging supply chain strategy*. The aim of a risk-hedging strategy is to minimise the disruption that the high supply uncertainty places on the supply chain, while managing costs efficiently (Liu, Chen, Li & Zhai, 2014:112-113). Supply uncertainty is generally reduced by pooling or sharing of resources in a supply chain. For example, a small restaurant that relies only on a specific butchery for its meat supply may be subjected to supply disruptions if that butchery fails to perform. If the restaurateur decides to buy from several butcheries, the risk of supply disruptions will decrease. Another method of risk-hedging is to increase the level of safety inventory in order to reduce the risk of inventory shortages. For example, if the restaurant increased each meat order by 10 kilograms, it will ensure that shortages do not occur.

For products characterised by high demand uncertainty and low supply uncertainty, managers would benefit by selecting a *responsive supply chain strategy* to reduce the demand uncertainties placed on the supply chain. For example, by sharing information and taking advantage of a stable supply process, flexibility could be increased, thus allowing the

supply chain to operate more successfully (Lee, 2002:108). When products with high customer demand and high supply uncertainties are involved, a business would benefit from selecting an *agile supply chain strategy*. This would ensure flexibility and responsiveness to uncertain customer demand, while reducing the risks of supply uncertainties (Gligor and Holcomb, 2012:438-439; Merschmann and Thonemann, 2011:43). An agile supply chain strategy combines the strengths of both a risk-hedging and a responsive strategy. It decreases supply uncertainties while meeting customer demand efficiently (increased flexibility) (Qrunfleh and Tarafdar, 2013:579). For example, a small electronics vendor who sells the latest cell phones, sound systems and television sets, would benefit from an agile supply chain strategy, since the supply and customer demand uncertainties faced by the retailer is high. An agile supply chain strategy would enable the retailer to respond to the changing needs of customers through increased flexibility and by reducing the risk of supply uncertainties. This can be achieved, for example by either retaining more than one supplier for a product, or by increasing the level of safety inventory.

Although Lee (2002:113-114) identifies four supply chain strategies, the orientation of each strategy remains towards either responsiveness (responsive and agile supply chain strategies) or cost-efficiency (efficient and risk-hedging supply chain strategies).

Another option open to managers when selecting an appropriate supply chain strategy, is to consider the influence of customers' buying behaviour on the uncertainties that the supply chain faces. For example, customers who rush to fill-up their cars when there are reports of a pending strike will increase the demand and supply uncertainties for fuel (Gattorna, 2010:39-40). Normally fuel is classified as having low demand and supply uncertainties, but due to the buying behaviour of users, both the demand and supply uncertainties increase when more fuel is demanded by customers and more fuel needs to be provided by suppliers. Therefore, when selecting an appropriate supply chain strategy, the influence of customer buying behaviour should be borne in mind to enable a business to meet customer demand (Christopher and Gattorna, 2005:118).

### **2.4.1.3 Selecting a supply chain strategy based on customer buying behaviour**

The literature describes numerous ways in which customers can be segmented, for example by geography, size, revenue, price point, product characteristics, profitability and revenue (Gattorna, 2010:36). However, Gattorna (2010:36) considers these segmentations as irrelevant, since they interpret only transactional data, which is usually gathered over long periods of time. Customers' preferences and needs change on a regular basis, as stated by Gattorna (2010:36) and therefore faster and better ways of keeping up with these preferences and needs are necessary. He argues that behavioural data should be considered when segmenting customers, since buying behaviours identify the evolvement of customers' preferences and needs. According to Gattorna (2003:31), four buying behaviours are pertinent, namely collaborative, efficient, demanding and innovative behaviours.

#### **a) Customers with collaborative buying behaviour**

In collaborative buying behaviour, suppliers aim to create a close working relationship with customers. Suppliers and customers collaborate by sharing information, forming strategic partnerships and building trustworthy relationships (Gattorna, 2010:169). A supply chain strategy developed for customers with this type of behaviour, entails that the different supply chain members focus on providing a stable source of supply and satisfying the end-customers' demands in the most cost-efficient way and is referred to as a *collaborative replenishment supply chain strategy* (Christopher and Gattorna, 2005:119-120; Gattorna, 2003:31-33). For example, a supplier who provides a hairdresser with a specific range of colouring products could benefit from selecting a collaborative replenishment supply chain strategy as a trustworthy relationship between the hairdresser and the supplier could lead to sharing of information (such as demand forecasts) and ultimately could reduce costs.

#### **b) Customers with efficient buying behaviour**

Suppliers serving customers with efficient buying behaviour should focus on providing products or services at the lowest possible cost. Efficient buying behaviour customers are characterised by their predictable demand, their price-sensitivity and their regular purchases from a specific supplier. Suppliers should focus on reducing any supply uncertainties by

ensuring that ample products are available at the lowest possible cost. A supply chain strategy for customers with efficient customer behaviour should focus on economies of scale through synergy and low-cost processes; and this is referred to as a *lean supply chain strategy* (Christopher and Gattorna, 2005:119-120; Gattorna, 2003:31-33). For example, a small tavern providing beer to customers at a low cost would benefit from implementing a lean supply chain strategy as the predictable customer demand and low supply uncertainty of beer, would enable the tavern to respond cost-efficiently to customer demand.

**c) Customers with demanding buying behaviour**

Customers with demanding buying behaviour require that a supplier responds rapidly to their demands. Demanding customers usually purchase on an ad-hoc basis and they value suppliers' responsiveness and flexibility more than a long-term relationship and cost-efficiency. Therefore, an *agile supply chain strategy* that is focused on responding rapidly to unpredictable customer demand and uncertain supply conditions, is required (Qrunfleh and Tarafdar, 2013:573; Christopher and Gattorna, 2005:119-120; Gattorna, 2003:31-33). A small business retailing an innovative product characterised by unpredictable customer demand and uncertain supply, such as the latest high-tech cell phones, would benefit by selecting an agile supply chain strategy. Selecting an agile supply chain strategy would allow the business to adapt to unpredictable customer demand and uncertainties in supply of the high-tech cell phones.

**d) Customers with innovative buying behaviour**

Customers with innovative buying behaviour are characterised by unpredictable demand. They require innovative products and solutions from suppliers within a short time-frame. The implementation of a hedging or deployment strategy, referred to as a *fully-flexible supply chain strategy*, would allow suppliers to be flexible and to offer these customers new products more frequently (Merschmann and Thonemann, 2011:44; Christopher and Gattorna, 2005:119-120; Gattorna, 2003:31-33). A fully-flexible supply chain strategy is often referred to as an "emergency supply chain" as it focuses on developing the capabilities required in order to operate in the face of unforeseen and unplanned events and is therefore more suitable for governmental institutions (Gattorna, 2010:252). For example, to



execute a relief mission after a natural disaster, suppliers who are highly flexible should be used.

To summarise, the different supply chain strategies that can be employed, based on customer buying behaviour, would be orientated towards either cost-efficiency or responsiveness. Collaborative replenishment and lean supply chain strategies are orientated towards achieving cost-efficiency; whereas agile and fully-flexible supply chain strategies are orientated towards responsiveness.

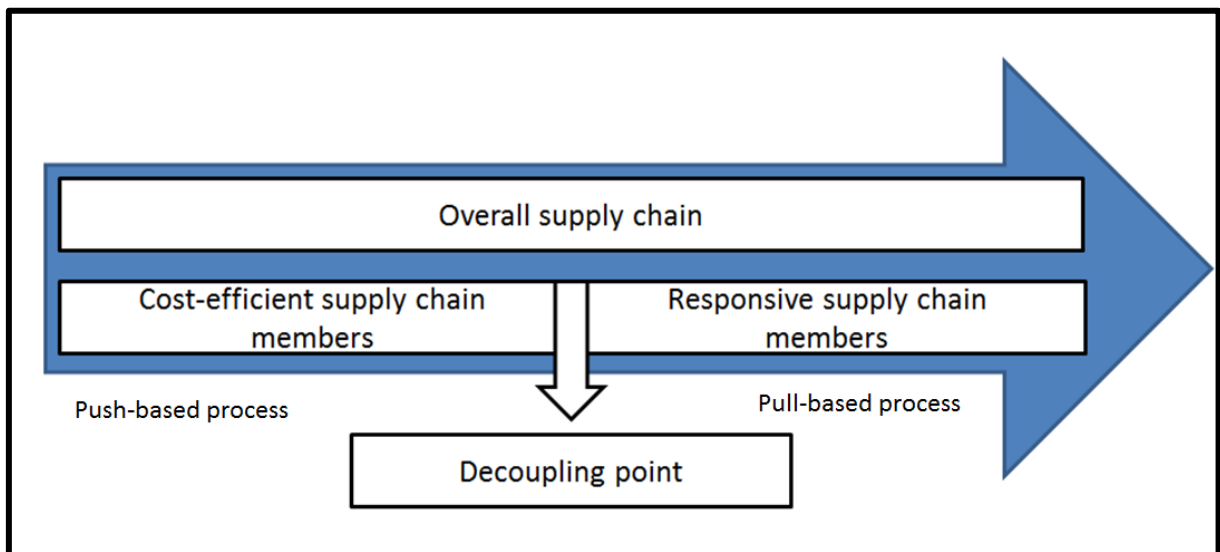
#### **2.4.1.4 Additional factors to consider when selecting a supply chain strategy**

Various authors (Ambe, 2012; Duarte and Machado, 2011; Martinez-Olvera and Shunk, 2006; Christopher and Towill, 2002) identify additional factors that managers should consider when selecting an appropriate supply chain strategy. These factors include the position of the supply chain member within the supply chain; whether the product is a market winner or qualifier; as well as the type of production process that is implemented. The influence of these factors on the type of supply chain strategy will differ depending on the industry in which the business operates. The influence of the different factors on the selected supply chain, as identified above, is discussed briefly below.

##### **a) The position of the supply chain member within the supply chain**

Thus far supply chains and the different supply chain strategies have been discussed in terms of their orientation towards responsiveness or cost-efficiency; but in reality is it possible for a supply chain to combine both, and then it is referred to as a leagile supply chain (Towill and Christopher, 2002:299). Within a leagile supply chain, certain members can be focused on cost-efficiency, while others can be focused on responsiveness. Figure 2.6 illustrates such a supply chain.

**Figure 2.6 A supply chain that combines cost-efficient and responsive strategies**



Source: Compiled by researcher

A leagile supply chain consists of both push-based and pull-based processes. A push-based process uses demand forecasts to predict future customer demand, and supplies products accordingly at the lowest possible cost. A pull-based process, on the other hand, reacts only once a customer's need is known, and therefore requires a supply chain that can react to this need in a timely manner. A pull-based process can also be referred to as a "wait-and-see" approach, since a business only commits to produce or source a product once the customer's demand becomes known (Qrunfleh and Tarafdar, 2013:573). Therefore, a push-based supply chain requires a strategy focused on cost-efficiency, whereas a pull-based supply chain requires a strategy focused on responsiveness (Ambe, 2012:135-136; Simchi-Levi, Kaminsky & Simchi-Levi, 2003:190).

With a leagile supply chain it is important to determine at what point the supply chain should be managed cost-efficiently and where it should be managed responsively. This point, where the one supply chain strategy is replaced with the other, is known as the decoupling point (see figure 2.6) (Hines, 2013:258). Leagile supply chains are mainly associated with manufacturing supply chains, such as in the automotive industry (Christopher, 2011:99-100). Since this study is focused on formal independent small businesses operating within the retail sector, a leagile supply chain strategy is not applicable to this study.

**b) Classification of the product or service as either a market winner or a market qualifier**

Products or services can be classified as either market winners or market qualifiers. Market qualifiers refer to the minimum requirements, such as price or quality, that products or services should have in order to compete within a specific market; whereas market winners refer to products or services with characteristics in excess of market qualifiers (Martinez-Olvera and Shunk, 2006:4513; Mason-Jones, Naylor & Towill, 2000:4061). Depending on the minimum requirements (in the case of a market qualifier) and the additional features (in the case of a market winner) the supply chain strategy should be focused on either cost-efficiency or responsiveness (Mason-Jones et al., 2000:4063; Rahimnia and Moghadasian, 2010:801). If the market qualifier or winner is low-cost the supply chain strategy should be focused on cost-efficiency, whereas if the market qualifier or winner is the additional features of the product the supply chain strategy should be focused on responsiveness. In a market where a low price is a necessity, any business that prices its product or service in line with that of its competitors will be classified as a market qualifier, but a business that provides its product or service at a higher quality and price, will be classified as a market winner. For example, if the market winner is low cost, a small bakery would benefit by selecting a supply chain strategy orientated toward cost-efficiency in order to provide customers with the lowest priced products.

**c) Type of production process**

Production processes and their manufacturing environments are designed for either mass production or mass customisation. Within a mass production process the ability to accurately forecast demand is a necessity, as mass production usually focuses on reducing costs through synergies and economies of scale. On the other hand, a mass customisation production process is designed to customise products according to customer demand. A mass production process requires an efficient supply chain strategy, whereas a mass customisation process requires a responsive supply chain strategy (Zhang and Chen, 2006:668). As this study is focused on small businesses operating within the retail sector, production processes as a factor that influences the selection of an appropriate supply chain strategy is not considered further.

## 2.4.2 Orientation of supply chain strategies

The preceding discussions on supply chain strategies (sections 2.4.1.1 to 2.4.1.4) can be summarised as follows.

**Table 2.3 Characteristics of the orientation of supply chain strategies**

<b>Characteristics of supply chain strategies orientated towards responsiveness<sup>LF7</sup></b>	<b>Characteristics of supply chain strategies orientated towards cost-efficiency<sup>LF8</sup></b>
<ul style="list-style-type: none"> <li>• Highly flexible</li> <li>• Adapt easily to market changes and unpredictable customer demand</li> <li>• Suitable for innovative products</li> <li>• Reduce risk of supply uncertainty mainly through risk-hedging and safety inventory</li> <li>• Ability to propose new and innovative solutions to customers</li> <li>• Serve non price-sensitive customers</li> <li>• Mainly build short-term relationships with customers</li> <li>• Additional capacity available to ensure flexibility</li> <li>• Products characterised by short life-cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Highly cost-conscious</li> <li>• Focus on achieving economies of scale, synergy and implement low-cost processes</li> <li>• Suitable for predictable customer demand</li> <li>• Suitable for functional products</li> <li>• Reduce risk of supply uncertainty mainly through pooling or sharing of resources</li> <li>• Serve price-sensitive customers</li> <li>• Build long-term relationships with customers mainly to share knowledge</li> <li>• Focus on cost-competition</li> <li>• Use demand forecasts</li> <li>• Products characterised by long life-cycles</li> </ul>

Source: Compiled by researcher

## 2.5 Conclusion

Following from the discussions in this chapter, it can be concluded that businesses fail due to a lack of strategic fit between the competitive and supply chain strategies. A strategic fit can be achieved when the goals of the supply chain strategy are aligned with the goals of the competitive strategy. When selecting a competitive strategy, small businesses will benefit from competing in narrow target markets, as they are prevented from competing in large markets, mainly due to their limited resources. Porter's focus competitive strategy was identified as the most appropriate competitive strategy for small businesses since this strategy targets a narrow market. It also became clear that differentiation as a source of competitive advantage is more suitable for innovative products with an uncertain customer

demand, operating in an unstable and dynamic market environment, and when less price-sensitive customers are served. Small business managers using the focus differentiation competitive strategy, should ensure that they are equipped to operate in this unstable and dynamic market environment, by being flexible. They should implement appropriate functional strategies in order to adapt easily to changes in the market and fluctuating customer demand. In other words, these strategies must be managed to be responsive. It was established that the focus low-cost competitive strategy is more suitable for functional products with certain customer demand, operating in stable and stationary markets and serving price-sensitive customers. Small businesses competing with a focus low-cost competitive strategy should concentrate on lowering costs, for example by taking advantage of economies of scale. After selecting an appropriate competitive strategy, the different functional strategies should be developed, and this includes the supply chain strategy.

When selecting a supply chain strategy, each business should consider the trade-off between the level of responsiveness and cost-efficiency at which they operate; and this should be aligned with the overall level of responsiveness and cost-efficiency of the entire supply chain. Although many factors (such as product characteristics; the level of demand and supply uncertainties placed on the supply chain; customers' buying behaviour; the position of the supply chain member within the supply chain; order winners and order qualifiers; and the production process), influence the selected supply chain strategy, the strategy will be orientated towards either responsiveness or cost-efficiency. In the remainder of the chapter, different supply chain strategies were discussed with specific reference to the orientation of the strategy. The chapter was concluded by presenting the characteristics of a supply chain strategy orientated towards responsiveness, as well as a supply chain strategy orientated towards cost-efficiency. The eight literature findings (LF) made within the chapter are listed in table 2.4.

**Table 2.4 Literature findings in chapter 2**

Literature findings within the chapter	
LF1 :	Three aspects should be in place before a strategic fit can be achieved between the competitive and supply chain strategy: <ul style="list-style-type: none"><li>a) The goals of the competitive strategy must be aligned with the goals of the supply chain strategy to form an overall coordinated strategy.</li><li>b) The processes and resources of each functional area should be structured so that the functional area's strategy can be implemented successfully.</li><li>c) The business' supply chain strategy must be aligned with the orientation of the overall supply chain (refer to section 2.2).</li></ul>
LF2:	Porter's focus competitive strategy is the most appropriate competitive strategy for small businesses (refer to section 2.3).
LF3:	The focus differentiation competitive strategy emphasises flexibility and therefore promotes supply chain responsiveness (refer to sections 2.3 and 2.3.3.4).
LF4:	The focus low-cost competitive strategy emphasises cost savings and therefore promotes supply chain cost-efficiency (refer to sections 2.3 and 2.3.3.4).
LF5:	When selecting a supply chain strategy, a trade-off between the level of responsiveness and cost-efficiency at which the business operates, needs to be made and should be aligned with the overall level of responsiveness or cost-efficiency of the entire supply chain (refer to section 2.4).
LF6:	Several factors, such as product characteristics, the level of demand and supply uncertainties placed on the supply chain, customer buying behaviour, the position of the supply chain member within the supply chain, order winners and order qualifiers and the production process should be considered before selecting an appropriate supply chain strategy (refer to section 2.4).
LF7:	A supply chain strategy orientated toward responsiveness is characterised by: <ul style="list-style-type: none"><li>a) high flexibility,</li><li>b) adapting easily to market changes and unpredictable customer demand,</li><li>c) being suitable for innovative products,</li></ul>

- d) reducing the risk of supply uncertainty mainly through risk-hedging and safety inventory,
- e) having the ability to propose new and innovative solutions to customers,
- f) serving customers who are not price-sensitive,
- g) building mainly short-term relationships with customers,
- h) having additional capacity available to ensure flexibility,
- i) working with products that have shorter life-cycles (refer to section 2.4.2).

LF8: A supply chain strategy orientated towards cost-efficiency is characterised as:

- a) being highly cost-conscious,
- b) focussing on achieving economies of scale, synergy and implementing low-cost processes,
- c) being suitable when customer demand is predictable,
- d) being suitable for functional products,
- e) reducing the risk of supply uncertainty mainly through pooling or sharing of resources,
- f) serving price-sensitive customers,
- g) building long-term relationships with customers mainly to share knowledge,
- h) focusing on cost-competition,
- i) using demand forecasts,
- j) working with products that have longer life-cycles (refer to section 2.4.2).

Source: Compiled by the researcher

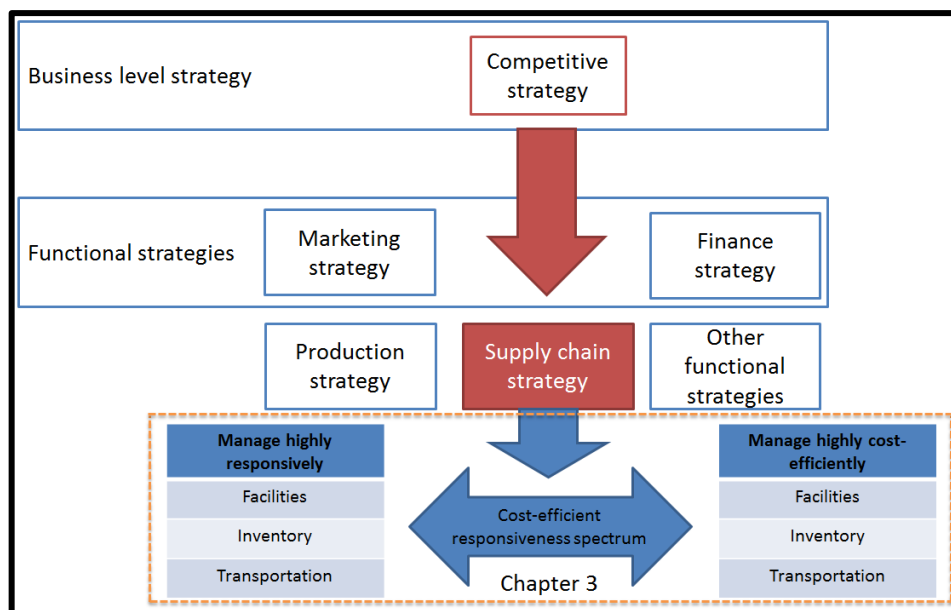
# Chapter 3

## The logistical supply chain drivers

### 3.1 Introduction

In chapter 1 the logistical supply chain drivers, namely facilities, inventory and transportation, were introduced, and in chapter 2 the influence of the orientation of the selected supply chain strategy on the management of a business, was discussed. The focus of this chapter is on the decisions that owners and managers need to make in order to determine the level of responsiveness and cost-efficiency at which the logistical supply chain drivers should be managed (based on the orientation of the selected supply chain strategy).

**Figure 3.1 Overview of the literature covered in chapter 3**



Source: Compiled by researcher

This chapter is structured to first discuss a simplified retail supply chain and then to identify the different members within the supply chain of a small retail business. As this chapter is focused on the three logistical supply chain drivers, an overview of logistics in general, and then specifically within South Africa as a developing country, is provided. This is followed by a discussion on the management of logistics within small businesses. The focus of the chapter then shifts to the three logistical supply chain drivers individually. Each driver is discussed in terms of the different management decisions that will influence the desired



level of responsiveness and cost-efficiency. In this chapter the next fourteen literature findings are made and indicated by the abbreviation LF. The findings in this chapter, along with the previous literature findings in chapter 2 and the empirical findings in chapters 5 and 6, are used in chapter 7 to make recommendations on how formal independent small retail businesses in Soweto should manage their logistical supply chain drivers, based on the selected supply chain strategy, in order to survive.

In section 1.2.1 a simplified supply chain for small retail businesses was illustrated. A retailer, as a supply chain member, is involved with the vending of goods and services to final customers, but relies on suppliers to obtain these products and services (Fernie and Sparks, 2014:4). Since this study is focused on how these small retailers **manage their logistical supply chain drivers**, an in-depth analysis of the different tiers of the supply chain will not be conducted. The following discussions will focus on the retailer's first-tier suppliers and customers. Any supplier from whom a retailer purchases directly, will be referred to as the retailer's first-tier supplier; and any customer who purchases directly from the retailer, will be referred to as the retailer's first-tier customer.

### **3.2 Logistics: a South African small business perspective**

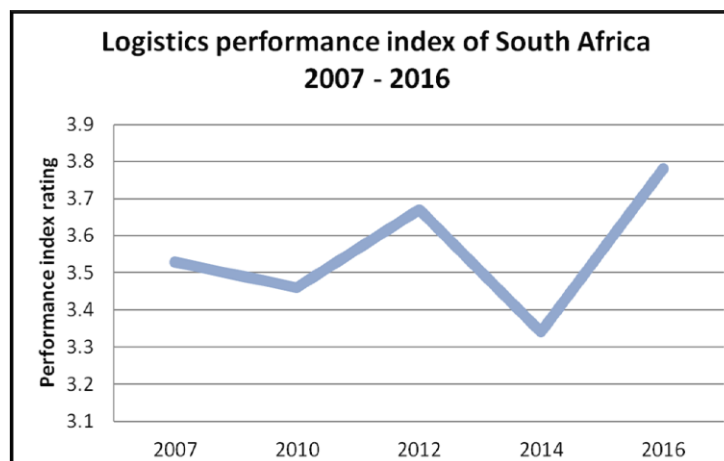
The term "logistics" refers to the movement of the right product, at the right time, to the right location, at the lowest possible cost - as agreed upon by both suppliers and customers (Bowersox, Closs, Cooper & Bowersox, 2013:33). Geographically, logistics is a network that spans the globe, and the growth in international commerce has increased the complexity and extent thereof (Bowersox et al., 2013:28-29). Logistics is one of the most complex areas of business operations, as it creates and manages the flow of goods and services between the different supply chain members (Wisner et al., 2016:301).

This section is structured to consider three aspects: first, logistics within South Africa as a developing country; secondly, the management of logistics within small businesses; and finally the different logistical linkages within a retail business.

### 3.2.1 State of logistics in South Africa as a developing country

Based on a country's gross national income (GNI) per capita, per year, the World Bank classifies a country as either *developed* or *developing* (Todaro and Smith, 2006:38). Countries with low (\$1 045 or less), middle (\$1 046 - \$4 125), or upper-middle (\$4 126 - \$12 736) GNI per capita, per year, are classified as developing countries (World Bank, 2015). In 2015, South Africa had a GNI per capita, per year of \$6 050, thereby placing it within the *developing* category (World Bank, 2016a). According to Chu (2012:1), logistics is one of the main stimulators of economic growth within a developing country and the state of a country's logistics network (infrastructure) impacts the potential investments from both international and domestic investors (Zuraimi, Yaacob & Ibrahim, 2013:325). The World Bank rates the logistical performance of all countries every 2-3 years on a 5-point scale, where 1 indicates a low overall logistics performance and 5 a high overall logistics performance. Figure 3.2 illustrates South Africa's ratings from 2007 – 2016. Although South Africa's performance fluctuated during this time, it received its highest rating in 2016 - at 3.78; placing South Africa's logistical performance among upper middle income countries.

**Figure 3.2 South Africa's logistics performance index ratings for 2007-2016**



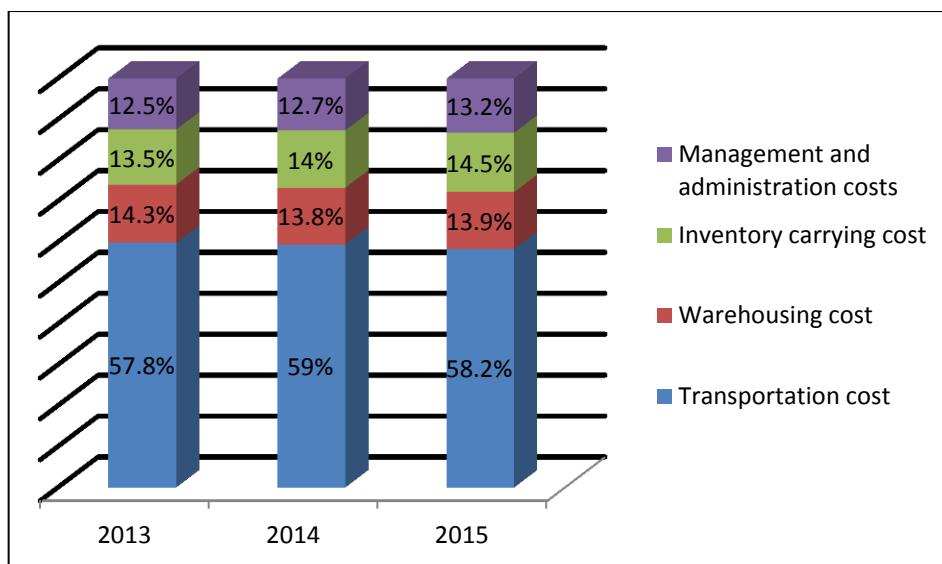
Source: Adapted from World Bank (2016b)

An annual report that focuses on identifying logistical trends and opportunities for South African businesses (Barloworld Logistics Supply Chain Foresight, 2016:3-4, 19, 25, 28) has identified some logistical constraints that possibly contributed to the country's fluctuating logistics performance rating. These constraints included the unstable economy, political uncertainty, high cost burdens (such as overheads) and skill shortages in both upper and

lower management. These are in line with the challenges faced by other developing countries, such as China and Malaysia (Li & Fung Research Centre, 2008; Zuraimi et al., 2013:326).

According to the CSIR’s 10<sup>th</sup> Annual State of Logistics Survey for South Africa (2014:28), the performance of South Africa’s logistics industry is dependent on the country’s transport infrastructure, logistics service provision, cross-border trade facilitation and telecommunication systems. The CSIR survey (2014:1-7) further explains that South Africa’s economy is classified as a high transport intensive economy, since products frequently have to be transported to fulfil demand (Havenga and Simpson, 2014:35). This occurs because of the vast imbalance between the demand and supply of products. The Logistics Barometer of South Africa is a platform that reports on the national logistics costs, the different cost drivers, as well as the latest logistical trends in the country. Figure 3.3 illustrates the different cost components of South Africa’s logistics costs as reported by The Logistics Barometer of South Africa for 2013, 2014 (estimated) and 2015 (forecasted). The estimated (or forecasted) logistical costs for 2016 were not available when finalising this study.

**Figure 3.3 Cost components of South Africa’s logistics costs for the period 2013 – 2015 in percentages**



Source: Adapted from Stellenbosch University (2015:7)

According to the Barometer, South Africa can be classified as a high transport intensive economy, because approximately 60% of all logistics costs for this period were classified as

transportation costs. Warehousing costs range between 13% – 14% of total logistics costs and inventory carrying costs between 13% – 15% of total cost during the period 2013 – 2015. South Africa's estimated cost of logistics as a percentage of gross national income for 2014 and 2015, was 11.4% and 11.7% respectively, which is in line with other developing countries (Stellenbosch University, 2015:4, 7).

### **3.2.2 Logistics management in small businesses**

Managing logistics within a business in order to create an effective logistical network can be the differentiating factor that distinguishes a business from its competitors (Wisner et al., 2016:301; Nichols, 2010). The performance of a small business is directly influenced by logistics and can be enhanced by reducing overall logistics costs, for example by reducing inventories and managing transportation efficiently (Orfanos, Mylonakis & Evripiotis, 2010:21, 26). Although small businesses are more simply structured in terms of the number of employees, annual turnover, capital assets and the managerial involvement of its owners, than larger businesses (Erasmus, Strydom & Rudansky-Kloppers, 2013:52; Töyli, Häkkinen, Ojala & Naula, 2008:61), the logistical challenges they face do not differ, as the essential components, such as facilities, inventory and transportation of the logistical function, are still present (Zowada, 2013:116).<sup>LF9</sup>

Small businesses are normally characterised by the lack of ability to manage their logistics (Soinio, Tanskanen & Finne, 2012:33) and therefore, generally, they contract outside service providers (Zowada, 2013:115). A logistics service provider (referred to as a third-party logistics provider) is an external business that performs the whole or part of the logistical function on behalf of a business. Small businesses may also find it more cost-efficient to hire a logistics service provider than to manage this function themselves (Zowada, 2013:112; Petty, Palich, Hoy & Longenecker, 2012:467).<sup>LF10</sup> Zowada (2013:112,114) reports that 84% of small and medium-sized businesses operating in Silesia, Poland use a logistic service provider to increase their flexibility, and secondly, the managers prefer to focus their efforts on the core activity of the business instead of on the logistical function. Small and medium-sized businesses that use one or two logistics service providers, usually form partnerships with the aim to reduce logistics costs. These businesses strive to be independent and to increase their flexibility (Zowada, 2013:113).

Generally, small businesses only use the transportation services offered by the logistical service providers (Zowada, 2013:117; Soinio et al., 2012:33).<sup>LF10</sup> According to Zowada (2013:117), this can be ascribed to the fact that these small businesses find it difficult to maintain a transport facility of their own and that transportation costs contribute the most towards their total logistical costs.<sup>LF11</sup>

### **3.2.3 The four logistical linkages within a small retail business**

The logistics activity synchronises the supply chain by linking its members with one another (Bowersox et al., 2013:4, 29). The four logistical linkages can be classified as inbound logistics, intra-organisational movements, outbound logistics and reverse logistics (Monczka et al., 2016:659). Inbound logistics consist of the transportation and warehousing of raw materials or semi-finished products from a supplier. From a business' point of view, inbound logistics will include all activities related to acquiring (purchasing) and storing materials from suppliers, for example a small fast food restaurant that collects and stores potatoes in order to make chips (Monczka et al., 2016:659-661; Lee, Cho & Jung, 2014:1001). Intra-organisational movements refer to the flow and storage of raw materials or semi-finished products within the precincts of the business and are often referred to as production logistics (Monczka et al., 2016:659-661; Lee et al., 2014:1001). For example, if a small garage services cars at a specific location, but stores the spare parts at a different location, a spare part is transported from the storage unit to the location where the car is serviced. Outbound logistics represent the link between the business and its customers and entails the delivery of finished products to customers (Monczka et al., 2016:659-661; Lee et al., 2014:1001), for example, a small florist shop delivering bouquets to customers. Reverse logistics include that part of logistics that is focused on the movement and management of inventory or resources, after a sale and delivery have been made to the customer. Reverse logistics is also referred to as the process whereby the return of products by customers is managed (Wisner et al., 2016:534; Badenhorst, 2013:2) for example, when a customer returns milk that has turned sour to the small retail grocer from which it was purchased.

To conclude section 3.2 on the state of logistics within South Africa, the management of logistics within a small business, and the four logistical linkages within a small retail business, it can be summarised as follows:

- The logistical performance of South Africa is influenced by a number of constraints.
- South Africa is classified as a transport intensive economy.
- Transportation, facilities and inventory contribute significantly to South Africa's total logistical costs.
- Small businesses face the same challenges as larger businesses.
- Small businesses generally use a third-party logistics service provider, due to the high cost of transportation and the difficulty in maintaining a transport facility.
- The four logistical linkages synchronise the supply chain by linking the different members.
- All four logistical linkages are present within the logistics function of small retail businesses.

Although the three logistical supply chain drivers cannot be managed in isolation (Chopra and Meindl, 2016:57), each driver is presented separately in sections 3.3 to 3.5 for discussion purposes. The discussion will consider the role of each supply chain driver within a retail supply chain; the different management decisions related to each supply chain driver; and the different decisions management need to make regarding the business' orientation towards responsiveness and cost-efficiency.

### **3.3 Facilities as a logistical supply chain driver**

Facilities provide supply chain services that include the storage of inventory, customer order fulfilment, and assembling of different parts of a product. If these services are managed and designed effectively, it can result in improved customer service through increased responsiveness (Wisner et al., 2016:318). When facility decisions are aligned with the orientation of the selected supply chain strategy, businesses tend to be more successful (Chopra and Meindl, 2016:59). Businesses can use facilities as a source of a competitive advantage, based on reducing either cost or lead-times (Graungaard Pedersen, Zachariassen & Stentoft Arlbjörn, 2012:354).

Traditionally, the functionality of facilities has only been regarded as a place to store products, but more recently its functionality includes the mixing and modifying of products

according to customer's orders (Wisner et al., 2016:319). Facilities can be classified according to their function as a production facility, where inventory is assembled, manufactured, modified or fabricated; as a storage facility where inventory is stored; as a distribution centre where inventory is cross-docked; as the premises from which a retailer operates; or as a service facility where a service is rendered to a customer by using an inventory component (Bowersox et al., 2013:37; Lawrence, Sivakumar & Arivarignan, 2013:4771). A service facility could, for example be used by an accountant or an undertaker. The accountant's office or the funeral parlour would be classified as the service facility, since it is the place where the inventory is used to render a service.

Facilities, as a logistical supply chain driver, are present in all four supply chain linkages (discussed in section 3.2.3) as inventory is transported between the different facilities of the supply chain members. For example, a retail grocery store receives inventory from a supplier at the supplier's loading bay (inbound logistics) and moves the inventory from the loading bay into storage or directly to the retailer's shop (intra-organisational movements) where a customer can purchase and remove the inventory (outbound logistics). In the event that the customer is dissatisfied with the product, the customer would return the product to the retailer's facility and the retailer would return the product back to the supplier's facility (reverse logistics). At each stage of this example, inventory is moved from one supply chain member's facility to the next.

In terms of this study, facilities refer to the facilities where formal independent small retail businesses receive and store inventory that is purchased from first-tier suppliers, as well as facilities where small retailers sell inventory to first-tier customers. If a small retailer renders a service, the premises from which the service is rendered is classified as the small retailer's facility. According to the World Bank (2014: 46), most township entrepreneurs have the necessary start-up capital to purchase (or rent) a facility from which to operate their businesses, but find it difficult to acquire facilities (regardless of the function) due to the general lack of retail space within townships.<sup>LF12</sup> If a business owner is able to rent a facility, the average cost is between R1000 and R2000 per month, which some owners find difficult to afford (World Bank, 2014: 157, 171).

Designing a facility network entails decisions related to the function, location and capacity of the facility, which will impact supply chain performance in terms of the level of responsiveness and cost-efficiency (Horn, Badenhorst-Weiss, Cook, Heckroodt, Howell, Phume & Strydom, 2014:15). The different management decisions related to facilities are discussed in the next section.

### **3.3.1 Components of facilities decisions**

Managers must ensure that the appropriate facility network, in terms of function, location and capacity is designed depending on the logistical operations of the business (Bowersox et al., 2013:37). For example, a retail business selling consumer products should design a facilities network that is able to serve the selected target market, while bearing in mind costs and responsiveness (Chopra and Meindl, 2016: 59; Bowersox et al., 2013:37). The management decisions relating to the function, location and capacity of facilities are discussed in the following sections. Each management decision is first considered from a general perspective and secondly, from the perspective of a small retailer selling a final product or a retailer rendering a service.

#### **3.3.1.1 Function of the facility**

As stated in section 3.3, a facility can be classified according to the facility's function as a production facility, a storage facility, a distribution centre, the premises from which a retailer operates or a service facility.

Within a production facility, raw-materials or semi-finished products are received from suppliers and transformed into final products that are sold to customers, for example a car manufacturing plant that receives different components (raw-materials or semi-finished products) to build its cars. Production facilities can be designed to be either dedicated and to produce a specific number of products, or to be flexible and produce a variety of products (Chopra and Meindl, 2016:60). Dedicated production facilities are usually more cost-efficient, since the facility can take advantage of economies of scale and streamline the production of products (Christopher, 2011:174; Hasan, Sarkis & Shankar, 2012:900). On the other hand, flexible production facilities have the ability to produce a variety of products according to customer demand and can respond faster to the needs of customers



(Christopher, 2011:174; Hasan et al., 2012:898). As production facilities are generally associated with the manufacturing sector, and the focus of this study is on small businesses operating in the retail sector, production facilities fall outside the scope of this study.

A storage facility can be used to hold several types of inventory, for example safety or seasonal inventory in preparation for fluctuating customer demand (Richards, 2014:9; Baker and Canessa, 2009:425). Generally, large businesses store products at a storage facility situated away from retail outlets, until a customer's demand becomes evident and then it is transported to the retail outlet (Monckza et al., 2016:20). For example, a large hardware retailer who stockpiles steel beams at a facility situated away from the retail outlet until a customer places an order for steel beams. The steel beams would only be transported from the storage facility to either the retail outlet or directly to the customer once the customer's order has been placed. Smaller retailers are known to use a storage facility (or room) at their shops to store inventory (Fernie and Sparks, 2014:4). Any facility that a small retail business uses to store inventory received from first-tier suppliers, is considered to be a storage facility. The inventory can be stored either at the premises from which the business is operated or at a facility located elsewhere. The World Bank reports (2014:207) that business owners in townships indicated that there is a lack of storage space within townships, especially for those businesses operating within the "make, process, or repair" industry. The lack of storage space influences the amount of inventory that these retailers purchase (World Bank, 2014:207).

Generally, large retailers use cross-docking distribution centres to break large orders down into smaller batches and then send them to different retail outlets (Vincent, Jewpanya, & Redi, 2016:1117). For example, when Pick n Pay places a large order for Tastic rice from Tiger Brands, the latter will deliver the order to Pick n Pay's cross-docking centre, where it will be broken down into smaller batches and sent to different retail outlets (or franchises). Thus, the inventory is transported directly to the retail outlets and is not stored until customer demand arises. Not only do businesses that utilise cross-docking distribution centres save on transportation costs (due to large shipments, transported less frequently, to the cross-docking distribution centre), but they also save on inventory costs as they receive discount on bulk purchasing (Agustina, Lee & Piplani, 2014:29). Small retailers who do not form part

of a retail group, such as Pick n Pay, or a franchise such as McDonald's, generally do not make use of a cross-docking distribution centre; they receive their inventory directly from first-tier suppliers.

The retail premises are the facility from which a retailer sells products to customers, for example the Woolworths retail outlet where a customer purchases groceries. Managers should bear in mind their target market when designing or selecting the premises for their retail outlet. Factors, such as product variety and level of shopping convenience, will influence the size and layout of the retail premises (Kotler, Burton, Deans, Brown & Armstrong, 2013:435). For example, a small retailer who strives to provide customers with a fast shopping experience would focus on obtaining retail premises that are designed for fast and convenient shopping.

A service facility is a facility where a service is rendered to a customer and includes an inventory component, for example when a panel beater installs a bumper on a customer's car, the facility from which he operates is the service facility and the bumper is the inventory item (Berman and Sapna, 2002:464; Berman and Sapna, 2001:430). Service retailers must aim to balance the optimal rate at which a service is provided and the cost of providing the service (Berman and Sapna, 2001:429). An increase in the rate of providing the service will increase cost, such as overheads and storing costs, as the retailer has to ensure that inventory and staff are available; whereas a decrease in the rate of providing customers with a service will lead to a decrease in costs, as less inventory can be kept and less staff employed. Managing service facilities to reduce customers' waiting periods (lead-times) will increase, not only the retailer's level of responsiveness, but also profit, as more customers can be assisted (Berman and Sapna, 2001:429).

### **3.3.1.2 Location of the facility**

According to Chopra and Meindl (2016:59), the most important factor to consider with regard to the location of a facility, is the decision to use a centralised or decentralised facility system. When using a centralised facility system, a business will have fewer facilities than with a decentralised facility system. The advantages of a centralised facility system lie in lower facility costs (for example administration costs) and increased efficiency of the facility

through economies of scale (decreasing the facility cost per unit) (Graungaard Pedersen et al., 2012:353). The disadvantages of a centralised facility system are increased transportation costs and delivery times, due to the increased distances that the inventory travels between suppliers, customers and the facility. Therefore, a centralised facility system can increase the cost-efficiency (if the cost advantage gained from economies of scale outweighs the increase in transportation costs) at the expense of the level of responsiveness (due to longer distances travelled). Gaining the advantages of economies of scale (by purchasing in large quantities) when using a centralised facility system, may prove to be more difficult for smaller businesses with their limited resources (Graungaard Pedersen et al., 2012:366).

Alternatively, when using a decentralised facility system, a business will have more facilities available. The advantages of using a decentralised facility system lie in the shorter distances and delivery times of inventory between the suppliers, customers and facilities (Schmitt, Sun, Snyder & Shen, 2015:202). Holding inventory closer to customers allows a retailer to reduce transportation costs and meet customers' needs faster (Richards, 2014:20). According to the World Bank (2014:153), the owners and managers of businesses in the Diepsloot township are aware that being located close to their customers is an advantage, since their customers mainly reside in the neighbourhood and generally walk to the retailer from their homes or on their way from a taxi rank. The World Bank (2014:163) reports that these owners and managers indicated that instead of expanding their current shops (facilities) they would rather open more shops at different locations (decentralising) in order to be close to more customers. The disadvantage of using a decentralised facility system is that the number of facilities that needs to be managed will increase, and therefore costs, such as administration costs, will escalate (Wisner et al., 2016:321). The advantage of gaining economies of scale by purchasing in bulk is more difficult to obtain when using a decentralised facility system, as each facility can only handle a specify number of inventory items. Consequently, businesses need to weigh the cost benefits associated with a centralised facility, against the benefits of responsiveness associated with decentralised facilities when deciding on the type of facility system required (Coyle, Langley, Novack & Gibson, 2013:474).

In terms of this study, a small retailer who stores inventory (including the inventory that a retailer uses to render a service) or produces a product at their premises, and not at a facility located elsewhere, is implementing a centralised facility system. Thus, first-tier suppliers will deliver inventory to the same premises that first-tier customers will purchase a product from or obtain a service, such as a haircut. A small retailer who stores inventory (including the inventory that a retailer uses to render a service, for example a plumber) or produces products at a different location than where the first-tier customers purchase the products, will have a decentralised facility system.

The next management decision component is the facility's capacity.

### **3.3.1.3 Capacity of the facility**

The capacity of a facility refers to a number of issues, such as the maximum average rate at which inventory can flow through the system; the rate at which a service can be rendered; or the available storage space at a facility (Wisner et al., 2016:527; Bowersox et al., 2013:103). The available capacity of a facility influences business performance in terms of responsiveness and cost-efficiency (Chopra and Meindl, 2016:60). Having excess capacity will increase costs, but will enable the business to respond swiftly to changes in customer demand (Kamath and Roy, 2007:336). Excess storage capacity will allow a business to store additional inventory and have the items on hand whenever customer demand arises. Additional capacity for service retailers will entail, for example, an accountant having sufficient time to take on additional clients, or a plumber having free time to assist an existing customer with an additional problem. Although excess capacity can increase the level of responsiveness, cost-efficiency will decrease, as idle capacity does not generate revenue and also increases facility costs (Hugos, 2006:10-11). On the other hand, by not having excess capacity available, the level of cost-efficiency increases (due to a decrease in facility costs) at the expense of the level of responsiveness, as any change in customer demand cannot be met timeously.

Small retailers must decide whether they prefer to make provision for fluctuations in customer demand by having additional capacity (thus increased responsiveness at higher cost), or whether they would rather wait until a first-tier customer's demand is known. This

will allow them to purchase the appropriate level of inventory from first-tier suppliers, and so eliminate the need for excess capacity (thus increasing cost-efficiency at the expense of responsiveness) (Chopra and Meindl, 2016:60-61).

### **3.3.2 Management of facilities by small retailers**

The purpose of this section is to summarise the literature and the results of previous studies conducted in townships (section 3.3.1), on the ways in which the different components of facility decisions are *generally* managed; based on a small retail business' (including service retailers) orientation towards either responsiveness or cost-efficiency, as aligned with its supply chain strategy.

**Table 3.1 Components of decisions on facilities by retailers – depending on their focus**

Supply chain driver	Components of decisions related to facilities	Management decision when focused on responsiveness	Management decision when focused on cost-efficiency	Relevant authors	Related section in discussion
Facilities	Classification as storage, retail or service facility	<p><b>Facility characteristics:</b> Excess inventory (safety or seasonal) is purchased and stored, either in-store or at a storage facility situated away from the retailer.<sup>LF13</sup></p> <p>Retail facility (premises) is designed to increase the customer’s level of shopping convenience. Ample storage space is available at the retail premises to store additional inventory.<sup>LF13</sup></p> <p>Service facility is managed to reduce the time that customers wait to receive the specific service (lead-time). Facility is flexible - by holding sufficient inventory and staff to perform the service.<sup>LF13</sup></p>	<p><b>Facility characteristics:</b> Excess inventory (safety or seasonal) is not purchased and therefore there is no need for a storage facility.<sup>LF14</sup></p> <p>A smaller retail facility (premises) is selected as limited or no excess inventory is held.<sup>LF14</sup></p> <p>Service facility is managed to focus on reducing costs by not holding excess inventory and employing only the necessary number of staff.<sup>LF14</sup></p>	<p>Richards 2014:9</p> <p>Bowersox et al. 2013:37</p> <p>Kotler et al. 2013:435</p> <p>Lawrence et al. 2013:4771</p> <p>Berman and Sapna 2001:429, 430</p>	<p>3.3</p> <p>3.3.1.1</p>

	Location	<b>Number of stores:</b> Rather open an additional shop in order to be located close to more customers, than expand current facility (decentralised system). <sup>LF13</sup>	<b>Number of stores:</b> Have only one facility from where the business is operated (centralised system). <sup>LF14</sup>	Chopra and Meindl 2016:59  Wisner et al. 2016:321  Schmitt et al. 2015:202  Richards 2014:20	3.3.1.2
		<b>Closeness to customers:</b> Stores are located close to customers or taxi ranks to increase responsiveness (reduce lead-times). <sup>LF13</sup>	<b>Closeness to customers:</b> Not willing to rent an additional facility to be located closer to customers, as cost-efficiency would decrease. <sup>LF14</sup>	World Bank 2014:153, 163  Coyle et al. 2013:474  Graungaard Pedersen et al. 2012:353	
	Capacity or available space	<b>Excess capacity:</b> Excess capacity is available to render a service or to store inventory. <sup>LF13</sup>	<b>Excess capacity:</b> Fixed capacity available to render services and store inventory. <sup>LF14</sup>	World Bank 2014:207  Kamath and Roy 2007:336  Hugos 2006:10-11	3.3  3.3.1.3

Source: Compiled by researcher

In the next section the logistical supply chain driver *inventory* is discussed. The section is structured to first, discuss the relevant aspects to consider when making decision on inventory, followed by the management of inventory, depending on the business' orientation towards responsiveness or cost-efficiency.

### **3.4 Inventory as a logistical supply chain driver**

Inventory includes all goods in motion and at rest within a supply chain, which can consist of raw materials, semi-finished products (also referred to as intermediate products) and finished products (Coyle et al., 2013:636). Raw materials refer to low-value, unfinished products that are used to produce finished products (Monczka et al., 2016:622-624; Pienaar and Vogt, 2012:221), for example, the flour purchased by a small bakery from a first-tier supplier to bake bread (the finished product).

Semi-finished inventory has not yet been transformed into a final product and includes all inventories that are idle and waiting to be transported to another process or station within a production process (Monczka et al., 2016:622-624). Semi-finished inventory is more valuable than raw materials, but less valuable than finished products (Pienaar and Vogt, 2012:221). An example of semi-finished products is the different ingredients of a menu item that can be converted into the final product (dish) at a later stage.

Finished products are inventory items sold to customers for different uses (Monczka et al., 2016:623). Although the business selling the finished product can view the product as a finished product, the customer may view the product as either a semi-finished or a finished product, depending on the purpose of the product. A haberdashery will, for example, view fabric as a final product, whereas the customer who purchases the fabric with the purpose of making a quilt, will view the fabric as a semi-finished product. As this study is focused on small retailers, the products that they purchase from first-tier suppliers can either be semi-finished goods that they will convert into finished products (such as the ingredients used by a small bakery), or finished products that they will sell directly to their first-tier customers (such as a hammer sold by a hardware store).

Inventory is kept in a supply chain to address the imbalance between the supply and demand of products (Chopra and Meindl, 2016:61). A retailer will, for example, carry additional inventory in



anticipation of future customer demand or in preparation for an event, such as a sale or the holiday season. Retailers who deliver a service will view the products that they use to perform the service, as inventory, for example the electrical cables that an electrician installs at a house (Berman and Sapna, 2001:430). The challenge lies in finding the right balance between the amount of inventory that businesses should carry to satisfy unpredictable customer demand, and the cost of carrying additional inventory (Ehrental, Honhon & Van Woensel, 2014:527; Pienaar and Vogt, 2012:218). Within many businesses, inventory is the most expensive asset and should be managed effectively (Monczka et al., 2016:621-622; Wisner et al., 2016:209). Effective inventory management implies that the right amount of inventory is purchased to support the business' day to day activities, whereas ineffective inventory management can lead to excess inventory and a waste of resources (Wisner et al., 2016:209). Generally, small township businesses do not find it difficult to purchase inventory, since these businesses can select from multiple first-tier suppliers and even search for first-tier suppliers with the lowest prices (World Bank, 2014:172).<sup>LF15</sup> The different decisions managers have to make with regard to inventory are discussed in the next section.

### **3.4.1 Components of inventory decisions**

Managers classify inventory as cycle, safety or seasonal inventory, depending on the purpose of the inventory. Each of the classifications is discussed in sections 3.4.1.1 to 3.4.1.3 below.

#### **3.4.1.1 Cycle inventory**

Cycle inventory is the average amount of inventory that is purchased or produced in order to satisfy customer demand within a specific cycle (weekly/monthly/annually) (Horn et al., 2014:80).

On average, small retailers purchase inventory every two weeks (World Bank, 2014:153, 155, 172).

<sup>LF16</sup> Within the retail sector, cycle inventory will include products that retailers sell to first-tier customers, products that a service provider uses to render the service to first-tier customers, as well as products that retailers use to produce other products. According to the World Bank (2014:173, 175), small businesses in townships in Gauteng usually purchase inventory from Marabastad (a market situated in Pretoria), large wholesalers (for example Makro), or business associates (for example Muslim retailers often purchase from others in the Muslim community). These retailers usually search for the lowest prices among the different suppliers, as purchasing

inventory at a lower price allows them to price their products lower than their competitors (World Bank, 2014:173).

When ordering cycle inventory, managers must first consider the amount and frequency of inventory that is required (Islam, Meier, Aditjandra, Zunder & Pace, 2013:3-4). Businesses that purchase cycle inventory in large batches, do so to take advantage of economies of scale; as this will lead to a decrease in the costs of production, transportation, ordering and purchasing. Although purchasing cycle inventory in large batches decreases costs, managers should be aware of the cost increase in carrying a large amount of inventory (Chopra and Meindl, 2016:62, 280). Some township businesses are known to coordinate when purchasing inventory in bulk, in order to gain the advantage of economies of scale (World Bank, 2014:173); something they would not be able to do on their own.

#### **3.4.1.2 Safety inventory**

Any additional inventory held above cycle inventory is classified as safety inventory. The purpose of safety inventory is to prevent a loss of sales due to stock-outs (Coyle et al., 2013:324). Therefore, safety inventory buffers a business against unpredictable customer demand (Bowersox et al., 2013:48; Baker and Canessa, 2009:425). Managers should carefully determine the amount of safety inventory items to hold, because if a surplus is held, a mark-down may be required in order for it to be sold. Not only will income be lost (because of the mark-downs), but the carrying cost will decrease cost-efficiency (Graungaard Pedersen et al., 2012:354). On the other hand, insufficient safety inventory may result in decreased responsiveness, and a consequent loss in sales (Baily, Farmer, Crocker, Jessop & Jones, 2008:164). The managers or owners of small retail businesses should determine the level of safety inventory depending on their orientation towards cost-efficiency or responsiveness. According to the World Bank (2014:207), almost 20% of business owners in townships reported that they cannot purchase excess (safety) inventory as they do not have space to store it.

#### **3.4.1.3 Seasonal inventory**

Inventory that is accumulated to counter predictable seasonal customer demand is called seasonal inventory. A business will produce or purchase additional inventory in times when customer

demand is low, in preparation for times when demand is high (Chopra and Meindl, 2016:63; Ehrenthal et al., 2014:527). For example, a small bakery will bake additional rusks in summer or a small retail grocery store will purchase additional hot chocolate (when the demand for rusks and hot chocolate are lower) in preparation for the increase in demand during winter. Deciding whether or not to produce seasonal inventory usually depends on the flexibility of the production process. If the production process can be adapted easily and cost-efficiently to increase the production rate, the business may not consider it necessary to hold seasonal inventory. However, if changing the production process in order to produce more is expensive, it would be wise to rather produce at a constant rate and build up seasonal inventory (Wisner et al., 2016:211). Then again, if inventory is produced at a constant rate, it will deprive the business of the opportunity to save costs by halting the production line during periods of low customer demand. The decision to purchase seasonal inventory depends mainly on whether the small retailer views the increase in carrying cost worth having the products available when customer demand is higher. Therefore, purchasing seasonal inventory will increase the retailer's level of responsiveness at the expense of the level of cost-efficiency (Chopra and Meindl, 2016:63).

In section 3.4.2 the different components of inventory decisions are summarised in terms of the retailer's focus on responsiveness or cost-efficiency.

### **3.4.2 Management of inventory by small retailers**

In this section, the findings from the literature and the results of previous studies conducted in townships (as discussed in section 3.4.1) are summarised in order to provide an overview of the management of the components of inventory decision by small retailers (including service retailers) based on the orientation of their supply chain strategy.

**Table 3.2 Components of decisions on inventory by retailers – depending on their focus**

Supply chain driver	Components of decisions related to inventory	Management decision when focused on responsiveness	Management decision when focused on cost-efficiency	Relevant authors	Related section in discussion
Inventory	Cycle inventory	<b>Order frequency of cycle inventory:</b> Order frequently and in smaller batches for immediate satisfaction of customer demand, thereby forgoing the possibility of saving costs (such as ordering, carrying and transportation costs). <sup>LF17</sup>	<b>Order frequency of cycle inventory:</b> Order less frequently to minimise costs (such as ordering, carrying and transportation costs) and in large batches to benefit from economies of scale. LF18	Chopra and Meindl 2016:62, 280	3.4.1.1
		<b>Purchasing inventory:</b> Do not find it difficult to purchase inventory from suppliers as retailers can select from multiple suppliers. <sup>LF15</sup>	<b>Purchasing inventory:</b> Do not find it difficult to purchase inventory from suppliers as retailers can select from multiple suppliers. Retailers actively search for the supplier with the lowest prices. <sup>LF18</sup>	World Bank 2014:172  Islam et al. 2013:3-4	3.4.1.2
		<b>Partnerships between retailers:</b> Generally do not collaborate with other retailers to purchase inventory. <sup>LF17</sup>	<b>Partnerships between retailers:</b> Purchase large amounts of inventory together with other retailers to gain the advantage of economies of scale. LF18	Graungaard Pedersen et al. 2012:352-353	

	Safety (or excess) inventory	<b>Quantity of safety inventory:</b> Hold a large amount of safety inventory to ensure immediate satisfaction of customer demand. <sup>LF17</sup>	<b>Quantity of safety inventory kept:</b> Hold a small amount of inventory items to save on costs (such as carrying costs and loss of income due to mark-downs). <sup>LF18</sup>	World Bank 2014:172, 207  Bowersox et al. 2013:48  Coyle et al. 2013:324  Baker and Canessa 2009:425	3.4.1.2
		<b>Space to store safety inventory:</b> Pay rent for additional space to store safety inventory, thereby increasing the level of responsiveness. <sup>LF17</sup>	<b>Space to store safety inventory:</b> Hold a small amount of inventory items, therefore additional space does not have to be rented. <sup>LF18</sup>	Baily et al. 2008:164	
	Seasonal inventory	<b>Provision for seasonal demand:</b> Purchase additional products in off-peak periods to make provision for increased demand in peak periods. <sup>LF17</sup>	<b>Provision for seasonal demand:</b> Do not make provision in off-peak periods for increased demand in peak periods; instead save on costs (such as carrying costs) during off-peak periods. <sup>LF18</sup>	Chopra and Meindl 2016:63  Wisner et al. 2016:211  Ehrental et al. 2014:527	3.4.1.3

Source: Compiled by researcher

In the next section the logistical supply chain driver *transportation* is discussed. The section is structured to first discuss the relevant components of transportation decisions, followed by the management of transportation by small retail businesses in terms of their orientation towards responsiveness or cost-efficiency.

### **3.5 Transportation as a logistical supply chain driver**

Transportation is an important part of logistics and is a key driver within supply chain management (Monczka et al., 2016:659). It can be described as the movement of inventory from one point to another, since products are seldom produced, sold and consumed at the same location (Goldsby et al., 2014:4-5; Nwaogbe, Omoke, Ubani & Ukaegbu, 2013:1). Transportation does not only refer to transporting inventory, but also to the delivery of a service to a customer, for example when a plumber needs to drive to a customer to repair a problem. Transportation reduces the business' financial resources through costs for, among others, labour, fuel, vehicles and vehicle maintenance (Bowersox et al., 2013:187). Transportation is present in all four supply chain linkages discussed in section 3.2.3 (Monczka et al., 2016:659) and can influence the success of a supply chain (Chopra and Meindl, 2016:431).

Transportation should be managed effectively and cost-efficiently, since it generally forms the largest logistical expense for any business (Bowersox et al., 2013:187). Effective transportation management refers to the extent that transportation contributes to meeting customer needs; whereas cost-efficient transportation management measures how economically transportation can be used to meet customer needs (see section 1.2.3.2). Holter, Grant, Ritchie and Shaw (2008:22) identify two reasons for the importance of transportation management, particularly in small businesses. First, transportation is a process that is repeated numerous times throughout the supply chain and secondly, transportation is the most costly logistical activity for many small businesses (see section 3.2.2). Through the effective and cost-efficient management of transportation, customers' expectations can easily be met (Bowersox et al., 2013:187). In a study by the World Bank (2014:153) small retailers within townships indicated that they find it easy to transport their inventory and that keeping transportation costs low provides a competitive advantage. If the owner or manager of a small business in a township collects inventory from a supplier themselves, the average transportation costs is between R300 and R350 per trip (World

Bank, 2014:153, 172).<sup>LF19</sup> Township retailers who purchase inventory in large quantities from wholesalers do not have any transportation costs, as the wholesalers usually provide free delivery to these customers.<sup>LF20</sup> Many small businesses in Gauteng townships purchase inventory from markets (such as Marabastad in Pretoria) and other small businesses that do not offer delivery services (World Bank, 2014:151-153, 172-173, 206).

Regardless of the type of product being transported, four crucial participants are involved and have to work together to ensure that transportation is managed effectively and cost-efficiently. These participants are shippers, carriers, owners of transport infrastructures and the relevant governing bodies (Chopra and Meindl, 2016: 413). A shipper moves a product or service from one point in the supply chain to another with the aim of minimising the cost of transportation, while bearing in mind the desired level of responsiveness. The carrier is contracted by the shipper to move a specific product or service to an allocated site. The task of a carrier includes investing in transportation equipment and making operating decisions (Bowersox et al., 2013:188-190). South Africa's transport infrastructures are mainly publicly owned and are managed by Transnet and the South African National Road Agency. The Department of Transport, including the nine provincial transport departments, are responsible for formulating transportation policies that are used as guidelines for the amount of resources that the government should spend on improving and maintaining infrastructure. Small retail businesses must adhere to all policies, rules and regulations promulgated by these governing bodies.

For small retailers, transportation in the supply chain will entail collecting or receiving inventory from a first-tier supplier, and delivering inventory to first-tier customers (if a delivery service is offered). The different management decisions regarding transportation are discussed in the next section.

### **3.5.1 Components of transportation decisions**

The different modes and routes, by which inventory is transported to different locations, are referred to as the transportation network. A well-designed transportation network will assist a supply chain to achieve the desired level of responsiveness at the lowest possible cost (Chopra and Meindl, 2016:64).

### **3.5.1.1 Transportation routes**

When designing a transportation network, managers should consider two aspects; first, whether the inventory will be transported directly from the supplier to the customer and secondly, whether the inventory will pass through an intermediate site, such as a cross-docking distribution centre (see section 3.3.1.1) (Chopra and Meindl, 2016:64). These two aspects are discussed below.

#### **a) Direct transportation of inventory**

Direct shipment of inventory indicates that inventory does not go through an intermediate storage site, but is directly transported from a supplier to a customer. This means that the coordination between the different supply chain members is relatively easy in many ways, for example, the scheduling of delivery times. Direct delivery will minimise the time that inventory spends in transit (Chopra and Meindl, 2016:64-65). In terms of this study, direct transportation will entail the direct delivery of inventory from a first-tier supplier to the small retailer, as well as the direct delivery from the small retailer to a first-tier customer. For example, if a small hardware store ordered inventory from Builders Warehouse and the inventory is delivered directly by Builders Warehouse to the small hardware store, direct delivery took place. According to the World Bank (2014:206), some owners and managers of small retail businesses in townships use their own private vehicles to deliver inventory to customers.

#### **b) Transportation of inventory through an intermediate site**

Inventory can be transported through an intermediate site before delivery to a customer. When a cross-docking distribution centre is used, a supplier will send a truck containing several customers' inventory to the centre to be combined with inventory from other suppliers. By coordinating and sharing transportation, the inbound costs can be lowered. An outbound truck will combine the inventory from several suppliers destined for one customer (Chopra and Meindl, 2016:423; Yu and Egbelu, 2013:168).

In a storage facility, inventory from a supplier is received and stored until a customer needs the inventory. Inbound transportation costs decrease since suppliers can benefit from economies of scale by sending large shipments of inventory to the storage facility. Normally the outbound



transportation costs are low, as the storage facility centre is located close to customers when using a decentralised facility system (Chopra and Meindl, 2016:423).

The next component within the transportation network that should be considered is the mode of transportation.

### **3.5.1.2 Mode of transportation**

The mode of transportation describes the type of transportation that is used to move products from one point to another in the supply chain. Pienaar and Vogt (2012:334) identify three basic forms of transportation, namely land, water and air. Land transportation can be divided into road, rail and pipeline transportation; whereas water transportation can be divided into sea and in-land water transportation. Since in-land water transport is only common in European countries, this is not included in the discussion below. The sections below are structured to discuss each mode of transportation in terms of its relevance to this study.

#### **a) Rail transportation**

Rail transportation has the advantage of transporting large volumes of goods, and is therefore one of the most cost-efficient modes of transportation (Goldsby et al., 2014:25). A disadvantage of using rail transport is long transit times (Langley, Coyle, Gibson, Novack & Bardi, 2009:279). Transnet Freight Rail (TFR), a state-owned business in South Africa, is responsible for all rail freight transport activities within the country. In 1938 the TFR network coverage was already 95% completed, and 40% of the network had electrified traction. Unfortunately, investment and maintenance have been limited until 2005, and it was only in 2013 that TRF invested R16.2 billion for the maintenance of the existing infrastructure (CSIR, 2014:28-29). In South Africa, rail transportation is mainly used for low-value raw materials travelling over long distances, such as agricultural products (Stellenbosch University, 2015:13). When using rail transportation, the level of cost-efficiency increases at the expense of responsiveness. Since rail transportation is generally associated with large volumes, and small retailers operating in townships generally purchase inventory in smaller quantities, rail transportation is not a viable option for these retailers.

## **b) Pipeline transportation**

For businesses that move large volumes of liquids, pipeline transportation will form an important part of its supply chain (Goldsby et al., 2014:37). In South Africa, Transnet Pipeline is the primary provider and operator of pipelines and it transported 16.7 billion litre of liquid fuel and 494 million metric tons of gas in the 2012/2013 financial year (CSIR, 2014:35). For example, Sasol transports jet fuel through the 60 km pipeline from Natref refinery in Sasolburg to OR Tambo International Airport (CSIR, 2014:35). For the purpose of this study, pipeline transportation is disregarded since the relevant businesses do not deal in large volumes of liquids.

## **c) Water transportation**

Water transportation, also known as port transportation, is the oldest mode of transportation and includes both inland and ocean going vessels. Usually these vessels transport low-value items in large quantities (Bowersox et al., 2013:198). This is a less expensive mode of transportation, but has limited flexibility and is slow in speed (Monczka et al., 2016:671). South Africa has eight commercial ports under the Transnet National Ports Authority and each port has specific operations, for instance Saldanha handles mostly iron ore and Mossel Bay off-shore oil and gas (CSIR, 2014:33-34). Port transportation is typically used by businesses purchasing large quantities of goods or raw materials from international suppliers (Monczka et al., 2016:671). Water transportation is not a viable option for the small retailers in this study since they are situated inland.

## **d) Air transportation**

Air transportation is a fast, but expensive mode of transportation and is mainly used for time-sensitive and high-value items (Chopra and Meindl, 2016: 412). Air carriers that specialise in cargo transportation will use the full capacity of the aircraft and focus on long distance routes. Some passenger airlines allow cargo to be carried in the lower cargo hold (Goldsby et al., 2014:36). The Airports Company of South Africa invested approximately R20 billion in all ten airports, but this investment was focused on improving only the passenger handling infrastructure (CSIR, 2014:36). When using air transportation, the level of responsiveness increases at the expense of cost-efficiency. Air transportation is a possible, but unlikely mode of transportation for the small

retailers, because of the expense involved. In the event of a small retailer requiring a product urgently, for example a specific car part, the auto retailer could turn to a first-tier supplier who uses air transport. The first-tier customers of the Soweto retailers would normally not require such a service from these retailers.

**e) Road transportation**

Road transportation is viewed as the most popular mode of transportation as it is fast and reliable (Monczka et al., 2016:671; Goldsby et al., 2014:17). Different vehicles, from small delivery vans to large trucks are used to move inventory from its point of origin to its final destination in the supply chain. The available highway networks enable trucks to reach nearly every shipping and receiving location (Coyle et al., 2013:405-406). The ability of road transportation to deliver door-to-door makes it the most flexible mode of transportation. This flexibility comes at a cost, since transportation by road is more expensive than by rail and water (Monczka et al., 2016:669).

In South Africa, the managing, financing, improving and maintenance of South African roads are the responsibility of the South African National Road Agency Limited, known as SANRAL. According to the 10<sup>th</sup> Annual State of Logistics Survey of South Africa, the comprehensive road network of the country consists of 535 000 km proclaimed roads, including 366 872 km non-urban roads (CSIR, 2014:31). Although road transportation is more expensive than other modes of transportation, the advantage of easy access to the final location normally outweighs the additional costs (Chopra and Meindl, 2016:416). The World Bank (2014:206) reports that small businesses operating within townships primarily use road transportation when collecting inventory for their stores. Retailers who purchase smaller quantities of inventory have to travel to wholesalers that are located within a reasonable distance from their stores, by using public transport (taxis in the form of mini-busses), or by hiring a small truck (referred to as a *bakkie*) (World Bank, 2014:151-153, 172-173). This is in line with Goldsby et al. (2014:24) who state that small businesses primarily use road transportation by selecting small trucks and motor vehicles to transport inventory. Road transportation will increase a retailer's level of responsiveness, but at the same time decrease the level of cost-efficiency (Hugo and Badenhorst-Weiss, 2011:179–180).

## **f) Intermodal transportation**

Intermodal transportation involves more than one mode of transportation (road, rail, water and air) to move inventory from its origin to its final destination within the supply chain (Coyle et al., 2013:405). It aims to take advantage of the inherent economies of each mode of transportation in order to ultimately provide an integrated transportation service at a lower cost (Bowersox et al., 2013:188-190).

The most common intermodal transportation method is the combination of road and rail transportation (Chopra and Meindl, 2016: 417). The flexibility of road transportation for shorter distances is combined with the cost-efficiency of rail for longer distances (Bowersox et al., 2013:201). Intermodal transportation goes beyond the first-tier supplier(s) and first-tier customer(s) of a supply chain. In a typical retail supply chain, intermodal transportation will entail the moving of raw materials from a supplier to a manufacturer using rail transportation; whereafter the manufacturer will transfer the semi-finished or finished product to a wholesaler, using road transportation.

In South Africa the move from road, back to rail transportation, is high on both the private and public sectors' agendas. The main reason for this sought-after shift is to preserve roads and lower logistics costs. It is hoped that this rail-friendly policy will also increase South Africa's competitiveness (CSIR, 2014:39). This shift to rail and intermodal transportation on the whole, is however unlikely to directly impact the small retail businesses in Soweto, since they will continue to transport inventory by road.

### **3.5.2 Management of transportation by small retailers**

The findings from the literature and the results of previous studies conducted in townships (as discussed in section 3.5.1) are summarised in this section. An overview of the components of the different transportation decision by small retailers, based on the orientation of their supply chain strategy, is provided in table 3.3.

**Table 3.3 Components of decisions on transportation by retailers – depending on their focus**

Supply chain driver	Components of decisions related to transportation	Management decision when focused on responsiveness	Management decision when focused on cost-efficiency	Relevant authors	Related section in chapter
Transportation	Routes	<p><b>Delivery of inventory:</b> Use direct delivery of inventory from and to first-tier suppliers and customers in order to minimise transit time and to increase the level of responsiveness.<sup>LF21</sup></p>	<p><b>Delivery of inventory:</b> Retailers order large quantities of inventory to qualify for free delivery from suppliers. Larger retailers may have inventory delivered to an intermediate site to lower inbound transportation costs.<sup>LF22</sup></p>	<p>Chopra and Meindl 2016:64-65</p> <p>World Bank 2014:151-153, 172-173, 206).</p> <p>Yu and Egbelu 2013:168</p>	3.5.1.1
	Mode	<p><b>Mode of transportation:</b> Use fastest and most flexible modes to transport inventory between suppliers and customers.<sup>LF21</sup></p> <p><b>Availability of transportation:</b> Transportation of inventory is effortless and most often a car is used or a small truck is hired to increase flexibility.<sup>LF19</sup></p>	<p><b>Mode of transportation:</b> Use slowest and cheapest mode to transport inventory between suppliers and customers.<sup>LF22</sup></p> <p><b>Availability of transportation:</b> Transportation of inventory is effortless and most often a car is used or a small truck is hired to save on transportation costs.<sup>LF22</sup></p>	<p>Monczka et al. 2016:671</p> <p>World Bank 2014:151-153, 172-173, 206</p> <p>Goldsby et al. 2014:17</p> <p>Hugo and Badenhorst-Weiss 2011:179–180</p>	3.5.1.2

Source: Compiled by researcher

### 3.6 Conclusion

Chapter 3 focused on the three logistical supply chain drivers identified in chapter 1, namely facilities, inventory and transportation. It was established that within a retail supply chain, products are moved between the different supply chain members through the four supply chain linkages, namely inbound logistics, intra-organisational movements, outbound logistics and reverse logistics. The three logistical supply chain drivers are present within each of these linkages, and therefore must be managed as a cohesive unit.

It was established that South Africa, as a developing country, faces certain logistical constraints and can be classified as a transport intensive economy. Facilities, inventory and transportation contribute significantly to the total logistical costs of the country. It was concluded that small businesses generally make use of third-party logistics service providers to perform their logistical functions.

Facilities, inventory and transportation were discussed in terms of the different components that managers need to consider when deciding on the management of the three logistical supply chain drivers. The management of the three logistical supply chain drivers in terms of the level of responsiveness and cost-efficiency that are aimed for, should be aligned with the level of responsiveness and cost-efficiency stipulated by the selected supply chain strategy. Each component influences the level of responsiveness and cost-efficiency that the business aims for.

Managing facilities when orientated towards responsiveness will entail that the business implements a decentralised system with excess capacity; while managing facilities when orientated towards cost-efficiency, will entail that the small retailer implements a centralised system with the minimum excess capacity.

A retailer orientated towards responsiveness will order cycle inventory on a frequent basis, hold large amounts of safety inventory, and prepare for seasonal changes in demand. However, when a retailer is orientated towards managing inventory cost-efficiently, the retailer will order cycle inventory on an ad-hoc basis, hold small amounts of safety inventory and will not prepare for seasonal changes in demand.

With regard to transportation, a retailer who is orientated towards responsiveness will have inventory delivered directly from first-tier suppliers and deliver directly to first-tier customers, using the fastest mode of transportation. Cost-efficient transportation will entail that when the customer's needs are known to the retailer, the cheapest and slowest mode of transportation will be used. The fourteen literature findings in this chapter are presented in table 3.4.

**Table 3.4 Literature findings in chapter 3**

Literature findings	
LF9:	Small businesses face the same logistical challenges as large businesses (refer to section 3.2.2).
LF10:	Small businesses generally use a third-party logistics service provider, specifically for the transportation function (refer to section 3.2.2).
LF11:	The majority of a small business' logistics costs consist of transportation costs (refer to section 3.2.2).
LF12:	A general lack of retail space exists within townships (refer to section 3.3).
LF13:	When facilities, as a logistical supply chain driver, are managed responsively: <ul style="list-style-type: none"> <li>a) excess capacity is available either at a storage facility or at the retailer's premises to store excess inventory or to render additional services,</li> <li>b) lead-times are reduced by holding sufficient inventory and hiring additional staff,</li> <li>c) a decentralised system is implemented in order to be closer to customers,</li> <li>d) stores are located close to customers,</li> <li>e) the retailer's premises are designed to increase customers' level of convenience (refer to sections 3.3, 3.3.1.1, 3.3.1.2, 3.3.1.3 and 3.3.2).</li> </ul>
LF14:	When facilities, as a logistical supply chain driver, are managed cost-efficiently: <ul style="list-style-type: none"> <li>a) fixed capacity is set to render services and to store inventory at the retailer's premises or storage facility,</li> <li>b) excess capacity is not required, as excess inventory is generally not purchased,</li> <li>c) costs are reduced by not holding excess inventory and not hiring additional staff,</li> <li>d) a centralised facility system is implemented to reduce costs,</li> <li>e) smaller retail premises are selected, as no (or limited) excess inventory is purchased (refer to sections 3.3, 3.3.1.1, 3.3.1.2, 3.3.1.3 and 3.3.2).</li> </ul>

LF15: Retailers within townships do not find it difficult to purchase inventory, since there are numerous suppliers in the areas (refer to section 3.4 and 3.4.2).

LF16: Generally, small township retailers purchase inventory every two weeks (section 3.4.1.1).

LF17: When inventory, as a logistical supply chain driver, is managed responsively:

- a) small batches of inventory are ordered frequently, for immediate satisfaction of customer demand,
- b) a large amount of safety inventory is held,
- c) provision is made for fluctuating customer demand, by carrying safety and seasonal inventory,
- d) the business will pay rent for additional storage space to store excess inventory,
- e) retailers will usually not collaborate with other retailers when purchasing inventory (sections 3.4.1.1, 3.4.1.2, 3.4.1.3 and 3.4.2).

LF18: When inventory, as a logistical supply chain driver, is managed cost-efficiently:

- a) large batches of inventory are ordered less frequently, in order to benefit from economies of scale,
- b) inventory is purchased from suppliers with the lowest price,
- c) larger quantities of inventory are purchased in collaboration with other retailers in order to benefit from economies of scale,
- d) no, or a small amount of, safety and seasonal inventory is held,
- e) additional space to store excess inventory is not required (sections 3.4.1.1, 3.4.1.2, 3.4.1.3 and 3.4.2).

LF19: Transportation cost is between R300-R350 per trip for small township retailers (section 3.5).

LF20: Retailers in townships either collect inventory themselves or they purchase large amounts to qualify for free delivery (section 3.5).

LF21: When transportation, as a logistical supply chain driver, is managed responsively:

- a) transit times are reduced by delivering inventory directly from a supplier to a customer (sections 3.5.1.1 and 3.5),
- b) the fastest mode of transportation is selected,
- c) a car or small truck is used (or hired) to increase flexibility (sections 3.5.1.2 and 3.5.2).



LF22: When transportation, as a logistical supply chain driver, is managed cost-efficiently:

- a) inventory is delivered to an intermediate site in order to save on costs (sections 3.5.1.1 and 3.5),
- b) large quantities of inventory are ordered to qualify for free delivery from suppliers (sections 3.5.1.1 and 3.5),
- c) the slowest and cheapest mode of transportation is selected,
- d) a car or small truck is used (or hired) to save on transportation costs (delivery fees) (sections 3.5.1.2 and 3.5.2).

Source: Compiled by the researcher

## Chapter 4

### Research Methodology

#### 4.1 Introduction

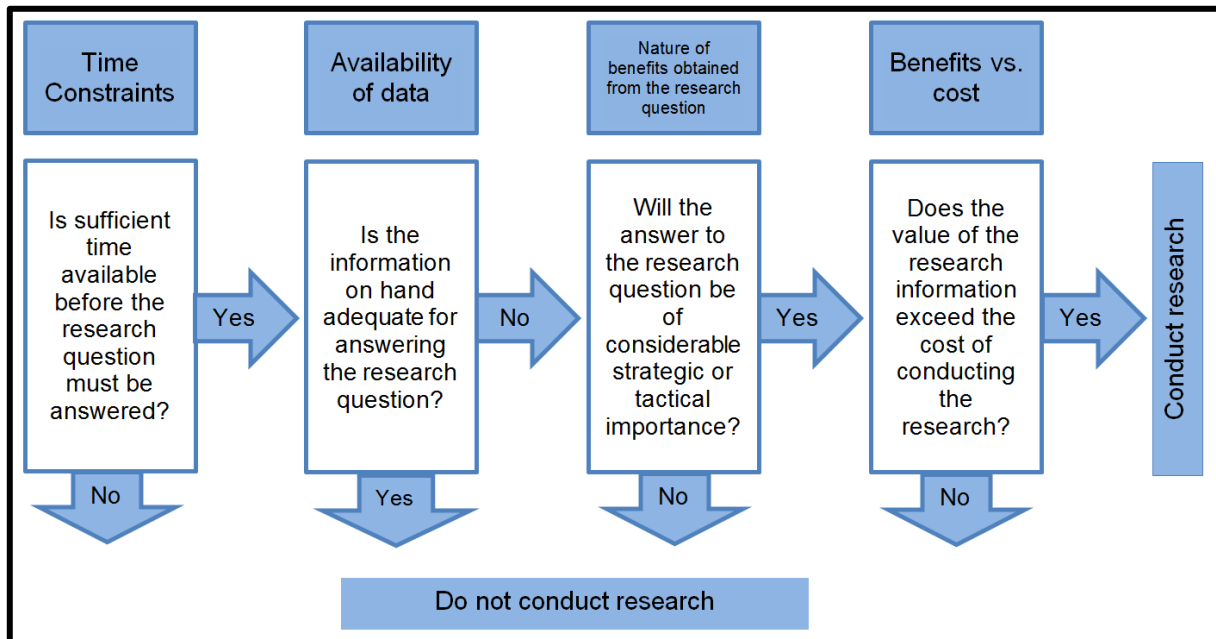
Research can be defined as any action that a person takes to obtain data in a systematic way in order to ultimately increase knowledge (Saunders et al., 2012:5). During the research process data is collected and interpreted in order to answer a specific research question (Quinlan et al., 2015:2). This chapter describes the research methodology used to answer the primary research question: how can formal independent small retail business in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive? This chapter begins by determining the need for research, whereafter the discussion focuses on the research process. This process was used as a foundation for establishing the research problem; research objectives; research design and identifying the data sources; developing the sample plan; and designing the research instrument for this study. The discussion will also touch on how the data was collected, coded and captured, as well as on the different statistical techniques that were used for analysing the data. Before the process is discussed in detail it is important to provide some background with regard to research in general.

#### 4.2 Determining the need for research

Although data and information are required to answer a research question, not all research questions can be investigated due to, for example time constraints, the availability of current data, the nature of the benefit to be obtained and the benefits of the research as opposed to the cost of conducting the research (Cooper and Schindler, 2014:18).

Figure 4.1 illustrates the decision-making process in order to determine whether research should be conducted or not. Only when the answers to the questions regarding time constraints, the availability of data, the nature of the benefits and the cost of conducting the research, are known, would a researcher be able to determine whether research should be conducted or not.

**Figure 4.1 Determining whether research should be conducted**



Source: Adapted from Zikmund and Babin (2010:20)

Before conducting research for this study, these four questions were considered. The conclusions regarding the four questions in terms of this study are summarised in table 4.1 below.

**Table 4.1 Determining whether to conduct research for this study**

Considerations that determine the need for research	Formal questions	Answers in terms of this study	Does this study qualify to move on to the next consideration?
Time constraints	Do the owners or managers of formal independent small retail businesses need the information within a specific time frame?	No, since this is not commissioned research, no time constraints exist.	Yes
Availability of data	Is existing information adequate to assist the formal independent small retail businesses to survive?	No, limited research has been done on SCM and small businesses, especially with regard to the logistical supply chain drivers and formal independent small retail businesses operating within Soweto.	Yes
Nature of the benefits obtained from the research question	Is the successful operation of the formal independent small retail businesses of strategic or tactical value?	The findings of the research will be of strategic importance to the small business owners or managers as the findings could influence their selection of competitive and supply chain strategies. The findings of the research will also be of tactical importance as the findings could influence how the small retailers manage their logistical supply chain drivers in terms of the levels of responsiveness and cost-efficiency.	Yes

Benefits versus costs	Does the value of the research information exceed the cost of conducting the research?	Yes, the value of the research exceeds the cost incurred to conduct the research as the findings of this study will be used to make recommendations to the small business owners or managers on how they can increase their odds of survival.	Yes
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Source: Compiled by the researcher

After answering all four questions, it was evident that this research would be valuable to the owners and managers of formal independent small retail businesses and the next step in the research process could be started. In the following section the research process will be discussed in detail.

### **4.3 Research process**

A research process is a multi-stage process that provides for a systematic and planned approach to a project in order to ensure that the stages of conducting research form a coherent whole (Tustin, Ligthelm, Martins & Van Wyk, 2005:75; Saunders et al., 2012:12). Figure 4.2 graphically illustrates the research process. The first step in the process is to determine the research problem to be addressed, followed by the establishment of research objectives. Only thereafter can the research design be determined. This requires that the different methods and processes to collect and analyse the information should be indicated (Babbie, 2016:113-114). Once the research design has been established, the type and sources of information can be determined. This is followed by the development of the sample plan and research instrument. After the fieldwork has been conducted, the coding, editing and capturing of the data is done in preparation for the statistical analyses. Lastly, the research findings are presented and possible future research is identified (Tustin et al., 2005:75, 77, 81-82, 88, 99-102, 107).

**Figure 4.2 Graphic illustration of the research process**



Source: Tustin et al. (2005:76)

### **4.3.1 Research problem**

The research process usually starts when problematic issues are identified in a certain field of interest. This study arose from the concern about the low survival rate of township businesses. Several further issues presented themselves in earlier studies (see section 1.3), and these reinforced the realisation that this was in fact a worthwhile project. Some of these issues are the limited success of the Gauteng Department of Economic Development in developing the economies of townships; the lack of owners' business skills; the low levels of entrepreneurial activities within townships; the low survival rate of township businesses and the underdeveloped linkages between local and formal supply chains. When considering these issues, along with the

strategic importance of SCM in terms of the orientation of the selected supply chain strategy as discussed in section 1.2, the research problem focused on how small business owners could increase their odds of survival by using SCM (Gauteng Department of Economic Development, 2014:4-5; World Bank, 2014:10, 13, 19, 22-23).

Identifying and defining the research problem together with step 2, (establishing the research objectives) will serve as a blueprint for any research process. Once the research problem has been identified it can be defined. When defining the research problem, one is determining what information is needed, as well as how the information will be gathered in the most efficient and effective way (Tustin et al., 2005:77-78). For this study, the next step in the research process was to establish the research objectives. Section 4.3.2 will discuss the primary and secondary research objectives derived from the research problem.

#### **4.3.2 Research objectives**

Research objectives are based on a study's research problem and identify what the researcher aims to accomplish by conducting the research (Saunders et al., 2012:680). In table 4.2 below the research problem as well as the primary and the secondary research objectives for this study are outlined.



**Table 4.2 Primary and secondary research questions and objectives**

<b>Primary research question:</b>	
How can formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive?	
<b>Secondary research questions:</b>	
SRQ 1:	How do small businesses achieve a strategic fit between their competitive and supply chain strategies?
SRQ 2:	How, according to the literature, are the three logistical supply chain drivers managed by small businesses in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy?
SRQ 3:	How do formal independent small retail businesses operating within Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency?
SRQ 4:	Does the industry in which the Sowetan formal independent small retail businesses operate, influence the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency?
SRQ 5:	Can the management of the logistical supply chain drivers increase the odds of the formal independent small retail businesses operating within Soweto to survive?
<b>Primary research objectives</b>	
To determine how formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive.	
<b>Secondary research objectives</b>	
SRO 1:	To discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies.
SRO 2:	To establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-

	efficiency, based on the orientation of the selected supply chain strategy.
SRO 3:	To determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency.
SRO 4:	To investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency.
SRO 5:	To determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive.
<b>Boundaries of the study:</b>	
All formal independent small retail businesses operating within the boundaries of the township of Soweto.	

Source: Compiled by the researcher

After the problem statement, the primary and secondary questions and objectives had been identified, the next step, namely research design, could be embarked upon.

### 4.3.3 Research design

The research design is considered to be a plan or blueprint of how a research problem and objectives are going to be solved and achieved. The research design includes describing the sources from which data will be collected; how the data will be collected; how the data will be analysed; what the limitations of the study are; as well as the ethical issues that need to be considered (Saunders et al., 2012:159). Three design approaches are available, namely exploratory, causal and descriptive.

An exploratory research design (also known as exploratory research) is employed when the researcher aims to determine the general nature of a research question. A researcher asks open questions in order to gain insight into a topic of interest. Exploratory research can be used to clarify a specific research problem (Cooper and Schindler, 2014:127; Saunders et al., 2012:171).

Highly flexible, unstructured and qualitative research methods are used when conducting exploratory research (Tustin et al., 2005:86). Often exploratory research will conclude that a specific research problem does not exist. For this study the research problem was clearly identified, defined and formulated, therefore an exploratory research design was not suitable.

A causal research design determines whether one variable causes, determines or affects another variable. In such cases experiments are used as the research method in order to measure the connections between different variables (Babbie, 2016:29). During this study no specific variable was identified and used to determine if it was causing certain behaviour; therefore a causal research design was not used in this study.

A descriptive research design aims at answering the *who, what, when, where* and *how* questions that will enable the researcher to ultimately solve a specific research problem. When conducting descriptive research the researcher already understands the underlining relationship between the problem area and the research questions, and univariate (percentages), bivariate (hypotheses) and multivariate (binary logistic regression) analyses can be conducted. Structured and quantitative research methods are used when conducting descriptive research, for example face-to-face interviews (Tustin et al., 2005:86-87). For this study a descriptive research approach was followed to answer the *who, what, when, where* and *how* questions pertaining to the logistical supply chain drivers, by making use of a questionnaire (see appendix A).

The next step in the research process was to identify the information types and sources that would be used during the study.

#### **4.3.4 Identifying information types and sources that will be used during the research process**

Usually the next step in the research process involves identifying the information types and sources of information. Tustin et al. (2005:88) state that a researcher should always keep in mind the time and cost of collecting the necessary data when deciding on the information types and sources. The two different groupings in data are primary and secondary data. The next section will start with a discussion of secondary data since researchers need to investigate existing sources before conducting primary research.

#### **4.3.4.1 Secondary research**

Secondary data is data that has already been collected for a different purpose and has already been interpreted by a researcher (Cooper and Schindler, 2014:86; Saunders et al., 2012:304). When using secondary data, the data is analysed further to gain new or different knowledge, interpretations and conclusions. Secondary data can therefore be obtained either internally, for example business records and warranty cards; or externally, for example press and trade publications. Secondary data research acknowledges that the uses of the data is secondary in nature and that the data may not exactly meet the requirements of the specific study; therefore, secondary data is an excellent starting point when conducting research since it is easily obtainable (Management Study Guide, 2016). For the purpose of this study, secondary data was used to conduct the literature reviews in chapters 2 and 3. Chapter 2 provided a literature review of the different competitive and supply chain strategies that managers employ within their small businesses. Chapters 3 provided an in-depth literature review of the logistical supply chain drivers (facilities, inventory and transportation).

When secondary data is deemed inadequate to answer the research questions or achieve the research objectives, primary research should be conducted. In this study the secondary data contained in chapters 2 and 3 was used to answer some of the research questions and achieve some of the research objectives. However, primary research was necessary in order to address the remaining research questions and objectives.

#### **4.3.4.2 Primary research**

As mentioned earlier, primary data is collected to address specific research problems or achieve specific research objectives when secondary data is deemed inadequate. When conducting primary research, the most appropriate research approach (quantitative or qualitative), as well as the primary method of data collection, must be identified (Tustin et al., 2005:89). First, a distinction needs to be made between qualitative and quantitative research.

##### **a) Qualitative research**

Qualitative research provides researchers with an opportunity to gain insight regarding certain research areas that may be difficult to quantify. Qualitative research is a less structured and more

flexible approach to research. A qualitative research approach is based on personal value judgements and meanings; therefore it can be difficult to draw general conclusions (Cooper and Schindler, 2014:144). Qualitative research is ideal for extracting feelings, emotions, motivations and perceptions, but the validity of qualitative research may be questioned because of the subjectivity of different researchers (Cooper and Schindler, 2014:145). Qualitative research was not deemed suitable for this study for two reasons: first, qualitative research is focused on explaining emotions, motivations and perceptions and not to answer questions, such as *who*, *what*, *when*, *where*, and *how* and secondly, due to the scope of the study it would not have been feasible to use a qualitative research method to gather the necessary primary data.

## **b) Quantitative research**

Quantitative research usually involves the collection of primary data from a large number of individuals with the intention of projecting the results to a wider population (Quinlan et al., 2015:399). The results of quantitative research are presented by means of numbers, figures or statistical parameters. The data collected from the large number of individuals are statistically analysed to provide representative data for the entire population in order to forecast events under different conditions. Results are statistically analysed with precise estimations, and therefore the results can be deemed valid and reliable (Saunders et al., 2012:472-473). Primary quantitative data can be collected through observations, experiments and surveys (Quinlan et al., 2015:131-135; Sachdeva, 2009:111).

- *Observations*

Quinlan et al. (2015:225) define observation as a systematic process whereby the behaviour patterns of people, objects and occurrences are observed without questioning or communicating with them. The observers rely on their observation skills to collect, record, describe and analyse people's behaviour (Saunders et al., 2012:676). Observation was not used during this study as personal communication was deemed necessary to collect the primary data.

- *Experiments*

Saunders et al. (2012:670) define experiments as a research method that is aimed at studying the probability of a change in an independent variable, causing a change in a dependent variable in a

controlled environment. Experiments are used to assist in identifying causal relationships. Since this study was not focused on identifying causal relationships, experiments were not used as a primary data collection method.

- *Surveys*

Quinlan et al. (2015:268) define a survey as a method of collecting primary data where the necessary information is gathered through interacting with a representative sample or group of people. Surveys are the most common primary data collection method used in research and use a structured approach to obtain quantified responses. Surveys can therefore typically be classified as quantitative research (Strydom, Jooste & Cant, 2002:156). Different types of surveys can be used in order to obtain primary data. Surveys can take the form of self-administrated surveys, computer-aided surveys and interviewer-administrated surveys. Table 4.3 contains a description of the different types of surveys as well as some of the advantages and disadvantages of each survey method.

**Table 4.3 Comparison of self-administrated, computer-aided and interviewer-administrated surveys**

	<b>Self-administrated surveys</b>	<b>Computer-aided surveys</b>	<b>Interviewer-administrated surveys</b>
<b>Description</b>	A traditional paper-based questionnaire where respondents complete the questionnaire themselves without the assistance of an interviewer. Self-administrated surveys can include mail surveys, faxed surveys, warranty cards and panel surveys.	In computer-aided surveys, respondents complete questions on a computer via online services, the intranet and internet.	Interviewer-administrated surveys are personal face-to-face interviews that involve the interviewer asking questions from a paper-based questionnaire and recording the responses. Respondents are selected to form part of a sample and are interviewed in person by trained interviewers.
<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Allow contact with respondents who would otherwise be inaccessible.</li> <li>• Increase geographical area without increasing costs dramatically.</li> <li>• Minimal staff required.</li> <li>• Anonymous respondents.</li> <li>• Respondents have time to think about questions.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase geographical area without increasing costs dramatically.</li> <li>• Minimal staff required.</li> <li>• Anonymous respondents (preventing interview bias).</li> <li>• Respondents have time to think about questions.</li> <li>• Respondents who cannot be reached telephonically or personally, can be accessed.</li> <li>• Sample frame lists provide viable</li> </ul>	<ul style="list-style-type: none"> <li>• Good cooperation from respondents.</li> <li>• The interviewer can answer questions about the survey, probe for answers, use follow-up questions and gather information through observation.</li> <li>• Special visual aids and scoring devices can be used.</li> <li>• Illiterate respondents can be included.</li> <li>• Pre-screening of respondents is possible to ensure that they fit the profile.</li> </ul>

		locations rather than prospective respondents.	
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>• High printing costs.</li> <li>• No one available to explain questions.</li> <li>• Mainly short and simply stated questions.</li> <li>• Accurate mailing-list required.</li> <li>• Often respondents who return surveys represent extremes of the population (skewed responses).</li> <li>• Low-distraction environment needed to complete questionnaire.</li> <li>• Accessibility and availability of respondents.</li> </ul>	<ul style="list-style-type: none"> <li>• No one available to explain questions.</li> <li>• Accurate email list required.</li> <li>• Often respondents who return surveys represent extremes of the population (skewed responses).</li> <li>• Computer security.</li> <li>• Accessibility and availability of internet.</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive.</li> <li>• Highly-trained interviewers are required.</li> <li>• Fieldwork is time-consuming.</li> <li>• Wide geographic dispersion.</li> <li>• Accessibility and availability of respondents.</li> <li>• Unwillingness to talk to researchers.</li> <li>• Security concerns in some neighbourhoods.</li> </ul>
<b>Appropriateness of the survey type as the primary quantitative data collection method for this study</b>	<p>Self-administrated surveys were not deemed an appropriate primary quantitative data collection method because:</p> <ul style="list-style-type: none"> <li>• only physical business addresses were available for the 650 small businesses operating within Soweto that formed</li> </ul>	<p>Computer-aided surveys were not deemed an appropriate primary quantitative data collection method because:</p> <ul style="list-style-type: none"> <li>• not all respondents would have access to a computer and the internet,</li> <li>• respondents might not be computer</li> </ul>	<p>Interviewer-administrated surveys were deemed the appropriate primary quantitative data collection method because:</p> <ul style="list-style-type: none"> <li>• many respondents did not have English as their first language and may therefore misunderstand certain</li> </ul>



	<p>the sample frame for this study; therefore, mail surveys were not viable,</p> <ul style="list-style-type: none"> <li>• many respondents did not have English as their first language and may therefore misunderstand certain questions and answer inappropriately, and</li> <li>• some questions contained business management terminology that may require explanation.</li> </ul>	<p>literate,</p> <ul style="list-style-type: none"> <li>• many respondents did not have English as their first language and may therefore misunderstand certain question and answer inappropriately, and</li> <li>• some questions contained business management terminology that may require explanation.</li> </ul>	<p>question and answer inappropriately,</p> <ul style="list-style-type: none"> <li>• some questions contained business management terminology that may require explanation. An interviewer could ensure that relevant responses were obtained, and</li> <li>• illiterate respondents could be included if an interviewer could guide the respondent through the questions.</li> </ul>
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Source: Adapted from Cooper and Schindler (2014:225); Mentz (2014:144); Marx (2013:93-94); Tustin et al. (2005:145, 184, 208)

After considering the advantages, disadvantages and the appropriateness of each survey method with regard to this study, it was decided to use an interviewer-administrated survey to gather the primary quantitative data. With the information types and sources also established, the next steps in the research process, namely developing the sample plan and designing the research instrument, could receive attention.

#### **4.3.5 Developing the sample plan and designing the research instrument**

Before the sample plan and design instrument can be discussed, some contextualisation is necessary. As mentioned in section 1.5.2.3, the researcher conducted the study in conjunction with the BMR of UNISA. An opportunity became available for the researcher to join other colleagues from the Department of Business Management (UNISA) and researchers from the BMR to gather information on formal independent small businesses in Soweto in 2014. The following aspects were covered in the combined study:

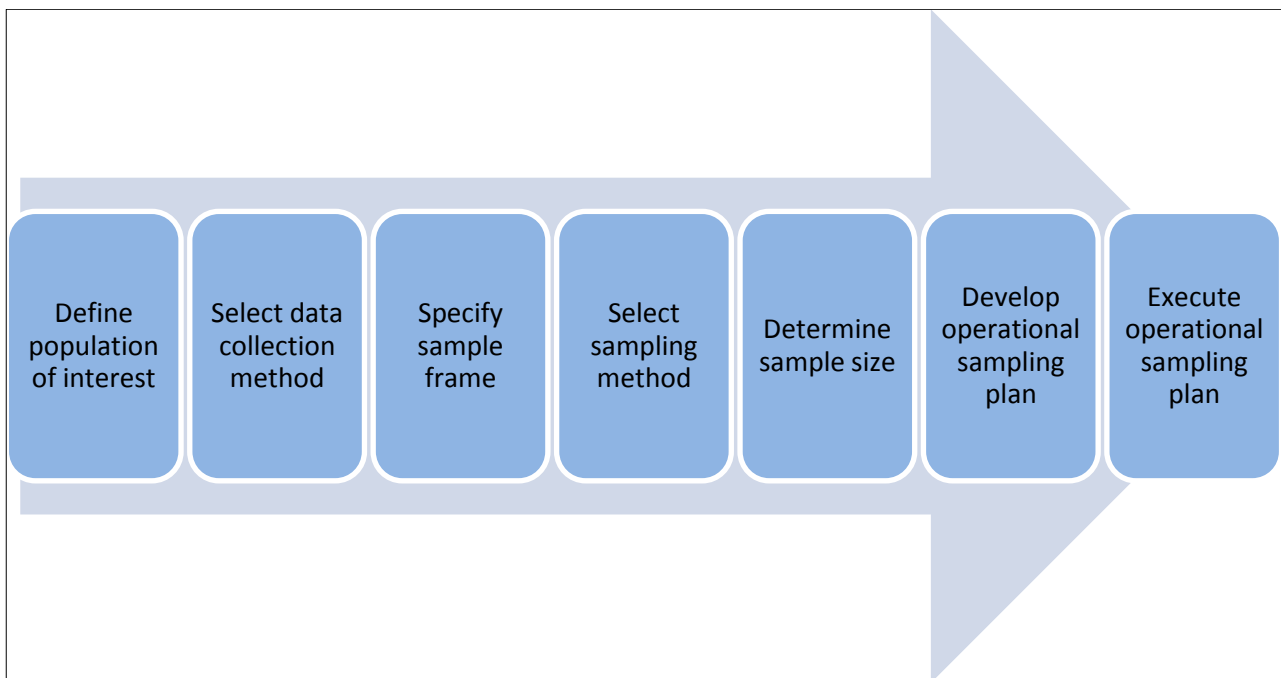
- General information
- Nature of the business
- Geographical location
- Logistics or physical distribution channels
- Internal operations
- Supply chain management
- Turnover
- Business support
- Level of entrepreneurship
- Demographic information

Together with the researchers from the BMR and colleagues from the Department, a sample plan and the research instrument were designed. This would serve as a follow-up on a study conducted in 2012 by the BMR on formal independent small businesses in Soweto. Because of the successful gathering of data in 2012, it was decided that the sample plan and research instrument for the 2014 study, would be based on the 2012 study. For the sake of clarity, in the discussion of the development of the sample plan and the research instrument, the previous study will be referred to as the "2012 Soweto study" and the present study as the "2014 Soweto study".

#### 4.3.5.1 Developing the sample plan

Tustin et al. (2005:336) state that when developing an appropriate sampling plan a researcher typically has to follow seven steps (see figure 4.3).

**Figure 4.3 Seven steps in developing a sample plan**



Source: Adapted from Mentz (2014:153); Tustin et al. (2005:339)

During the development of the sample plan the population is defined; the data collection method selected; a specialised and appropriate sample frame is determined; a sample method is selected; the sample size is determined; and finally the sample is developed and tested. These steps will be discussed in more detail below.

##### **a) Define the population of interest**

A population is defined as a group of elements that shares a common set of characteristics, for example the area in which a business operates. The population serves as an important source of information (Cooper and Schindler, 2014:662; Quinlan et al., 2015:268). The population of the 2014 Soweto study consisted of formal independent small businesses situated within the boundaries of Soweto, which included businesses situated in shopping malls, large shopping areas (outside shopping malls), smaller shopping areas, stand-alone businesses and industrial areas with 2-5, 6-10 and 10-plus surrounding businesses.

**b) Select data collection method**

In section 4.3.4.1 it was mentioned that secondary data would be accessed for the literature reviews in chapters 2 and 3. However, quantitative primary data would be collected with the aid of an interviewer-administrated questionnaire. The quantitative primary data would then be statistically analysed (see chapters 5 and 6).

**c) Specify sample frame**

This step entails identifying the sample frame from which respondents will be drawn. A sampling frame refers to possible elements, for example a comprehensive list of businesses from which the sample is drawn (Quinlan et al., 2015:268). The sampling frame that was used for this study was the list of 650 formal independent small businesses that had been identified during the 2012 Soweto study. Formal businesses were defined in section 1.5.2.3 as businesses that operate within purpose-built shops and form part of the registered business infrastructure of South Africa; they pay taxes and other levies to different levels of government (Strydom, 2015:464; Ligthelm, 2013:59; Du Plessis, Strydom & Jooste, 2012:56).

The five fieldworkers were instructed, by the researcher, that in the case of a business that had closed down since 2012, they were to include any formal independent small businesses that complied with the criteria for selecting respondents during the 2012 Soweto study. Consequently, the following businesses were excluded from the 2014 Soweto study as they had also been excluded from the 2012 Soweto study: branches of chain stores, franchises, street vendors on pavements, home-based businesses (such as spazas and tuck shops), professional and business services and transport businesses (passenger busses and taxis).

**d) Select sampling method**

In survey studies one of two sampling methods can be used, namely probability sampling and non-probability sampling. Probability sampling entails that each element in the population has a known non-zero probability of being selected for the sample; whereas in non-probability sampling the probability of being selected is unknown (Tustin et al., 2005:344). Probability sampling methods include simple random sampling, systematic sampling, stratified sampling and cluster sampling; whereas non-probability sampling methods include convenience sampling, judgement sampling,

quota sampling, snowball sampling and internet sampling (Quinlan et al., 2015:268). As each formal independent small business in the population had the same probability of being selected, the method used in this study can be classified as probability sampling using a stratified sampling method.

**e) Determine sample size**

A sample is defined as a subset or representative group of a population (Tustin et al., 2005:336). According to Cooper and Schindler (2014:662), determining the correct sample size is complex and depends on factors, such as resource availability in terms of time, money and personnel. The sample size of this study was 650 formal independent small businesses.

Table 4.4 summarises the sample plan for this study.

**Table 4.4 Summary of the sample plan**

Empirical research aspect	Description of empirical research aspect
Survey area	Defined business areas in Soweto.
Survey population	Formal independent small businesses located within business areas/stands across Soweto. These include businesses situated in shopping malls, large shopping areas (outside shopping malls), smaller shopping areas, stand-alone businesses and industrial areas with 2-5, 6-10 and 10-plus surrounding businesses.
Data collection methods	Secondary data would be accessed for the literature reviews. Quantitative primary data collected through interviewer-administrated surveys. Personal face-to-face interviews with owners or managers of the small businesses.
Sample frame	A list of 650 formal independent small businesses operating within the boundaries of Soweto, compiled in 2012 by the BMR.
Sampling method	Probability sampling using a stratified sampling method.
Sample size	650 formal independent small businesses.

Source: Compiled by the researcher

#### 4.3.5.2 Designing the research instrument

When conducting a survey, a questionnaire is generally used to gather the necessary information. Questionnaire design involves formulating questions and response options based on the research objectives (Tustin et al., 2005:98). The purpose of a research instrument is to ensure that relevant data is collected and compared, respondents are motivated to participate and bias is minimised.

For this study the questionnaire contained questions from different researchers involved in the 2014 Soweto study and covered several general business-related topics. The following discussion refers only to the supply chain management questions and questions regarding the survival of the formal independent small businesses that were included in the questionnaire. The questions on supply chain management were developed specifically for this (2014) study. Therefore, the research problem and objectives of this study guided the formulation of these questions. The questions numbered D2, D3, E2, E3 (a-h; j; k), E6 (a; c), and E11 (a; c; j; k; m) focused on supply chain management and questions B1 and F2 covered the formal independent small business' survival; measured in terms of age and growth (refer to section 6.2.1) (see appendix A).

##### a) Questionnaire type

Different types of questionnaires (unstructured, semi-structured, and structured) were considered before deciding on a structured questionnaire for the 2014 Soweto study.

- **Unstructured questionnaires:** Neither the researcher nor the respondents are bound by the structure of the questionnaire. The interview is conducted without any pre-formulated questions and respondents express their opinions in their own words. A topic-list provides the issues to be covered and the researcher is free to formulate and explain the questions as he or she sees fit.
- **Semi-structured questionnaires:** Questions accommodate a variety of answers for respondents to choose from. Introductory questions may be structured, but follow-up questions will result from the respondents' replies.
- **Structured questionnaires:** All questions are pre-formulated, structured and controlled and the appropriate response is chosen from several possible options (Quinlan et al., 2015:282).

In the 2014 Soweto study a structured questionnaire was used and all the questions were pre-formulated, structured and controlled. Respondents could choose the appropriate response from several possible options.

**b) Form and scale of measurement of responses**

Questionnaires are further characterised by the level of freedom a respondent has in answering the questions. Thus, questions can be either open-ended or close-ended. Open-ended questions require respondents to reply in their own words, whereas close-ended questions provide different options from which respondents select a response (Cooper and Schindler, 2012:653; 658). Three types of close-ended responses are distinguished, namely dichotomous, multichotomous and scale responses. Table 4.5 summarises the characteristics of the three types of close-ended responses.

**Table 4.5 Characteristics of close-ended responses**

Close-ended responses	Description
Dichotomous response	It provides respondents with only two possible answers and is the most common close-ended response.
Multichotomous response	Also called the multiple-choice response. It provides respondents with more than two possible answers to select from.
Scale response	A scale response captures the completeness and intensity of the response; consequently it captures more than a simple "yes" or "no" answer.

Source: Adapted from Tustin et al. (2005:397-410)

These three types of close-ended questions can be posed using different types of measurement scales. Quinlan et al. (2015:107) discuss the following different types of measurement scales that should be considered when generating questions:

- **Nominal scales:** A number or a letter is assigned to specific objects as labels for identification or classification. For example 1=yes and 2=no.
- **Ordinal scales:** Arrangement of objects according to their magnitude in an ordered relationship. For example 1=poor, 2= average and 3=excellent.

- **Interval scales:** Similar to ordinal scales, but the difference between the scale values can be interpreted more meaningfully. In interval scales, zero does not mean a specific characteristic is absent. For example in temperatures, zero does not mean that there is no temperature.
- **Ratio scales:** Similar to interval scales, but the ratios of numbers can be interpreted more meaningfully. In ratio scales, zero means that the specific characteristic is absent. For example with regard to annual income, zero means that there is no income.

To conclude this section, the table below summarises the form and scale of measurement for each of the supply chain management questions, the questions related to survival, as well as the biographical questions that were included in the 2014 Soweto study questionnaire.

**Table 4.6 Form and scale of measurement for the supply chain management, sustainability and biographical questions in the 2014 Soweto study**

Question number in the questionnaire	Type of close-ended question	Scale of measurement
D1	Scale	Ordinal scale
D2	Scale	Ordinal scale
D3	Dichotomous	Nominal scale
E2	Scale	Ordinal scale
E3 (a-h; j; k)	Scale	Ordinal scale
E6 (a; c)	Scale	Ordinal scale
E11 (a; c; j; k; m)	Scale	Ordinal scale
B1	Scale	Nominal scale
F2	Scale	Nominal scale

Source: Compiled by researcher

Before finalising the questionnaire, it was evaluated and approved by all the researchers involved, as well as a statistician. The next step in the research process concerns the planning for the collection, coding and capturing of data.



#### **4.3.6 Collecting, coding and capturing of data**

Collecting, coding and capturing of data are part of the sixth step in the research process. Independent research consultants who specialise in both qualitative and quantitative surveys were contracted to collect data for this study. The researcher and staff from the BMR undertook the coding and capturing of the data.

After designing the questionnaire, the researcher held a work session with the independent research consultants to explain the rationale for each question. This was to ensure that the consultants could explain the rationale behind each question to the five fieldworkers and that the fieldworkers would understand exactly what information each question was designed to yield. After the completion of the fieldwork the independent research consultants presented a fieldworkers' report that contained the following important information:

- Fieldworkers were trained with regard to each question. The fieldworkers were able to explain every question in order to gather the necessary data.
- Three hundred and twenty-five (325) formal independent small businesses that formed part of the 2012 Soweto study had either closed-down or relocated. The researcher instructed the fieldworkers to replace the small businesses that had closed-down with other small businesses that complied with the criteria used for the 2012 Soweto study (refer to section 4.3.5.1).
- The fieldwork was done in June/July 2014 over a 7-week period.
- The most prevalent problems that fieldworkers encountered were the absence of a manager or owner at the business and the unwillingness of managers or owners to participate. If the owner or manager was absent the fieldworker returned to the business when he or she was available.

In the next step of the research process the analyses of the data are discussed.

#### **4.3.7 Analysis of data**

Cooper and Schindler (2014:655) explain that data analysis is a process that facilitates understanding. Data analysis involves the reduction of the collected data into a manageable size in order to develop summaries, identify patterns and apply statistical techniques. Before any

analyses were done in this study, the data had to be filtered to include only formal independent small businesses in the *retail* sector as the focus of this study is on small businesses operating within the retail sector. The 650 formal independent small businesses were divided into different industries that operate in the different categories identified in the 2014 Standard Industrial Classification (SIC).

Five hundred and fifty-six (556) formal independent small retail businesses were identified. As the industry in which the respondents operate, influences customer demand, supply uncertainties, customer buying behaviour, and ultimately the orientation of the supply chain strategy (refer to section 2.4), the 556 retail respondents were divided into their different industry groups. Table 4.7 displays the number of respondents in each industry group.

**Table 4.7 Classification of respondents in the 2014 Soweto study**

Code	SIC Industry group description	Frequency
04	Retail Grocery	209
05	Retail Hardware	42
07	Retail General Store	88
08	Retail Service	142
09	Eating and Drinking Places	39
10	Sale, maintain and repair of vehicles and retail auto (hereafter referred to as retail auto)	36
Total:		556

Source: Compiled by the researcher from survey results

Both descriptive and inferential analyses were done on the data. Descriptive statistics are used to describe the characteristics of the distribution of data, whereas inferential statistics relate the data to the hypotheses and furthermore generalise the data to a larger population (Van Zyl, 2014:161).

#### **4.3.7.1 Descriptive statistical analyses**

A descriptive analysis is performed to obtain an accurate first impression of the gathered data (Van Zyl, 2014:162). Zikmund et al. (2013:484) define descriptive analyses as the basic transformation of research data that describe the most important characteristics of the data. This includes the distribution of scores, comparing the distribution of scores and measuring the central tendency (Van Zyl, 2014:162-164). These characteristics can be reported on by using different

types of tabular and graphical illustrations, as well as by numerical descriptive statistics that include means and averages (Williams, Sweeney & Anderson, 2006:12-13). In this study the data was descriptively analysed (see chapter 5), using frequency distributions. In the next section inferential statistical analysis is discussed.

#### **4.3.7.2 Inferential statistical analyses**

Inferential statistics are used to infer a finding about the population from which the sample was drawn, based on the characteristics of the sample (Van Zyl, 2014:177). Inferential analyses were done on the data gathered on all three logistical supply chain drivers to determine whether the industry in which the respondents operate, influences their responses. When conducting inferential statistical analyses, the corresponding *p-value* for each test should be considered. The *p-value* reports the extent to which the test statistics disagree with the null hypotheses (Williams et al., 2006:359). Cooper and Schindler (2011:462) explain that “the *p-value* is the probability of observing a sample value as extreme as, or more extreme than, the value actually observed, given that the null hypotheses is true.” The calculated *p-value* is compared to the level of significance and based on this comparison, the null hypotheses is accepted or rejected. The significance level of a test is defined as the probability of making a decision to reject the null hypothesis, when the null hypothesis is actually true (a decision known as a Type 1 error).

In this study the chosen level of significance was 0.05. Therefore, for a statistical test to be deemed statistically significant, the *p-value* had to be lower or equal to 0.05 ( $p \leq 0.05$ ). In this study three inferential statistical tests were conducted namely, the Kruskal-Wallis test, the Pearson Chi-Square test and binary logistic regression. Each test is explained in more detail below.

##### **a) The Kruskal-Wallis Test**

The Kruskal-Wallis test is a one-way analysis of variances by rank test. The Kruskal-Wallis test is a nonparametric test, which is used to compare the medians of three or more independent variables (Cooper and Schindler, 2014:617). The Kruskal-Wallis test was used to determine whether there is a statistical significant difference between the six industries with regard to the responses relating to the questions on the three logistical supply chain drivers. The nonparametric test was used because the data being measured was on an ordinal scale. If the *p-value* of the

Kruskal-Wallis test was higher than 0.05 ( $p > 0.05$ ), no statistically significant difference exists at the 5% level, between the different industry groups (refer to table 4.6) with regard to the specific question; therefore, the industry group in which the respondents operate do not influence their responses. On the other hand, if the *p-value* was lower or equal to 0.05 ( $p \leq 0.05$ ), a statistically significant difference between the six industry groups, with regard to the responses relating to the specific question, exists. To further investigate the differences between the six industry groups with regard to the specific question (where a statistical significant difference exists), the mean ranks generated by the Kruskal-Wallis test were considered. The mean ranks are described as the sum of the ranks, assigned in ascending order to all observations, for each specific subgroup, divided by the number of observations for each subgroup/category. A mean rank does not indicate a fixed point on a scale, but only shows a tendency to the left or right anchor points of a scale. Based on the relative position of the mean rank, it was construed that the industry with the highest mean rank shows a higher frequency or level of importance (on the scale of either never, sometimes and always or on the scale of unimportant to very important) compared to other industry groups.

#### **b) The Pearson Chi-Square Test**

The Pearson Chi-Square test checks for a significant difference between the *observed* distribution of data in the categories and the *expected* distribution, based on the null hypotheses (Cooper and Schindler, 2011:469). The Pearson Chi-Square test was used to determine whether there is an association between the six industry groups (see table 4.6) and the responses relating to the questions regarding the three logistical supply chain drivers. The nonparametric test was used as the data being measured was on a nominal scale. As with the Kruskal-Wallis test, if the *p-value* of the Pearson Chi-Square test was higher than 0.05 ( $p > 0.05$ ), no statistically significant association exists at the 5% level among the different industry groups and the specific question; therefore, the industry group (refer to table 4.6) in which the respondent operates do not influence their responses. Then again, if the *p-value* was lower or equal to 0.05 ( $p \leq 0.05$ ), a statistically significant association do exist between the industry groups and the specific question.

### c) Binary logistic regression model

Logistic regression is a statistical method used to determine whether one or more independent variables can be used to predict a dichotomous dependent variable. Before the binary logistic regression model could be developed, preparatory principal component analyses were employed to reduce the data on the three logistical supply chain drivers.

Principal component analysis is a technique that is used to examine patterns of relationships between selected variables, in order to establish if there is an underlying combination of the original variables that can summarise the set of variables. Basically, a principal component analysis is performed in order to create a more manageable number of variables from a larger set (Cooper and Schindler, 2014:657). The principal component analysis in this study resulted in valid and reliable factors, as well as independent items, which were then used to develop the two binary logistic regression models (see chapter 6). Principal component extraction and varimax rotation were used to determine the factor structure of the questions; where unidimensionality measured the extent to which the questions (referred to as items – see section 6.2.2) related to a specific aspect. When conducting principal component analyses, some general guidelines are pertinent - of which the following relate to this study:

- To ensure sampling adequacy, two measures were used to determine whether a principle component analysis could be conducted on the questions (items), namely the Kaiser-Meyer-Olkin test and the Bartlett's test of sphericity. If the Kaiser-Meyer-Olkin value was higher or equal to 0.5 ( $p \geq 0.05$ ), and the Bartlett's test of sphericity was significant ( $p=0.000$ ), a principle component analysis could be conducted on the question.
- The number of factors identified by the principal component analysis was identified through the Eigenvalue criterion of Eigenvalues greater than one.
- Once a factor(s) had been identified by the principle component analysis, the internal consistency of the factor(s) was considered by examining the Cronbach Alpha value of each factor(s). The Cronbach Alpha value measured how closely related the different questions (items) within a group were to each other. A value above the exploratory threshold of 0.6 was deemed as satisfactory.

After the data on the three logistical supply chain drivers were reduced, two binary logistic regression models were developed. Using regression terminology, the variable that is being predicted is referred to as the dependent variables and the variables used for the prediction are referred to as independent variables (Williams et al., 2006:561). When developing a binary logistic regression model the independent variables can only predict the probability of a binomial outcome (one of two possible outcomes) for the dependent variable. The following should be noted when developing a binary logistic regression model:

- To determine adequacy of fit, the Hosmer and Lemeshow test is used. The Hosmer and Lemeshow test uses a null hypothesis to determine whether the fitted model is adequate (goodness of fit) by providing a *p-value* between 0 and 1. The hypothesis for the Hosmer and Lemeshow test can be stated as follows:

H<sub>0</sub>: There is a goodness of fit of the logistic regression model

H<sub>1</sub>: There is no goodness of fit of the logistic regression model

If the *p-value* is higher than 0.05, H<sub>0</sub> cannot be rejected and the logistic regression can be assumed to be adequate. The higher the *p-value* of the Hosmer and Lemeshow test, the better the fit of the logistic regression model (Allison, 2014:1).

- The overall correct prediction classification of the binary logistic regression model indicates the accuracy of the prediction regarding the dependent variable of the model. The overall correct prediction classification is calculated for both possible outcomes of the dependent variables.
- If the Hosmer and Lemeshow test indicates a goodness of fit (H<sub>0</sub> is valid), the odds ratios of the regression model are considered. Independent variables with a *p-value* lower or equal to 0.05 ( $p \leq 0.05$ ) are statistically significant predictors of the dependent variable of the regression model and only the odds ratios of these independent variables are considered.
- An odds ratio indicates whether the independent variable influences the dependent variable positively by having an odds ratio larger than 1, or negatively by having an odds ratio lower than 1. The decimals of the odds ratio indicate the percentage of the positive or negative influence of the independent variable on the dependent variable. To calculate the

percentage positive influence of the independent variable on the dependent variable, the following calculation should be conducted:

$$\text{Odds ratio} - 1 \times 100 = \% \text{ positive influence on the dependent variable}$$

To calculate the percentage negative influence of the independent variable on the dependent variable, the following calculation should be conducted:

$$\frac{1}{\text{odds ratio}} = \% \text{ negative influence on the dependent variable}$$

When data is statistically analysed, three requirements need to be considered, namely validity, reliability and practicality.

#### 4.3.7.3 Validity, reliability and practicality

Cooper and Schindler (2014:280) emphasise the importance of a good measuring tool and explain that three criteria exist whereby a measuring tool can be evaluated, namely validity, reliability and practicality.

##### a) Validity

Validity is defined as the accuracy of the measure and therefore serves as an assessment of the exactness of the measurement relative to what actually exists. Validity can take two forms, namely content validity and criterion-related validity. Table 4.8 summarises the two forms of validity.

**Table 4.8 Two forms of validity**

Forms of validity	Description of validity type	Validity reached with regard to this study
Content validity	Refers to the degree to which a measure reports on the subject of interest. Therefore, the content validity of the questionnaire is determined by the extent to which the questionnaire	This study complied with the content validity as the in-depth literature reviews (discussed in chapters 2 and 3) were used as background to ensure that appropriate questions were asked to

	provides valid reporting with regard to the objectives of a study.	achieve the objectives of the study.
Criterion-related validity	Reports on the success of the measures used for prediction or estimation. Criterion-related validity focuses on the success of the processes used for approximation.	Criterion-related validity was reached by using correlation analyses.

Source: Adapted from Mentz (2014:161); Marx (2013:109-101); Cooper and Schindler (2011:257-262); Saunders et al., (2012:429-430)

The next criterion by which a measuring tool can be evaluated is reliability.

#### **b) Reliability**

Burns and Bush (2010:319) define reliable measures as a process where identical or similar responses are obtained for the same question. Three reliability measures exist, namely Test-retest, Parallel forms and Cronbach's Alpha (Split-half, KR20) (Cooper and Schindler, 2014:259-260).

For this study, the Cronbach's Alpha was used to measure the reliability of the scales used in the questionnaire. A Cronbach's Alpha value above the exploratory threshold of 0.6 or the generally accepted threshold of 0.7, was deemed satisfactory. The Cronbach's Alpha values were also used as a reliability measure when conducting the principal component analyses.

#### **c) Practicality**

Practicality refers to whether the study could be executed successfully. The measurement process should be reliable and valid, while the operational requirements call for it to be practical (Cooper and Schindler, 2011:257). To ensure the practicality of this study, attention was given to the layout and design of the questionnaire in order to ensure that the questionnaire was easy to administer. A statistician was also consulted to ensure that the researcher appropriately formulated each question to gather the necessary data.



### 4.3.8 Presentation of research findings and future research

After analysing the data, the next step in the research process is to present the research findings. The research findings for this study are reported in chapters 5 and 6. Since this study was conducted on formal independent small retail business operating within the boundaries of the township Soweto, it should be noted that the findings cannot be generalised to small businesses in other townships. In Chapter 7, issues for future research will be identified.

### 4.3.9 Ethical considerations

Throughout the entire study all ethical standards and principles, as set out by the UNISA Ethical Policy, were met. This study was conducted according to the four moral principles of ethics that UNISA recognises as the basis of any research, namely:

- research should respect the autonomy, rights and dignity of research participants,
- research should make a positive contribution toward the welfare of people,
- research should not cause harm to the research participant(s) in particular or to people in general, and
- the benefits and risks of research should be fairly distributed among people (UNISA, 2013:9).

The UNISA Ethical Policy requires that certain general ethical principles are met before, during and after the research. The way in which this study adhered to the general ethical principles are summarised in table 4.9.

**Table 4.9 General ethics principles considered in this study**

General ethics principle	Adherence to the general ethical principle during this study
Essentiality and relevance	An extensive literature review was conducted to establish whether there was a need for the research and whether the research was essential in the pursuit of knowledge. According to the literature, a need for developing and strengthening supply chains within

	<p>townships exists. Therefore, the research could be deemed essential in the pursuit of knowledge in order to assist small business owners or managers in developing and strengthening their supply chains and possibly increasing the businesses' odds of survival. The knowledge could benefit the more capable owners or managers and improve their businesses' sustainability.</p>
<p>Maximisation of public interest and of social justice</p>	<p>The purpose of this study was to determine how formal independent small retail businesses in Soweto could increase their odds of survival by managing their logistical supply chain drivers in terms of responsiveness and cost-efficiency. As many of these businesses are faced with similar challenges, the findings of this study could be used to assist small businesses operating in other townships as well.</p>
<p>Respect for and protection of the rights and interests of the participants</p>	<p>The dignity, privacy and confidentiality of the respondents were respected and protected to the best of the researcher's ability. The fieldworkers were trained in order to ensure that they treated the respondents with respect, and treated all information as confidential. Fieldworkers were instructed to explain the purpose of the questionnaire, and to inform respondents on how, and by whom, the information would be used. Both the information and the sources of information were, and will be, treated as confidential. The completed questionnaires are stored at the BMR and are only accessible to personnel involved in the study.</p>
<p>Informed and non-coerced consent</p>	<p>The purpose of the research was explained to the respondents by the fieldworkers before the questionnaires were completed. Respondents were</p>

	informed that participation was voluntary and that they may halt the process at any stage, if they were uncomfortable about the questions. Respondents signed the questionnaires; indicating that they understood the aim and purpose of the study; what participation involved; and that they could withdraw at any time. By signing the questionnaire respondents also agreed that they consented freely and voluntarily to participate in the study.
Integrity, transparency and accountability	The researcher used professional fieldworkers to gather the primary data to ensure that the research was conducted honestly, fairly and transparently.

Source: Compiled by the researcher

The study was reviewed by the Ethical Committee of the BMR and ethical clearance was granted. (see appendix B).

#### 4.4 Conclusion

This chapter began by defining research and determining the need for this particular project. After taking into consideration time constraints, available data and the nature of the benefits, as opposed to the costs of the project, it was established that research was necessary to determine how formal independent small retail businesses in Soweto can manage the three supply chain drivers, in terms of responsiveness and cost-efficiency, in order to survive. The research process that was followed to conduct the research was identified and consisted of nine steps. Each step of the research process was addressed in theory, as well as in how it applied to this study. Table 4.10 provides a summary of the research methodology discussed in this chapter.

**Table 4.10 Summary of the research methodology for this study**

Empirical research aspect	Description of empirical research aspect in this study
Survey area	Defined business areas in Soweto.
Survey population	Formal independent small businesses located within

	business areas/stands across Soweto. These include businesses situated in shopping malls, large shopping areas (outside shopping malls), smaller shopping areas, stand-alone businesses and industrial areas with 2-5, 6-10 and 10-plus surrounding businesses.
Sample frame	A list of 650 formal independent small businesses operating within the boundaries of Soweto compiled in 2012 by the BMR.
Sample size	650 formal independent small businesses.
Sampling method	Probability sampling using a stratified sampling method.
Research instrument	Structured interviewer-completed questionnaires consisting of close-ended questions, using nominal and ordinal measurement scales (refer to appendix A).
Collecting, coding and capturing of data	The fieldwork was coordinated by the BMR and the data was gathered within 7 weeks (July-August) by five fieldworkers. Data was captured on Excel and SPSS (version 23).
Analysis of data	Both descriptive (frequency distributions) and inferential analyses (Kruskall-Wallis test, Pearson Chi-Square test and binary logistic regression) were conducted on the data.
Ethical considerations	The fieldwork was conducted within the directives of the ethical policy of the University of South Africa (refer to appendix B for the ethical clearance certificate).

Source: Compiled by the researcher

## Chapter 5

### Empirical findings on the logistical supply chain drivers

#### 5.1 Introduction

In this chapter the empirical analyses related to the three logistical supply chain drivers are discussed by presenting both descriptive and inferential statistical findings. The findings are derived from data gathered from 556 formal independent small retail businesses which will be referred to as “the respondents” or “small retailers” in the subsequent discussions. The inferential analyses were performed by either the Kruskal-Wallis test or the Pearson Chi-Square test. Throughout the chapter, twenty four empirical findings are reported on, and indicated by using the abbreviation EF.

#### 5.2 Notes regarding the statistical analyses of the data

Before discussing the statistical analyses the following should be noted:

- **Different scales of measurement:** When discussing the descriptive findings (in sections 5.3.1, 5.4.1 and 5.5.1), the findings on a specific aspect related to facilities, inventory or transportation are grouped together, despite the data coming from different questions in the questionnaire. Since the scales of measurement vary for different questions due to the type and detail of information required, the frequency distribution of the responses is presented in separate tables. When asked to rate the importance of a question, the scale ranged from very unimportant to very important, and when asked about frequency (how often), a scale of never, sometimes and always, was used.
- **Inferential analyses:** As discussed in section 4.3.7.2, inferential analyses were done on the data regarding the three logistical drivers in order to determine whether the industry in which the respondents operate, influences their responses. If a statistically significant difference or association ( $p \leq 0.05$ ) was found between the six industry groups with regard to the responses relating to a specific question, only the industry with the highest mean rank was considered. If no statistically significant difference exists at the 5% level between the different industry groups with regard to the specific question, the industry group in

which the respondents operate do not influence their responses, therefore the mean ranks were not discussed. The mean ranks of the questions where no statistically significant difference exists are available in appendix C.

- **Stock versus inventory:** The concepts of stock and inventory are viewed as synonymous in this study. The word “stock” was used in the questionnaire and interviews as the respondents are probably more familiar with the word. When reporting on the results the word “inventory” is used in order to conform to the academic literature.

### **5.3 Empirical findings related to facilities as a logistical supply chain driver**

In the questionnaire, sections E11 and E3 contained questions on how small retailers manage their facilities (see appendix A). This section (5.3) is structured to first discuss the descriptive analyses of the data regarding facilities, followed by the inferential analyses of the data.

#### **5.3.1 Descriptive analyses of the data pertaining to facilities**

The descriptive analyses of the data regarding facilities are structured under five headings: the proximity of the business to customers; the proximity of the business to public transport; providing customers with a fast checkout; the capacity of the facility; and accessibility of excess inventory. The frequency distribution of the importance rating regarding the first three issues (proximity to customers and public transport, and providing a fast checkout) are provided in table 5.1 and is followed by a discussion. Thereafter, the frequency distribution (provided in table 5.2) of the agreement of the respondents (in terms of how often/frequently) regarding the last two issues (capacity of the facility and accessibility of excess inventory) is discussed.

**Table 5.1 Respondents’ importance rating of the different aspects relating to facilities**

Facility aspects	Percentages				
	Very unimportant ← → Very important				
Near to customers	0.9	1.3	2.5	9.4	84.9
Near to public transport	0.7	0.5	2.3	10.1	85.3
Fast checkout	1.3	2.5	6.5	18.9	70

Source: Compiled by the researcher from survey results

### 5.3.1.1 Proximity of the business to customers

The respondents were asked to rate the importance (ranging from very unimportant to very important) of being located near to customers. From table 5.1 it follows that the majority (84.9%) of respondents indicated that they view it as very important that their facility are located near to their customers. In 2014, researchers for the World Bank (2014:153, 163) found that owners and managers know that being located close to customers holds an advantage. They also found that township residents generally purchase from retailers that are located within their neighbourhood and usually walk to a retailer’s store (World Bank, 2014:15). The high importance rating of respondents with regard to their facility being located near to customers in this study corroborates these findings. Therefore, the decision to be located near to customers indicates the retailers’ focus on **responsiveness**.<sup>EF1</sup>

### 5.3.1.2 Proximity of the business to public transport

In another question the respondents were asked to rate the importance of being located near to public transport. Once again, a similarly large majority (85.3%) of the respondents indicated that it is very important to be located near to public transport (see table 5.1). A possible reason for the high rating can be that retailers know that customers find it convenient to purchase products or use services at a taxi rank or bus stop on their way home. This is in line with the previous finding in section 5.3.1.1, that the majority of respondents view it as very important to be located near to customers. The decision to be located near to public transport is once again based on **responsiveness**.<sup>EF1</sup>

### 5.3.1.3 Providing customers with fast checkout

In terms of facilities, the respondents were asked to indicate how important they viewed it to provide customers with a fast checkout at the retail facility. A slightly lower majority (70%) indicated that it is very important to provide customers with a fast checkout (see table 5.1). Such a response implies that respondents are focused on **responsiveness** by assisting customers at their facility as quickly as possible.<sup>EF1</sup>

### 5.3.1.4 Capacity of the facility

Table 5.2 provides the frequency distribution of the respondents' level of agreement with regard to how frequently the statements regarding the capacity of the facility and the accessibility of excess inventory, applied (see sections 5.3.1.4 and 5.3.1.5).

**Table 5.2 Respondents' rating on facility statements**

Facility statements	Rate		
	Never	Sometimes	Always
I have the capacity to store excess stock in my store.	32.4	16.7	48.2
I can access my excess stock quickly and easily.	29	16	52.7

Source: Compiled by the researcher from survey results

Respondents had to indicate whether they (never, sometimes or always) had the capacity to store excess inventory in their stores. 32.4% of respondents (see table 5.2), indicated that they never have the capacity to store excess inventory in their stores. A possible explanation for the difficulty in having capacity to store excess inventory in-store is confirmed by the overall lack of retail space within townships (World Bank, 2014:46). By not having the capacity to store excess inventory in their stores, retailers are at risk of not having products immediately available to customers and this can lead to a decrease in retailers' level of responsiveness. More than half (64.9%) of the respondents indicated that they sometimes and always have the capacity to store excess inventory in their stores (see table 5.2). The respondents who have the capacity to store excess



inventory in their stores, will most likely experience an increase in their level of responsiveness, as inventory will be readily available when customer demand arises. Therefore, the decision to have capacity to store excess inventory in their stores, is based on **responsiveness**.<sup>EF1</sup>

#### **5.3.1.5 Accessibility of excess inventory**

When the respondents were asked whether they could (never, sometimes or always) access their excess inventory quickly and easily, more than half (68.7%) indicated that they can sometimes and always access their excess inventory quickly and easily (see table 5.2). Considering the previous finding in section 5.3.1.4 where 64.9% of the respondents indicated that they sometimes and always have capacity to store excess inventory in their stores, it suggests that the respondents do not only see the benefits of having the capacity to store excess inventory in their stores, but are also aware of the benefits of having quick and easy access to the excess inventory. Having a facility where excess inventory is quickly and easily accessible indicates the retailers' emphasis on **responsiveness**.<sup>EF1</sup>

To summarise, the descriptive analyses of the data on facilities regarding the trade-off between responsiveness and cost-efficiency, confirm that formal independent small retail businesses operating in Soweto acknowledge the importance of, and are focused on, being **responsive** when managing facilities as a logistical supply chain driver.<sup>EF1</sup>

The next step was to perform inferential analyses to determine whether a difference exists between the retailers from the six industry groups with regard to the responses to the questions concerning facilities.

#### **5.3.2 Inferential analyses of the data pertaining to facilities**

When analysing the selected questions on facilities in sections E11 and E3, the Kruskal-Wallis one-way analysis of variance by rank test was used to analyse the ordinal data obtained (see section 4.3.7.2). Two hypotheses were formulated and are discussed in sections 5.3.2.1 and 5.3.2.2.

### 5.3.2.1 Hypothesis 1

The first hypothesis was formulated to determine if a difference exists between the retailers from the six industry groups with regard to their importance rating of their location near to customers; near to public transport; and providing customers with a fast checkout. The hypothesis was formulated as follows:

H<sub>1</sub>: There is a difference between the industry groups with regard to their importance rating (very unimportant to very important) concerning whether they are

- H<sub>1a</sub> near to customers
- H<sub>1b</sub> near to public transport
- H<sub>1c</sub> providing a fast checkout.

The results of the Kruskal-Wallis test in terms of the difference between the industry groups with regard to the importance rating of the facility aspects (hypothesis 1), are shown in table 5.3.

**Table 5.3 Kruskal-Wallis test results on hypothesis 1**

Facility aspects	Chi-Square	Df	Asymptotic significance
Near to customers	3.363	5	.644
Near to public transport	8.196	5	.146
Fast checkout	6.901	5	.228

Source: Compiled by the researcher from survey results

The results show that no statistically significant difference exists at the 5% level of significance (all *p-values* > 0.05) among the different industry groups with regard to their importance ratings of the facility aspects. The mean ranks are fairly similar (see section 5.2) and thus show a similar rating of the importance by the different industry groups to being located near to customers, being located near to public transport and providing customers with a fast checkout.<sup>EF2</sup>

### 5.3.2.2 Hypothesis 2

The second hypothesis was formulated to determine if a difference exists between the retailers from the six industry groups with regard to their agreement on how frequently they have the capacity to store excess inventory in their stores; and how frequently they can access their excess inventory quickly and easily. The hypothesis was stated as follows:

H<sub>2</sub>: There is a difference between the industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- H<sub>2a</sub> have the capacity to store excess stock in their stores
- H<sub>2b</sub> can access their excess stock quickly and easily.

The results of the Kruskal-Wallis test in terms of the difference between the industry groups regarding the second hypothesis, are shown below.

**Table 5.4 Kruskal-Wallis test results on hypothesis 2**

Facility statements	Chi-Square	Df	Asymptotic significance
I have the capacity to store excess stock in my store.	35.109	5	.000
I can access my excess stock quickly and easily.	15.081	5	.010

Source: Compiled by the researcher from survey results

The results show that a statistically significant difference exists at the 1% and 5% levels of significance ( $p$ -values < 0.01 and 0.05, respectively) between the different industry groups with regard to their agreement on how frequently (never, sometimes, always) they have the capacity to store excess inventory in their stores and how frequently they can access their excess inventory quickly and easily.<sup>EF3</sup>

To further investigate the differences between the six industry groups and their capacity to store excess inventory in their stores and also access their excess inventory quickly and easily, the mean ranks (see section 5.2) as provided in table 5.5, were considered.

**Table 5.5 Mean ranks for hypothesis 2**

Industries	Mean ranks	
	I have the capacity to store excess stock in my store	I can access my excess stock quickly and easily
Retail Grocery	283.72	280.06
Retail Hardware	299.37	301.12
Retail General Store	316.55	304.07
Retail Service	216.81	237.34
Eating and Drinking Places	291.45	278.67
Retail Auto	226.47	231.24

Source: Compiled by the researcher from survey results

A higher mean rank indicates that an industry group tends to have capacity to store their excess inventory in their stores more frequently, and access their excess inventory quickly and easily more frequently, than the other industry groups. Table 5.5 shows that retail general stores tend to have the capacity to store excess inventory in stores more frequently than the other industry groups, with a mean rank of 316.55. Retail general stores can also access their excess inventory quickly and easily more frequently than the other industry groups (mean rank of 304.7). A possible reason can be that retail general stores, by their very nature (selling a variety of products), may require additional storage space. The results regarding the industry groups indicate that retail general stores place more emphasis on **responsiveness** than the other industries.<sup>EF4</sup>

## 5.4 Empirical findings related to inventory as a logistical supply chain driver

In sections D2, E2, E3, E6 and E11 of the questionnaire, respondents were asked to indicate the type of supplier they purchase inventory from most frequently; their level of agreement with regard to how frequently an inventory statement applies to them; their importance rating of certain inventory aspects; and their disagreement or agreement with various inventory statements. First, the descriptive findings pertaining to inventory will be discussed, followed by the inferential analyses of the relevant inventory questions.

### 5.4.1 Descriptive analyses of the data pertaining to inventory

The descriptive analyses of data gathered in sections D2, E2, E3, E6 and E11 are discussed under two headings, namely the average rate of purchasing inventory and the quantity of inventory purchased.

#### 5.4.1.1 Average rate of purchasing inventory

The average rate of purchasing inventory was established by examining the frequency distributions of questions D2, E3 (e) and E2 (see tables 5.6, 5.7 and 5.8).

**Table 5.6 Type of supplier from whom respondents purchase inventory**

Different types of suppliers	Percentage of respondents purchasing from the supplier
Manufacturers	15.7
Wholesalers	62.3
Retailers	15.2
Agents	1.3
NGOs	0.9
Other	4.7

Source: Compiled by the researcher from survey results

**Table 5.7 Respondents' rating on obtaining more inventory from suppliers**

Inventory statement	Rating		
	Never	Sometimes	Always
I can easily obtain more stock from my suppliers if I run out of stock.	29.9	21.2	45.5

Source: Compiled by the researcher from survey results

**Table 5.8 Respondents' rate of purchasing inventory**

Rate of purchasing inventory	Daily	Weekly	Monthly	When I see that my stock is low
How often, on average, do you purchase inventory?	12.4	51.6	10.3	24.3

Source: Compiled by the researcher from survey results

The majority (62.3%) of respondents indicated that they purchase their inventory from wholesalers (see table 5.6).<sup>EF5</sup> The respondents were also asked whether they could easily obtain more inventory from suppliers when they ran out of inventory (never, sometimes or always). Table 5.7 shows that two thirds (66.7%) of the respondents indicated that they can sometimes and always easily obtain more inventory from their suppliers if they run out of inventory. Researchers of the World Bank (2014:172) also found that retailers in townships generally find it easy to purchase inventory from their suppliers, as multiple suppliers are available to choose from. The ability to easily acquiring more inventory from suppliers when necessary may increase the retailers' level of responsiveness.<sup>EF6</sup>

When the respondents were asked how often, on average, they purchased inventory, a similar percentage (64%) of the respondents indicated that they purchase inventory on a daily or weekly basis (see table 5.8). A possible explanation for purchasing inventory on a daily or weekly basis, can be ascribed to the lack of retail space within townships (World Bank, 2014:46); which makes it difficult for retailers to store excess inventory. Other possible reasons for purchasing inventory on a daily or weekly basis may be because, first, retailers do not want to risk running out of inventory, and secondly, the ease with which new inventory can be acquired by the respondents since there

are numerous suppliers to select from. Purchasing inventory on a daily or weekly basis may increase the retailers' level of responsiveness.<sup>EF6</sup> To conclude, the respondents' purchasing decisions seem to underline their commitment to **responsiveness**.

#### 5.4.1.2 Quantity of inventory purchased

The quantity of inventory purchased by the respondents was analysed by examining data obtained from questions E3 (a–d; f–h); E6 (a; c) and E11 (a; c). Tables 5.9 to 5.11 provide the frequency distributions for each question.

**Table 5.9 Respondents' ratings on inventory statements**

Inventory statements	Rates		
	Never	Sometimes	Always
I purchase less stock than what I sell within a month.	43.5	32.6	21.2
I purchase the exact amount of stock that I sell within a month.	31.7	39.6	25.9
I purchase more stock than what I sell within a month.	27.9	36.3	33.1
It is too expensive for me to purchase more stock than what I can sell within a month.	27.5	31.5	38.1
I purchase more stock when it is on sale at my suppliers.	19.2	25.7	51.8
I purchase more stock when I have a sale in my store.	26.4	27.5	42.6
I make provision for the fluctuation in the demand from my customers (e.g. over Easter and Christmas).	24.5	24.6	48.2

Source: Compiled by the researcher from survey results

When the respondents were asked whether they purchased less, or the exact amount, or more inventory than they sold within a month, 53.8% of the respondents indicated that they sometimes

and always purchase less, 65.5% that they sometimes and always purchase the exact amount and 69.4% that they sometimes and always purchase more (see table 5.9).

Poor inventory management can be a possible reason for the just more than half (53.8%) of respondents who indicated that they sometimes and always purchase less inventory than they can sell within a month. Purchasing less inventory than they could sell within a month may decrease the level of responsiveness of the retailers, since they may not have a product when required by customers. The decisions of the almost two thirds (65.5%) of respondents who indicated that they sometimes and always purchase the exact amount of inventory than they sell within a month, can be due to the lack of storage space in townships (World Bank, 2014:207). The decisions of the retailers (69.4%) who indicated that they sometimes and always purchase more inventory than they sell within a month, can be due to the retailers purchasing inventory in large quantities, in order to qualify for free delivery from suppliers (World Bank, 2014:151-153). Such a small business could increase its level of cost-efficiency, since it would save on transportation costs. However, owners or managers of small businesses should take into consideration the cost of purchasing additional inventory (to qualify for the free delivery), as it may exceed the saving on transportation costs. This can result in the business eventually paying more for the additional inventory and ultimately decreasing the level of cost-efficiency.<sup>EF6</sup>

More than two thirds (69.6%) of the respondents indicated that it was sometimes and always too expensive for them to purchase more inventory than they can sell within a month (see table 5.9). These responses imply that respondents are aware of the costs involved when purchasing more inventory than they can sell within a month.<sup>EF7</sup> When the respondents were asked whether they purchased more inventory when it was on sale at their suppliers, more than half (51.8%) of the respondents indicated that they always purchase more during sales (see table 5.8). Paying less for inventory will contribute to cost-efficiency and responsiveness as excess inventory is available.<sup>EF7</sup>

A majority (70.1%) of respondents indicated that they sometimes and always purchase more inventory when they have a sale in their stores (see table 5.9). Purchasing more inventory when having a sale, implies that the retailers make provision for the increase in customer demand.<sup>EF6</sup> Additionally, 72.8% of respondents indicated that they sometimes or always make provision for fluctuation in customer demand during special times, such as Easter and Christmas (see table 5.9).



This is in line with the previous finding that 70.1% of the respondents purchase more inventory when they have a sale in their stores. These responses indicate that the retailers are focused on **responsiveness**.<sup>EF7</sup>

**Table 5.10 Respondents' level of agreement with the inventory statements**

Inventory statements	Strongly disagree ← → Strongly agree				
	A product should be immediately available to my customers when they want to buy it.	0.7	0.7	2.3	21.9
My customers know that I will always have enough stock.	0.7	0.9	3.8	24.8	68

Source: Compiled by the researcher from survey results

When the respondents were asked to rate their level of agreement (ranging from strongly disagree to strongly agree) with a statement on the immediate availability of a product to customers, the majority (72.8%) indicated that they strongly agree (see table 5.10). Having products immediately available to customers when they want to buy it, will increase the respondents' level of responsiveness.<sup>EF6</sup> A similar percentage (68%) of the respondents also indicated that they strongly agree that their customers know they will always have enough inventory (see table 5.10) indicating the retailer's perception of their customers' opinions on their ability to always stock sufficient inventory.<sup>EF6</sup>

**Table 5.11 Respondents' importance rating of the different aspects relating to inventory**

Inventory aspects	Percentages				
	Very unimportant ← → Very important				
Quality products	0.7	1.8	3.4	20.1	73.2
Enough product variety	0.5	1.1	4.1	24.6	68.9

Source: Compiled by the researcher from survey results

Respondents were asked to rate the importance, ranging from very unimportant to very important, of carrying quality products and offering enough product variety (see table 5.11). The

majority (73.2%) of respondents rated it very important to carry quality products. According to the World Bank (2014:10, 268), residents in townships expect the same quality products from small retailers as from large retail groups, such as Shoprite and Pick n Pay. Quality products are generally associated with higher prices and will decrease a retailer's cost-efficiency.<sup>EF6</sup> Similarly, 68.8% of the respondents rated carrying enough product variety as very important. Carrying enough product variety will also increase the retailer's responsiveness since customer demand can be met.<sup>EF6</sup> Therefore, the decisions with regard to the quantity of inventory purchased by small retailers are based on either **responsiveness** or **cost-efficiency**, depending on the circumstances of the individual retailer.

To summarise, the descriptive analyses of the data on inventory, regarding the trade-off between responsiveness and cost-efficiency, confirm that formal independent small retail businesses operating in Soweto, seem to focus on **responsiveness** when managing inventory as a logistical supply chain driver.

The next step with regard to inventory was to perform inferential analyses on the relevant responses to determine whether a difference exists between the six industry groups and the responses on the questions pertaining to inventory.

#### **5.4.2 Inferential analyses of the data pertaining to inventory**

The Kruskal-Wallis one-way analysis of variance by ranks test was used to analyse the ordinal data obtained by the questions in sections E2, E3, E6 and E11 of the questionnaire. Four hypotheses were formulated and will be discussed in sections 5.4.2.1 to 5.4.2.4.

##### **5.4.2.1 Hypothesis 3**

The third hypothesis was formulated in order to determine if a difference exists between the six industry groups with regard to how often (daily, weekly, monthly, when I see my stock is low), on average, they purchase inventory. The hypothesis was formulated as follows:

H<sub>3</sub>: There is a difference between the industry groups with regard to how frequently (daily, weekly, monthly, when I see my stock is low), on average, they purchase inventory.

The results of the Kruskal-Wallis test in terms of the different industry groups with regard to how often, on average, they purchase inventory, are shown in table 5.12.

**Table 5.12 Kruskal-Wallis test results on hypothesis 3**

Inventory question	Chi-Square	Df	Asymptotic significance
How often, on average, do you purchase inventory?	15.469	5	.009

Source: Compiled by author from survey results

The results show that a statistically significant difference exists at the 1% level of significance ( $p\text{-value} < 0.01$ ) between the different industry groups with regard to how often, on average, they purchase inventory. This means that the six industries differ with regard to how often, on average, they purchase inventory.<sup>EF8</sup>

To further investigate the differences between the six industry groups with regard to how often, on average, the respondents purchase inventory, the mean ranks (provided in table 5.13) were considered.

**Table 5.13 Mean ranks for hypothesis 3**

Industries	Mean ranks
	How often, on average, do you purchase inventory?
Retail Grocery	265.50
Retail Hardware	308.25
Retail General Store	283.75
Retail Service	285.73
Eating and Drinking Places	201.51
Retail Auto	303.80

Source: Compiled by author from survey results

A low mean rank indicates that the industry group tends to purchase inventory on a daily basis, whereas a high mean rank indicates that the industry tends to purchase inventory only when they see the inventory level is low. The results indicate that retail hardware stores (mean rank = 308.25) tend to purchase inventory only when inventory levels are low.<sup>EF9</sup> The products that they sell are generally characterised as specialised and sometimes expensive, for example bricks and cement. Generally the demand for these specialised products are lower, compared to products in other industries; therefore, retail hardware stores may choose not to purchase more inventory than necessary, as this could increase costs (such as facility and inventory costs). From the above it seems that retail hardware stores are more focused on cost-efficiency when making decisions on replenishing inventory.

#### **5.4.2.2 Hypothesis 4**

The fourth hypothesis was aimed at determining if a difference exists between the six industry groups with regard to their agreement on how frequently they purchase inventory; whether it is too expensive to purchase more inventory than they can sell within a month; the effort in obtaining inventory; and providing for fluctuating customer demand. The hypothesis was formulated as follows:

H<sub>4</sub>: There is a difference between the industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- H<sub>4a</sub> purchase less stock than they can sell within a month
- H<sub>4b</sub> purchase the exact amount of stock that they sell within a month
- H<sub>4c</sub> purchase more stock than they sell within a month
- H<sub>4d</sub> find it too expensive to purchase more stock than they can sell within a month
- H<sub>4e</sub> can easily obtain more stock from their suppliers if they run out of stock
- H<sub>4f</sub> purchase more stock when it is on sale at their suppliers
- H<sub>4g</sub> purchase more stock when they have a sale in their stores
- H<sub>4h</sub> make provision for fluctuation in demand from their customers (e.g. over Easter and Christmas).

The results of the Kruskal-Wallis test to determine whether there is a difference between the industry groups with regard to the agreement on how frequently the inventory statements apply to them, are shown in table 5.14.

**Table 5.14 Kruskal-Wallis test results on hypothesis 4**

Inventory statements	Chi-Square	Df	Asymptotic significance
I purchase less stock than what I sell within a month.	9.081	5	.106
I purchase the exact amount of stock that I sell within a month.	2.961	5	.706
I purchase more stock than what I sell within a month.	3.897	5	.564
It is too expensive for me to purchase more stock than what I can sell within a month.	5.015	5	.414
I can easily obtain more stock from my suppliers if I run out of stock.	21.097	5	.001
I purchase more stock when it is on sale at my suppliers.	29.711	5	.000
I purchase more stock when I have a sale in my store.	10.841	5	.055
I make provision for the fluctuation in the demand from my customers (e.g. over Easter and Christmas).	15.081	5	.010

Source: Compiled by author from survey results

The results show that no statistically significant difference exists at the 5% level of significance (all *p-values* > 0.05) between the different industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- H<sub>4a</sub> purchase less stock than they sell within a month
- H<sub>4b</sub> purchase the exact amount of stock that they sell within a month
- H<sub>4c</sub> purchase more stock than they sell within a month
- H<sub>4d</sub> find it too expensive to purchase more stock than they can sell within a month.
- H<sub>4g</sub> purchase more stock when they have a sale in their stores.

The mean ranks are fairly similar and thus show a similar rating of agreement on how frequently these inventory statements apply to the industry group.<sup>EF10</sup>

The results of the remaining inventory statements show that statistically significant differences exist at the 1% and 5% levels of significance ( $p < 0.01$  and  $p < 0.05$ ) between the different industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- H<sub>4e</sub> can easily obtain more stock from their suppliers if they run out of stock
- H<sub>4f</sub> purchase more stock when it is on sale at their suppliers
- H<sub>4h</sub> make provision for the fluctuation in demand from their customers (e.g. over Easter and Christmas).<sup>EF11</sup>

To further investigate the differences between the six industries and their agreement on the three matters above, the mean ranks (see section 5.2) provided in table 5.15 were considered.

**Table 5.15 Mean ranks for hypothesis 4**

Industries	Mean ranks		
	I can easily obtain more stock from my suppliers if I run out of stock	I purchase more stock when it is on sale at my suppliers	I make provision for the fluctuation in demand from my customers (e.g. over Easter and Christmas)
Retail Grocery	288.50	286.60	295.92
Retail Hardware	300.21	281.04	268.88
Retail General Store	280.91	311.57	262.17
Retail Service	227.44	217.22	244.17
Eating and Drinking Places	285.76	262.99	289.42
Retail Auto	224.49	251.00	226.22

Source: Compiled by author from survey results

When considering the mean ranks (in table 5.15) it appears that retail hardware stores (mean rank = 300.21) tend to easily obtain more inventory from suppliers when they run out of inventory more frequently than the other industry groups.<sup>EF12</sup> This finding can shed light on the previous finding (for hypothesis 3) that retail hardware stores purchase inventory only when their inventory level is low. Both findings indicate that owners or managers of retail hardware stores tend to operate their businesses more **cost-efficiently**.

Retail general stores tend to purchase more inventory, more frequently, when it is on sale at suppliers than the other industry groups<sup>EF13</sup>, with a mean rank of 311.57. Purchasing more inventory at a lower price can increase the retail general store's cost-efficiency. In hypothesis 2 it was determined that retail general stores tend to have capacity to store excess inventory more frequently, which can also encourage them to purchase more inventory.

With a mean rank of 295.92, retail grocery stores tend to more frequently make provision for fluctuation in demand from customers, than the other industry groups.<sup>EF14</sup> Retail grocery stores may be influenced by special occasions, such as Easter and Christmas, more than other industry groups, since special occasions are generally associated with higher consumption of food and beverages. By ensuring that they make provision for the fluctuation in customer demand, these stores can increase their level of responsiveness.

### 5.4.2.3 Hypothesis 5

The purpose of the fifth hypothesis was to determine if a difference exists between the six industry groups with regard to their level of agreement on having products immediately available to customers; and having their customers know that they will always have enough inventory. The hypothesis was formulated as follows:

H<sub>5</sub>: There is a difference between the industry groups with regard to their level of agreement (strongly disagree to strongly agree) on whether

- H<sub>5a</sub> they have products immediately available to customers when they want to buy it
- H<sub>5b</sub> their customers know that they will always have enough stock.

The results of the Kruskal-Wallis one-way analysis of variance by ranks tests are shown in table 5.16.

**Table 5.16 Kruskal-Wallis test results on hypothesis 5**

Inventory statements	Chi-Square	Df	Asymptotic significance
A product should be immediately available to my customers when they want to buy it.	2.112	5	.833
My customers know that I will always have enough stock.	6.617	5	.430

Source: Compiled by the researcher from survey results



The results show that no statistically significant difference exists at the 5% level of significance ( $p$ -values > 0.05) between the different industry groups with regard to the level of agreement on the two inventory statements in hypothesis 5. The mean ranks are fairly similar and therefore indicate a similar rating between the different industry groups.<sup>EF15</sup>

#### 5.4.2.4 Hypothesis 6

The sixth hypothesis was aimed at determining if a difference exists between the six industries with regard to their importance rating on carrying quality products and having enough product variety. The hypothesis was formulated as follows:

H<sub>6</sub>: There is a difference between the industry groups with regard to their importance rating (very unimportant to very important) on the following aspects related to inventory:

- H<sub>6a</sub> carrying quality products
- H<sub>6b</sub> having enough product variety.

The results of the Kruskal-Wallis test in terms of the difference between the industry groups and the importance rating on carrying quality products and having enough product variety, are shown in table 5.17.

**Table 5.17 Kruskal-Wallis test results on hypothesis 6**

Inventory aspects	Chi-Square	Df	Asymptotic significance
Quality products	6.915	5	.227
Enough product variety	4.776	5	.444

Source: Compiled by the researcher from survey results

The results show that no statistically significant difference exists at the 5% level of significance ( $p$ -values > 0.05) between the different industry groups with regard to the level of importance on carrying quality products and having enough product variety available to customers. The mean ranks are fairly similar and therefore indicate a similar rating between the different industry groups with regard to the importance of these inventory aspects.<sup>EF16</sup>

By examining the inferential analyses of the different industry groups in terms of inventory, it can be concluded that retail hardware stores manage inventory more cost-efficiently, since they tend to only purchase inventory when their level is low (see section 5.4.2.1). Retail general stores take advantage of having capacity to store excess inventory by purchasing more inventory, more frequently, than other industry groups, when a supplier has a sale. By paying less for inventory, retail general stores increase their cost-efficiency (see section 5.4.2.2). By making provision for fluctuation in customer demand, retail grocery stores tend to be more **responsive** than other industry groups.

## **5.5 Empirical findings related to transportation as a logistical supply chain driver**

Sections D2 and D3 of the questionnaire contained questions on the management of transportation by small retailers. In question D2 respondents had to indicate their level of agreement with regard to how frequently a transportation statement applied to them; whereas they had to indicate in question D3 whether they would pay higher delivery costs if a supplier could deliver inventory sooner than usual. The descriptive findings on these questions will be discussed below, followed by the inferential analyses of the retailers' responses.

### **5.5.1 Descriptive analyses of the data pertaining to transportation**

This section is structured to provide the frequency distributions and discussion of the agreement of the respondents with statements on transportation (see table 5.18). These statements refer to direct delivery of inventory by suppliers; payment for direct delivery; higher payment than competitors for faster delivery; collection of inventory with own car; collection of inventory by using a transportation opportunity; collaboration with other retailers; and willingness to wait longer to pay less for delivery. Thereafter, the frequency distribution and discussion of the respondents' willingness to pay a supplier more to receive inventory sooner (see table 5.19), are provided in section 5.5.1.8.

**Table 5.18 Respondents' agreement with statements on transportation**

Transportation statements	Rate		
	Never	Sometimes	Always
My supplier(s) deliver(s) my stock directly to my store.	40.6	23	34.7
I pay my supplier(s) to deliver my stock directly to my store.	74.6	13.3	9.9
I pay my supplier more than my competing retailers to receive my stock faster.	88.3	7.4	2.7
I collect my stock using my own transportation (using your own car).	23.4	18.5	55.9
I collect my stock by making use of a transport opportunity (not using my own car).	42.8	24.5	31.3
Another retailer(s) and I take turns to fetch the stock for both/all of our shops.	66.7	15.5	16
I am willing to wait longer to pay less for my stock.	78.8	9.9	9.4

Source: Compiled by the researcher from survey results

### 5.5.1.1 Direct delivery of inventory by suppliers

When asked whether the respondents had their inventory delivered directly to their stores, the responses were distributed across the options, with 40.6% indicating that suppliers never deliver inventory directly to their stores; 23% indicating that inventory is sometimes delivered directly to their stores by suppliers; and 34.7% indicating that suppliers always deliver inventory directly to their stores (see table 5.18). According to the World Bank (2014:151-153, 172-173), managers or owners of small businesses in townships generally travel to formal wholesalers by making use of public transport (taxis in the form of minibuses) or by hiring a small truck to collect inventory for their stores. This can explain the fairly high percentage (40.6%) of respondents who indicated that they never have their inventory delivered directly to their stores by suppliers. Collecting inventory personally can increase the level of responsiveness of a business as they can easily adapt to changes, for example, in day or time of collection. The 34.7% (just over a third) of respondents who indicated that they always have their inventory delivered directly to their store by their

suppliers, can be considered as unique for a small business. The World Bank (2014: 151-153, 172-173) suggests that larger wholesalers deliver inventory to small businesses only if they order large quantities which is generally not possible for small businesses as they have limited resources available. Not only can respondents save on transportation costs by purchasing large quantities, but they can also benefit from a lower price per unit. By saving on transportation costs and gaining the benefit of a lower price per unit, they can increase their level of cost-efficiency. Therefore, the decision to have inventory directly delivered by suppliers to the respondents' stores can be based on either **responsiveness**<sup>EF17</sup> or **cost-efficiency**<sup>EF18</sup>.

#### **5.5.1.2 Payment for direct delivery**

Almost three quarters (74.6%) of the respondents indicated that they never pay a supplier to deliver inventory directly to their stores (see table 5.18). Three possible reasons could be given for this high percentage. First, not all of the respondents have their inventory delivered to their stores by suppliers; which confirms the previous finding (section 5.5.1.1), where 40.6% of the respondents indicated that their suppliers never deliver inventory directly to their stores. Thus, not having inventory delivered directly to their stores by suppliers will involve no delivery costs. Secondly, the supplier may not offer a delivery service, such as a supplier operating from a stall at a market, as indicated by the World Bank (2014: 151-153, 172-173). Thirdly, a small retailer may order large quantities at wholesalers (which, as stated in section 5.5.1.1, is unusual for a small business), and therefore the wholesalers may deliver free of charge. If small retailers order larger quantities of inventory in order to qualify for free delivery, they can increase their level of cost-efficiency as they will save on transportation costs (as discussed in 5.5.1.1). However, owners or managers should consider the cost of purchasing additional inventory (to qualify for the free delivery) because it may exceed the cost (transportation cost) benefit of free delivery. This can result in the retailer eventually paying more for the additional inventory and ultimately decreasing the level of cost-efficiency. In conclusion, the decision to pay a supplier to deliver inventory directly to the respondents' stores is based on **cost-efficiency**.<sup>EF18</sup>

#### **5.5.1.3 Higher payment than competitors for faster delivery**

Almost 90% of the respondents indicated that they would never pay a supplier more than competing retailers in order to receive their inventory faster (see table 5.18). Although receiving

inventory before a competitor, could give retailers a competitive advantage, by having inventory readily available to customers, the respondents in this study will, by implication, rather wait longer to receive their inventory than to increase transportation costs. The respondents may argue that an increase in transportation costs would lead to an increase in the price of their products or services. By not paying an additional fee to receive inventory faster, the small retailers are focused on cost-efficiency rather than responsiveness. As transportation costs can influence the price of a product, and retailers in Soweto are mainly serving price-sensitive customers (Strydom, 2013:2870), an increase in the price of a product can negatively influence sales. If a small retailer paid a supplier more to receive inventory faster, it could increase responsiveness but at the same time decrease cost-efficiency, which could lead to a loss in sales. In conclusion, not paying a higher fee than a competitor for faster delivery of inventory, indicates that the focus is on **cost-efficiency**.

EF18

#### **5.5.1.4 Collection of inventory with own car**

When asked whether the respondents (never, sometimes or always) collected inventory using their own transportation (using their own car), the responses were distributed across the options: 23.4% of the respondents indicated never, 18.5% indicated sometimes and more than half (55.9%) of the respondents indicated always (see table 5.18). The responses of the business owners or managers who indicated that they never use their own transport can be attributed to the fact that they may either not own cars (which is more likely) or that they may prefer not to use their own cars for collecting inventory (for instance because of the size of the inventory items or the quantity purchased). According to the World Bank (2014: 151-153, 172-173), small businesses in townships that do not use their own cars to collect inventory usually collect their inventory by making use of public transportation or by hiring small trucks (which is the focus of the next transportation statement). Since the average cost of collecting inventory from a supplier is between R300 and R350 per trip when making use of public transport or hiring a small truck (as calculated by the World Bank, 2014: 151-153, 172-173), an owner or manager who owns a car will probably find it cheaper to use their own car to collect inventory. This explains why the majority (55.9%) indicated that they always use their own cars to collect inventory. The explanations for the different responses on this issue can range from respondents being responsive, to them being cost-efficient, EF17 depending on their situation. Irrespective of the line of reasoning behind not using one's own

car for inventory collection, a focus on cost-efficiency seems to drive this decision. Those respondents who indicated that they sometimes and always (74.8%) use their own cars to collect inventory could be either cost conscious (saving the fee associated with other transport) or responsive (taking control of the situation to fetch inventory themselves). This finding aligns with a previous descriptive finding that the majority of respondents never pay their suppliers to have inventory delivered directly to their stores. Therefore, the decision to use their own cars for inventory collection could be based on either **responsiveness**<sup>EF17</sup> or **cost-efficiency**<sup>EF18</sup>.

#### **5.5.1.5 Collection of inventory by using a transportation opportunity**

When asked whether the respondents (never, sometimes or always) collected inventory by using a transportation opportunity, which implies that they do not use their own cars, the responses were distributed across the options: 42.8% indicated never, 24.5% indicated sometimes and 31.3% indicated always (see table 5.18). The high percentage (42.8%) who indicated that they never use a transportation opportunity confirms the previous finding (see section 5.5.1.4) that the majority of respondents use their own transport to collect inventory. The 55.8% of respondents who indicated that they sometimes or always use a transport opportunity, will therefore be willing to pay the transportation fee of between R300 and R350 per trip. Thus, the main reason for making use of transportation opportunities (and not one's own car) seems to be based on **cost-efficiency**.<sup>EF18</sup>

#### **5.5.1.6 Collaborating with other retailers to collect inventory**

Two thirds (66.7%) of respondents indicated that they never take turns with other retailers to fetch inventory for both/all of their shops (see table 5.18). This high percentage could be an indication of a silo mentality and the fact that respondents do not realise the synergistic advantages of working with others. Owners or managers seem to take sole responsibility for collecting their inventory, and this can be a reflection of their focus on responsiveness. By functioning on their own, in terms of collecting inventory, small retail owners and managers show a preference for having more control of their situations; in this case by controlling the time and speed of collection. In contrast, the World Bank (2014: 151-153, 172-173) reports that, in general, owners or managers in townships seem to be more focused on cost-efficiency; and that they collaborate by renting a small truck together (and sharing the cost) to collect both businesses'

inventory. It therefore seems that since the respondents of this study have not realised and/or experienced the benefits of collaboration (such as cost savings), their focus is probably still more aligned with **responsiveness**, which can be more costly.<sup>EF17</sup>

#### 5.5.1.7 Willingness to wait longer for inventory in order to pay less

On a statement whether the respondents are never, sometimes or always willing to wait longer in order to pay less for their inventory, a large majority (78.8%) indicated never (see table 5.18). From this response it can be concluded that the respondents choose to be **responsive** rather than forfeit a sale.<sup>EF17</sup>

#### 5.5.1.8 Willingness to pay a supplier more to receive inventory sooner

The respondents were asked whether they would pay higher delivery costs if a supplier could deliver inventory sooner than usual. The frequency distribution of responses is presented in table 5.19.

**Table 5.19 Delivery of inventory**

Transportation question	Yes	No
Would you pay higher delivery costs if your supplier can deliver stock sooner than usual?	9.9	86.9

Source: Compiled by the researcher from survey results

A large majority (86.9%) of the respondents indicated that they would not pay higher delivery costs to have inventory delivered sooner than usual by a supplier (see table 5.19). This finding is in line with the finding in section 5.5.1.3, where 88.3% of the respondents indicated that they never pay a supplier more than a competing retailer to receive their inventory faster. This indicates that **cost-efficiency** is the focus of these respondents.<sup>EF18</sup>

To summarise, the descriptive analyses of the data on transportation, regarding the trade-off between responsiveness and cost-efficiency, confirm that formal independent small retail businesses operating in Soweto seem not to focus solely on either **cost-efficiency** or **responsiveness** when managing transportation as a logistical supply chain driver.

Following the descriptive analyses on the transportation questions, inferential analyses were done to determine whether a difference exists between the six industry groups with regard to their responses regarding transportation.

## **5.5.2 Inferential analyses of the questions pertaining to transportation**

When analysing the questions in sections D2 and D3 of the questionnaire, the Kruskal-Wallis one-way analysis test was used to analyse the ordinal data obtained by the questions in D2, and the Pearson Chi-Square test of independence was used to analyse the nominal data gathered on the question in D3 (see section 4.3.7.2). Two hypotheses were formulated (see section 5.2) and are discussed in sections 5.5.2.1 and 5.5.2.2

### **5.5.2.1 Hypothesis 7**

The intention of the seventh hypothesis was to determine if a difference exists between the six industry groups with regard to their agreement on how frequently they had inventory delivered; paid for the delivery of inventory; and collaborated with other retailers with regard to the collection of inventory. The hypothesis was formulated as follows:

H<sub>7</sub>: There is a difference between the industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- H<sub>7a</sub> have stock delivered directly to their stores by their suppliers
- H<sub>7b</sub> pay their suppliers to deliver their stock directly to their stores
- H<sub>7c</sub> pay a supplier more than competing retailers to receive stock faster
- H<sub>7d</sub> collect their stock using their own transportation (using their own cars)
- H<sub>7e</sub> collect their stock by making use of a transport opportunity (not using their own cars)
- H<sub>7f</sub> collaborate with another retailer(s) to take turns to fetch the stock for both/all of their shops
- H<sub>7g</sub> are willing to wait longer to pay less for their stock.

The results of the Kruskal-Wallis one way analysis of variance by ranks test, in terms of the difference between the industry groups on the transportation statements, are shown in table 5.20.



**Table 5.20 Kruskal-Wallis test results on hypothesis 7**

Transportation statements	Chi-Square	Df	Asymptotic significance
My supplier(s) deliver(s) my stock directly to my store.	13.010	5	.023
I pay my supplier(s) to deliver my stock directly to my store.	8.639	5	.124
I pay my supplier more than my competing retailers to receive my stock faster.	4.596	5	.467
I collect my stock using my own transportation (using my own car).	20.269	5	.001
I collect my stock by making use of a transport opportunity (not using my own car).	5.297	5	.381
Another retailer(s) and I take turns to fetch the stock for both/all of our shops.	9.929	5	.077
I am willing to wait longer to pay less for my stock.	19.463	5	.002

Source: Compiled by the researcher from survey results

The results show that no statistically significant difference exists at the 5% level of significance (all  $p$ -values > 0.05) between the different industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- $H_{7b}$  pay their suppliers to deliver their stock directly to their stores
- $H_{7c}$  pay a supplier more than competing retailers to receive stock faster
- $H_{7e}$  collect their stock by making use of a transport opportunity (not using their own cars)
- $H_{7f}$  collaborate with another retailer(s) to take turns to fetch the stock for both/all of their shops.

There are no statistically significant differences between the six industry groups with regard to these 4 transportation statements; which is deduced from the fairly similar mean ranks. Having similar mean ranks between the different industry groups indicate that all six industries have similar frequency distributions with regard to how frequently they pay their suppliers to deliver their inventory directly to their stores; pay a supplier more than competing retailers to receive inventory faster; collect their inventory by making use of a transport opportunity (not using their own car); and work with another retailer(s) to take turns to fetch the inventory for both/all of their shops.<sup>EF19</sup>

The results of the remaining transportation statements show that statistically significant differences exist at the 1% and 5% levels of significance ( $p$ -values < 0.05) between the different industry groups with regard to their agreement on how frequently (never, sometimes, always) they

- have stock delivered directly to their store by their suppliers
- collect their stock using their own transportation (using their own cars)
- are willing to wait longer to pay less for their stock.<sup>EF20</sup>

To further investigate the differences in the frequency distribution between the six industry groups, the mean ranks (provided in table 5.21) were considered.

**Table 5.21 Mean ranks for hypothesis 7**

Industries	Mean ranks		
	My supplier(s) deliver(s) my stock directly to my store.	I collect my stock using my own transportation (using your own car).	I am willing to wait longer to pay less for my stock.
Retail Grocery	285.94	258.61	285.76
Retail Hardware	330.34	270.34	272.82
Retail General Store	243.06	319.55	240.32
Retail Service	258.90	246.76	272.37
Eating and Drinking Places	263.15	306.72	242.58
Retail Auto	284.84	301.39	317.51

Source: Compiled by the researcher from survey results

A higher mean rank indicates that an industry group tends to have more frequent deliveries of inventory directly to their stores by suppliers than other industries. From table 5.21 it follows that retail hardware stores tend to have their inventory delivered directly to their stores by suppliers more frequently<sup>EF21</sup> with the highest mean rank of 330.34. A possible reason can be that the nature of the products that retail hardware stores sell, require specialised vehicles (for instance for bricks and cement). Respondents in the retail general store group tend to more frequently collect inventory by using their own transportation, than the other industry groups<sup>EF22</sup> (mean rank of 319.55). This can be due to the ease of transporting inventory items and/or the speed at which items can be brought to the stores. Another possible reason may be that the owner or manager prefers to have more control over the delivery process. Retail auto respondents tend more frequently to be willing to wait longer in order to pay less for their inventory<sup>EF23</sup> (mean rank of 317.51). In terms of retail auto owners or managers, they sometimes have no choice other than to wait for inventory items, since the correct item may have to be sent from overseas or from auto manufacturers in an area far outside Soweto. Retail auto parts are sometimes only dispatched once the order is large enough, in an effort to save on delivery costs. Depending on the motive for using their own cars, retail general store owners or managers could be focused on either

responsiveness or cost-efficiency. In light of the World Bank’s (2014) findings, the most probable reason for the respondents using their own cars would be to save on transportation costs, which will indicate cost-efficiency as the basis for their decisions. Retail auto respondents tend to be willing to wait longer for inventory in an effort to pay less for it. This is probably because of the waiting time associated with ordering retail auto inventory items and the saving in delivery costs if full batches are transported.

### 5.5.2.2 Hypothesis 8

The eighth hypothesis was formulated to determine if there is an association between the six industry groups and whether they would pay a higher delivery cost if their supplier could deliver their inventory sooner than usual. The hypothesis was stated as follows:

H<sub>8</sub>: There is an association between the industry groups and whether they would pay a higher delivery cost if their supplier could deliver their inventory sooner than usual.

The results of the Pearson Chi-Square test on hypothesis 8 are presented in table 5.22.

**Table 5.22 Pearson Chi-Square test results on hypothesis 8**

	Value	Df	Asymptotic significance (2-sided)
Pearson Chi-Square	1.291 <sup>a</sup>	5	.936
N of Valid Cases	538		

<sup>a</sup> 3 cell (25.0%) have expected count less than 5. The minimum expected count is 3.58

Source: Compiled by the researcher from survey results

The result of the Pearson Chi-Square test indicated that there is no statistically significant association, at the 5% level of significance, between the industry groups and whether they would pay a higher delivery cost if their supplier could deliver their inventory sooner than usual ( $p = 0.936$ ). Regardless of the industry they operated in, the respondents generally are not willing to pay a higher delivery cost to their supplier in order to receive inventory faster than usual.<sup>EF24</sup>

By examining the inferential analyses of the different industry groups in terms of the different transportation statements, and their willingness to pay an additional fee for faster delivery of inventory, it seems as if the formal independent small retail businesses manage transportation based on either responsiveness or cost-efficiency, depending on the types of products they sell. Depending on the reason (whether the retailers find it easier to transport the inventory themselves or prefer to have more control over the delivery process) retail grocery general stores manage transportation more responsively or more cost-efficiently than the other industries. It seems that retailers in the retail auto industry tend to manage transportation focused more on cost-efficiency than the other industry groups.

## **5.6 Conclusion**

Chapter 5 focused on determining whether the formal independent small retail businesses operating within Soweto manage their logistical supply chain drivers orientated toward responsiveness or cost-efficiency. Both descriptive and inferential analyses were conducted on each logistical supply chain driver.

According to the descriptive findings, the formal independent small retailers manage their facilities responsively. Further inferential findings indicated that retail general stores manage their facilities more responsively than the other industry groups, possibly due to the retailers' focus on keeping ample inventory and having easy access to excess inventory more frequently. Through the descriptive findings, it was determined that the formal independent small retailers' inventory management is orientated towards responsiveness. The inferential findings showed that retail grocery stores tend to be the most responsive among the different industries; mainly by making provision for fluctuation in customer demand. The inferential analyses also indicated that retail general stores tend to manage inventory more cost-efficiently than the other industries. According to the data, retail general stores manage facilities more responsively, but inventory more cost-efficiently, which may be problematic, as maintaining a higher level of responsiveness decreases the cost-efficiency of the retailer. Both the descriptive and inferential analyses indicated that transportation is managed orientated towards either responsiveness or cost-efficiency, depending on the types of products sold. The twenty-four empirical findings in chapter 5 are presented in table 5.23.

**Table 5.23 Empirical findings in chapter 5**

<b>Empirical findings in this chapter</b>	
EF1:	Retailers operating within Soweto manage their facilities responsively by: <ul style="list-style-type: none"><li>a) being located near to customers (section 5.3.1.1),</li><li>b) being located near to public transport (section 5.3.1.2),</li><li>c) providing customers with a fast checkout at their facilities (section 5.3.1.3),</li><li>d) having capacity to store excess inventory in their stores (section 5.3.1.4),</li><li>e) accessing excess inventory quickly and easily (section 5.3.1.5).</li></ul>
EF2:	The industry group in which the retailer operates, does not influence the importance rating by the retailer in terms of: <ul style="list-style-type: none"><li>a) being located near to customers,</li><li>b) being located near to public transport,</li><li>c) providing customers with a fast checkout at their facilities (section 5.3.2.1).</li></ul>
EF3:	The industry group in which the retailer operates. influences how frequently they: <ul style="list-style-type: none"><li>a) have capacity to store excess inventory in store,</li><li>b) access excess inventory quickly and easily (section 5.3.2.2).</li></ul>
EF4:	Retail general stores tend to manage facilities more responsively by having capacity to store excess inventory in store and accessing excess inventory quickly and easily, more frequently than the other industry groups (section 5.3.2.2).
EF5:	Small retailers operating within Soweto purchase inventory most frequently from wholesalers (section 5.4.1.1),
EF6:	Retailers operating within Soweto who manage their inventory responsively: <ul style="list-style-type: none"><li>a) have the ability to easily obtain more inventory from suppliers (section 5.4.1.1),</li><li>b) purchase inventory on a daily or weekly basis (section 5.4.1.1),</li><li>c) purchase more inventory than they sell within a month (section 5.4.1.2),</li><li>d) purchase more inventory when they have a sale in their stores (section 5.4.1.2),</li><li>e) make provision for fluctuation in customer demand (section 5.4.1.2),</li><li>f) have products immediately available to a customer when they want to buy it (section 5.4.1.2),</li><li>g) believe that their customers are of the opinion that they will have enough inventory (section 5.4.1.2),</li></ul>

h) stock quality and a variety of products (section 5.4.1.2).

EF7: Retailers operating within Soweto who manage their inventory cost-efficiently:

- a) find it too expensive to purchase more inventory than they sell within a month (section 5.4.1.2),
- b) purchase more inventory when items are on sale at suppliers (section 5.4.1.2).

EF8: The industry group in which the retailer operates, influences how often, on average, they purchase inventory (section 5.4.2.1).

EF9: Retail hardware stores tend to purchase inventory less often (only when they see that their inventory level is low) than the other industry groups (section 5.4.2.1).

EF10: The industry group in which the retailer operates, does not influence how frequently they:

- a) purchase less inventory than they sell within a month (section 5.4.3.2),
- b) purchase the exact amount of inventory that they sell within a month (section 5.4.3.2),
- c) purchase more inventory than they sell within a month (section 5.4.3.2),
- d) find it too expensive to purchase more inventory than they sell within a month (section 5.4.3.2),
- e) purchase more inventory when they have a sale in their stores (section 5.4.3.2).

EF11: The industry group in which the retailer operates, influences how frequently they:

- a) can easily obtain more inventory from suppliers if they run out of inventory,
- b) purchase more inventory when it is on sale at their suppliers,
- c) make provision for fluctuation in customer demand (section 5.4.2.2).

EF12: Retail hardware stores tend to easily obtain more inventory from their suppliers more frequently than the other industry groups (section 5.4.2.2).

EF13: Retail general stores tend to purchase more inventory more frequently than the other industry groups when it is on sale at a supplier (section 5.4.2.2).

EF14: Retail grocery stores tend to make provision for fluctuation in demand from customers more frequently than the other industry groups (section 5.4.4.2).

EF15: The industry group in which the retailer operates, does not influence their level of agreement on having:

- a) a product immediately available to customers when they want to buy it (section 5.4.2.3),
- b) customers know that they will always have enough inventory (section 5.4.2.3).

EF16: The industry group in which the retailer operates, does not influence the importance rating on:

- a) carrying quality products (section 5.4.2.4),
- b) having enough product variety (section 5.4.2.4).

EF17: Retailers operating within Soweto who manage their transportation responsively:

- a) never have inventory delivered directly to their stores by their suppliers (section 5.5.1.1),
- b) always use their own cars to collect inventory (section 5.5.1.4),
- c) do not collaborate with other retailers to collect inventory (for both of their stores) from suppliers (section 5.5.1.6),
- d) are not willing to wait longer for inventory in order to pay less for the inventory (section 5.5.1.7).

EF18: Retailers operating within Soweto who manage their transportation cost-efficiently:

- a) have inventory delivered directly to their stores by their suppliers (section 5.5.1.1),
- b) never pay a supplier to deliver inventory directly to their stores (section 5.5.1.2),
- c) never pay a supplier more than competing retailers to receive their inventory faster (section 5.5.1.3),
- d) always use their own cars to collect inventory (section 5.5.1.4),
- e) collect inventory by using a transportation opportunity (section 5.5.1.5),
- f) never pay a higher delivery fee to receive inventory faster than usual (5.5.1.8).

EF19: The industry group in which the retailer operates, does not influence how frequently they:

- a) pay suppliers to deliver inventory directly to their stores (section 5.5.2.1),
- b) pay a supplier more than a competing retailer to receive their inventory faster (section 5.5.2.1),
- c) collect inventory by making use of a transportation opportunity (section 5.5.2.1),
- d) collaborate with other retailers to collect inventory (for both of their stores) from



suppliers (section 5.5.2.1).

EF20: The industry group in which the retailer operates, influences how frequently they:

- a) have inventory delivered directly to their stores by their suppliers (section 5.5.2.1),
- b) collect inventory by using their own transportation (section 5.5.2.1),
- c) are willing to wait longer to pay less for inventory (section 5.5.2.1).

EF21: Retail hardware stores have inventory delivered directly to their stores more frequently than the other industries (section 5.5.2.2).

EF22: Retail general stores tend to collect their inventory by using their own cars more frequently than the other industries (section 5.5.2.2).

EF23: Retail auto stores tend to be more willing to wait longer to pay less for their inventory than the other industry groups (section 5.5.2.2).

EF24: The industry group in which the retailer operates, does not influenced how frequently they pay a higher delivery fee to receive inventory faster than usual (section 5.5.2.2)

Source: Compiled by the researcher

## Chapter 6

### Predicting the survival of Sowetan small retailers through binary logistic regression models

#### 6.1 Introduction

Chapter 5 concluded that formal independent small retail businesses operating within Soweto manage facilities and inventory orientated more towards responsiveness and manage transportation oriented towards either responsiveness or cost-efficiency. The purpose of this chapter is to determine whether the management of the three logistical supply chain drivers influences the survival of the formal independent small retail businesses. Two binary logistic regression models are developed to determine whether the survival of the formal independent small retail businesses can be predicted. In section 6.2 an overview of a binary logistic regression model is provided and the dependent and independent variables necessary for developing the two binary logistic regression models for this study, are identified. The first model (discussed in section 6.3) aims to predict the survival of the small retailers in terms of the *age* of the business, and the second (discussed in section 6.4) to predict the survival of the small retailers based on the income change pattern for the past year (hereafter referred to as *growth*). The two literature and eight empirical findings of this chapter are presented in table 6.4.

#### 6.2 Binary logistic regression model: an overview

As stated in section 4.3.7.2, logistic regression is a statistical method used to determine whether one or more independent variables can be used to predict a dichotomous dependent variable (Williams et al., 2006:561). When developing a binary logistic regression model the independent variables can only predict the probability of a binomial outcome (one of two possible outcomes) for the dependent variable. Therefore, the first step is to determine the dependent variable with its two possible outcomes, followed by identifying the independent variables that will be used to predict the dependent variable.

### 6.2.1 Selecting the dependent variable for each binary logistic regression model

Two dependent variables, namely the *age* and *growth* of the business, were identified to be used in the two binary logistic regression models with which the survival of the small retailers could be predicted.

The age of the business was deemed a suitable dependent variable to predict the survival of the small retailers, as being in business for five years and longer serves as a measure of success worldwide. The US Small Business Administration (2014), a United States government agency supporting small businesses, indicates that half of all small businesses close down by the fifth year of trading, which is in line with the findings of the official statistics of the United Kingdom (Deakins and Freel, 2012:19). In South Africa the percentage of small businesses that close down within the first 5 years is a staggering 80% (Strydom, 2015:467; Van Eeden, Viviers & Venter 2003:12; Moodie, 2003:1). Therefore, in this study, any small business that has been in business for 5 year or longer is deemed to be successful.<sup>LF23</sup> As the binary logistic regression model can only predict a binomial outcome (one of two possible outcomes) the age of the small retailers was recorded in two categories: those in business for *less than 5 years* and those in business for *more than 5 years*.

The second dependent variable that was used to predict the survival of the small retailers was the growth of the retailer and this was measured in terms of the retailers' income change pattern over the past year. Growth was deemed a suitable variable to predict survival since it indicates that the retailers have expanded their businesses and exploited business opportunities in order to grow and survive (Ligthelm, 2010:137).<sup>LF24</sup> The growth of the retailers was recorded in two categories: those businesses whose *income contracted or stayed the same over the past year*, and those whose *income grew over the past year*.

Binary logistic regression models were developed for each dependent variable and they are discussed in sections 6.3 and 6.4. In the next section the independent variables that were used in order to predict the outcomes of the dependent variables, are identified.

### 6.2.2 Selecting the independent variables used in both binary logistic regression models

The set of independent variables that was used in the binary logistic regression models was derived from the questions on the management of the three logistical supply chain drivers.

Hosmer and Lemeshow (2000:92) state that the more independent variables included in a binary logistic regression model, the greater the estimated standard errors become. Therefore, the number of independent variables should be minimised in order to produce models that are numerically more stable and more easily generalised (Hosmer and Lemeshow, 2000:92).

Considering the impact of the number of independent variables on the outcome of the binary logistic regression model, it was decided to limit the number of independent variables to a minimum. Therefore, principal component analysis (factor analysis) was used to reduce the number of independent variables (based on the different sections of the questionnaire concerning the three logistical supply chain drivers) and to group highly correlated variables together.

Before discussing the results of the principal component analyses, the following should be noted (as discussed in section 4.3.7.2):

- The questions in the different sections of the questionnaire are referred to as items.
- Since both sections E2 and D3 in the questionnaire contained only one item, a principal component analysis could not be conducted on these sections; therefore these items were used as independent variables. Principal component analyses were conducted on the remaining sections of the questionnaire, namely E3, E11, E6, and D2, as these sections contained multiple items.
- The two measures of sampling adequacy, namely the Kaiser-Meyer-Olkin test and the Bartlett's test of sphericity, were used to determine whether a principle component analysis could be conducted on the items. Significance is indicated when the Kaiser-Meyer-Olkin value is higher or equal to 0.5, and the *p-value* of the Bartlett's test of sphericity is  $p=0.000$ .
- To ensure that the number of factors identified was less than the number of items on which the principal component analysis was conducted, the eigenvalue criterion of eigenvalues should be larger than one.
- Since the Cronbach Alpha value measures how closely related the different items within a group are to each other, a value above the exploratory threshold of 0.6 or the generally accepted threshold of 0.7, was deemed a satisfactory indication of internal consistency.

The results of the principle component analyses are presented in table 6.1.

**Table 6.1 Results of the principle component analyses conducted on the different items**

Logistical supply chain driver	Items in the questionnaire	Is the Kaiser-Meyer-Olkin measure of sampling adequacy $p \geq 0.5$ ?	Is the Barlett's test of sphericity significant ( $p=0.000$ )?	Is a principal component analysis appropriate?	Is the eigenvalue criterion of eigenvalues $> 1$ ?	Factor label*	Is the Cronbach Alfa value above the acceptable threshold (value $> 0.6$ )?	Can this factor be used as an independent variable in the binary logistic regression model?
Facilities	E3 (j, k)	Yes, (0.500)	Yes, $p=0.000$	Yes	Yes and 88.84% of the variance is explained	Excess storage	Yes, the Cronbach Alfa value = 0.874	Yes
Facilities	E11 (j, k, m)	Yes, (0.573)	Yes, $p=0.000$	Yes	Yes and 60.352% of the variance is explained	Convenience level	Yes, the Cronbach Alfa value = 0.618	Yes
Inventory	E3 (a-h)	Yes, (0.719)	Yes, $p=0.000$	Yes	Yes and 54.71% of the variance is explained	Maintaining a low inventory level	Yes, the Cronbach Alfa value = 0.637	Yes
						Maintaining a high inventory level	Yes, the Cronbach Alfa value = 0.765	Yes
Inventory	E6 (a, c)	Yes, (0.500)	Yes, $p=0.000$	Yes	Yes and 69.54% of the variance is explained	-	No, the Cronbach Alfa value is below the acceptable threshold = 0.561	No, if the Cronbach Alfa value is below the acceptable

								threshold a factor cannot be created and the two items will both be used as independent variables.
Inventory	E11 (a, c)	Yes, (0.500)	Yes, $p=0.000$	Yes	Yes and 74.46% of the variance is explained	Product offering	Yes, the Cronbach Alfa value = 0.657	Yes
Transportation	D2 (a-g)	Yes, (0.64)	Yes, $p=0.000$	Yes	Yes and 67.6% of the variance is explained	Transportation dependency	Yes, the Cronbach Alfa value = 0.808	Yes
						Financial considerations	Yes, the Cronbach Alfa value = 0.752	Yes
						Inventory collection	Yes, the Cronbach Alfa value = 0.656	Yes

\* Factor loadings of each factor is presented in appendix C

Source: Compiled by the researcher

Eight factors and two items (E6a and E6c) were identified after conducting the principal component analyses. Together with items E2 and D3 (see section 6.2.2), 12 independent variables were identified and used in the binary logistic regression models to predict the survival of the small retailers. These factors and items are hereafter referred to as the independent variables. The 12 independent variables are listed below:

- Excess storage
- Convenience level
- Maintaining a high inventory level
- Maintaining a low inventory level
- Product offering
- Transportation dependency
- Financial considerations
- Inventory collection
- Rate of purchasing inventory
- Having products immediately available
- Perception that customers know retailers have enough inventory
- Higher delivery cost for earlier inventory delivery.

To determine whether these independent variables are statistically significant predictors of the survival of small retailers (in terms of the two dependent variables *age* and *growth*), two binary logistic regression models were developed. The first binary logistic regression model determined the influence of the independent variables on the dependent variable *age*, followed by the second binary logistic regression model that determined the influence of the independent variables on the dependent variable *growth*.

### **6.3 Binary logistic regression model with the dependable variable *age***

In this section the results of the binary logistic regression model predicting the small retailers' survival in terms of *age* is discussed. Before the results are discussed, the following should be noted (as discussed in detail in section 4.3.7.2) in terms of the validity and

reliability of the logistic regression model predicting the small retailers' survival in terms of *age*:

- The Hosmer and Lemeshow test indicated goodness of fit of the logistic regression model with a *p-value* of 0.145. Therefore the model is assumed to be adequate.
- The overall correct prediction classification improved from 59% (model 0 outcome - the business survives for less than 5 years) to 65.3% (model 1 outcome - the business survives for more than 5 years) as seen in appendix C. Therefore, the results of the binary logistic regression model with the dependent variable *more than 5 years* are discussed.
- An odds ratio larger than 1 indicates that the independent variable increases the small retailers' odds to *survive beyond 5 years*, whereas an odds ratio smaller than 1 indicates that the independent variable decreases the small retailers' odds to *survive beyond 5 years*.

Table 6.2 provides the results of the 12 independent variables that were included in the binary logistic regression model. Five independent variables were identified as statistically significant predictors of the model (*p-values*  $\leq 0.05$ ) (highlighted in table 6.2). The odds ratios of these five independent variables were considered to determine whether the independent variables had a positive or negative influence on the dependent variable.



**Table 6.2 Independent variables in the equation for the binary logistic regression model with the dependent variable *age***

<b>Independent variables</b>	<b>Beta Coefficient</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Odds ratio (Exp(B))</b>
Maintaining a low inventory level	-.583	.181	10.335	1	.001	.558
Maintaining a high inventory level	-.155	.211	.539	1	.463	.856
Product offering	.178	.203	.770	1	.380	1.195
Excess storage	-.526	.146	12.905	1	.000	.591
Convenience level	.078	.239	.099	1	.753	1.078
Transportation dependency	-.448	.164	7.450	1	.006	.639
Financial considerations	.735	.294	6.233	1	.013	2.048
Inventory collection	.589	.220	7.147	1	.008	1.802
Having products immediately available	.105	.180	.338	1	.561	1.111
Perception that customers know retailers have enough inventory	-.031	.160	.037	1	.848	.970
Rate of purchasing inventory	.017	.099	.030	1	.863	1.017
Higher delivery cost for earlier inventory delivery	.203	.323	.396	1	.529	1.226
Constant	-.365	1.346	.073	1	.786	.694

Source: Compiled by the researcher from survey results

The results indicated that the following independent variables are statistically significant predictors (at the 5% level of significance), for the age of the business: maintaining a low inventory level; excess storage; transportation dependency; financial considerations; and inventory collection. Having allowed for the other variables in the equation, the odds ratios of the 12 independent variables further indicated that:

- Each decrease in frequency of maintaining a low inventory level, increases the odds of the business' survival (*survive beyond 5 years*) by 79.2% ( $\frac{1}{0.558}$ ).
- Each decrease in the frequency of having excess storage, increases the odds of the business' survival (*survive beyond 5 years*) by 69.4% ( $\frac{1}{0.59}$ ).
- Each decrease in the frequency of transportation dependency, increases the odds of the business' survival (*survive beyond 5 years*) by 56.4% ( $\frac{1}{0.639}$ ).
- Each increase in the frequency of financial considerations, increases the odds of the business' survival (*survive beyond 5 years*) by 108.4% ( $2.084 - 1 \times 100$ ).
- Each increase in the frequency of inventory collection, increases the odds of the business' survival (*survive beyond 5 years*) by 80.2% ( $1.802 - 1 \times 100$ ).

From the results of this binary logistic regression model, using *age* as the dependent variable, it can be stated that:

A decrease in the frequency of the independent variables:

- maintaining a low inventory level<sup>EF25</sup>
- excess storage<sup>EF26</sup>
- transportation dependency<sup>EF27</sup>

will increase the likelihood of the retailer's survival (to survive beyond 5 years).

An increase in the frequency of the independent variables:

- financial considerations<sup>EF28</sup>
- inventory collection<sup>EF29</sup>

will increase the likelihood of the retailer's survival (to survive beyond 5 years).

The results of the first binary logistic regression model indicated that the following independent variables: maintaining a low inventory level; having excess storage; transportation dependency; financial considerations; and inventory collection, are statistically significant predictors of the age of the formal independent small retail businesses.

#### **6.4 Binary logistic regression with the dependent variable *growth***

In this section the results of the binary logistic regression model predicting the small retailers' survival in terms of *growth* is discussed. Before the results are discussed, the following should be noted (as discussed in detail in section 4.3.7.2) regarding the validity and reliability of the logistic regression model predicting the small retailers' survival in terms of *growth*:

- The Hosmer and Lemeshow test indicated goodness of fit of the logistic regression model with a *p-value* of 0.494. Therefore the model is assumed to be adequate.
- The overall correct prediction classification improved from 74.2% (model 0 – business income contracted or stayed the same) to 76.4% (model 1 - business income grew over the past year) as seen in appendix C. Therefore, the results of the binary logistic regression model with the dependent variable *income growth over the past year* are discussed.
- An odds ratio larger than 1 indicates that the independent variable increases the small retailers' odds of *growing their income*, whereas an odds ratio smaller than 1 indicates that the independent variable decreases their odds of *growing their income*.

Table 6.3 provides the results of the 12 independent variables that were included in the binary logistic regression model. Three independent variables were identified as statistically significant predictors of the model (*p-values*  $\leq 0.05$ ) (highlighted in table 6.3). The odds ratios of these three independent variables were considered in order to determine whether the independent variables had a positive or negative influence on the dependent variable.

**Table 6.3 Independent variables in the equation for the binary logistic regression model with the dependent variable *growth***

Independent variables	Beta Coefficient	S.E.	Wald	df	Sig.	Odds ratio (Exp(B))
Maintaining a low inventory level	-.952	.209	20.776	1	.000	.386
Maintaining a high inventory level	1.203	.268	20.180	1	.000	3.329
Product offering	.220	.242	.830	1	.362	1.246
Excess storage	-.305	.165	3.401	1	.065	.737
Convenience level	-.038	.271	.020	1	.888	.963
Transportation dependency	-.311	.191	2.649	1	.104	.732
Financial considerations	.215	.325	.438	1	.508	1.240
Inventory collection	.560	.273	4.213	1	.040	1.750
Having products immediately available	-.156	.204	.584	1	.445	.856
Perception that customers know retailers have enough inventory	-.067	.179	.139	1	.709	.935
Rate of purchasing inventory	-.0143	.116	1.512	1	.219	.867
Higher delivery cost for earlier inventory delivery	.131	.369	.126	1	.723	1.140
Constant	-2.024	1.582	1.636	1	.201	.132

Source: Compiled by the researcher from survey results

The results indicated that the following independent variables are statistically significant predictors, at the 5% level of significance, of the growth (in terms of income change patterns) of the business: maintaining a low inventory level; maintaining a high inventory level; and inventory collection. Having allowed for the other variables in the equation, the odds ratios of the 12 independent variables further indicated that:

- Each decrease in the frequency of maintaining a low inventory level, increases the odds of the business' survival (*growing their income*) by 159.07% ( $\frac{1}{0.386}$ ).
- Each increase in the frequency of maintaining a high inventory level, increases the odds of the business' survival (*growing their income*) by 232.9% (3.329 more likely).
- Each increase in the frequency of inventory collection, increases the odds of the business' survival (*growing their income*) by 75% (1.750 more likely).

A decrease in the frequency of the independent variable:

- maintaining a low inventory level<sup>EF30</sup>

will decrease the likelihood of the retailer's survival (*growing their income*).

An increase in the frequency of the independent variables:

- maintaining a high inventory level<sup>EF31</sup>
- inventory collection<sup>EF32</sup>

will increase the survival of the retailers (*growing their income*).

The results of the second binary logistic regression model indicated that the independent variables: maintaining a low inventory level; maintaining a high inventory level and inventory collection, are statistically significant predictors of the growth (in terms of income change patterns) of the formal independent small retail businesses.

## 6.5 Conclusion

The purpose of this chapter was to determine whether the survival of the formal independent small retail businesses could be predicted by using two binary logistic regression models. The potential survival of the retailers was tested in terms of the age (binary logistic regression model 1) and the income change patterns (binary logistic regression model 2) of the businesses.

The set of independent variables consisted of all items related to the three logistical supply chain drivers. Principal component analyses were conducted using principal component extraction and varimax rotation to determine the factor structure of the items, in order to reduce the number of independent variables for use in the binary logistic regression models. Twelve independent variables were identified, consisting of 8 factors and 4 items.

The first binary logistic regression model that was developed included the 12 independent variables with the dependent variable *age*. The results indicated that the following independent variables: maintaining a low inventory level; having excess storage; transportation dependency; financial considerations; and inventory collection, are statistically significant predictors of the age of a business. The second binary logistic regression model that was conducted included the 12 independent variables with the dependent variable *growth*. The results indicated that the independent variables: maintaining a low inventory level; maintaining a high inventory level; and inventory collection, are statistically significant predictors of the growth (in terms of income change patterns) of a business.

The literature findings in chapters 2 and 3, together with the results of the statistical analyses (reported on in chapters 5 and 6), now allows for recommendations to be made on how small retailers can improve their odds of survival by the management of the logistical supply chain drivers (chapter 7). The two literature and eight empirical findings in chapter 6 are presented in the table below.

**Table 6.4 Literature and empirical findings in chapter 6**

<b>Literature findings in this chapter</b>	
LF23:	A small business that has been in business for 5 year or longer is deemed as surviving.
LF24:	A small business that shows an increase in their income is deemed as surviving.
<b>Empirical findings in this chapter</b>	
EF25:	Each decrease in the frequency of maintaining a low inventory level, increases the odds of the business' survival.
EF26:	Each decrease in the frequency of having excess storage, increases the odds of the business' survival.
EF27:	Each decrease in the frequency of transportation dependency, increases the odds of the business' survival to survive beyond 5 years.
EF28:	Each increase in the frequency of financial considerations, increases the odds of the business' survival to survive beyond 5 years.
EF29:	Each increase in the frequency of inventory collection, increases the odds of the business' survival to survive beyond 5 years.
EF30:	Each decrease in the frequency of maintaining a low inventory level, increases the odds of the business' survival in terms of growing their income.
EF31:	Each increase in the frequency of maintaining a high inventory level, increases the odds of the business' survival in terms of growing their income.
EF32:	Each increase in the frequency of inventory collection, increases the odds of the business' survival in terms of growing their income.

Source: Compiled by the researcher

## Chapter 7

### Conclusions and recommendations

#### 7.1 Introduction

The purpose of the final chapter is to draw conclusions on how the small retailers operating within Soweto manage their three logistical supply chain drivers in terms of responsiveness and cost-efficiency and to propose recommendations on the management of the three logistical supply chain drivers by the small retailers in order to increase their odds of survival. These conclusions and recommendations are based on the two literature chapters (chapters 2 and 3), and the empirical research reported on in chapters 5 and 6. This chapter is structured to first state the primary research problem and secondary research objectives that were addressed in this study and then to focus on each chapter by identifying the secondary research objective(s) addressed within the specific chapter and the steps taken to address the secondary research objective(s) (see section 7.3). Conclusions and recommendations for each secondary research objective are presented in section 7.4. Thereafter, an overview of the entire study is provided in table 7.1. This will link the secondary research objectives on the one hand with the questionnaire, the literature and empirical findings, and the conclusions and recommendations on the other. The chapter is concluded by listing the limitations that were faced in the study and identifying future research opportunities.

#### 7.2 The primary and secondary research objectives addressed in this study

Based on the discussion in chapter 1, which highlighted the drive of the Gauteng Department of Economic Development to develop the economies of townships; the impact of small businesses on the country's economy and on its citizens; the lack of owners' business skills; the low levels of entrepreneurial activities within townships; the low survival rate of township businesses; as well as the need for developing and strengthening supply



chains within townships through SCM, the following primary research objective for this study was formulated:

**To determine how formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive.**

To achieve the primary research objective the following five secondary research objectives were formulated:

- SRO 1: To discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies.
- SRO 2: To establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy.
- SRO 3: To determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency.
- SRO 4: To investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency.
- SRO 5: To determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive.

Before the conclusions and recommendations are presented, a brief overview of chapters 2, 3, 5 and 6 are provided in the next section. Since chapter 4 dealt with the research methodology used to gather primary data it is omitted from this overview.

### **7.3 Overview of chapters 2, 3, 5 and 6**

In the subsequent discussion a brief description of each chapter is provided, followed by the secondary research objective(s) that were achieved in the specific chapter. The process that was followed to reach the objective(s) is also outlined.

#### **7.3.1 Chapter 2 – Selecting appropriate competitive and supply chain strategies**

The purpose of chapter 2 was to provide a theoretical foundation in terms of the different competitive and supply chain strategies that small businesses can select from. The first secondary research objective (SRO1), namely *to discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies*, was addressed in this chapter. In order to achieve this objective the researcher embarked on the following steps to structure the process:

- Determined how a strategic fit could be achieved between the competitive and supply chain strategies.
- Identified the different competitive strategies that small businesses can select from, and considered the influence of each strategy on the level of responsiveness and cost-efficiency.
- Identified the different supply chain strategies that small businesses can select from, and reviewed the orientation of each strategy in terms of responsiveness and cost-efficiency.
- Considered how different competitive and supply chain strategies should be aligned, based on the goals of each strategy in terms of promoting either responsiveness or cost-efficiency.

The literature review in chapter 2 provided eight literature findings, and these were presented in table 2.4.

#### **7.3.2 Chapter 3 – The logistical supply chain drivers**

This chapter provided a literature overview of how the three logistical supply chain drivers are managed within small businesses, specifically within townships businesses, based on the

orientation of the selected supply chain strategy. Each logistical supply chain driver was discussed individually. Secondary research objective 2 (SRO2), namely *to establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy*, was addressed in this chapter. The following main aspects were identified in order to achieve secondary research objective 2:

- Identified the different supply chain members within a simplified retail supply chain.
- Provided an overview of the state of logistics within South Africa as a developing country.
- Established how the logistical function operates within a small retail business.
- Identified and discussed the different components that managers or owners of township businesses have to consider when managing the logistical supply chain drivers, and consider the influence of these components on the retailers' level of responsiveness and cost-efficiency.

The fourteen literature findings from chapter 3 were presented in table 3.4.

### **7.3.3 Chapter 5 – Empirical findings on the logistical supply chain drivers**

Chapter 5 presented the empirical findings which resulted from the statistical analyses conducted on data related to the three logistical supply chain drivers. The purpose of this chapter was to determine whether the formal independent small retail businesses operating within Soweto manage their logistical supply chain drivers orientated towards responsiveness or cost-efficiency. Both descriptive and inferential analyses were conducted on the data pertaining to each logistical supply chain driver. Descriptive analyses were undertaken by generating frequency distributions and inferential analyses were conducted by formulating hypotheses and testing these with the appropriate statistical tests. Secondary research objectives 3 and 4 were addressed in this chapter: *to determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers, in terms of responsiveness and cost-efficiency* and *to investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of*

*responsiveness and cost-efficiency*. In order to reach objectives 3 and 4, the following steps were taken:

- A detailed research plan was developed (in chapter 4) on how secondary research objectives 3, 4 and 5 (discussed in section 7.3.4) were to be achieved. This included identifying the sources from which data had to be gathered, the way in which the data had to be gathered, as well as the statistical analyses that had to be conducted in order to achieve these secondary objectives.
- The data was entered into the statistical program SPSS (version 23) to perform the different statistical analyses necessary in order to reach the empirical findings.

The analyses in chapter 5 resulted in twenty-four empirical findings and these were listed in table 5.23.

### **7.3.4 Chapter 6 – Predicting the survival of Sowetan small retailers through binary logistic regression models**

Chapter 6 was focused on determining whether the survival of formal independent small retail businesses in Soweto could be predicted by using binary logistic regression models. The first model aimed to determine the survival of the small retailers in terms of the *age* of the business, whereas the second model aimed to determine the survival of the small retailers in terms of the *growth* of their income. The secondary research objective 5 (SRO5), namely *to determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive*, was considered in chapter 6. This chapter contributed two literature and eight empirical findings and these were listed in table 6.4.

## **7.4 Conclusions and recommendations related to each secondary research objective**

The literature and empirical findings from chapters 2, 3, 5, and 6, form the basis for the conclusions and recommendations in this section.

### 7.4.1 Secondary research objective 1

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SRO1 - To discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies.

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A strategic fit can be achieved when the goals of the selected competitive and supply chain strategies are aligned (LF1). When selecting a competitive strategy small businesses will benefit from competing in narrow target markets, as they are prevented from competing in large markets, mainly due to their limited resources. Porter's focus competitive strategy is deemed as the most appropriate competitive strategy for small businesses, as this strategy targets a narrow market (LF2). Furthermore, small businesses can select to compete with a focus strategy within a narrow market, based on either differentiation or on low-cost. On the one hand the focus differentiation competitive strategy is more suitable for innovative products with uncertain customer demand, operating in an unstable and dynamic market environment and serving less price-sensitive customers (LF3). On the other hand, a focus low-cost competitive strategy is more suitable for functional products with certain customer demand, operating in a stable and stationary market while serving price-sensitive customers (LF4). Managers need to consider numerous factors when deciding on the orientation of their supply chain strategy (LF6), and when deciding on the orientation of the entire supply chain in which the small business operates (LF5). Depending on the decision regarding a supply chain strategy orientated towards either responsiveness (LF7) or cost-efficiency (LF8), the following can be concluded:

**Conclusion 1.1:** A responsive supply chain strategy is most suitable for a focus differentiation competitive strategy and a cost-efficient supply chain strategy is most suitable for a focus low-cost competitive strategy.

Based on the above conclusion from the literature, the following recommendations for small retail businesses are made:

**Recommendation 1.1:** In order to compete effectively, small retail businesses should select a focus competitive strategy.

**Recommendation 1.2:** If small retail businesses decide to compete with a focus differentiation competitive strategy, they should select a supply chain strategy orientated towards responsiveness to ensure a strategic fit.

**Recommendation 1.3:** If small retail businesses decide to compete with a focus low-cost competitive strategy, they should select a supply chain strategy orientated towards cost-efficiency to ensure a strategic fit.

#### **7.4.2 Secondary research objectives 2 and 3**

In this section two secondary research objectives are discussed, namely SRO2 and SRO3. Both these objectives are referred to in this discussion since they deal with the management of the three logistical supply chain drivers, in terms of responsiveness and cost-efficiency. The discussion is structured to consider each logistical supply chain driver in terms of the management of the driver by a small business, based on the orientation of the selected supply chain strategy (according to the literature findings), as well as how the small retailers in this study manage the specific logistical supply chain driver (according to the empirical findings). SRO2 and SRO3 are:

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SRO2 - To establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy.

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SRO3 - To determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency.

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The three logistical supply chain drivers were identified as facilities, inventory and transportation. Although small businesses differ from larger businesses in numerous ways, they face the same logistical challenges (LF9).

#### 7.4.2.1 Facilities as a logistical supply chain driver

Facilities as a logistical supply chain driver must be managed according to the orientation decided upon for the business' supply chain strategy. When small businesses design an appropriate facility network they should consider the function, location and capacity of the facility; as this can result in reduced costs or lead-times and so be a source of competitive advantage. When facilities are managed responsively, a small retailer will have excess capacity available (at a storage facility or at the retail premises) to store excess inventory and a small retailer who renders a service will have excess space to hire additional staff and so to reduce lead-times (LF13a, LF13b). The majority of participants in this study, not only have excess capacity within their facilities to store additional inventory, but also ensure that they can access their excess inventory quickly and easily (EF1d, EF1e). These small retailers can be considered fortunate, as a general lack of retail space exists within townships and retailers generally find it difficult to obtain facilities from which to operate their businesses (LF12). The majority of small retailers in this study prefer to have facilities close to their customers or close to public transport (EF1a, EF1b), in order to increase the number of customers that they can serve. This confirms that when implementing a decentralised facility system, retailers can increase their level of responsiveness (LF13c, LF13d). Additionally, the majority of small retailers in this study strive to provide customers with a fast checkout, which increases the rate at which they can assist customers and meet their demands; ultimately leading to an increase in responsiveness (EF1c, LF13e). In contrast, when facilities are managed cost-efficiently, small retailers usually have a facility with limited capacity (at a storage facility or at the retailer's premises) since limited or no excess inventory is purchased. In the case of a service retailer, additional staff is not hired to reduce lead-times as it would increase costs (LF14a, LF14b, LF14c, LF14e). A cost-efficient facility is usually centralised and is therefore not necessarily located close to customers (LF14d).

**Conclusion 2.1:** The majority of small retailers in this study manage facilities responsively as they have excess capacity available within their facilities and they operate decentralised facility systems. These small retailers also increase their level of responsiveness by providing customers with a fast checkout.

**Recommendation 2.1:** If Sowetan small retailers are orientated towards managing their facilities responsively, based on the selected supply chain strategy, they should consider the following: opening further outlets at different locations to increase the number of customers that they can serve; increasing their facilities' capacity to store more excess inventory; hiring additional staff to reduce lead-times; and increasing the rate at which customers are served by providing a faster checkout.

**Recommendation 2.2:** If Sowetan small retailers prefer to manage their facilities orientated towards cost-efficiency, based on the selected supply chain strategy, they should reduce the excess capacity at their facilities; implement a centralised facility system to decrease costs, such as facility and transportation costs; and not hire additional staff to reduce lead-times.

#### **7.4.2.2 Inventory as a logistical supply chain driver**

The orientation of the selected supply chain strategy will determine whether inventory is managed more responsively or more cost-efficiently. Since inventory can be the most expensive asset in many businesses, it should be managed with caution. The different components that small business managers should consider when managing inventory are the amount of cycle, safety and seasonal inventory to carry, as well as the frequency of purchasing these inventory items. The majority of retailers in this study purchase inventory on a daily or weekly basis (EF6b); which is more often than other retailers operating within townships (who do so only every two weeks) (LF15). The research results show that the majority of retailers in this study do not find it difficult to purchase inventory from suppliers (EF6a), which is in line with retailers operating within other townships (LF16). Those in other townships can also select from multiple suppliers from whom to purchase inventory (LF16). The majority of retailers in this study purchase inventory from wholesalers (EF5).

When inventory is managed responsively, cycle inventory is purchased on a more frequent basis (LF17a) to ensure that inventory levels are maintained at the small retailer's preferred level. Responsive retailers view having ample inventory as so important that they are willing to pay for additional storage space to store their excess inventory (LF17d). The majority of small retailers in this study purchase more inventory than they sell within a month (EF6c), which confirms their focus on responsiveness (by holding large amounts of safety inventory)



(LF17b). This focus on responsiveness is further strengthened by the small retailers' efforts to make provision for fluctuating customer demand (LF17c; EF6e), especially when having in-store sales (EF6d). Furthermore, the majority of participants in this study increases their level of responsiveness by providing customers with a variety of products (EF6h) and by viewing it as important that their customers know that they always have enough inventory available (EF6g).

In contrast, when a small retailer decides to manage inventory cost-efficiently, cycle inventory is purchased less often and in larger batches to save on, for example ordering costs, or to gain the benefits of economies of scale (LF18a). The small retailers in this study find it too expensive to purchase more inventory than they can sell within a month (EF7a) and they use cost saving opportunities by purchasing more inventory when the supplier has a sale (EF7b). Small retailers will generally purchase inventory from suppliers who offer the lowest prices (LF18b). As cost-efficient retailers do not make provision for fluctuation in customer demand, they hold small amounts of safety inventory (LF18d) and to increase their level of cost-efficiency, they collaborate with other retailers in terms of purchasing inventory in bulk (LF18c).

**Conclusion 2.2:** The majority of small retailers in this study manage inventory responsively as they hold safety inventory and make provision for fluctuating customer demand. These retailers also increase their level of responsiveness by holding a variety of products and by striving to create the perception with their customers that they will always have enough inventory available.

**Recommendation 2.3:** If Sowetan small retailers are orientated towards managing inventory responsively, as stipulated by their selected supply chain strategy, they should consider increasing the amount of safety or seasonal inventory, or they should increase the rate at which they purchase cycle inventory, if at all feasible. This will allow them to always have ample inventory readily available to customers.

**Recommendation 2.4:** If Sowetan small retailers are orientated towards managing inventory cost-efficiently, depending on the orientation of the selected supply chain strategy, they should reduce the amount of safety or seasonal inventory in order to minimise the amount

of money tied up in their inventory, or decrease the rate at which they purchase cycle inventory. They should also collaborate with other retailers to order inventory in bulk and so gain the advantage of economies of scale.

#### **7.4.2.3           Transportation as a logistical supply chain driver**

The majority of small businesses' logistical costs consist of transportation costs (LF11) and on average transportation can cost between R300 to R350 per trip (LF19). Some small retailers find it too expensive to maintain their own transportation fleet and therefore use a third-party logistic service provider for the transportation of their inventory (LF10).

Whether transportation is managed more responsively or more cost-efficiently depends on the orientation of the selected supply chain strategy. When designing their transportation networks, small businesses should consider the mode, as well as the route used, to transport their inventory.

When transportation is managed responsively, inventory is transported directly from a supplier to a small retailer using the fastest mode of transportation (LF21a, LF21b). The small retailers in this study do not have inventory delivered directly to their stores by suppliers (EF17a), but prefer to collect the inventory personally, using their own transportation (EF17b). The focus on responsiveness by the retailers is strengthened by their reluctance to wait longer for inventory in order to pay less for it (EF17d). Furthermore, these retailers do not collaborate with others to collect inventory from suppliers (despite the possible cost advantages) (EF17c).

In contrast, when transportation is managed cost-efficiently, the slowest and cheapest mode of transportation is used (LF22c) and inventory is usually delivered to an intermediate site, such as a distribution centre, in order to lower inbound transportation costs (LF22a). Retailers in townships purchase large amounts of inventory to qualify for free delivery from suppliers (LF20, LF22b), and this seems to be the main driving force behind small retailers in this study having their suppliers deliver inventory directly to their stores (EF18a). In contrast with the majority of retailers operating within other townships, the small retailers in this

study will rather use their own cars to collect inventory (LF20, EF18d) in order to increase their level of cost-efficiency by not paying delivery costs to suppliers (EF18b).

The retailers in this study will also rather use a transportation opportunity, for example a taxi, to collect inventory from suppliers (EF18e), as this may be less expensive than to pay for delivery by a supplier. Even if the retailers in this study pay for delivery of inventory, they are still not willing to pay a supplier more than a competing retailer to receive inventory sooner (EF18f); which indicates that the cost of transportation outweighs the possible advantage of having inventory sooner than a competitor.

**Conclusion 2.3:** The small retailers in this study manage transportation not solely focused on either responsiveness or cost-efficiency.

**Conclusion 2.4:** The small retailers in this study who manage transportation orientated towards responsiveness, do so by collecting inventory directly from suppliers and use their own cars, and thereby ultimately increase their flexibility. These responsive retailers will not make use of cost-saving opportunities if this will lead to a decrease in their level of responsiveness.

**Conclusion 2.5:** The respondents who manage transportation orientated towards cost-efficiency, do so in several ways. First, by ordering large amounts of inventory to qualify for free delivery; secondly, they collect inventory by using their own cars; or thirdly, by using a transportation opportunity to keep costs as low as possible. These cost-efficient retailers will not make use of any transport opportunity that might lower their level of cost-efficiency.

**Recommendation 2.5:** Considering conclusions 2.1 and 2.2, (that Sowetan small retailers manage facilities and inventory orientated towards responsiveness as stipulated by the selected supply chain strategy) this recommendation is that small businesses should also manage transportation orientated towards responsiveness so that the three logistical supply chain drivers are aligned.

**Recommendation 2.6:** If Sowetan small retailers are orientated towards managing transportation responsively, to align the orientation of the three logistical supply chain

drivers, they should consider collaborating with a trustworthy fellow-retailer to increase the frequency at which inventory is collected, or have inventory delivered directly to their stores by suppliers.

#### **7.4.3 Secondary research objective 4**

The fourth secondary research objective addressed in this study was:

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SRO4 - To investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency.

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It was established that the industry in which small businesses operate, influences customer demand; supply uncertainties; customer buying behaviour; and ultimately the orientation of the supply chain strategy (LF6).

##### **7.4.3.1 Influence of the industry group on the management of facilities**

The industry in which the Sowetan small retailers operate, influences the management of facilities in terms of having capacity to store excess inventory in stores, as well as being able to access the excess inventory quickly and easily (EF2, EF3). Retail general stores tend to manage facilities more responsively by having capacity to store excess inventory in stores, and they can access excess inventory quickly and easily, more frequently than the other industries (EF3). The industry in which the retailer operates also influences the management of inventory in terms of how often inventory is purchased (EF8). Retail hardware stores tend to purchase inventory less often than the other industry groups (EF9).

##### **7.4.3.2 Influence of the industry group on the management of inventory**

The management of inventory is influenced by the industry in which the Sowetan small retailers operate, in terms of how frequently they can easily obtain more inventory from their suppliers; purchase more inventory when such items are on sale at their suppliers; and make provision for fluctuation in customer demand (EF10, EF11). Retail hardware stores tend to obtain inventory more easily from suppliers than the other industries (EF12). Retail

general stores tend to purchase inventory more often when the inventory is on sale at suppliers than the other industries (EF13). With regard to making provision for fluctuation in customer demand, retail grocery stores tend to do so more frequently than the other industries (EF14).

#### **7.4.3.3 Influence of the industry group on the management of transportation**

The industry in which the Sowetan small retailers operate, influences the management of transportation in terms of how frequently they have inventory delivered directly to their stores by suppliers; how frequently they collect inventory by using their own transportation; and their willingness to wait longer to pay less for inventory (EF20). Retail hardware stores have inventory delivered directly to their stores more frequently than the other industries (EF21); whereas retail general stores tend to collect their inventory using their own transportation more frequently than the other industry groups (EF22). The retail auto stores are generally more willing to wait longer to pay less for their inventory than the other industry groups (EF23).

**Conclusion 3.1:** The industry in which the Sowetan small retailers operate, influences their orientation towards responsiveness and cost-efficiency with regard to how the three logistical supply chain drivers are managed.

**Recommendation 3.1:** When Sowetan small retailers select an appropriate supply chain strategy they should consider the industry in which they operate, since it will influence the level of responsiveness and cost-efficiency at which the logistical supply chain drivers can be managed.

#### **7.4.4 Secondary research objective 5**

The fifth secondary research objective addressed in this study was:

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SRO5 - To determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive.

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A small business that has been in operation for 5 years or longer; or a small business that has shown an increase in income over the past year is deemed as surviving (LF23, LF24). Formal independent small retailers operating within Soweto can increase their odds of surviving beyond 5 years, by doing one or more of the following:

- decrease how frequently they maintain a low inventory level (EF25)
- decrease how frequently they have excess storage (EF26)
- decrease how frequently they are transportation dependent (EF27)
- increase how frequently they review their financial situation (EF28)
- increase how frequently they collect inventory (EF29)

Sowetan formal independent small retail businesses can increase their odds of growing in terms of income by acting to:

- decrease how frequently they maintain a low inventory level (EF30)
- increase how frequently they maintain a high inventory level (EF31)
- increase how frequently they collect inventory (EF32).

**Conclusion 4.1:** The management of the three logistical supply chain drivers in terms of their orientation, influences the Sowetan small retailers' odds to survive beyond 5 years and grow their income.

**Recommendation 4.1:** Should small Sowetan retailers aim to increase their odds of surviving beyond 5 years, they should:

- hold more inventory, or
- decrease excess facility capacity, or
- be less dependent on transportation opportunities and other retailers for the transportation of their inventory, or
- increase collection of inventory.

**Recommendation 4.2:** Should small Sowetan retailers aim to increase their odds of growing their income, they should:

- hold more inventory, and/or
- increase frequency of inventory collection.

## **7.5 Linking secondary research objectives to questions in the questionnaire, literature and empirical findings, conclusions and recommendations**

Table 7.1 illustrates the links between the five secondary research objectives and the questions pertaining to the three logistical supply chain drivers in the questionnaire, the literature and empirical findings made throughout the study, as well as the conclusions and recommendations presented in this chapter.

**Table 7.1 Linking the research objectives to the questionnaire, findings, conclusions and recommendations**

Secondary research objectives	Questions in the questionnaire	Literature findings	Empirical findings	Conclusions	Recommendations
SRO1 - To discuss how small businesses achieve a strategic fit between their competitive and supply chain strategies.	Not applicable	LF1; LF2; LF3; LF4; LF5; LF6; LF7; LF8	Not applicable	C1.1	R1.1 R1.2 R1.3
SRO 2 - To establish how, according to the literature, small businesses manage the three logistical supply chain drivers in terms of responsiveness and cost-efficiency, based on the orientation of the selected supply chain strategy.	E11 j, k, m E3 j, k E2	LF12; LF13; LF14	EF1	C2.1	R2.1 R2.2
	E3 a-h E6 a, c	LF15; LF16; LF17; LF18	EF5; EF6; EF7	C2.2	R2.3 R2.4
	E11 a, c D2 D3	LF10; LF11; LF19; LF20; LF21; LF22	EF17; EF18	C2.3 C2.4 C2.5	R2.5 R2.6
SRO3 - To determine how formal independent small retail businesses operating in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency.					



<p>SRO4 - To investigate whether the industry group in which the Sowetan formal independent small retail businesses operate, influences the management of the logistical supply chain drivers in terms of responsiveness and cost-efficiency.</p>	<p>E11 j, k, m E3 j ,k E2 E3 a-h E6 a, c E11 a, c D2 D3</p>	<p>LF6</p>	<p>EF2; EF3; EF8; EF9; EF10; EF11; EF12; EF13; EF14; EF20; EF21; EF22; EF23</p>	<p>C3.1</p>	<p>R3.1</p>
<p>SRO5 - To determine whether the management of the logistical supply chain drivers increases the odds of the formal independent small retail businesses operating within Soweto to survive.</p>	<p>E11 j, k, m E3 j ,k E2 E3 a-h E6 a, c E11 a, c D2 D3 B1 F2</p>	<p>LF23; LF24</p>	<p>EF25; EF26; EF27; EF28; EF29; EF30; EF31; EF32</p>	<p>C4.1</p>	<p>R4.1</p>

Source: Compiled by the researcher

## 7.6 Limitations of the study

The following limitations in terms of this study were identified:

- The respondents' first language was not English, therefore fieldworkers had to assist the respondents in completing the questionnaires.
- As the study's sample frame was based on the list of 650 formal independent small businesses operating within the boundaries of Soweto compiled in 2012 by the BMR, some of the retailers had since closed down and fieldworkers had to find others who complied with the requirements for the 2014 study. In such cases the fieldworkers found it time-consuming to identify other small retailers who both complied with the requirement and who were willing to participate in the study.
- Fieldworkers indicated that some owners or managers were not available when they initially arrived at the shops, and they had to make appointments to return at later times. Revisiting these small businesses was time-consuming and prolonged the collection period.
- As the study was conducted on a very specific sample (formal independent small retail business operating within Soweto), the recommendations in section 7.4 cannot be generalised to other small retail businesses in other townships.
- The inclusion of questions related to other fields of business management resulted in a very lengthy questionnaire that may have discouraged some business owners or managers from participating in the study,

## 7.7 Future research identified

The following areas for future research were identified:

- This research was conducted on the management of only three logistical supply chain drivers by small retailers. Therefore, future research could focus on determining how these retailers manage the three cross-functional supply chain drivers (information, sourcing and pricing).

- A longitudinal study could be conducted to determine whether the formal independent small retail businesses operating within Soweto changed the orientation of how they manage their logistical supply chain drivers over time; and if so, how the changes influenced the survival of these small retailers.
- The independent variables (identified in chapter 6) that positively influenced the age and growth of the small retailers could be explored further to investigate how they could be managed to increase the odds of survival of small retailers.
- For comparison purposed, a similar study could be conducted on the management of the three logistical supply chain drivers in different townships.

## 7.8 A final word

The primary research objective of this study was:

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**To determine how formal independent small retail businesses in Soweto manage their logistical supply chain drivers in terms of responsiveness and cost-efficiency in order to survive.**

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The three logistical supply chain drivers should be managed as a cohesive unit and should be aligned with the orientation of the selected supply chain strategy, in terms of responsiveness and cost-efficiency. It was established that formal independent small retail businesses operating within the boundaries of Soweto mainly manage facilities and inventory as logistical supply chain drivers, responsively. However, these small retailers manage transportation as a logistical supply chain driver, not solely orientated towards either responsiveness or cost-efficiency. As the orientation of the logistical supply chain drivers influences the odds of survival for the formal independent small retail businesses operating within Soweto, these small retailers should consider adapting their management style to manage transportation more responsively, so that it aligns with the orientation of the other two logistical supply chain drivers.

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## Appendix A – Soweto 2014 Questionnaire



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### 2014 SMALL BUSINESS SURVEY: SOWETO

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Questionnaire number 1    3

#### SECTION A: GENERAL INFORMATION

##### A1.1 Name and contact particulars

Name of business \_\_\_\_\_

Business address \_\_\_\_\_  
\_\_\_\_\_

Contact person: Name \_\_\_\_\_

Telephone no \_\_\_\_\_

E-mail \_\_\_\_\_

##### A1.2

#### RESPONDENT INFORMED CONSENT TO PARTICIPATE IN THE SOWETO BUSINESS SURVEY

I, \_\_\_\_\_ (Name and Surname) am satisfied that I understand the aim and purpose of the study, what participation will involve, and that I can withdraw at any time. I therefore consent freely and voluntarily to participate in the study.

\_\_\_\_\_  
(Signature of respondent)

\_\_\_\_\_  
(Date)

A1.3 Please indicate one of the following (circle one):

(a) Same business as interviewed in 2012 (included in the list provided)	1
(b) Substitute business (not included on the list)	2

A2. What is your main product line? (Probe: What are the main products or services that you provide? Example: Selling fruit, phone shop, hairdresser, selling liquor, motor mechanic, etc.)

Specify **detail information** on business: \_\_\_\_\_

**For office use only**

Manufacturing	01
Construction	02
Wholesale	03
Retail grocery	04
Retail hardware	05
Retail clothing	06
Retail general store	07
Retail services	08
Retail 'other' (specify)	09

**SECTION B: NATURE OF BUSINESS**

B1. How long has this business been in operation?

	<b>Circle one</b>
(a) Less than 1 year	1
(b) 1 year but less than 3 years	2
(c) 3 years but less than 5 years	3
(d) 5 years and longer	4

B2. What was the main reason for starting this business?

	Circle one
(a) Was unemployed/no income	1
(b) Take over a family business	2
(c) To seize a business opportunity	3
(d) Supplement my income	4
(e) Other (specify):	5

B3. Do you run your business on a:

	Circle one
(a) Full-time basis	1
(b) Part-time basis	2

B4. What is the status of your business?

	Circle one
(a) Sole proprietor	1
(b) Partnership	2
(c) Co-operative	3
(d) CC – Close Corporation	4
(e) Pty Ltd	5
(f) Other (specify):	6

**SECTION C: GEOGRAPHICAL LOCATION OF BUSINESS**

C1. Please indicate the name of the nearest large shopping mall:

\_\_\_\_\_

C2. What is the distance of your business to the nearest large shopping mall in Soweto (e.g. Jabulani)?

	Circle one
(a) In large shopping mall	1
(b) Less than 1 km	2
(c) Between 1 and 3 km	3
(d) Between 3.1 and 5 km	4
(e) More than 5 km	5

**SECTION D: LOGISTICS/PHYSICAL DISTRIBUTION CHANNEL**

D1. Where do you buy the stock for your business? (If more than one type of supplier, rank the top three from 1 to 3, where 1 = most frequently used; 2 = second frequently used and 3 = the third frequently used)

Channel	Circle all applicable	Rank
(a) Manufacturers	1	
(b) Wholesalers	2	
(c) Retailers	3	
(d) Agents	4	
(e) NGOs	5	
(f) Other (please specify):	6	

D2. To what extent would the following statements about the transportation of your inventory apply towards your business?

Statement	Rate		
	Never	Sometimes	Always
My supplier(s) deliver(s) my stock directly to my store.	1	2	3
I pay my supplier(s) to deliver my stock directly to my store.	1	2	3
I pay my supplier more than my competing retailers to receive my stock faster.	1	2	3
I collect my stock using my own transportation (using your own car).	1	2	3
I collect my stock by making use of a transport opportunity (not using my own car).	1	2	3
Another retailer(s) and I take turns to fetch the	1	2	3

stock for both/all of our shops.			
I am willing to wait longer to pay less for my stock	1	2	3

D3.1. Would you pay higher delivery costs if your suppliers can deliver your stock sooner than usual.

	<b>Circle one</b>
Yes	1
No	2

D3.2. If yes, how much are you prepared to pay more towards your delivery costs, if it means that your stock will be delivered faster to your store?

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Less than half	Half	More than half	Double	More than double

**SECTION E: INTERNAL OPERATIONS**

**Price**

E1. What is the main method to determine the selling price for your products/services?

<b>Method</b>	<b>Circle one</b>
(a) Cost plus fixed percentage mark-up	1
(b) Competitive pricing (same as competitors)	2
(c) Variable pricing depending on time of day/month/season	3
(d) Other (please specify):	4

**Inventory**

E2. How often, on average, do you purchase inventory?

	<b>Circle one</b>
(a) Daily	1
(b) Weekly	2
(c) Monthly	3
(d) When I see my stock is low	4

E3. To what extent do you agree with the following statements about inventory in your business?

Statement	Rate		
	Never	Sometimes	Always
I purchase less stock than what I sell within a month.	1	2	3
I purchase the exact amount of stock that I sell within a month.	1	2	3
I purchase more stock than what I sell within a month.	1	2	3
It is too expensive for me to purchase more stock than what I can sell within a month.	1	2	3
I can easily obtain more stock from my suppliers if I run out of stock.	1	2	3
I purchase more stock when it is on sale at my suppliers.	1	2	3
I purchase more stock when I have a sale in my store.	1	2	3
I make provision for the fluctuation in the demands from my customers (e.g. over Easter and Christmas).	1	2	3
I purchase more stock in order to save on my transportation costs.	1	2	3
I have the capacity to store excess stock in my store.	1	2	3
I can access my excess stock quickly and easily.	1	2	3
I would collaborate with one of my competitors to bargain for lower prices at suppliers.	1	2	3

### Financial Planning

E4. How do you remunerate yourself for work done for the business?

Remuneration	Circle one
(a) Fixed monthly payment/salary	1
(b) Take money on daily/weekly basis out of cash register	2
(c) Do not make sufficient profit to take any money	3
(d) Other (please specify):	4

### Marketing

E5. Do you know your target market?

	Circle one
Yes	1
No	2

E6. Please indicate to what extent do you agree with the following statements from 1 to 5 where 1 is strongly disagree and 5 is strongly agree.

Statement	Strongly disagree ←————→ Strongly agree				
	1	2	3	4	5
A product should be immediately available to my customer when they want to buy it.	1	2	3	4	5
My products must be available at lower prices than my competitors.	1	2	3	4	5
My customers know that I will always have enough stock.	1	2	3	4	5
Collecting information about the market in which my business operates can be to the advantage of my business	1	2	3	4	5

E7. Please rate the importance of each of the following statements regarding your business from 1 to 5 where 1 is not important and 5 is extremely important.

Rate	Not important ←————→ Extremely important				
	1	2	3	4	5
Knowing what products my customers want	1	2	3	4	5
Continuously seeking up to date information on new products and services	1	2	3	4	5
Having a product available to a customer even if the product is more expensive than at a competitor.	1	2	3	4	5

E8. Do you differentiate your business from competitors?

	Circle one
Yes	1
No	2

E9. Please rate each of the following statements in terms of the frequency of use (about information in the market that you operate in).

Statement	Rating				
	Never	Seldom	Occasionally	Often	Always
I make use of market information* in my business.	1	2	3	4	5
I actively gather market information (e.g. latest trends).	1	2	3	4	5
I gather market information from my customers.	1	2	3	4	5
I gather market information from my suppliers.	1	2	3	4	5
I gather market information from my competitors.	1	2	3	4	5
I gather market information from the internet.	1	2	3	4	5
I gather market information from newspapers.	1	2	3	4	5
I gather market information from television.	1	2	3	4	5
I gather market information by word of mouth.	1	2	3	4	5
I gather market information by actively doing market research (informal or formal).	1	2	3	4	5
I will pay money to receive market information.	1	2	3	4	5

\* Market information refers to information about the market that you operate in, this information can be obtained formally or informally and will have an influence on decisions that you will make with regards to your business.

E10. How loyal are your customers to your business? Rate it on a 5-point scale where 1 is totally disloyal and 5 is extremely loyal.

<b>Totally disloyal</b>	1	2	3	4	5	<b>Extremely loyal</b>
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E11. How important would you rate the following marketing aspects in your business on a 5-point scale where 1=very unimportant and 5=very important.

Marketing aspect	Circle one in each row				
	Unimportant ←→ Very important				
<b>Product</b>					
(a) Quality products	1	2	3	4	5
(b) Best brands	1	2	3	4	5
(c) Enough product variety	1	2	3	4	5
<b>Price</b>					
(d) Lowest prices in area	1	2	3	4	5
(e) Lower prices than my direct competitors	1	2	3	4	5
(f) Value for money (the price justifies the offer)	1	2	3	4	5
(g) Higher prices as indicator of higher quality	1	2	3	4	5
(h) Offer credit	1	2	3	4	5
(i) Offer lay-by	1	2	3	4	5
<b>Place</b>					
(j) Near to customers	1	2	3	4	5
(k) Near to public transport	1	2	3	4	5
<b>Promotion</b>					
(l) Appealing in-store appearance	1	2	3	4	5
(m) Fast checkout	1	2	3	4	5
(f) Advertise merchandise	1	2	3	4	5
(g) In-store promotions	1	2	3	4	5
(h) Seasonal promotions (Christmas)	1	2	3	4	5

### Competition

E12. To what extent do the following external variables influence the success of your business (ie your business vitality)? Use a 5-point scale where 1 is not influenced at all and 5 is influenced to a large extent.

External variables	Not at all → To a large extent					With a rating of 3 to 5 please indicate how you deal with the influence
	1	2	3	4	5	
(a) Other small local competitors (excluding hawkers)	1	2	3	4	5	
(b) Large retailers in shopping malls	1	2	3	4	5	
(c) Foreign entrepreneurs	1	2	3	4	5	
(d) Hawkers	1	2	3	4	5	

**SECTION F: TURNOVER**

F1. What is the turnover (income) of your business during a normal month?

Per month (R)	Circle one
(a) Less than 5 000	1
(b) 5 000 – 10 000	2
(c) 10 001 – 30 000	3
(d) 30 001 – 50 000	4
(e) 50 001 – 100 000	5
(f) 100 000+	6

F2. During the past year, in terms of turnover (or sales) has your business:

	Circle one
(a) Expanded	1
(b) Contracted	2
(c) Remained the same size	3

F3. How do you see your business in two years' time?

	Circle one
(a) Continue with business as is	1
(b) Stop business and take up wage job	2
(c) Switch to another line of small business	3
(d) Give business to children and retire	4
(e) Sell business and retire	5
(f) Can't say/Don't know	6
(g) Other (specify):	7

**SECTION G: BUSINESS SUPPORT**

**Finance and Banking**

G1.1 (a) Does your business make use of the financial services provided by a bank?

	Circle one
Yes	1
No	2

G1.1(b) If no, why not?.....

.....

.....

If no, please do not answer any further questions numbered G1

G1.2. What bank(s) are you dealing with? Mark all that apply. (If you deal with more than one bank indicate your usage in ranking order with 1 being the bank that you deal with the most)

Bank	Use services	Ranking of usage (1 = most used)
ABSA	1	
Capitec	2	
FNB	3	
Nedbank	4	
Standard Bank	5	
Stokvel	6	
Other bank (please mention name)	7	

If you use more than one bank, please answer the rest of the questions based on the experience with the bank that you use/deal with the most – ‘your bank’,

G1.3. How would you rate your bank’s service to you? Use a 5-point scale where 1 is extremely poor and 5 is excellent.

<b>Extremely poor</b>	1	2	3	4	5	<b>Excellent</b>
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G1.4. What banking financial services are you currently using (please select all the services utilised)?

Savings	1
Current account (cheque account)	2
Loan facilities	3
Business loan	4
Long-term deposits	5
Bond	6
Credit card	7
Store card machine	8
Other (please specify):	9

G1.5. If you have asked the bank for a business loan (indicated above), what was their reaction? (Indicate all the responses that are applicable)

Reaction	Tick
Asked for financial statements	1
Enquired about your success record as an entrepreneur	2
Asks questions that indicated to you that they did not understand your business	3
Asked for some form of surety	4
Stalled your request until such a time that you gave up on the application	5
Took so long to decide that the opportunity to use the loan disappeared	6

G1.6. If you have applied for a loan, how would you evaluate the application process for a business loan? Use a 5-point scale where 1 is extremely poor and 5 is excellent.

Extremely poor	1	2	3	4	5	Excellent

G1.7. Have you asked your bank to assist you in performing any of the following business activities? Select all that apply:

Developing a business plan	1
Cash flow management	2
Developing a marketing plan	3
Sustainability analysis	4
Management advice (succession, HR)	5

G1.8. Please rate your bank on the assistance provided regarding the activities where you have asked for support:

Activity	Extremely poor ←————→ Excellent				
Business Plan	1	2	3	4	5
Cash Flow	1	2	3	4	5
Marketing	1	2	3	4	5
Sustainability	1	2	3	4	5
Management	1	2	3	4	5



(vii) I considered alternative business investments prior to starting my business	1	2	3	4	5
(viii) I have a future vision for my business	1	2	3	4	5
(ix) I regularly (continuously) investigate alternative business investments	1	2	3	4	5
(x) I would easily consider venturing into a new business	1	2	3	4	5
(xi) I am not scared to risk capital funds in a new business venture	1	2	3	4	5
(xii) Taking calculated risks are not a problem for me	1	2	3	4	5
(xiii) I own more than one business	1	2	3	4	5

**SECTION I: DEMOGRAPHIC INFORMATION**

I1. Gender of owner

Male	1	Female	2
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I2. Level of education of the owner

	<b>Circle one</b>
(a) No schooling	1
(b) Grade 1-3	2
(c) Grade 4-6	3
(d) Grade 7-12	4
(e) Technical/trade/training of less than 3 years	5
(f) University/College/More than 3 years	6

I3. Age of the owner

<b>&lt;18 years</b>	<b>18-30 years</b>	<b>31-40 years</b>	<b>41-50 years</b>	<b>51-60 years</b>	<b>61&gt; years</b>
1	2	3	4	5	6

## Employment

14. How many employees, including the owner/manager work in the business?

Work status	Male	Female
Full time		
Part time		
Total		

14.1 How many of the employees are members of the owner(s)' household (including the owner)?

(Compare this total with total number of employees indicated in question 14)

\_\_\_\_\_

15. What are your ambitions for your children?

\_\_\_\_\_

Ambition	Circle one
(a) Take over my business	1
(b) Become a government teacher/nurse	2
(c) Become a nonteaching government employee	3
(d) Salaried employee in a private firm	4
(e) Other (specified)	5

16. Is access to finance which includes availability, cost, interest, fees and collateral requirements an obstacle in the current operations of your business? Use a 5-point scale with 1 being no obstacle and 5 a very severe obstacle.

<b>No obstacle</b>	1	2	3	4	5	<b>Very severe obstacle</b>
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17. Is a lack of business management experience and/or training an obstacle in the current operations of your business? Use a 5-point scale with 1 being no obstacle and 5 a very severe obstacle.

<b>No obstacle</b>	1	2	3	4	5	<b>Very severe obstacle</b>
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18. If business management experience/training is regarded as an obstacle, please identify the major management obstacle (e.g. financial management, human resource management, marketing, supply chain management, etc.)

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**SECTION J: LONGITUDINAL STUDY**

- J1. Would you be prepared to participate in completing a similar questionnaire in 2015?

	Circle one
Yes	1
No	2

**SECTION K: QUESTIONNAIRE SUPPLEMENT**

(TO BE COMPLETED BY THE INTERVIEWER)

- K1. Indicate the status of the respondent

Status	Circle one
(a) Owner	1
(b) Manager	2
(c) Other (specify):	3

- K2. Business location: To be completed by the fieldworker without asking the respondent.

Location	Circle one
(a) Located in shopping mall (Bara, Maponya, Jabulani, Dobsonville, Naledi or Protea)	1
(b) Stand-alone shop	2
(c) Shopping centre with 2-5 surrounding businesses	3
(d) Shopping centre with 6-10 surrounding businesses	4
(e) Shopping centre with 11-20 surrounding businesses	5
(f) Shopping centre with more than 20 surrounding businesses	6
(g) Industrial area	7

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**THANK YOU FOR YOUR COOPERATION**



## Appendix B - Ethical Clearance Certificate



15 April 2013

**TO:** Prof AA Ligthelm & Prof CJ van Aardt  
Bureau of Market Research  
TvW Building  
B1-07

**FROM:** BMR Research Ethics Committee (REC)  
Bureau of Market Research  
TvW Building

**APPLICATION FOR ETHICAL CLEARANCE: 2014 SMALL BUSINESS SURVEY IN SOWETO (CR060)**

The BMR Research Ethics Committee (REC) has reviewed your research proposal on identifying and analysing the key characteristics and dynamics of formal small business enterprises in the township area of Soweto with a key focus on supply chain management. The BMR REC noted that this is a repetitive study that will be based on a reliable prototype research method with low risks of causing any harm to participants or the institution. Accordingly, you are granted permission to proceed with the study provided that the research principles as outlined in the Unisa and BMR Research Ethics Policies are adhered to throughout the entire project.

Regards,

A handwritten signature in black ink, appearing to read "DH Tustin". The signature is stylized and somewhat cursive.

Prof DH Tustin  
Head: Bureau of Market Research

## **Appendix C – SPSS Data Outputs**

Please see attached CD for the SPSS Version 23 outputs.