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2016

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Relationship between reverse logistics and green supply chain management in retail in Gauteng

Nosipho Gxumisa

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2016

ABSTRACT

Reverse logistics and green supply chain management are concepts that are relatively new to South Africa, compared to more developed countries. The aim of the research was to understand how South African companies are approaching these concepts and to determine whether a relationship exists between reverse logistics and green supply chain management in the retail sector in Gauteng. Due to the lack of data of companies using reverse logistics and green supply chain management in Gauteng, a qualitative research methodology was used to gather more information on the topic.

Thirteen interviews were conducted with experienced individuals representing some of the largest and most well-established retail companies in Gauteng. The results from the interviews and literature demonstrated that companies who want to implement a successful reverse logistics strategy must establish and adopt reliable processes to follow. Without proper record keeping, companies will be overwhelmed and be unable to track returns, resulting in unhappy customers.

Green operations can also have economic benefits, as demonstrated by most of the respondents. The literature mentions financial spin offs from remanufacturing of used products resulting in secondary markets and companies in South Africa need to focus more on creating these markets.

As customers and consumers become more aware of sustainability issues, it is important that companies be seen to be practicing good environmental principles and caring for the sustainability of the communities that they serve. Companies that have positive environmental strategies improve their competitive position and grow their market share.

DECLARATION

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

Nosipho Gxumisa

Signed at ……

On the …….. day of …… 2016

DEDICATION

I would like to dedicate this report to my daughter, Anati, who encouraged me to continue even on difficult days. Thank you for your endless support and for sacrificing our time together for me to do this. I am so proud to call you my daughter.

ACKNOWLEDGEMENTS

First and foremost, I wish to thank God for whom none of this is impossible and for the many blessings He has bestowed upon me.

I wish to like to thank my family for their belief in me and their constant and ever-present support. Thank you for the words of encouragement and the respect you have shown me through the years.

I would like to thank my supervisor, Trevor Lake, for his guidance, encouragement, wisdom and the endless supply of drinks.

Thank you to the companies and individuals who opened their doors to me and for sharing their experiences.

Last but not least, I would like to thank Wits Business School for giving me the opportunity to complete my studies and for making the resources available for me.

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ABBREVIATIONS

RL:	Reverse logistics
GrSCM:	Green Supply Chain Management
LCA:	Life Cycle Analysis
ECD:	Environmentally Conscious Design
EOL:	End of life
OEM:	Original Equipment Manufacturer

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to determine whether a relationship exists between reverse logistics and green supply chain management in the retail industry in Gauteng (see definition of terms in section 1.6). The report establishes the key elements of this relationship and whether and how that relationship can translate to any benefit e.g. economic, customer loyalty, etc. for the company.

1.2 Context of the study

According to Fleischmann, Krikke, Dekker and Flapper (2000, cited in Cheng & Lee (2009) firms all over the world are becoming more interested in recovering used products, especially in the face of growing environmental awareness and increasing customer expectations of enterprises to dispose of manufactured products safely. Sustainability and social responsibility will be the next focus for organisations. One of the ways to achieve sustainability is by minimising waste generation and by a conscious move from one-time use of resources and its disposal to recycling, reusing and regenerating Sen (2009). The author goes on to say greening the supply chain is no longer a choice but needs to be a conscious strategy which includes design for environment, eco-efficiency, environmentally preferable purchasing, extending producer responsibility and resource efficiency.

In South Africa, we see even schools getting involved in recycling and teaching students the benefits of recycling and cleaning the environment. The effects of global warming have been felt by many citizens in the form of unpredictable weather patterns, floods, and extremely hot conditions. Consumers are demanding that companies become more responsible in how they treat the planet. The green strategy also extends to producers as they are responsible for the products they produce. In South Africa, the government has introduced

Extended Producer Responsibility (EPR), which forces producers of products and packaging to be responsible for the disposal of their products. Simply put, this means that they are responsible from cradle to grave.

Not only should products and packaging be environmentally friendly, but they should also be reusable or recyclable. According to Sen (2009) , eco-efficiency is about maximising shareholder value without degrading the environment in any major way. A simple example of eco-efficiency is in the automobile industry, where they pay a surcharge to the consumer if the consumer returns an old part like a car battery, or any other major component which can be reused, recycled or disposed of in an environmentally friendly manner. This is not only improving their environmental image, but it is also strengthening their competitiveness by using readily available parts or materials from products that have been stripped or reselling remanufactured products in second hand markets.

While ordinary supply chains focus on delivering products from the supplier to the consumer, reverse supply chains focus on the backward flow of materials from customers to suppliers. Stock (1998, cited in Cheng & Lee (2009) adds that the services in this chain include product returns, recycling, materials substitution, reuse of materials, waste disposal, refurbishing, repair, and remanufacturing. The management of reverse supply chains has become important over the past couple of years for a number of reasons:

- Sales opportunities in secondary and global markets from previously discarded products Meyer (1999).
- Consumer pressure on businesses to take responsibility for the disposal of their products.
- Dumping sites are limited and alternatives such as repackaging, remanufacturing and recycling have become more prevalent and viable Thorn & Rogerson (2002).

A well-managed reverse logistics network not only provides important cost savings in procurement, recovery, disposal and transportation but also helps in customer retention S.K. Srivastava (2008).

There is very little evidence or research done on South African companies about reverse logistics or green supply chain management. This research report is aimed at addressing that gap and to bring South African companies in line with other companies in the world that have implemented successful reverse supply chains.

1.3 Problem statement

1.3.1 *Main problem*

The intention of this research is to determine whether a relationship exists between reverse logistics and green supply chain management in the retail industry in Gauteng and to determine whether and how this translates to any benefits for companies in SA.

1.3.2 *Sub-problem 1:*

The first sub-problem is to identify key components of reverse logistics and those of green supply chain management.

1.3.3 *Sub-problem 2:*

The second sub-problem is to identify the relationship between reverse logistics and green supply chain management in the retail industry in Gauteng.

1.3.4 *Sub-problem 3:*

The third sub-problem is to determine whether and how this can translate to any benefit for companies in retail in Gauteng.

1.4 Significance of the study

The study fills a gap in that there is currently no research addressing reverse logistics and its impact on green supply chain management in the South African

context. Even in countries where research has been conducted, companies have been very slow in adopting green supply chain management. The majority of South African companies only focus on one component of reverse logistics which is waste management.

The study provides guidance to management in the supply chain environment on how to handle product returns and to formulate processes that govern returns. The research also encourages companies to explore alternative ways of disposal like reuse, and remanufacturing while extending their reach to new markets. Environmental issues have been brought to the fore and this is going to be the next area of competitive advantage.

1.5 Delimitations of the study

- The study addresses the importance of green supply chain management and reverse logistics to organisations in the retail industry;
- The study only focuses on the retail industry in the Gauteng province.

1.6 Definition of terms

- Reverse Logistics – “the process of planning, implementing and controlling the efficient, cost-effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or for proper disposal” Rogers & Tibben-Lembke (1999:2). Examples of reverse logistics include, but are not limited to, parts return in the motor industry. When a consumer replaces a gearbox, for example, the car dealership will take the old gearbox, refurbish or repair it and will sell it as a reconditioned gearbox.
- Reverse supply chain management – “the efficient and effective management of the series of activities required to retrieve a product from a customer to either dispose of it or recover value” Prahinski and Kocabasoglu (2006) p. 519.
- Green supply chain management - “integrating environmental thinking into supply chain management including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life.” S.K. Srivastava (2008) p. 536.
- Remanufacturing – restoring a product to new-like condition and replacing parts.
- Reuse – using good components from retired assemblies.
- Recycling – taking component material and processing them into the same material or other used material Kumar and Putnam (2008).

1.7 Assumptions

The following assumptions have been made in relation to the study:

- There are companies in South Africa that are using reverse logistics and that are looking at implementing green supply chain management.
- The sample population was enough to draw a reasonable conclusion.

- The companies were willing to share the information and they had enough knowledge on reverse logistics and green supply chain management.

CHAPTER 2. Literature review

2.1 Introduction

The literature review discusses key themes that are relevant to the study. The literature first explores the elements of reverse logistics and green supply chain management and the importance of it. The research also tries to establish whether and how these two concepts impact each other and the benefits to companies using them.

2.2 Background discussion

The concepts of reverse logistics and that of the environment have been given increasing importance by managers in the last couple of decades due to a number of factors S.K. Srivastava (2008); Fleischmann et al (2000); Tibben-Lembke (2002). According to Ravi and Shankar (2005), competition and marketing motives, direct economic benefits and environmental concerns are just a few of these factors.

Governments have also introduced legislation that has made it difficult for companies to dispose of products or materials as they see fit. According to Lambert, Riopel, and Abdul-Kader (2011), legal motivations are one of the most effective as demonstrated by the European Union (EU) directive on Waste Electrical and Electronic Equipment (WEEE). The authors go on to explain that in the case of this directive, governments enforce manufacturers to be responsible for the entire lifecycle of their products for the purpose of sustainability. We see the same directive being enforced by the South African government, although it is not on all products produced.

As Autry (2005) suggests, a quick and efficient handling of returned products can be critical in sustaining relationships and creating repeat business. Blumberg (1999, cited in Autry (2005) states that reverse logistics allows companies an opportunity to differentiate themselves, builds consumer confidence in the company and influences customer satisfaction positively. The

three main factors of reverse logistics are recycling, remanufacturing and disposal Samir K. Srivastava (2013).

Table 1 Major Reverse Logistics Decisions - Adapted from Lambert, et al., 2011 Samir K. Srivastava (2013)

Strategic	Tactical	Operational
Whether or not to integrate RL with the forward logistics	Decide transportation means and establish transportation routes	Logistics and operations scheduling
Allocate adequate financial resources	Establish operational policies (production and inventory)	Emphasise cost control
Categorise and define return policies	Define return policies for each item	Return acquisition activities
Determine reasons, stakeholders, and issues related to RL	Define technical support to offer (in-store, sub-contractors, etc.)	Consider time value of returns
Evaluate internal expertise in RL and decide about outsourcing a few/all RL activities	Do the RL activities (transportation, warehousing, remanufacturing, etc., in-house or subcontract)	Train personnel on RL concepts and practices
Implement environmental management systems and acquire knowledge of directives, laws, and environmental rules	Develop a planning system for various RL activities and establish quality standards for them	Manage information
Choose activities (repair/rework, reuse, etc.) and identify potential locations	Decide the location and allocation of capacities for RL facilities	Determine level of disassembly

Risk assessment (value of information and uncertainties)	Define performance measures: optimise policies	Analyse returns in order to improve disposition

Table 1 deals with decisions that companies need to make should they wish to embark on reverse logistics and how this would impact the operation.

According to Srivastava (2008), reverse logistics can have both a positive and negative cash flow for the business. The author suggests that organisations and supply chains need to understand the financial impact of reverse logistic strategies which can generate negative cash flows that are difficult to predict and account for. Wilson (2005, cited in Lambert, Riopel et al. 2011) estimates that 4% of total logistics costs go to reverse logistics. The author goes on to state that the total transportation costs in the United States in 2004 reached $636 billion and $25 billion of that was spent on reverse logistics transportation costs Lambert et al. (2011).

The importance of reverse supply chain management has increased in recent years for a number of reasons including sales opportunities in the secondary markets; consumer pressure and end-of-life take back laws Prahinski and Kocabasoglu (2006).

The same factors that drive reverse logistics i.e. economic, regulatory and consumer pressure also drive green supply chain management. Therefore, according to Srivastava (2008), designing an effective and efficient reverse logistics network is a pre-requisite for repair and remanufacturing and is a key driver for providing the economic benefits necessary to introduce and sustain green supply chain management initiatives. Toffel (2003, cited in Lambert, et al., 2011) states that “the EU directive on End-of-Life (EOL) vehicles requires automakers by 2006, to reuse or recycle 85% of an EOL automobile’s weight, and 95% by 2015”.

2.3 Key components of reverse logistics and those of green supply chain management

Supply chain management has received increased attention in the past few decades. Simchi-Levi, Kaminsky and Simchi-Levi (2003, cited in Prahinski and Kocabasoglu (2006) define supply chain management as “a set of approaches utilised to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations and at the right time, in order to minimise system-wide costs while satisfying service level requirements.” The management of the reverse flows is an extension of the traditional supply chain with used materials or products either returning to be reprocessed or being disposed Prahinski and Kocabasoglu (2006). According to the Reverse Logistics Executive Council, the cost of handling, transporting and determining the nature of returned products is estimated at around $35bn annually and remanufacturing is $50bn annually Meyer (1999).

Fleischmann, et al. (1997, cited in S.K. Srivastava (2008)) state reverse logistics as one of five key activities for establishing a reverse supply chain and its network design has aspects of product acquisition and remanufacturing. Srivastava goes on to say that the literature identifies collection, inspection and sorting, pre-processing, and location and distribution network design as four important functional aspects in reverse logistics.

Reverse logistics activities differ from each company but they are generally processes that companies use to collect or receive used, damaged, unwanted products or product recalls from customer or end user back to the supplier. If the product has not been used i.e. unwanted product due to excessive stock, the company may choose to return it to the supplier for a full refund. The product may also be resold to a different customer or through an outlet. The company may also decide to refurbish or recondition the item and resell it. Regardless of how the product is treated after being returned, the first step is always the collection process.

2.3.1 *Stages in the reverse logistics channel*

Reverse logistics is made up of various activities that have been decided upon by the organisation and are determined by the product being returned. Figure 1 shows a schematic diagram of these activities. It should be noted that all returns, regardless of the nature or type, go through the collection and sorting and inspection activities.

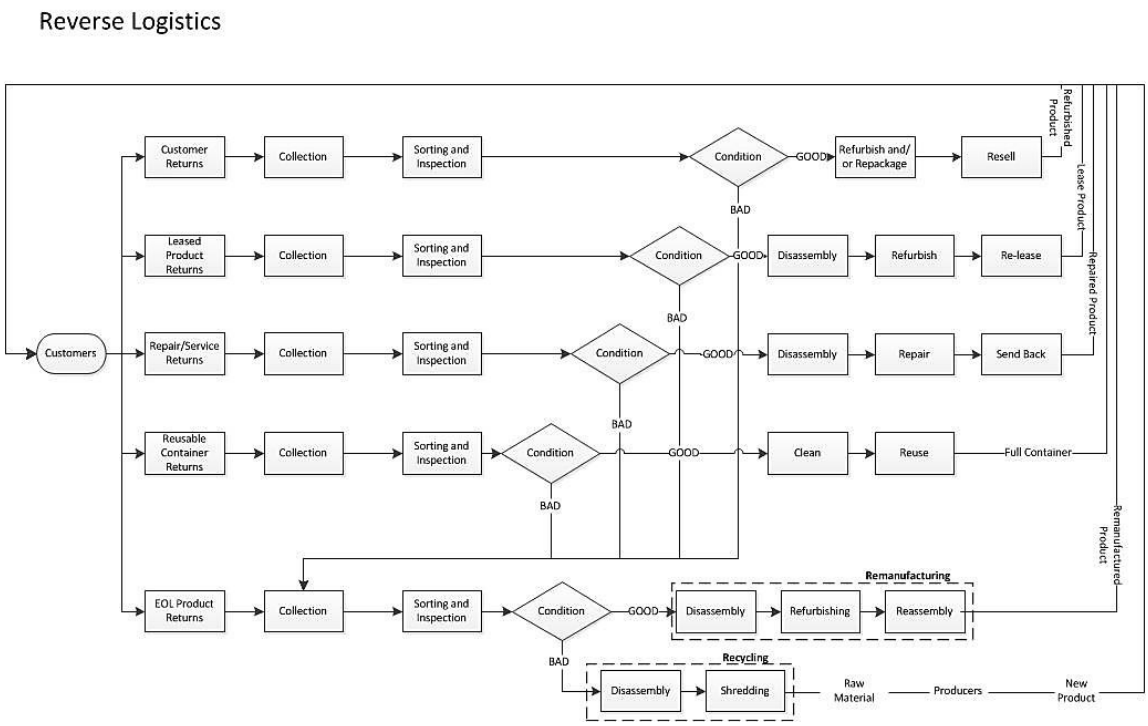


Figure 1 Reverse Logistics Process Gupta (2013)

Before the collection process, the company must have gatekeeping that will decide which products are allowed to enter the system. This step is critical in the success of the reverse logistics system and controlling of costs. The only way to control reverse logistics successfully is to control the entry point to the cycle.

If companies do not have a successful gatekeeping process to the reverse logistics cycle, a large number of unauthorised and unwanted products will enter the system. With unwanted product handling, storage, sorting, refurbishing and disposal, costs will increase dramatically which will impact on profitability. Not only does effective gatekeeping limit unwanted product from

entering the system, it also channels the product to the correct destination, i.e. landfills, or the relevant Collection Centre (CC). A CC is a facility that handles returns quickly and efficiently. The CC will receive all the returns that entered the cycle through a well-managed gatekeeping process. The CC is responsible for sorting and processing returns and forwarding them to the next destination.

Collection is the process of retrieving the product from the customer. These products can be returns or product recalls. According to Lambert et al. (2011), the company must decide at the time of defining the return policies, who pays for transportation of the returned product for products that are repaired while under warranty or replaced. The authors further explain that the collection costs must not only be for transportation, but also for the consolidation space.

The inspection and sorting determines the fate of the product. During sorting, decisions will be made, in line with manufacturer's specifications, on whether the returns will be refurbished, recovered in full or partially, or destroyed. The products are then grouped together based on the process they will follow, e.g. disposal, recycling or remanufacturing. The pre-processing is the testing process to determine if the product still has life left in it. All of these processes are underpinned by a strong communication and information system that captures return authorisation numbers.

Genchev (2009) notes that companies can become overwhelmed by the complex nature of returns. He goes on to state that the lack of personal accountability and a system for monitoring and controlling the reverse logistics operation can reduce the efficiency of handling returns. Once the product enters the reverse logistics cycle via efficient gate keeping, it is important that the product is pushed through the cycle in as short a time as possible. The collection, storage, sorting and refurbishment must be done with the same urgency as the final product in the forward cycle. Inventory costs money and must be kept as low as possible, regardless of the stage of that inventory.

2.3.2 *Remanufacturing and refurbishment for the secondary market*

Remanufacturing is sometimes the most desirable way to handle returns as it not only minimises impact on the environment but it can also create new market opportunities. The secondary market has grown in the past decade due to environmental pressures and the economic benefits it provides for companies. A number of organisations are using incentives to influence the quality of product returns. This concept is similar to a trade in and it motivates customers to return the product as they know that they will benefit in return. According to Fleischmann, et al. (2001, cited in S.K. Srivastava (2008)), buy backs may lead to higher returns, leading to economies of scale.

There are many challenges on reverse supply chains that are confronting managers and some of these include the variation in quantity of the returned products, and the severity of product defects. Both Meyer and Gooley, as quoted by Prahinski and Kocabasoglu (2006), state that companies that overcome these challenges expect to see improved revenue generation and reduced costs associated with product returns Prahinski and Kocabasoglu (2006). However, according to Giuntini and Gaudette (2003, cited in Pagell, Wu, and Murthy (2007) in several consumer goods markets, the processing costs of remanufacturing are higher than the selling price of new products. The authors go on to state that in a dispersed manufacturing supply chain, especially one in which some production processes are located far from markets, the costs of moving products back and forth for refurbishment can be prohibitive.

When products are disassembled before disposal, components from those products can be sent back to manufacturers or suppliers of raw materials or they can get into the second hand market. According to Rathore, Kota and Chakrabarti, remanufacturing is different from recycling mainly because it makes a greater economic contribution per unit of product than does recycling Rathore, Kota, and Chakrabarti (2011). In remanufacturing, products are disassembled and useful components are returned to new-like condition. These components are cleaned, refurbished and a new product is reassembled. Materials like silver and copper and other standard components from computers

can be sold as is in the secondary market. Over 73,000 U.S. firms with annual sales of over $53 billion in remanufactured products, are engaged in some form of remanufacturing Rathore et al. (2011).

Kerr and Ryan (2003, cited in Rathore et al. (2011)) state that remanufacturing helps reduce environmental impact and costs of manufacturing processes, while reducing final disposal costs of products and components.

2.3.3 *Collaboration with suppliers*

Customers and buyers are becoming more concerned with environmental issues like global warming and climate change and are demanding that suppliers offer products that are environmentally friendly and biodegradable. It is, therefore, imperative to involve suppliers in the product development process. It is also beneficial to invite suppliers to help improve the product design and manufacturing process and to improve the overall compliance with environmental regulations Chiou, Chan, Lettice, and Chung (2011).

Carter and Narasimhan (1996, cited (Humphreys, Wong, & Chan, 2003)), indicate in a survey of purchasing trends that the purchasing function has a significant role to play in developing an organisation's environmental policy. The current trend is for organisations to reduce the number of suppliers in their database and to establish closer, more strategic relationships with the few remaining suppliers, with the hope of undercutting the competition. Implementing an environmental management programme may give the supplier a competitive edge in the marketplace Humphreys et al. (2003).

Private organisations such as HP, IBM and Xerox have introduced some form of initiative for greening their supply chains, including the integration of suppliers, distributors, and reclamation facilities Sarkis (2003). The author goes on to state that the product life cycle will impact the greening of the supply chain particularly in the introductory phases where the product is greatly influenced by design and design for the environment will play a larger role at this stage. As the product matures and declines, refurbishment and a well organised reverse logistics will influence the organisation's green practices.

The process of redesigning products to consider not just their initial production, but also their eventual disassembly and recycling can be a path to innovation and unique competitive advantage Pagell et al. (2007). Once managers understand the relationship between product creation and product take-back, they start to consider the environmental impact in their day-to-day decision making, reducing the likelihood of having to make changes later.

To assist organisations with the “green” supplier selection process, Humphreys et al. (2003) propose a framework that incorporates the environmental criteria. Over the years, companies have developed a number of tools to engage potential suppliers but none of these have thought about the importance of environmental factors when making such decisions. The diagram of this framework is detailed below:

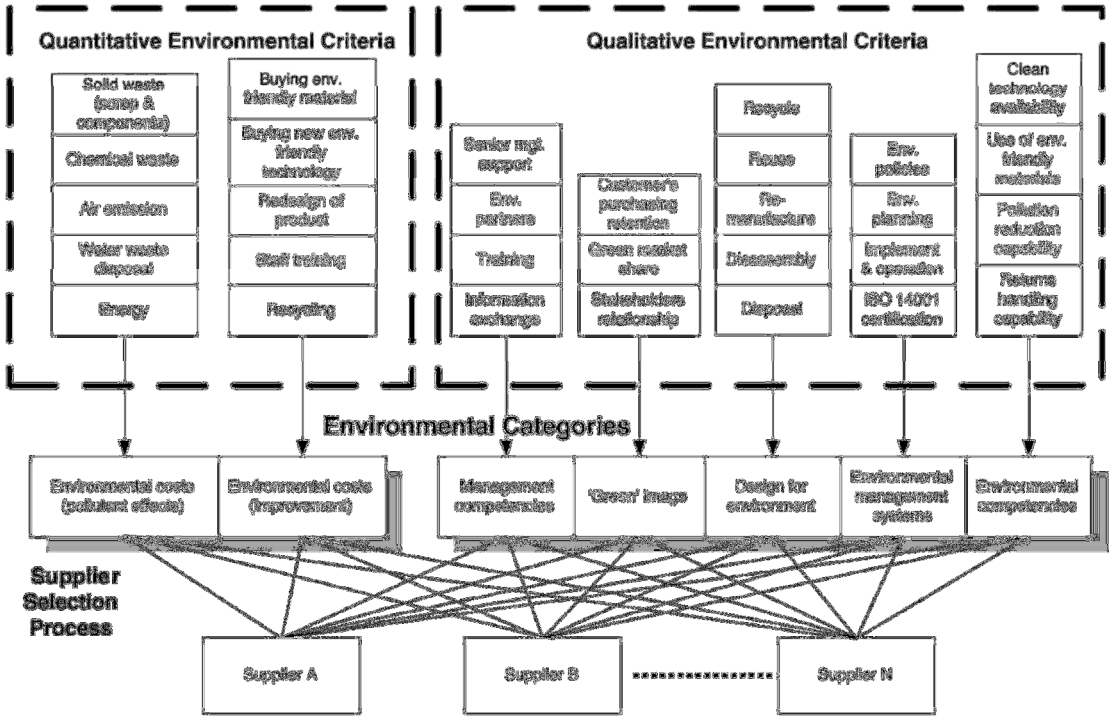


Figure 2 Environmental framework for incorporating environmental criteria into the supplier selection process (adapted from Humphreys et al. (2003))

The criteria in quantitative factors can be expressed in monetary terms and it includes environmental costs (pollutant effects) and environmental costs (improvement) as depicted in the diagram above Humphreys et al. (2003). The former are costs due to treatment of pollutants e.g. cost of solid waste disposal

and the latter refers to costs related to improving the supplier's environmental performance e.g. buying a new machine that reduces pollution. The other criterion is qualitative and it focuses on subjective factors like the environmental management system within an organisation and its green image Humphreys et al. (2003).

2.3.4 *Re-using and recycling materials and packaging*

Sen (2009) suggests that green supply chain initiatives should begin with the design of environmentally friendly products and processes. He goes on to say products and packaging should not only be environmentally friendly but also recyclable or reusable. He contests that an organisation's responsibility should not be limited to 'green' design, manufacturing, and distribution but should be extended to disposal or recycling of its products and packaging after use.

This view is also shared by Sarkis (2003), who states that the procurement or purchasing decisions of an organisation will impact the green supply chain through the purchase of materials that are either recyclable or reusable. Kumar and Putnam (2008) say that the focus on recovery of resources, recycling and reuse can be described as "cradle-to-grave" resource management.

Production processes can also influence efforts to "green" the supply chain by bringing together other components of reverse logistics like recycling or remanufacturing into the system. Production processes can also be designed for the reduction or prevention of waste. Packaging has a strong relationship with other components of the operational life cycle and systems that encourage and adopt returnable packaging will require a strong customer supplier relationship as well as an effective reverse logistics channel Sarkis (2003).

Governments the world over have come up with extended producer responsibility (EPR) which is a policy tool that extends the producers' responsibility to include the environmental impacts of their products over the entire product life cycle, including what occurs even after the consumer has discarded a product Sen (2009). When producers are made responsible for the extended end-of-life phase of products, they have more motivation to facilitate

other members of the supply chain, the users, and the stakeholders of end-of-life processing Kumar and Putnam (2008).

The authors go on to state that as the European Union has evolved its policies towards producer responsibilities, the manufacturers have stepped forward to accept the responsibilities and better performance has resulted. Producers are aligning with dismantlers and recyclers and used parts and recycled materials are reintroduced into their supply chains (Kumar & Putnam, 2008).

According to Pagell et al. (2007), direct involvement in recycling operations can create a unique knowledge of products, processes, and even customers. He goes on to state that in the future, companies that employ a recycling strategy that maintains control of plastics and other hard to get commodities may well hold a competitive advantage, as they will have a steady supply of materials at their command.

Recycling products also has the potential to create new business opportunities as demonstrated by Panasonic. The practice of simultaneously recycling their own products while providing recycling services to others has proven to be a profitable business undertaking for Panasonic Pagell et al. (2007).

“The issue of disposal systems and vendors may have the most long-term significance, where disposal of many materials, if not properly treated, may return to haunt an organisation in its future” Sarkis (2003), p.400.

2.3.5 *Proposition 1*

Reverse logistics is a component of green operations within most companies.

2.4 The relationship between reverse logistics and green supply chain management

The relationship between green management practices such as reverse logistics and green supply chain management is dependent on internal management. Carter, et al. (1998, cited in Lun (2011)) identified six key factors relating to green management practices including top management support, middle management support, the firm's mission, department goals, training of personnel to purchase environmental friendly materials and evaluation of purchasing management. These factors affect the organisation's green management practices.

There are many definitions of green supply chain management but according to Chiou et al. (2011), the concept is "broadly classified into internal and external environmental management. The internal environmental management focuses on internal support and commitment for green supply chain, compliance with certification and the existence of environmental management systems within the organisation. External environmental management is related to greening the suppliers so that they are involved with the organisation towards achieving environmental objectives" Chiou et al. (2011).

According to Samir K. Srivastava (2007), the growing importance of green supply chain management is driven mainly by the escalating deterioration of the environment, e.g. the diminishing raw material resources, overflowing waste sites and increasing levels of pollution. The author goes on to state that the scope of green supply chain management ranges from reactive monitoring of the general environmental management programmes to more proactive practices implemented through the various Rs i.e. Reduce, Reuse, Rework, Refurbish, Reclaim, Recycle, Remanufacture, Reverse Logistics, etc. Reverse logistics is a large component of green supply chain management that has been ignored in research literature and it fall under green operations Samir K. Srivastava (2007).

Srivastava (2007) goes on to explain that since RL operations and the supply chains they support are significantly more complex than traditional supply

chains, an organization that succeeds in meeting the challenges will possess a formidable advantage that cannot be easily duplicated by its competitors. The strategic importance of reverse logistics is clearly illustrated in Figure 3 below.

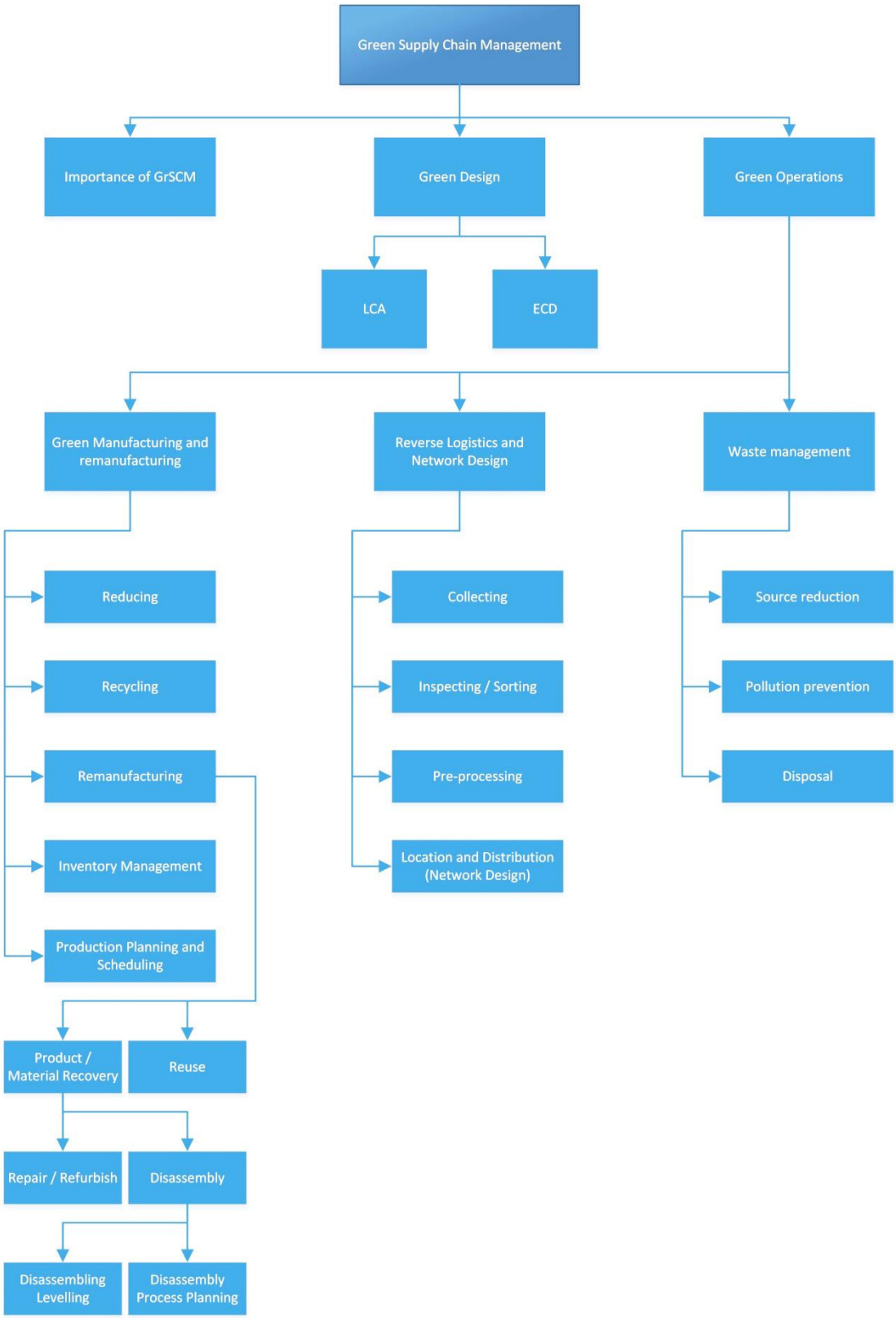


Figure 3 Classification and Categorization of existing Green SCM literature – LCA: life cycle analysis, ECD: environmentally conscious design (Adapted from Samir K. Srivastava (2013))

While regular forward supply chain usually deals with flow of products starting from initial processing of raw materials at suppliers to delivery of finished items to customers, the scope of green supply chain goes beyond this usual definition Bose and Pal (2012). The authors state that it also includes environmentally friendly product and process design, extension of product life cycle, and recovery of end-of-use and end-of-life returns. According to the authors, reverse logistics deals with bringing collected products to reprocessing facilities, inspection, recovery, and remarketing and this reverse chain is co-ordinated well with the regular forward chain to form the close-loop supply chain.

Based on this definition, the green supply chain includes components of environmental management as well as a closed-loop supply chain which starts from design to disposal at the end of useful life. In green product design, analysis is made to assess the environmental impact during the useable life cycle and afterwards, and attempts are made to minimise adverse effects. Return collection and recovery are an integral part of green supply chain Bose and Pal (2012).

2.4.1 *Proposition 2:*

Components of reverse logistics and those of green supply chain management are the same for most companies.

2.5 The benefits of using reverse logistics and green supply chain management in retail in Gauteng

The concept of green productivity shows that for any development strategy to be sustainable, it needs to have a focus on environment, quality, and profitability Diabat and Govindan (2011). By understanding the key elements of green management and its implications on firm performance, decision makers may be able to assess their business operations and build internal support to adopt green management practices Lun (2011).

According to Montabon, et al. (2007, cited in Lun (2011)), green management practices have emerged as an effective management tool for organisations to achieve superior performance Lun (2011). There are a number of benefits that have been achieved through the introduction of these practices including savings on energy consumed, procurement of materials and treatment of waste.

There are studies that indicate that involving suppliers as early as the design stage of the product can improve the overall performance of the organisation. However, conflicting evidence has been found in other studies, where they show that such integration could result in poor performance e.g. increased development time and development costs Chiou et al. (2011). This view has been contradicted by a number of other studies that suggest that the economic benefits of green management practices, if implemented properly, outweigh the costs.

Although the cost is a real issue at multiple points at the reverse flow, the benefits outweigh the cost of reverse logistics and source reduction programmes Dowlatshahi (2010). The author goes on to state that an organisation may face significant costs in producing and transporting the product and possibly in disposing of the product but emphasises that a liberal return policy is crucial for reducing the transaction risk and gaining competitive advantage.

Rosso and Fouts (1997, cited in Lun (2011)), have linked environmental performance to economic performance based on the resource-based view of

the organisation. The authors suggest that the improved environmental performance resulted in a competitive advantage that was reflected by the economic benefits.

According to Dowlatshahi (2010), reverse logistics can significantly impact a firm's profitability by reclaiming value. The author goes on to state that the recovery of products for remanufacturing, repair, and recycling can create profitable business opportunities. Recycling products also has the potential to create new business opportunities, as demonstrated by Panasonic. The practice of simultaneously recycling their own products while providing recycling services to others has proven to be a profitable business undertaking for Panasonic Pagell et al. (2007).

Rao and Holt (2005, cited in Chiou et al. (2011)) conducted empirical research on green supply chain management practices and their relationship between competitiveness and economic performance. Their research showed that implementing green supply chain management can improve a company's competitiveness and economic performance. In a study conducted by Chen (2008, cited in Chiou, et al. 2011, p533), he showed that green core competencies, defined as "the collective learning and capabilities about green innovation and environmental management" have a positive influence on a firm's ability to develop green products and process innovations which in turn helps to improve a company's green image and thus competitive advantage.

In recent years, more and more companies are reporting on the triple bottom line, which is an accounting framework that requires companies to not only report on financial, but also social and environmental results. This has forced companies to focus on environmental sustainability as part of their profitability.

2.5.1 *Proposition 3:*

Green management practices have implied economic benefits.

2.7 Conclusion of Literature Review

This is a relatively new topic and as such, has not been adequately researched. There has been more work done in developed countries than under developed economies. As issues of environmental management become more of a challenge, organisations will require strategies to deal with them. The voice of the consumer has become very strong and more consumers are becoming aware and are feeling the effects of environmental neglect. Environmental matters have become a source of competitive advantage and organisations that adopt green management practices have benefitted from this. Remanufacturing can create a second stream of income for the organisation and recycling can ensure that the organisation has a steady supply of raw materials.

2.7.1 *Proposition 1:*

Components of reverse logistics and those of green supply chain management are the same for most organisations.

2.7.2 *Proposition 2:*

Reverse logistics is a component of green operations within most companies.

2.7.3 *Proposition 3:*

Green management practices have implied economic benefits.

CHAPTER 3. Research methodology

This section outlines the methodology that was used to conduct this research. A qualitative research approach was used and individual face to face interviews were conducted to collect data for analysis. This section outlines the research methodology, research design, the research instrument used, procedure for data collection, the process for data analysis and interpretation, limitations of the study and lastly, the validity and reliability of the study.

3.1 Research methodology / paradigm

The research was conducted using the qualitative approach as it provided in-depth understanding of the research problem. The concept of reverse logistics in South Africa is not a foreign one but little or no research has been done on it. It is for this reason that a qualitative approach was chosen. According to Morse (1991, cited in Creswell (2003), a qualitative approach is necessary if the topic is new or has never been addressed with a certain sample. The research aimed to identify individual perceptions and actions and how each individual reality is unique in some way.

Qualitative research examines events and experiences in context from the perspective of the individuals experiencing the phenomena. This approach allows the researcher to explore the depth and complexity of a phenomenon, identify and describe its components and their relationships and develop a picture of the whole that can enhance and guide practice and future research Thompson & Walker (1998).

Qualitative research may be used to answer questions such as ‘what is going on here? Or how can we explain it?’ According to Thompson and Walker (1998), qualitative research can be used to describe how people live or cope with particular experiences. “Researchers adopting this approach are more concerned to understand individuals’ perceptions of the world” Bell (2005) p.7. They seek insights rather than numerical or quantified analyses of the world. According to Strauss and Corbin (1990, cited in Hoepfl (1997)) qualitative research can be defined as any kind of research that produces findings that

have not been arrived at by means of statistical procedures or other means of quantification. The authors go on to state that quantitative researchers seek causal determination, prediction, and generalisation of findings, whereas qualitative researchers seek instead illumination, understanding, and extrapolation to similar situations. Qualitative methods can be used to explore substantive areas about which little is known or about which much is known to gain novel understanding Strauss & Corbin (1990).

Hoepfl (1997) described qualitative research as the following:

- Qualitative research uses the natural setting as the source of data. The researcher attempts to observe, describe and interpret settings as they are, while maintaining “empathic neutrality”.
- The researcher acts as the “human instrument” of data collection.
- Qualitative researchers predominantly use inductive data analysis.
- Qualitative research reports are descriptive, incorporating informal, expressive language and the “presence of voice in the text”.
- Qualitative research has an interpretive character aimed at discovering the meaning events have for the individuals who experience them and the interpretation of those meanings by the researcher.
- Qualitative research is judged using special criteria for trustworthiness.

Eisner and Patton (1991, 1990, cited in Hoepfl (1997)), state that the credibility of a qualitative research report relies heavily on the confidence readers have in the researcher’s ability to be sensitive to the data and to make appropriate decisions in the field. The researcher is therefore part of the process and does not observe the process from a distance. The researcher interacts with the individuals who are providing input on their experiences and the phenomenon being investigated.

According to Johnson and Onwuegbuzie (2004), the strengths of a qualitative approach include the following:

- Provides understanding and description of people's personal experiences of phenomena i.e. the insider's view;
- Qualitative approaches are responsive to local situations, conditions, and stakeholders' needs;
- Qualitative researchers are responsive to changes that occur during the conduct of a study;
- Qualitative research can describe, in rich detail, phenomena as they are situated and embedded in local contexts;
- Qualitative data in the words and categories of participants lend themselves to exploring how and why phenomena occur.

3.2 Research Design

Research design is concerned with how the research process will be selected and how the data will be collected and analysed. The research used the simple interpretive design which aimed to investigate the perceptions, feelings, attitudes, and understanding relating to reverse logistics and green supply chain management. Interviews with management and specialists were conducted to collect the data needed. Qualitative interviewing techniques use open-ended questions that allow respondents to provide answers in their own words.

Semi-structured interviews were conducted. This method allowed the researcher to introduce the topic and then guide the discussion with specific questions. The guiding questions were determined by the responses from the interviewee. The respondents were allowed to answer the questions in their own way and to provide as much detail as they wanted. Face to face interviews allowed the interviewer to clarify, probe, and ask follow up questions. The in-depth interview was used to obtain detailed or descriptive information from individuals about a research topic with the intention to learn about a research topic from an individual's point of view Kalaf, Dan & Dietz (2008). Respondents were chosen from different companies within the retail sector. This provided the

diversity of responses and experiences as they were from a variety of industries from food to clothing to furniture retail.

The advantages of using this method is that data can be analysed in a variety of ways and interviews are relatively easier to arrange than other forms of qualitative data collection Willig (2008). The interviews are more friendly and flexible and respondents are free to ask questions. Semi-structured interviews can also be used to explore a broad spectrum of issues such as cultural diversity in organisations. Interviews are also readily accepted by most respondents.

The disadvantages of interviews include the following:

- They can be lengthy and time-consuming to conduct. This could make it difficult for the researcher to get people to participate.
- Transcribing the interviews can also be a time-consuming exercise as it can take several hours to transcribe one interview.
- The interviewer can influence the respondent.
- Interviews can yield a lot of data that might not be relevant to the research.

To overcome these disadvantages, the interview questions were kept as specific to the research topic as possible to reduce the time taken and content given by the interviewee.

3.3 Population and sample

3.3.1 *Population*

The population was a variety of retail companies within Gauteng that use reverse logistics. It was made up of companies from the food, furniture, and clothing industries. The population ranges from listed companies to family owned businesses and the size of the population was 13 companies. In the

case of a group of companies that belong to a holding company, only one company was interviewed. The assumption is that the policies would be standard throughout the companies. The companies selected are listed in Table 2 below:

Table 2- List of Companies using Reverse Logistics

Company	Industry
1. Makro	Food and Home Retail
2. Dion	Home Appliance
3. Hifi Corporation	Home Appliance
4. Incredible Connection	Electronics
5. Woolworths	General Merchandiser
6. Truworths Group	Clothing
7. Zara	Clothing
8. JD Group	Furniture
9. Pick & Pay	General Merchandiser
10.Checkers Hyper	General Merchandiser
11. Spar	Food
12. BMW: Cedar	Motor Retail
13. Mercedes-Benz: Sandton	Motor Retail

3.3.2 *Sample and sampling method*

In qualitative research, respondents are selected because they are knowledgeable about or have experienced the phenomenon of interest and are able to share that knowledge with the researcher (Thompson & Walker, 1998). This is also known as purposeful sampling (Hoepfl, 1997). Purposeful sampling seeks cases that are rich in information which can be studied in-depth.

For this exercise, a member of the management team was selected from each company. The selected managers have experience in reverse supply chains and the economic benefits thereof. A covering letter was sent to one manager from each of the chosen companies. There were 13 semi-structured interviews conducted in person. The list of respondents is tabled below:

3.4 The research instrument

Semi-structured interviews, using open-ended questions, were used for this research. The questions were specific to reverse logistics and the economic benefits of a green supply chain. A covering letter was sent to potential interviewees to request an interview. A list of questions that would be explored during the interview was prepared in advance to ensure that the same information was obtained from each person to be interviewed.

The advantages of using an interview schedule or guide include:

- It makes good use of limited interview time.
- It keeps the focus of the interview on the topic of research. Questions that are not relevant to the topic can be eliminated and therefore not discussed.
- It can help the interviewer probe and dig deeper within the scope of the research question as there are no predetermined answers.

The weaknesses of using an interview schedule or guide include:

- It is time consuming. Interviews in general are time consuming
- It requires discipline as it can be easy to get side-tracked once the interview starts.
- It also requires experience as some guides can include very difficult or ambiguous questions that respondents cannot answer.

3.5 Procedure for data collection

To collect the data, 13 respondents from Gauteng were identified and contacted for a face to face interview. The face to face interviews took place at a date and time that was convenient for both the researcher and the participant. The interviews were recorded using a tape recorder and the researcher also took notes. Recordings have the advantage of capturing data more faithfully than

written notes might and can make it easier for the researcher to focus on the interview Hoepfl (1997). The recordings were then transcribed and used for analyses.

3.6 Data analysis and interpretation

According to Bogdan and Biklen (1982, p.145, cited in Hoepfl (1997)), qualitative data analysis is “working with data, organising it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others.” Qualitative analysis requires some creativity, for the challenge is to place the raw data into logical, meaningful categories; to examine them in a holistic fashion; and to find a way to communicate this interpretation to others Hoepfl (1997). The analysis for this research was approached in the same way.

Organising data from all the pages of interview transcripts and notes can be discouraging and intimidating at the same time. This data must be reduced and synthesised into themes that communicate the essence of the experience Thompson & Walker (1998).

Strauss and Corbin (1990, cited in Hoepfl (1997) state that the analysis starts with the identification of the themes emerging from the raw data, a process sometimes referred to as “open coding”. Creswell (2009) points out that there is still debate among researchers as to how codes should be generated. The debate is whether these should be derived directly from the emerging information or derived from the theory being reviewed. The author submits that the traditional form is to derive them from emerging information.

According to Strauss and Corbin (1990), during open coding, the researcher must identify and tentatively name the conceptual categories into which the phenomena observed will be grouped. The objective for this is to formulate themes that will be part of an initial framework for analysis. Words, phrases or events that appear to be similar can be grouped into the same themes. These themes may be altered or replaced in the upcoming stages of analysis that follow.

As with the interview process, the researcher was cautious to avoid cognitive bias during the analysis process. The researcher then re-examined the categories mentioned above in open coding to determine how they were linked. These categories were compared and combined in new ways, as well as patterns and trends were noted, to assemble the "big picture". The idea was for the researcher to translate the conceptual model into the story line that would be read by others.

3.7 Limitations of the study

There are several factors that may potentially limit the conclusions to be drawn from the research.

- The companies chosen for sampling might not have had documented policies or strategies in reverse logistics.
- The topic might have been too new for some respondents to contribute meaningfully.
- The response rate to conduct interviews might have been too low.
- The interviewees might have given inaccurate information-telling the interviewer what he wanted to hear

3.8 Validity and reliability

Quantitative research is evaluated on the basis of reliability and validity. However, qualitative research is evaluated on credibility, transferability, dependability and conformability Thompson & Walker (1998).

3.8.1 *Credibility*

In qualitative research, the researcher assumes the presence of multiple realities and attempts to represent these realities adequately Hoepfl (1997). According to Thompson and Walker (1998), credibility addresses the truth value of a study and occurs when the descriptions or interpretations presented are

recognised immediately by people who have had that experience. Credibility depends less on sample size than on the richness of the information gathered and on the analytical abilities of the researcher.

3.8.2 *Transferability*

In quantitative research, external validity refers to the ability to generalise findings across different settings Hoepfl (1997). The author goes on to state that in qualitative research, the transferability of a working hypothesis to other situations depends on the degree of similarities between the original situation and the situation to which it is transferred. The researcher cannot specify the transferability of findings but can provide sufficient information that can be used by the reader to determine whether the findings are applicable to the new situation. Transferability of the data collected can be generalised to other industry sectors looking at reverse supply chains and those industries will derive value from the study.

3.8.3 *Dependability*

Thompson and Walker (1998) refer to dependability as the stability of the findings and the ability to track variance in the data over time. Lincoln and Guba (1985, p. 317, cited in Hoepfl (1997)) propose an “inquiry audit” as a measure which might enhance the dependability of qualitative research. In the “inquiry audit”, the reviewer examines both the process and the product of the research for consistency. To increase dependability in this research, a written, detailed record of each step of the research was kept and is made available to other researchers who may want to use the same method of research.

3.8.4 *Confirmability*

Confirmability is achieved when credibility, auditability and fit are achieved. This can also be referred to as neutrality Hoepfl (1997). The researcher needs to maintain a certain amount of neutrality and report on the research as it is. Subjectivity is sometimes very difficult to avoid when doing qualitative research

that involves interviews. The researcher has the ability to influence the respondent. To overcome this, the researcher need not have an opinion on the information given by the respondents. The raw data collected from the interview is made available to other researchers on request.

CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

The interviews provided an interesting insight into how companies view reverse logistics and green supply chains in Gauteng. The topic is relatively new to most organisations and some were reluctant to share their experiences. This impacted the sample size negatively.

The results of the interviews are presented in the form of categories or proposition statements as stated in section 2 above. The results have been further categorised according to the themes presented in the literature review.

4.2 Demographic profile of respondents

Fifteen interviews were conducted in the Gauteng Province. The original idea was to interview senior Supply Chain personnel, but their calendars did not permit the time, so the researcher was referred to operational personnel.

Table 3 - Profile of Respondents

Respondent Type	Number to be sampled
Supply Chain Manager	3
Customer Service Manager	3
VP: Supply Chain	1
Returns Manager	2
Store Manager	2
BU Manager	1
Logistics Co-ordinator	1

4.3 Results pertaining to Proposition 1: Reverse logistics is a component of green operations within most companies

4.3.1 *Experience within Supply Chain Management*

All 13 interviewees had substantial experience within the supply chain environment, varying from five years to 30 years and the industries were diverse. The industries represented varied from food to furniture to motor vehicles. All the companies interviewed have been in business for longer than 20 years.

4.3.2 *Process of returns*

All the respondents followed the same process of returns. The item or article would be collected, depending on the size, or the customer would bring it back to the shop. The item would then be recorded in the system. Depending on the industry, there will either be an exchange or a refund. In the case of damaged goods, these are sent back to the supplier.

The furniture business is an interesting case, as they have four different classifications of returns:

a) Product failure:
   Upon receipt of the item, the store logs a call with the supplier and the supplier issues what is called an upliftment number. The item is then taken to a service centre where it will then be transported back to the supplier for a return of credit. If the item is not fit for a refund, the customer is reimbursed.

b) Out of box failure:
   This is when a customer buys a fridge or any appliance and they realise that the appliance is faulty. The customer calls customer service to complain and the item is collected by the driver and it follows the same process as a product failure. Appliances are either repaired or replaced. The latter accounts for 90% of the items returned.

c) Sound and vision:

   The process followed is the same as that of product failure.

d) Repossessions:

   The company would employ the services of a sheriff if they cannot get hold of the customer. Once the item has been collected, it is recorded and kept in the service centre for 15 days. After 15 days, the item is auctioned off to recover the monies owed and the customer is liable for the shortfall, if any.

If the returned item is a perishable or food item, it is exchanged and, depending on the quality, sent to charities, food banks or animal farms. One respondent mentioned that they try and keep organic waste to a minimum, saying *"we have an arrangement that allows farmers and animal welfares to collect fruits and vegetables daily to feed livestock."*

The motor industry follows the same process of collection and recording but the remanufacturing, reuse and refurbish is done by the plant. The car dealership places an order with the Head Office Supply Chain department. The Supply Chain department places the order with the factory and forwards the vehicle, once received, to the dealer. If the customer cancels the order, SC takes it and puts it back in the system. All returns are processed on SAP. The dealer sends a cancellation form and gets credit from Head Office. Head Office sends a delivery instruction for the carrier company to collect the vehicle from the dealer and transport it to the storage yard.

At the storage yard, the vehicle is checked for scratches, etc. Once they determine that it is in the same condition that the dealer received it from Head Office, proof of delivery is signed and the hand over takes place. At that point, risk is transferred from the transporter and the dealer to Head Office. Head Office does not take excess stock from dealers though. Dealers deal with their own over-orders. If Head Office has excess stock due to a particular model reaching the end of range, the vehicles will go on special.

The other interesting form of return is when staff members return their vehicles for a replacement. These vehicles are then placed on auction that is only open to dealers to bid. The dealers then sell on these vehicles as pre-owned.

Spares like used battery, radiator, gearbox, etc., are returned to the parts department for recycling. These parts are sold on to remanufacturing companies, who in turn refurbish the part and sell it back to the motor vehicle dealerships or the public.

Two of the three respondents confirmed that the second hand parts market in South Africa is big:

"Motor vehicle manufacturers insist on genuine parts but that does not mean that the part has to be brand new. We recommend refurbished parts to those customers who cannot afford a new part."

4.3.3 *Environmental benefits*

According to respondents, many companies adopted reverse logistics to avoid sending waste to the landfill sites as they are running out of space. Other companies do it because it is a sustainable option. While there were those respondents who felt that they do reverse logistics and green supply chain management for their corporate brand, two were adamant that the majority of South Africans are driven by price rather than environmental processes.

A few respondents mentioned that their respective companies now monitor carbon emissions:

"We monitor CO2 emissions from our trucks, hence reducing the environmental footprint towards the earth's atmosphere."

The transport routes and distances involved in all these collections are planned and the carbon footprint is taken into account. Once the delivery is done, the retailer brings back the packaging that was used on the appliance or furniture. Once back in the warehouse, the packaging is measured, weighed, recorded and disposed of in a responsible manner.

“Other than the cardboard, plastic, glass and tin that we sort for recycling, we also keep organic waste to a minimum.”

All the respondents were aware of the laws that have been introduced by the government to try and control waste that goes to landfill sites. One respondent explained that they are guided and get their policies from their international parent company, which has to abide by strict international environmental laws.

The majority echoed this statement, saying:

“South Africa is not an island and since we export some of our products, international companies need to understand what our environmental policies are and how we dispose of our waste.”

“Waste management is a big talking point globally and how you manage your waste can determine your future dealings”

4.3.4 *Conclusion*

Based on the responses of all the interviewees, it is evident that the adoption of reverse logistics has seen companies engaging more on environmental matters and the disposal of waste.

It is clear that there is a process that they all follow, which allows them to track the returns and what happens to the item thereafter.

These results show that Proposition 1 is accepted.

4.4 Results pertaining to Proposition 2: Components of reverse logistics and those of green supply chain management are the same for most companies

4.4.1 *Reasons for choosing reverse logistics*

Most of the respondents felt that being a corporate citizen shows that the retailer understands its consumers and the society in which it operates.

One interviewee had this to say about why they adopted reverse logistics:

"To take correct action in reducing waste, prevent products being landfilled, and brand protection, to ensure the correct waste streams are being followed."

Another had this to add:

"Our organisation does not use 'conventional' reverse logistics. We are not a manufacturer that collects used products and refurbishes or recycles them. We do however, recycle waste, accumulate consumable product and distribute as part of a social responsibility program."

One respondent explained how reverse logistics has changed the way they work:

"Reverse logistics plays a key role in any organisation in terms of implementing processes to reduce business waste, manage refurbishment, repair, re-use and recycle disposal routes. The Reverse Logistics unit plans and executes product liquidation plans to ensure the correct disposal routes or waste stream are being followed. They own all returns processes and polices within the business. Reverse Logistics is one point of contact for inventory and processes pertaining to customers returns, quality, damages, etc."

One respondent compared their process of 'lean' to reverse logistics and drew out similarities, saying:

"As an organisation we already have "Lean" processes seeking to cut out the fat in our procedures, and only use the meat. This is applied across the board and

in every department/area of our operations. This initiative is a proactive and preventative measure to avoid waste."

4.4.2 *Connection between reverse logistics and green supply chain management in your organisation*

All the interviewees explained that reverse logistics falls under the big umbrella of green supply chain management. Six of the respondents stated that even though reverse logistics does not fall under procurement, the department responsible for green supply chain management, they apply the same principles of green operations to dispose of products.

"Procurement ensures that the packaging meets the environmental policies of the business. This is why we have recyclable plastics bags, returnable pallets and our suppliers adhere to strict regulations."

"Green supply chain management is when you integrate environmental responsibility into supply chain management or reverse logistics. Where the environment is taken into consideration during an items' design, the materials used and the impact it will have on future generations."

Another respondent stated that:

"Reverse logistics manage stock returns or rejected stock within the network. Green supply chain manages sustainability from manufacturing all the way through to disposal."

One passionate respondent said:

"As the Supply Chain Department, we strongly believe in the concept of 'cradle to grave' and we practise it in all that we do. When we buy a product from a supplier, we ensure that we or our customers can dispose of it in a responsible manner."

Another said:

"Like I mentioned earlier, reverse logistics is more waste management. Waste management contributes to the whole element of going green in the supply chain. Going green includes having ways to better manage your waste and re-use/refurbishment where possible."

4.4.3 *Conclusion*

These results indicate that Proposition 2 is accepted.

4.5 Results pertaining to Proposition 3: Green management practices have implied economic benefits

4.5.1 *Financial Implication*

All the respondents classified reverse logistics as a cost centre within their respective businesses as it does not produce direct profit to the organisation. They have all seen cost benefits since adopting green operations, especially in transport, which most of them stated as an outsourced cost.

Other respondents felt that green practices indirectly bring them improved market share and open up new markets as people become more sophisticated and demand organic products.

Some of the responses are summarised below:

"Our reverse logistics unit focuses on waste management. Previously, waste removal was costly; the current initiative has seen a significant reduction in costs."

"Our expenses have been reduced by this initiative. Waste was previously collected by a waste management company, at a cost. Waste is currently sorted for recycling, on the premises. The goods are then compacted and sold to recycling companies. Items which are deemed suitable for consumption are collected by local charities and distributed accordingly."

One respondent felt that they have not seen financial benefits as a company but reverse logistics is part of their risk management:

"No real financial benefit is sought after but it definitely avoids huge risks and lawsuits that we could potentially incur if not undertaken."

The respondents that are involved in refurbishment and re-use claimed that the market is insignificant and they do not track the financial benefits.

4.5.2 *Impact on the reputation of the organisation*

While some of the respondents felt that green practices were improving the reputation of the business, a few stated that environmental matters are not top of mind for South African consumers. The general consensus, though, was that customers deal with companies that give them immediate solutions to their problems.

"When a customer brings back a garment that is torn, he or she does not expect to get a thousand and one questions. They want you to exchange the item on the spot and deal with your internal processes later."

"The notion of 'the customer is always right' has never been more relevant than it is now."

"We have significantly reduced our lead times for repairs in order to satisfy our customers with the aim of retaining them. We have achieved this by putting in place proper processes and renegotiating our service level agreements with our third party service providers."

This particular respondent went further to explain the reasons why his organisation looks at reverse logistics in a more serious light:

"If we do not collect unwanted stock, it would be a burden for our customer to get rid of this waste, which makes our relations sour. Customers may end up throwing it away themselves in a reckless manner or even sell it at very low prices, and anyone can have access to that. If people get sick and babies die

from expired stock, this would give us a bad name and portray irresponsible behaviour from our side."

4.5.3 *Is reverse logistics a fad or trend?*

There was consensus in the viability of reverse logistics as an option. All the companies interviewed felt that reverse logistics will only grow in the future. Respondents mentioned benefits, such as job creation, cost savings, brand image, but a few were also cognisant of the fact that companies focus on profits above everything else.

"It certainly isn't a passing trend. I find that it has really grown over the years and is starting to become a priority in many companies. The only trick is that it is more a cost centre and not profit centre unit of the business. So as you know, business operations have at the top of their agendas, the aim of making a profit."

One of the interviewees felt that refurbishing and remanufacturing are growing markets that companies can explore:

"It has reduced our waste disposal costs. Furthermore, created jobs and uplifted certain sectors of the surrounding community. It has created an awareness amongst employees, which allows them to make decisions that would benefit our environment. Reverse logistics is a growing trend (not passing). Refurbishing, recycling and remanufacturing are growing markets and allow for greater product sustainability."

Another respondent shared the same sentiment:

"This is a growing focus in most companies, no matter how slow that rate might be."

This respondent took a more realistic and practical view:

"Fact is there will always be a need for this unit. While we can improve our processes to better manage short-dated items and avoid expiry, stock will

always get damaged at some point of the supply chain and somebody needs to take care of it."

4.5.4 *Conclusion*

It is evident from the information gathered that the companies interviewed have seen cost savings as a result of implementing green practices. This shows that Proposition 3 is accepted.

4.6 Summary of the results

The responses received from interviewees confirm that there are clear processes that their organisations follow when dealing with reverse logistics. All the respondents mentioned that they use some form of IT or Enterprise Resource Planning tool to record and track returned stock. What was even more interesting is that this stock is kept separately to normal stock, except in the case of returned vehicles, which go back to the system and await the next order.

All the interviewees recognised the need for green operations and the benefits thereof. They also recognise the fact that reverse logistics is growing in importance and everyone needs to play their role in ensuring a sustainable future for all. While the respondents feel that companies have not taken full advantage of some components of reverse logistics like remanufacturing and refurbishment, they believe that this will happen in the near future as a way of generating more employment and opening new markets.

It is of particular interest to note the different reasons why some organisations are using reverse logistics such as the one using it as a risk mitigation tool. The furniture business is another interesting one due to the personal nature of returns in their business. They have to go into people's homes to collect intimate items like a mattress that has squeaky springs or a television that does not work. The respondent explains the emotions involved and the sensitivity necessary for such jobs.

CHAPTER 5. DISCUSSION OF THE RESULTS

5.1 Introduction

This chapter discusses and explains the results in relation to the propositions stated. The structure of the results was compared to the literature review. This enabled the researcher to identify and highlight any similarities and/or discrepancies and possible reasons thereof.

5.2 Discussion pertaining to Proposition 1

Reverse logistics is a component of green operations within most companies.

This proposition deals with the different stages of reverse logistics and tries to show the similarities in elements of reverse logistics and those of green supply chain management. The findings of the research show that there is a tangible link between reverse logistics and green supply chain management.

It should be noted that reverse logistics in South Africa is not as mature as it is in most developed countries; however, there are companies that have adopted it and are pleased with the results.

5.2.1 *Stages in the reverse logistics channel*

These are stages that companies follow to ensure that the correct processes are followed when dealing with returned merchandise. The activities may differ from company to company depending on the product but the processes followed are the same. The literature identifies collection, inspection and sorting, pre-processing, and location and distribution network design as four important functional aspects in reverse logistics S.K. Srivastava (2008).

Before products are collected, companies need to establish a process of control, which is the gatekeeping process. This is important for a number of

reasons, one of them being stock control. A number of the companies interviewed stated that customers must have proof of purchase in the form of either a receipt or till slip, invoice or statement showing that the goods were obtained from that company. This is the first step of verifying the products that come in and is the gatekeeping process for most companies.

However, for other companies like clothing retailers, this is not enough. The respondents stated that if the customer does not possess any form of proof of purchase, they do not turn the customer away as that will be bad for business. They, instead, take the item and use the stock keeping unit (SKU) number to verify that the item is part of their inventory. Once the verification has been done, the customer will then be given a credit voucher, instead of a cash refund, to use in store.

In the case of a retailer that has to collect the item from the customer, Lambert, et al., (2011) suggests that the company must decide at the time of defining the return policies, on who pays for transportation of the returned product that is repaired or replaced while under warranty. There is consistency on this point as the companies that use this facility charge the transportation of that item back to the supplier.

Once the item has been collected, the inspection and sorting takes place to determine whether the item is refurbished, remanufactured, replaced, recycled or disposed of. This process takes place in a collection centre, which is different for different companies. Most companies that were interviewed stated that their collection centres are either inside the store, in a separate area in the store room, or near the store. A few mentioned that their collection centre is either in the warehouse or next to the warehouse.

None of the companies interviewed outsourced this processes and the pre-processing. They all confirmed that they outsource the transportation of the items. From the respondents' view, this stage of reverse logistics allows them to integrate the 'good' products back into their supply chain and that is easier to control if done in-house. The other point made was that it creates employment for the communities where they trade.

It is after pre-processing that the fate of the product is decided and it is either recycled or disposed of and sent to the landfill. The respondents of companies dealing with perishable items mentioned that they donate returns or excess stock to charities or this is given to farmers for their livestock.

All the respondents mentioned that they are involved in reverse logistics and its processes to minimise waste going to the landfills and to be environmentally friendly.

5.2.2 *Remanufacturing and refurbishment for the secondary market*

The remanufacturing and refurbishment of products is related to products like motor spares and electronics. This is when a returned product is stripped or disassembled to retrieve useful parts that can be refurbished and used in new products. In some cases, as with the motor industry, the retailer will offer customers genuine remanufactured parts as they are cheaper than original parts. When a customer brings back a broken or damaged part, the retailer will offer the customer a credit note against the remanufactured part. The remanufacturing of used parts saves motor retailers on production costs.

The electronics and appliances that are returned to retailers are stripped and the re-usable parts sold to suppliers. This is difficult in South Africa as customers do not return old appliances. These appliances end up in places where they should not be and cause damage to the environment. Before the retailer can declare your appliance or product failed, they need to perform a number of tests. An appliance can be broken and not fit for its primary use but the spares inside might still be worth something. This is in line with the literature by Kerr and Ryan (2003, cited in Rathore et al. (2011)), where they state that remanufacturing helps reduce environmental impact and costs of manufacturing processes, while reducing final disposal costs of products and components.

To curb this problem, companies are now offering incentives to customers who bring back old products when in store to buy a new one. This is called the trade in process. These trade ins are used to recover usable spares or are disposed of in an environmentally friendly manner. Some of the respondents explained that they do not do this for cash but to maintain their brand image. As the literature states, in many consumer goods markets, the processing costs of remanufacturing are higher than the selling price of a new product (Giuntini & Gaudette, 2003, cited in Pagell et al. (2007)).

The literature suggests that there are secondary markets that can be explored through remanufacturing and refurbishment, however, this has not been a significant focus in South Africa yet.

5.2.3 *Collaboration with suppliers*

It is always beneficial to invite suppliers to help improve the product design and manufacturing process and to improve the overall compliance with environmental regulations Chiou et al. (2011). The motor industry has, in adopting this approach, saved costs and reduced their lead times. It has also reduced the weight of the vehicles, thereby reducing fuel consumption. These are all the things that have been done consciously by automobile manufacturers in responding to the needs of the consumer. When governments started looking at carbon emissions, the car industry responded by producing vehicles that have reduced carbon emissions.

By integrating suppliers, distributors, and reclamation facilities, the product life cycle will impact the greening of the supply chain from design to maturing to decline stages of the product life Sarkis (2003). This ensures that products are designed with the disposal and environment in mind. This is particularly true for appliances and furniture.

Retailers generally work very closely with their strategic suppliers with the aim of introducing product innovation and perhaps environmental consciousness. One of the leading food retailers in South Africa has been doing this for years and they were the champions in this space. Long before the collaboration with

suppliers was topical; this retailer was already working with suppliers to create an environmentally friendly brand. They have even gone into sustainable or responsible fishing to create awareness to their consumers of endangered species. They are one of the few companies that also shine the spotlight on small start-up companies that they bring into their vendor pool. These start-up companies are from the communities where the retailer operates and they produce craft work, among other things, that ends up on the shelves for consumers to buy. The same collaboration has gone into bags and other merchandise.

5.2.4 *Re-using and recycling materials and packaging*

Re-using and recycling materials is mostly evident in the electronics space where they, among other things, collect ink cartridges and refill them. This brings down the costs considerably for the consumer and also for the retailer. By doing this, the retailers are also adhering to the principle of cradle-to-grave, which supports the government's Integrated Waste Management Policy. This principle states that a producer or manufacture is responsible for the product from design to end of life disposal. The policy has changed how packaging is designed and produced in South Africa, for it to be recyclable.

Packaging has a strong relationship with other components of the operational life cycle and systems that encourage and adopt returnable packaging will require a strong customer supplier relationship as well as an effective reverse logistics channel Sarkis (2003). Most companies that use re-usable packaging have also involved suppliers in their supply chains to ensure an environmentally friendly way of disposing of them. This is also evident in the pallets that supermarkets use. There has been a shift from wood to plastic.

Pagell, et al., (2007) states that direct involvement in recycling operations can create a unique knowledge of products, processes, and even customers, and that companies that employ a recycling strategy that maintains control of plastics and other hard to get commodities may hold a competitive advantage. This might be true for certain industries but not all. In the South African context,

companies have not experienced that and that might be a factor of reserve logistics being relatively new.

In fact, recycling waste is still new and perceived as a nuisance by most consumers. The majority of South Africans do not recycle waste, even the affluent ones. On a positive note, this has provided employment for those individuals who go through rubbish bins sorting plastics and other recyclables for them to sell to recyclers and make money. This perception is changing though as more and more schools introduce recycling programmes.

The most common use of recycling for consumers that has also helped retailers is refill packaging. More and more people are buying refill packs because they are cheaper than the packaged product. Food retailers charge a deposit when a consumer buys any beverage that is in a glass bottle that is returnable. This deposit is refunded when the consumer brings the bottle back to the retailer. The retailer, in turn, takes the bottle back to the original supplier who cleans and refills it. The refundable deposit has discouraged many people from buying glass bottled beverages and they are now buying PET bottles that are easy to recycle.

Re-use and recycling has always been practised in most households but no-one called it that. Most households reuse ice cream and margarine tubs to store left overs or use as a lunch box. Others use recycled glass containers as storage or flower vases to decorate the house, hence extending the use of the container.

5.2.5 *Conclusion*

It is clear from the interviews and the literature review that retailers in South Africa follow the same processes for reverse logistics as their counterparts in other parts of the world. The market in South Africa is still young and there are still opportunities to grow the secondary market. This secondary market can also service other countries within Africa and other developing countries, thereby boosting the economy of South Africa.

The results of the interviews and the literature show that there are benefits to creating and maintain relationships with your suppliers. These relationships can bring about innovation that will result in a competitive advantage for the company.

While the results concur with the literature review, there are still opportunities highlighted in the literature that South Africa can learn from and gain competitive advantage over other countries, especially when beneficiation is a topical issue in South Africa.

5.3 Discussion pertaining to Proposition 2

Components of reverse logistics and those of green supply chain management are the same for most organisations.

5.3.1 *The relationship between reverse logistics and green supply chain management*

Reverse logistics has always been seen as part of the green supply chain management. According to Samir K. Srivastava (2007), the growing importance of green supply chain management is driven mainly by the escalating deterioration of the environment, e.g. the diminishing raw material resources, overflowing waste sites and increasing levels of pollution. The author goes on to explain that reverse logistics is a big component of green supply chain management that has largely been ignored in research literature and it falls under green operations. The literature supports the results of the interviews, where respondents expressed a view that reverse logistics is primarily about environmental issues, with profits being secondary.

Although reverse logistics resides in a different department to supply chain management, the principles of these two departments are the same. When an organisation makes a decision to adopt green initiatives, the procurement department engages suppliers to seek innovation in this regard. Suppliers will design products that are easy to recycle or dispose of. Their end goal would be the impact the product will have on the environment. This is evident in the

products that consumers use on a daily basis, for example, plastic bags to carry groceries, and other recyclable products.

While regular forward supply chains usually deal with flow of products starting from initial processing of raw materials at suppliers to delivery of finished items to customers, the scope of the green supply chain goes beyond this definition to include environmentally friendly products and process design, extension of product life cycle, and recovery of end-of-life returns Bose and Pal (2012).

The researcher found this theory to agree with the results of the interviews conducted. This is evident in how most retailers treat returned products, especially the motor industry which refurbishes and remanufactures used parts. Another example is that of food that is no longer viable for human consumption and is used or sold for compost. This compost is used in many food gardens that sell their produce back to retailers for consumers to consume.

5.3.2 *Conclusion*

There is a positive correlation between the literature and the results of the interviews. Reverse logistics ensures that products are disposed of in an environmentally friendly manner rather than dumping them in landfill sites that are already overflowing with waste. The extension of product life cycle, or recycling, ensures that the product is re-used a number of times before being disposed and this reduces the number that is produced of that item.

5.4 Discussion pertaining to Proposition 3

Green management practices have implied economic benefits

5.4.1 *The benefits of using reverse logistics and green supply chain management in retail in Gauteng*

Companies get involved in reverse logistics for economic benefits, corporate image and environmental awareness and legislation. Economic benefit does not only refer to profit; it can also be cost saving and improvements in production processes. By using reverse logistics, companies have recorded reduced transport costs and disposal costs. Other companies have saved on the manufacturing of new parts.

Depending on the condition of the item being returned, it can be re-introduced in the supply chain to be sold as new or as a display unit item. This can generate additional revenue and save the costs of writing off the item as defective or obsolete. This was demonstrated by the motor retailers interviewed where they state that at the end of a particular range of car, they sell that model at a discounted price because there are people who still want it. This does not only bring in additional income, but it saves costs of transporting the vehicles back to the manufacturer.

Other companies stated that they have reduced waste disposal costs, thereby gaining savings on third party service providers. In the processes of disposing of waste, companies would call third party recyclers to collect the waste. Bringing this activity in-house creates jobs and saves on transport costs.

The other reason for getting involved is corporate or brand image and competition. One major food retailer is cashing in on its green reputation in the market. They were one of the first to introduce green initiatives to the retail industry and their market share has grown through this. They are now seen as an innovative company and consumers want to deal with them. These practices have brought new customers and they hope to retain this position going forward.

The indirect benefit of using reverse logistics is the invaluable customer data that retailers capture. This data can be used for marketing purposes or to pro-actively track customer satisfaction and implement changes to ensure that retailers do not lose those customers. At the time of the interviews, none of the interviewed companies were using this data for anything but to track and feedback progress on the returned item. The one concern with regard to using the customer's information for marketing is the POPI (Protection of Personal Information) Act that was signed into law in November 2013. This Act provides, among other things, "the rights of persons regarding unsolicited electronic communications and automated decision making".

From the evidence presented above, it is clear that there have been economic benefits that have been derived by retailers using green management practices.

5.5 Conclusion

Based on the above discussion, it is clear that there is a positive correlation between the literature and the results obtained from the interviews. It is clear that the activities and processes followed in reverse logistics and green operations are the same all over the world.

The literature and the results have clearly demonstrated that in order to be successful in reverse logistics, one needs a clearly defined and articulated green strategy, processes and policies. The way products are disposed of in the retail industry in Gauteng is in line with the environmental initiatives being implemented all over the world. Even though it is clear that South Africa still has a long way to go to catch up with its global counterparts, it is comforting to see that business and consumers all want a sustainable future for future generations.

All the literature reviewed states that there are major economic benefits to implementing reverse logistics that are achieved through the secondary markets. The interviewed companies have not yet tested this and the secondary market is mainly limited to the motor vehicle industry.

The findings above support propositions 1, 2 and 3 and are accepted.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter outlines the conclusions of the research, the recommendations and suggestions for further research.

6.2 Conclusions of the study

The purpose of this research was to determine whether there is a relationship between reverse logistics and green supply chain management in the retail sector in Gauteng. To do that, the researcher has summarised the propositions as listed in chapter 2.

Reverse logistics is a component of green operations within most companies.

6.2.1 *Reverse logistics is a component of green operations within most companies.*

It is clear from the interviews and the literature review that retailers in South Africa follow the same processes for reverse logistics as their counterparts in other parts of the world. The literature and the results have clearly demonstrated that in order to be successful in reverse logistics, one needs a clearly defined and articulated green strategy, processes and policies.

The study also demonstrated that collaborating with suppliers in greening your supply chain saves the company money and makes it easy to dispose of products. The relationship formed between supplier and retailer and consumer can give the retailer a competitive edge over other players.

Re-using products and recycling extends the life of the product and reduces production costs.

6.2.2 *Components of reverse logistics and those of green supply chain management are the same for most organisations.*

Reverse logistics ensures that products are disposed of in an more environmentally friendly manner than dumping them in landfill sites that are already overflowing with waste. Environmentally friendly processes like green supply chain management ensure that products are not only designed with the environment in mind but they are designed for safe disposal at the end of their useful life.

According to some of the respondents, reverse logistics and green supply chain management are two separate departments but their strategies are the same. They all want products that will be kinder to the environment and are recyclable.

6.2.3 *Green management practices have implied economic benefits*

All the literature reviewed states that there are major economic benefits to implementing reverse logistics that are achieved through the secondary markets. The interviewed companies have not yet tested this and the secondary market is mainly limited to the motor vehicle industry in South Africa.

The study also demonstrated that green practices give companies a good reputation in the markets that they serve and this brings repeat business.

What the study and the literature were silent on is the use of data that companies have in their possession that is collected during the initial activity of reverse logistics.

6.3 Recommendations

It is evident from the interviews that retail companies in Gauteng have adopted reverse logistics and are using proper processes to ensure that it works. What also came out clearly from the interviews is that the focus for the majority of these companies is waste management, which addresses ways of disposing of

the waste. Reuse and remanufacturing for secondary markets is not prominent or top of mind.

The lessons derived from the study can assist many companies that wish to implement reverse logistics or those that are looking to adopt a green or environmental strategy.

1. To realise the full impact of reverse logistics, companies need to commit to all the components and not just waste management. There must also be a bigger focus on the financial benefits of reverse logistics that are brought about by remanufacturing. Waste management is important to ensure that waste is disposed of in an environmentally friendly manner and that companies are seen to be citizens of the world. However, to realise tangible financial benefits, companies need to start focusing on creating secondary markets.
2. As demonstrated by the literature, reusing the materials like copper, from products that have reached their end of life can provide a competitive advantage and new product knowledge. Depending on the amount of the material in question, retailers are able to sell this on to consumers of that material.
3. South Africa is one of the most advanced countries in the African continent and we can share information and establish reliable secondary markets there. We have seen African traders coming to South Africa to buy stock for resale and there are South African retailers who have opened shops within the continent. These opportunities can be exploited for more benefits.
4. A clear strategy is also critical when deciding to implement reverse logistics. A company needs to understand the costs associated with setting up the unit and the IT systems necessary. Top management also needs to decide how far back in the supply chain the company is going to participate. Clear and concise policies need to be drawn up and followed to manage returns.
5. A strong relationship is critical with strategic suppliers when a company wants to introduce green supply chain management. The study has

provided a tool that companies can use to select suppliers that will assist them in implementing green operations. Research has shown that collaborating with suppliers can achieve benefits for the business both in manufacturing processes and waste management.

6.4 Suggestions for further research

The results of the study were drawn from a specific population and generalisations cannot be made for the majority of the companies in South Africa, or even in other provinces within South Africa. This can encourage further research into green operations that are adopted by other organisations. The following are suggestion for further research:

1. Benefits derived by companies that have successfully established secondary markets.
2. Green supply chain management within the manufacturing sector. Do OEMs follow the same processes and activities as retailers when dealing with reverse logistics?
3. Impact of green operations on brand awareness.

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APPENDIX A

Actual Research Instrument

Interview Questions

1) Please give an overview of what your organization does?

2) How long have you been in supply chain?

3) How do you handle returns in your organization?
   a) Is the process outsourced or do you do it yourself? Why?

4) Which of the following components do you employ in your reverse supply chain?
   a) Remanufacturing
   b) Refurbishment
   c) Repair
   d) Re-use
   e) recycle

5) Why is your organization involved in reverse logistics?

6) What other benefits, if any, has your organization derived from implementing reverse logistics?
   a) Have any of these been financial?

7) How does your company classify the reverse logistics unit?
   a) a cost centre or a profit centre? Why?

8) What is the connection between reverse logistics and green supply chain management?

9) What other green initiatives is your organization involved with?

10) What is your situation currently with returns?

11) What value do you think reverse logistics adds to your business or is it a passing trend?

APPENDIX B

Consistency matrix

Research problem: Determine if a relationship exists between reverse logistics and green supply chain management in the retail industry in Gauteng and determine whether and how this affects the bottom line of companies in SA					
Sub-problem	Literature Review	Propositions	Source of data	Type of data	Analysis
Identify key components of reverse logistics and those of green supply chain management	Prahinski and Kocabasoglu (2006) Rathore, Kota et al. (2011) Sarkis (2003) Kumar and Putnam (2008)	Reverse logistics is a component of green supply chain within most companies	Respondents in semi structured interviews	Qualitative data	Data reduction Data coding
Identify the relationship between reverse logistics and green supply chain management in the retail industry in Gauteng	Srivastava (2007) Chiou, Chan et al. (2011) Pagell, Wu et al. (2007)	Components of reverse logistics and those of green supply chain management are the same for most companies	Respondents in semi structured interviews	Qualitative data	Data reduction Data coding Conclusion drawing
Determine whether and how this can translate to any benefit for companies in SA	Lun (2011) Diabat and Govindan (2011) Dowlatshahi (2010)	Green management practices have implied economic benefits	Respondents in semi structured interviews	Qualitative data	Data reduction Data coding Conclusion drawing

5/26/2015

Nosipho Gxumisa
MBA: Wits Business School

Dear Sir/Madam,

I am currently completing an MBA at the University of Witwatersrand, Wits Business School. Part of the requirement to complete the programme is to write a thesis. My research thesis is on the relationship between reverse logistics and green supply chain management in the retail industry. While ordinary supply chains focus on delivering products from the supplier to the consumer, reverse supply chains focus on the backward flow of materials from customers to suppliers.

I would appreciate it you can spare half an hour of your time for an interview on the topic. The interview will be confidential and only for academic purposes. The questions will be focusing on challenges faced by organisations in implementing reverse logistics and the benefits of green policies. I understand that you are very busy but I would greatly appreciate your contribution on the topic and towards my research.

I will contact you via email to set up interviews.

Thank you for your assistance.

Yours sincerely,

Nosipho Gxumisa
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