

**REVERSE LOGISTICS AND COMPETITIVE  
ADVANTAGE: AN INVESTIGATION OF WATER BOTTLING  
COMPANIES IN NAIROBI**

**BY**

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of Business Administration, School of Business,  
University Of Nairobi,**

**2012.**

## DECLARATION

I declare that this project is my original work and has never been presented for evaluation in any other university

Signature..........

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D61/62646/2010

This project has been submitted with my authority as the university supervisor

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## **DEDICATION**

This project is dedicated to my late parents, Mrs. Miriam Ochieng' Ong'ombe and Mr. Fanuel Ongombe whose wish were that I give all to my education life.

To my late Husband, Mr. George Ooko Ochieng, who just before his demise in the year 2010 had a total commitment in disseminating knowledge.

To my late children who journeyed on with their father, Baby Angelicah Adhiambo Ooko and Baby John Otieno Ooko for whom I decided to hide the pain of losing them in the books.

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## **ABSTRACT**

The main aim of this study was to establish the relationship between reverse logistics practices and competitive advantage among water bottling companies in Nairobi. The study had two objectives to achieve: To establish the extent to which reverse logistics practices are adopted by water bottling companies in Nairobi. And to determine the effect of reverse logistics on competitive advantage to water bottling companies in Nairobi. A cross sectional census survey was adopted as the research design where all the water bottling companies in Nairobi were involved in the study. Data was collected using a questionnaire from logistics managers of the companies. The study concluded that there exists a very strong and significant relationship between reverse logistics practices and competitive advantage among the water bottling companies in Nairobi. It was clear that the most prevalent practices include: return of defective merchandise; screening of defective merchandise; re-use and recycling; remanufacture and recycling after sales support as well as employment of qualified staff.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the study

The field of reverse logistics has received much attention in supply chain management since it reflects the ability of a firm to positively influence the relationship it has with customers. Moreover, reverse logistics has major cost repercussions both for the company and its suppliers. Many retail companies that do not have the adequate capability to implement reverse logistics strategies experience financial constraints in improving customer service. The use of reverse logistics has become a competitive necessity in an overall supply chain strategy (Daugherty *et al.*, 2005). Therefore, if reverse logistics is well managed, it can assist a company to achieve cost savings in areas such as carrying inventory, transportation, and waste disposal; and efficiency in customer service improvement (Rogers & Tibben-Lembke, 1999; Horvath *et al.*, 2005).

In the past organizations used to practice forward logistics only. Brito and colleagues (2002) have concurred that traditionally a product was developed to be manufactured through the supply chain and then sold to the end-customer. However, today supply chains are steadily integrating more activities than those of forward logistics such as service and product recovery.

#### 1.1.1 The Concept of Reverse Logistics

According to the Council of Logistics Management, reverse logistics refers to 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 or creating value or for disposal (Smith, 2005).

Upon the arrival of this reverse flow, the company must determine what to do with each item; determine its condition; establish whether the item can be sold as new or sent back to a vendor; and then decide where the item should be sent, for example sold to a broker, recycled, or landfilled (Tibben-Lembke, 2002). Stock (1998) had observed that centralizing the reverse flows allows employees to focus mainly on reverse logistics. Reverse logistics also involves forward and backward information flow that may enable the company to initiate green and lean logistics, which would be of immense competitive advantage (Lysons & Farrington, 2006).

Reverse logistics forms an integral part of a product life cycle as well as corporate strategy that a company cannot afford to ignore. Smith (2005) noted that one of the important roles of reverse logistics is aiding a company in finding problem areas and patterns of defects, and thereby creating a way of reducing the number of returned items. Stock et al. (2001) have concurred that within the domain of reverse logistics, the product returns process emerges as a key element that can influence the customers' purchase decisions, and hence an effective product returns process is viewed as a competitive advantage. From the retail perspective, reverse logistics is a major concern for retail managers due to the shrinking margins occasioned by the costs of storage, loss of current sales, potential recoverable product value, and importance of both customer and channel partner relations (Daugherty *et al.*, 2005).

Reverse logistics encompasses areas such as where the products go once they are returned, the recycling process, the relationships between buyers and sellers, and the technology supporting the return process (Smith, 2005). A successful reverse logistics process is initiated by the management that must first develop a sense of urgency of the importance of reverse logistics in

strategic planning (Horvath *et al.*, 2005). Reverse logistics can be effective whenever there is availability of accurate information that should flow from both directions (backward and forward). It will, thus be possible to detected defective products after they have entered the supply chain resulting in a pullback of products through the chain.

At this stage of reverse logistics, there are more actors in the chain involved with the reverse flows on the basis of commercial agreements such as returning versus taking back obsolete stocks of short-life products and business to business returns (B2B); and therefore forging beneficial relationships becomes necessary. Additionally, in the business-to-consumer (B2C) scenery, products may be sent back due to mismatches in demand and supply in terms of timing or product quality (Brito *et al.*, 2002). Moreover, even after use or product life, products are collected to be remanufactured, recycled or incinerated – end-of-use and end-of-life returns. Here, both material's hazard and environmental impact have to be taken into consideration.

### **1.1.2 The concept of Competitive Advantage**

According Cole (2008), a competitive advantage is an advantage gained over competitors through offering to customers, greater value either in low pricing or in provision of additional benefits and services that justify similar or possibly higher prices. Every firm is a collection of activities that are performed to design, produce, market, deliver, and support its product (Porter, 1998). He demonstrates that a firm may develop a competitive advantage in any of the primary activities such as inbound logistics, operations outbound logistics, marketing and sales, and service; and support activities (Ankli, 1992). Additionally, Dess *et al.* (2005) argue that a

competitive advantage exists when a firm has a product or service that is perceived by its target market customers as better than that of its competitors.

Porter (2001) emphasized the importance of analyzing the five competitive forces (the threat of new entrants, rivalry among existing firms within an industry, the threat of substitute products/services, the bargaining power of suppliers and the bargaining power of buyers) in developing strategies for competitive advantage. Analyzing the forces illuminates an industry's fundamental attractiveness, exposes the underlying drivers of average industry profitability, and provides insight into how profitability will evolve in the future. The five competitive forces still determine profitability even if suppliers, channels, substitutes, or competitors change. For example, if the company is a low-cost producer, it may choose powerful buyers and sell them only products not vulnerable from substitutes. The company positions itself so as to be least vulnerable to competitive forces while exploiting its unique advantage (cost leadership). A company can also achieve competitive advantage by altering the competitive forces. For example, firms establish barriers to deter new entrants from coming into an industry by cultivating unique or capital-intensive resources that new firms cannot easily duplicate. Firms also increase bargaining power over their customers and suppliers by increasing their customers' switching costs and decreasing their own costs for switching suppliers (Shin, 2001).

### **1.1.3 Water bottling in Nairobi**

According to Mathaba (2011) bottled water is potable, clean and safe, readily available especially for those who can afford it. It is commonly used by corporate organizations. Many investors in Kenya have ventured in the sale of clean and safe water thus making the industry one of the fastest growing sectors in Kenya. In Kenya, it is estimated that the bottled water

business alone nets over 1.3 billion shillings (16 million U.S. dollars) annually and with the quest for a safer commodity, the sales are bound to rise with demand. Hotels and supermarkets have begun branding their own bottled water products just to compete with the already existing companies and individuals in the business. Other beverage production companies such as Coca cola and Quencher have also diversified into water bottling business thus making the business competitive.

Bottled water was seen as a product for the elite but as years went by, the industry began 'going small' by packaging small quantities that even the not-so rich person would afford. As the Water Ministry strives to ensure that Kenyans access adequate safe and clean drinking water, more and more investors are taking up the challenge in this multi-billion shillings industry to fill the gap occasioned by the shortage and provide a better alternative to the people Mathaba (2012).

## **1.2 Statement of the Problem**

Reverse logistics plays a crucial role in supply chains, has made it become a managerial priority because of the assets and value involved and the potential impact it has on customer relations (Daugherty *et al.*, 2005). Therefore, it is important that a company embraces reverse logistics to ensure that it influences customers' purchasing decision to its favour. Reverse logistics has a great potential of improving value, solidifying customer relations, positively influencing company profitability, and generating competitive advantage (Malone, 2004). The concept entails authorization of returns, transportation, auditing, product disposition, and creating information about the kind of products being returned and their source (Trebilcock, 2001). Water

bottling companies often practice reverse logistics especially where refills and recycling is required.

A number of studies have been conducted on reverse logistics as a competitive tool. Ramirez (2007) conducted a study on the benefits of reverse logistics for European and Colombian firms and established that the concept provides great benefits like the reduction of costs, new opportunities of business and improvement of the image of the company. A study conducted by Ramirez and Ortiz (2007) revealed that reverse logistics provides great benefits such as reduction of costs, new opportunities of business and facilitates adaptation to new regulations in the matter of environment and improves performance of the company and favours growth. Gupta (2012) in his study, observed that, reverse logistics is gaining justifiable popularity among society, governments and industry.

From the above studies, reverse logistics has been used as a competitive tool by many organizations. However, no empirical research has been done on the competitive advantages and challenges of reverse logistics among water bottling companies in Nairobi. This forms the knowledge gap that the study intended to fill up by investigating as to whether the said firms have adopted the concept; and the competitive advantages attributed to their adoption. The study sought to answer the following questions: To what extent have water bottling companies in Nairobi adopted reverse logistics? And what is the effect of reverse logistics on competitive advantage to water bottling companies in Nairobi?



### **1.3 Objectives of the Study**

The study was guided by the following objectives:

- i. To establish the extent to which reverse logistics practices are adopted by water bottling companies in Nairobi.
- ii. To determine the effect of reverse logistics on competitive advantage to water bottling companies in Nairobi.

### **1.4 Value of the study**

The findings of this study will enable water bottling companies in Nairobi to understand the different types of reverse logistics practices that can assist them achieve competitive advantage.

Water bottling companies in Nairobi will also be able to understand the challenges that they may have in their efforts to use reverse logistics as a competitive tool in their operations.

The academicians who may be interested in studying reverse logistics among manufacturing companies in Kenya will also find the findings of this study important in terms of reference and also assist in further researches.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents the literature that has been reviewed as far as reverse logistics and competitive advantage is concerned. Among the issues reviewed include reverse logistics, reverse logistics framework and competitive advantage strategies. The chapter also provides a summary of the entire literature review and a conceptual framework illustrating the relationship between reverse logistics and competitive advantage.

### **2.2 Reverse Logistics**

Rogers and Tibben-Lembke (1998) have defined reverse logistics as 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 proper disposal. This definition encompasses all the functions of logistics as espoused by The Council of Logistics Management, except the direction of operation, which in this case, is backwards. Lambert (2008) added that remanufacturing and refurbishing activities are also aspects of reverse logistics. Reverse logistics is more than reusing containers and recycling packaging materials. Redesigning packaging to use less material, or reducing the energy and pollution from transportation are important activities (Wisner & Stanley, 2007). Finally, Lambert (2008) observed that reverse logistics includes processing returned merchandise due to damage, seasonal inventory, restock, salvage recalls, and excess inventory. It also includes recycling programs, hazardous material programs, obsolete equipment disposition, and asset recovery (Wisner & Stanley, 2007).

Jack et al. (2009) note that reverse logistics has become a competitive necessity due to the increasing trend in customer returns, the increasing use of consignment inventory, shorter product lifecycles, and more demanding customers. Richey et al. (2005) concur that reverse logistics is increasingly being considered as a strategic process that captures value through customer satisfaction and cost control (Rogers & Tibben-Lembke, 2001). With the increasing volumes of returns in the business world, organizations are no longer able to ignore the reverse flow of products. In the retail context for example, reverse logistics involves the process of handling and the eventual disposition of returned products (Horvath *et al.*, 2005). As retail margins become narrower, reverse logistics has become a major concern for retail managers due to the costs of storage, loss of current sales, potential recoverable product value, and the importance of both customer and channel partner relations (Daugherty *et al.* 2005).

Smith (2005) posited that reverse logistics is an integral part of the product life cycle and corporate procedures cannot therefore afford to ignore it. Reverse logistics enables organizations to find problem areas as well as patterns of defects, thus creating a way to minimize the amount of returns a company receives. He argues that reverse logistics encompasses areas such as the destination of the returned products, the recycling processes, the relationships between buyers and sellers, and the technology supporting the return process (Smith, 2005). An organization that intends to compete favourably in the contemporary marketplace must leverage some type of reverse logistics process in place. The management, for instance, must first develop a sense of urgency of the importance of reverse logistics in strategic planning to achieve the competitive edge associated with the latter (Wang, 2010).

According to Langevin and Riopel (2005), when organizations consider the reverse logistics function, many are concerned with providing services to customers who for some reason need to return a product. The reasons for this can be broad-ranged including warranty requirements, defective products or even shipment of the wrong products (Langevin & Riopel, 2005). A reverse logistics chain would therefore include reclaim, recycle, remanufacture, reuse, take back and disposal needs to be available for adequate services requirements (Wisner & Stanley, 2007). The availability of these services will be dependent on the product life cycle, industry, and design of the reverse logistics network.

### **2.3 Reverse Logistics Framework**

Kumar et al. (2008) have noted that the reverse logistics framework gives an overview of the returns process and the associated sub-processes from the strategic and the operational points-of-view. The first framework is operating within government policy that influences reverse logistics practices. Kumar et al. (2008) observed that it is important for a firm to incorporate government policy when making high level decisions since the company is invariably compelled to operate within the limits of such policies (Kumar, Dieveney & Dieveney, 2008). It therefore means that the management must put into account these conditions while setting goals and formulating strategies.

The second framework is a well-developed reverse logistics network and the flow options (Wang, 2010). This framework helps a firm to avoid the dissatisfaction of the customers, defective products, wrong shipments, et cetera. Wang (2010) adds that the framework involves developing credit rules that guide the returns process for the customers and suppliers and

creating a framework of metrics for the supplier relationships. Smith (2005) observed that on the process interfaces, customer relationship management, service management, demand management, order fulfillment, manufacturing flow management, supplier relationships and product development and commercialization are vital interfaces that this framework addresses.

Another framework is linking operational sub-processes to reverse supply chain interfaces (Lambert, 2008). Each of these sub-processes are defined by activities such as initiation of return request, determining the right routing to keep the reverse logistics at a minimal cost, averting defective products, crediting consumers and suppliers, thus analyzing the returns and performance of the reverse supply chain (Lambert, 2008). The framework, according to Kumar et al. (2008) is useful in developing and maintaining supply network that would be efficient while adhering to the service contract and better the relationship with the supplier.

Kirsche (2004) talks of mechanisms that track products throughout the supply chain as a reverse logistics framework for handling returns. These mechanisms include innovative hardware such as new inter-modal terminals with efficient transshipment ability and innovative software such as truck route planning with ITS (Intelligent Transport System), GPS (Global Positioning System), RFID (Radio Frequency Identification), among others (Kirsche, 2004). By improving the reverse logistics, a firm ensures that forward improvements are also made that will reduce chances of poor quality materials getting into the supply chain.

Yaros and Wood (1979) identify direct control by a company over the entire supply chain and distribution as a framework of reverse logistics. Accordingly, a company should control

manufacturing, central and regional warehousing, and transportation to wholesale distributors (Yaros & Wood, 1979). In the event of a recall of a product, the company must rely on the distributor's or wholesaler's distribution information. Valero (2005) noted in this regard, that some companies do not handle returns well since they are not part of their core competencies, hence the use of third party providers.

## **2.4 Reverse Logistics and Competitive Strategies**

Logistics excellence has become a powerful source of competitive differentiation (Mentzer *et al.*, 2001b). Logistics management can provide a multitude of ways to increase efficiency and productivity (Christopher, 1998). Accordingly, reverse logistics, including remanufacturing, refurbishing, recycling, reuse, or disposal of goods, should be seen as an opportunity to enhance competitiveness and ultimately, create competitive advantage (Stock *et al.*, 2002). Anecdotal evidence suggests that substantial savings can be made by substituting new materials with components recovered from used products. Information can also be collected from used products (Krikke *et al.*, 2003b), and remanufacturing end-of use products has vital implications for the image of a company. In fact, goodwill building and the creation of a good corporate reputation are important sources of competitive advantage (Dowling, 2004).

### **2.4.1 The Role of Reverse Logistics**

According to Rogers and Tibben-Lembke (1999), reverse logistics affords companies the ability to recapture value that would otherwise be unavailable or lost. There are many reasons that make companies pull products back into the supply chain such as product recalls, un-sellable items, redistribution for resale, reuse, repair, and scrap or salvage potential (Rogers & Tibben-Lembke, 1999). Additionally, many products require continuous support after the sale, for example

repairs. When unsold, products re-enter the distribution center they are frequently sent back to a vendor's warehouse in very small quantities. Companies face challenge in handling the unsold products and other items in the reverse process as timely and cost-efficient as possible (Daugherty *et al.*, 2002).

Companies would want a way to distinguish themselves from their competitors and reverse logistics can make them achieve this uniqueness. Reverse logistics has the potential to shape the corporate image of a company that applies it (Smith, 2005). Selection of vendors and making re-purchase decisions can be made on the basis of reverse performance. Forging longer-term relationships is important since they are linked to high quality reverse logistics programs (Smith, 2005). Doing a good work in handling a return will make customers happy and they will more likely do business with the company again. Indeed, this is in consonance with Daugherty *et al.* (2002, p. 23) observation that: "Customer satisfaction ratings can soar with good reverse handling and corporate profitability can be directly impacted as well. It has been estimated that efficient management of the reverse process can cut as much as 10 per cent from companies' total annual logistics costs." On the other hand, companies that do not recognize the importance of an effective reverse logistics program risk damaging customer relations and may seriously jeopardize its reputation as well as brand image (Autry *et al.*, 2001).

It has been noted that reverse logistics also offers companies the opportunity to collect valuable information that may lead to identification of patterns of defects (Smith, 2005). Once the company identifies a problem area, it can rectify it once and for all. Unawareness of a recurring

problem would not make the company fix it and as the problem persists unnoticed, the company's image is scourged (Smith, 2005).

#### **2.4.2 Information Support and Performance for Reverse Logistics**

Information technology and support has been recognized as a competitive weapon. According to Richey et al. (2004), information support is particularly critical in achieving efficient reverse logistics operations. Reverse logistics is characterized by uncertainty and the need for rapid timing. Even though managers may not know when or if the products will be coming back, it is imperative that they are prepared to quickly process and handle the products on demand. Smith (2005) noted in this regard, that prompt and accurate exchange and access to information should be prioritized. Coordinating information flow can be challenging due to the multiple parties involved, yet if coordinated well, it produces maximum efficiency. Communication, therefore, becomes particularly important in facilitating and promoting longer-term business relationships (Meade & Sarkis, 2002).

Effy Oz (2008) observed that the quality and type of information available to support decision-making process affect the extent to which an organization achieves a balance between desired service level and cost control. There are various aspects of information systems support, though they can be categorized into three dimensions: capability, compatibility, and technologies (Smith, 2005). Organizations endeavor to develop capabilities that are unique, defensible, and difficult to copy, thereby providing them with a true competitive advantage. Furthermore, capabilities embrace business behavior and such processes as customer service, responsiveness to customers, and order cycle time (Smith, 2005). A responsive information systems networks



anticipate and accommodate operational change as well as customer demands. It is important for information capability to match business needs and besides, information must be continuously accessible and shared across the organization. Daugherty and colleagues (2002) concurred that accurate information provides necessary support for accommodating non-routine events such as product returns.

Compatibility of information systems ensures effective, fast cross-organizational sharing of information. Strategic decisions are influenced by a need to respond quickly to chain partners, which is only possible if channel members' information is compatible (Daugherty *et al.*, 2002). Systems compatibility between specific channel partners, nevertheless, can be difficult to arrange since most buying organizations have communication arrangements with multiple suppliers (Daugherty *et al.*, 2002). Information and information technologies offer competitive advantage through supporting the overall strategic initiatives of the organization. The complexity and fast-paced nature of logistics operations has prioritized information support in world-class companies (Smith, 2005).

#### **2.4.3 Relationship Commitment**

Smith and Rupp (2003) have noted that communication is a precursor to relationship commitment since it supports the buyer-seller relationship through the formal and informal sharing of meaningful and timely information. This information and communication exchange can lead to long-term commitment between exchange partners. Deepen (2007) defines relationship commitment as exchange partners believing that an ongoing relationship is so important as to warrant maximum efforts to maintain it. Benefits accrue from this relationship in

the form of reliable, long-term exchange as well as liabilities such as increased vulnerability to opportunism.

When there is increased commitment, organizations tend to resist attractive short-term alternatives (Deepen, 2007). Organizations stress preservation and promotion of an ongoing relationship in favour of expected long-term benefits. Therefore, reverse logistics efforts are likely to be more successful in a long-term relationship where both trading partners are committed to promoting the most efficient recovery of assets (Deepen, 2007). With the high value of information and the cost of information systems development, a greater relational commitment between supply chain partners is required to ensure both the security of information exchange and the recovery systems costs over the length of the relationship (Daugherty *et al.*, 2002).

Smith (2005) advised that trading partners should work together to ensure timeliness and efficiency. The greater the relationship commitment of the buying company to the supplier, the stronger the positive relationship between information systems support and reverse logistics product return performance. Closer relationships between the buyer and the seller supported by required information ensure that the returns are handled as efficiently as possible (Oz, 2008). Moreover, a longer-term benefit results from efficient handling of returns likely to influence repurchase decisions. Additionally, Deepen (2007) observes that by developing a close relationship, organizations can design a customized reverse logistics program that benefits both buyers and sellers.

## **2.5 Management of Returns**

Many researchers have outlined key reverse logistics management elements that can either positively or negatively impact a company's bottom line (Rogers & Tibben-Lembke, 1998; Hesselbach & Herrmann, 2011; Altekar, 2005). Rogers and Tibben-Lembke (1998) argue that one such element is "gatekeeping" which is the point of entry into the reverse logistics pipeline. It involves the screening of defective and unwarranted returned merchandise at the entry point into the reverse logistics process. Accordingly, good gatekeeping is the first critical factor in making the entire reverse flow manageable and profitable (Roome, 2002). Even though companies experience difficulty in conducting gatekeeping especially at the retail level, the practice has several benefits. Retailers require better training of sales associates.

Another critical element to successful reverse logistics management is having short disposition cycle times (Lambert, 2008). The reduced cycle times is related to return product decisions, movement, and processing. Most companies interviewed by Rogers and Tibben-Lembke (1998) in their study revealed that in most cases when materials come in to a distribution center, it is not clear whether the items are: defective, can be reused or refurbished, or need to be sent to a landfill. Part of the difficulty faced by companies in compacting disposition cycle time the lack of reward for taking responsibility and making a timely decision as to how product should be dispositioned (Rogers & Tibben-Lembke, 1998).

According to Lambert (2006) reverse logistics information systems are a critical element in managing returned products. Companies therefore need to have successfully automated information systems surrounding the return process. Reverse logistics is typically a boundary-

spanning process between companies or departments of the same company. Developing systems that have to work across boundaries can yield desired results in terms of managing the return process (Lambert, 2006). Such systems enable a company to have the benefit of tracking returns, measuring cycle times, and vendor performance. Customers of such a company are wont to have much better information when negotiating with suppliers. A company realizes these benefits after recognizing the bottom-line repercussion of reverse logistics thereby assigning its resources to work on reverse logistics systems problems (Rogers & Tibben-Lembke, 1998).

Centralized returns centers (CRCs), according to Ross (2010), are processing facilities devoted to handling returns quickly and efficiently. It is a key element in managing return process in reverse logistics program. In a centralized system, all products for the reverse logistics pipeline are brought to a central facility, where they are sorted, processed, and then shipped to their next destinations (Rogers & Tibben-Lembke, 1998). The system has the benefit of creating the largest possible volumes for each of the reverse logistics flow customers, which often leads to higher revenues for the returned items. CRCs are important part of a reverse logistics management strategy for they impose order on the reverse flow. Running a CRC requires a company to have some sort of reverse logistics systems in place (Rogers & Tibben-Lembke, 1998).

Zero returns program is another element of managing reverse supply chain logistics where the manufacturer or distributor does not permit products to come back through the return channel (Wisner & Stanley, 2007). Instead, they give the retailer or other downstream entity a return allowance, and develop rules and guidelines for acceptable disposition of the product. According to Rogers and Tibben-Lembke (1998), a zero returns policy can result in substantial lower costs.

Companies using zero returns can reduce the variability of returns costs by pre-setting the maximum shilling value of the returned product. By stabilizing return rates using a zero returns program, a company promotes planning and its fiscal well-being.

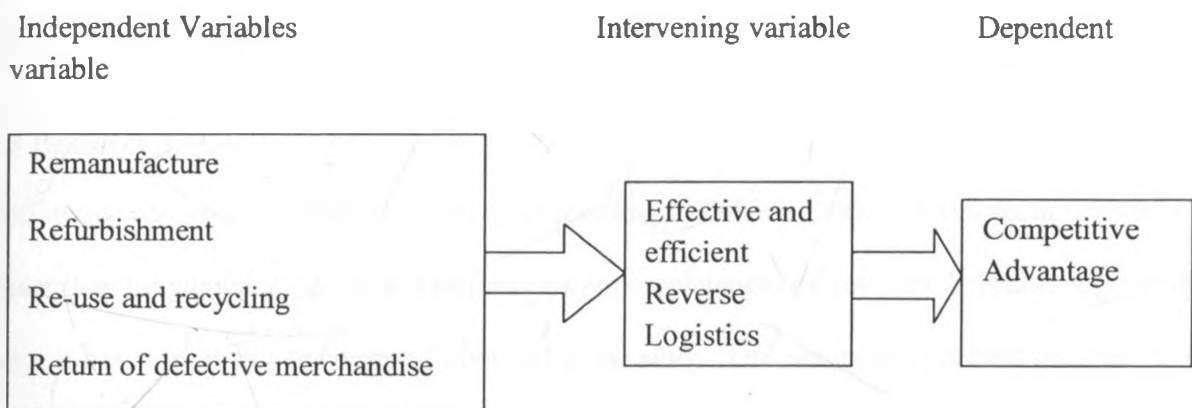
Another key element in reverse logistics management is remanufacture and refurbishment. Thierry and colleagues (1995) defined five categories of remanufacture and refurbishment as: repair, refurbishing, remanufacturing, cannibalization, and recycling. The first three categories involve product recondition and upgrade in which the degree of improvement determines the difference. While repair involves the least amount of effort to upgrade the product, remanufacture involve the greatest (Rogers & Tibben-Lembke, 1998). Cannibalization refers to the recovery of a restricted set of reusable parts from the used products and recycling is the reuse of materials that were part of another product/subassembly (Thierry *et al.*, 1995).

## **2.6 Summary of Literature Review**

Reverse logistics has become a critical issue that companies should adopt in the course of doing business. Reverse logistics deal with the processing of returned products and information from customers to the manufacturer in backward pattern. Most authors have alluded to the benefits that reverse logistics program accrues to companies that adopt the program in their corporate strategy. A part from achieving cost savings, proper management of reverse logistics enables a company to manage its customer relations that has an impact on their purchase decisions. It has also been established that managing reverse supply chain logistics requires information support systems and product tracking technologies. Communication is a vital aspect of reverse logistics and it spans inter-organizational and intra-organizational boundaries thus calling for effective information support systems. Relationship commitments among all players in the reverse chains

must be in tandem with the latter to yield successful reverse logistics program. Finally, authors have elaborated on the key elements of managing the return process, and they include CRCs, gatekeeping, remanufacturing and refurbishment, zero returns policy, et cetera.

## 2.8 Conceptual framework



**Source: Researcher**

There are various reverse logistics practices that a company must adopt in order to gain competitive advantage. These practices include: Remanufacture and Refurbishment, Screening of defective merchandise, Re-use and recycling, After sales support, Return of defective merchandise, Well organized channel for reverse logistics, having qualified staff and Simplification of return process. These practices are the independent variables that collectively lead to efficiency in reverse logistics. But the company may meet challenges when adopting these practices hence the need to overcome them. If the firm is successful in overcoming the challenges, then it is able to gain competitive advantage through an efficient reverse logistics process.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter discusses the methodology that will be used to obtain answers to the research questions outlined in Chapter One. The researcher has outlined the following aspects of research methodology: research design, study population, research instruments, validity and reliability, data collection procedure and data analysis.

### **3.3 Research Design**

The study is cross-sectional census survey. According to Thisted (2006) a cross sectional study is easier than longitudinal studies and can maximize completeness of key data. It is also appropriate since it has more than one company involved in the study. The design has enabled the researcher to examine all the water bottling companies in Nairobi.

### **3.4 Population**

According to Cooper and Schindler (2006), population refers to the total collection of elements about which one wishes to make some inferences. This has covered all the 19 water bottling companies operating in Nairobi.

### **3.5 Data Collection**

The researcher has used primary data for this study. Questionnaires have been used to obtain information from the respondents. There were a total of 114 questionnaires (6 from each water bottling company randomly selected) in the study. The 114 questionnaires were administered to logistics managers, their assistants and four other members of the department who were requested to provide information on the benefits that their organizations derive as a result of

using reverse logistics practices, the role of reverse logistics and any other information relevant to the study. The questionnaires were used for this study since they are easier to administer. The questionnaires were administered through drop and pick method.

### **3.6 Data Analysis**

The researcher has used descriptive analysis in summarizing the collected data. This is necessary for systematic thinking and it generates ideas for further probing and research. The data has been edited for accuracy, uniformity, completeness, and arranged for coding. A computer program, Statistical Packages for Social Sciences (SPSS) has been used to further analyze the data. SPSS has enabled a researcher to generate frequencies, descriptive statistics, tables, and graphs. The data has been presented using statistical measures such as percentages and frequencies. The findings are presented using bar graphs and tables.

A multiple regression equation of the form  $C = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e$  have been used to establish the relationship between reverse logistics practices and competitive advantage. Where C is competitive advantage; a is the C intercept when x is zero;  $b_1$ ,  $b_2$ ,  $b_3$  and  $b_4$  are the regression weights for each of the independent variables;  $x_1$  is remanufacture;  $x_2$  is refurbishment;  $x_3$  is Re-use and recycling and  $x_4$  is return of defective merchandise.



## CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

### 4.1 Introduction

This chapter presents the findings on reverse logistics and competitive advantage among water bottling companies in Nairobi. Data was successfully collected from 84 respondents out of the targeted 114. This was a response rate of 73.7% which was considered sufficient for this study.

### 4.2 Organizational profile

The researcher asked the respondents a number of questions that were meant to shed more light on the profiles of the water bottling companies that participated in the study. The respondents were required to tick the appropriate responses for each of the questions. The findings are presented and explained as follows.

**Table 4.1: Duration of operation**

|                      | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------------|-----------|---------|---------------|--------------------|
| 1-5 years            | 48        | 57.1    | 57.1          | 57.1               |
| Valid Above 10 years | 36        | 42.9    | 42.9          | 100.0              |
| Total                | 84        | 100.0   | 100.0         |                    |

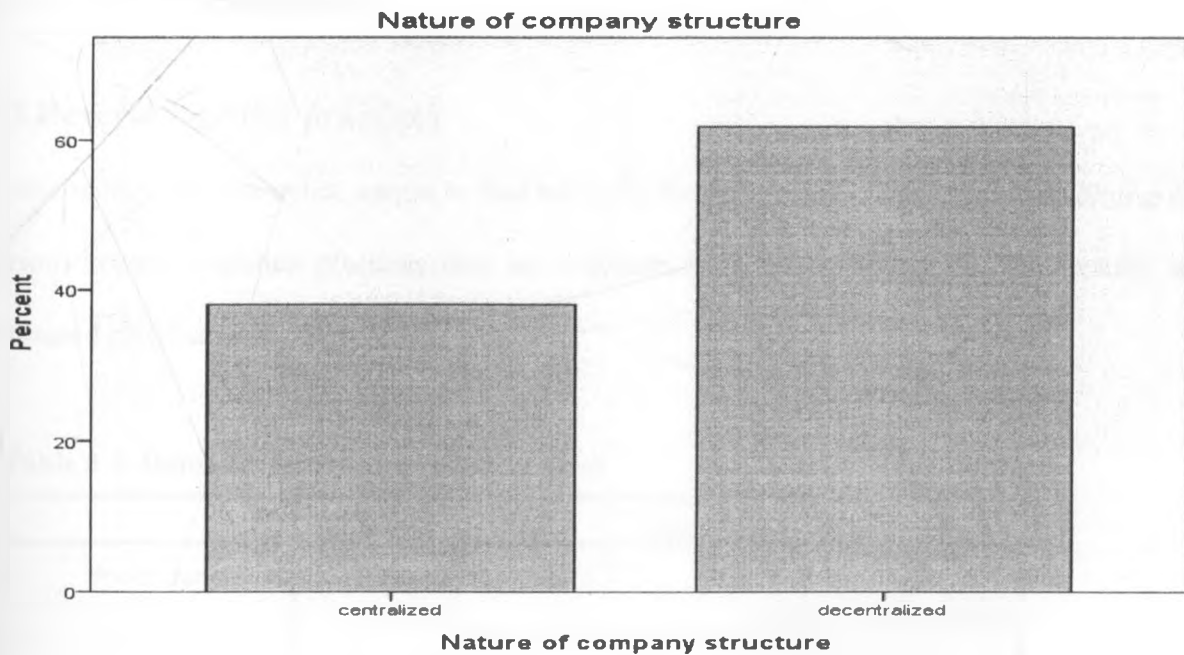
The researcher sought to know from the respondents the duration their companies had operated. The findings as illustrated in table 4.1 above confirms that 57.1% of the companies have been in operation for less than five years. It was only 42.9% of the water bottling companies that had been in existence for more than 10 years.

**Table 4.2: Number of employees**

|               | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------------|-----------|---------|---------------|--------------------|
| less than 500 | 37        | 44.0    | 44.0          | 44.0               |
| More than 500 | 44        | 52.4    | 52.4          | 96.4               |
| 3             | 3         | 3.6     | 3.6           | 100.0              |
| Total         | 84        | 100.0   | 100.0         |                    |

The study sought to investigate the number of employees in each of the water bottling companies that participated in the study. As can be observed from the findings in the table above, 52.4% of the companies had more than 500 employees.

**Figure 4.1: Nature of company structure**



The structure of an organization may affect decision making in the organization. The study sought to know whether the water bottling companies in Nairobi had a centralized or decentralized type of organizational structure. The findings in figure 4.1 above confirm that most of the companies have a decentralized structure.

**Table 4.3: Company ranking compared to competitors**

|                    | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------|-----------|---------|---------------|--------------------|
| Much higher        | 32        | 38.1    | 38.1          | 38.1               |
| Higher than others | 24        | 28.6    | 28.6          | 66.7               |
| same as others     | 28        | 33.3    | 33.3          | 100.0              |
| Total              | 84        | 100.0   | 100.0         |                    |

The respondents were also required by the respondent to rank the performance of their companies compared to their competitors. The results in the table above indicate that 38.1% of the water bottling companies in Nairobi considers themselves to be much higher in performance than their competitors. A good number of companies also considered themselves to be at the same level with the competitors.

### 4.3 Reverse logistics practices

In this section the researcher sought to find out from the respondents their views concerning the various reverse logistics practices that are common in their organizations. The results are explained here below.

**Table 4.4: Remanufacture and refurbishment**

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| strongly agree | 11        | 13.1    | 13.1          | 13.1               |
| Agree          | 73        | 86.9    | 86.9          | 100.0              |
| Total          | 84        | 100.0   | 100.0         |                    |

The findings indicated that 86.9% of the water bottling companies in Nairobi practice remanufacturing and refurbishment of their products. This is seen as one way of reducing defects in the end products that are manufactured by the companies.

**Table 4.5: Return of defective merchandise**

|                   | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------------------|-----------|---------|---------------|--------------------|
| strongly agree    | 54        | 64.3    | 64.3          | 64.3               |
| Agree             | 27        | 32.1    | 32.1          | 96.4               |
| Strongly disagree | 3         | 3.6     | 3.6           | 100.0              |
| Total             | 84        | 100.0   | 100.0         |                    |

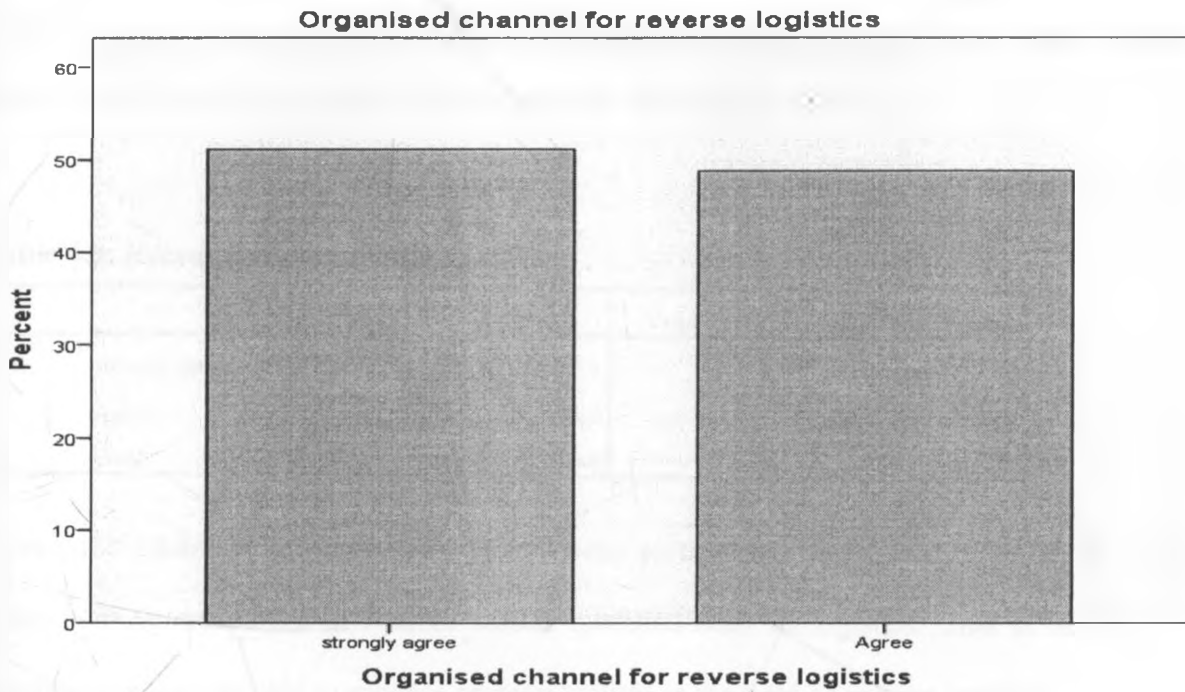
The study sought to investigate whether water bottling companies in Nairobi allow customers to return defective merchandise as part of reverse logistics practice. The findings in table 4.5 above, 64.3 strongly agreed that they allow for return of defective merchandise.

**Table 4.6: screening of defective merchandise**

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| strongly agree | 73        | 86.9    | 86.9          | 86.9               |
| Agree          | 3         | 3.6     | 3.6           | 90.5               |
| Disagree       | 8         | 9.5     | 9.5           | 100.0              |
| Total          | 84        | 100.0   | 100.0         |                    |

It was also important for the researcher to find out whether the companies practiced screening of defective merchandise in order to ascertain the problems that lead to the defects. The findings as tabulated above indicate that most of the water bottling companies strongly agreed that they screen their defective merchandise.

**Figure 4.2: Organized channel for reverse logistics**



The study sought to establish whether the water bottling companies in Nairobi have in place an organized channel for reverse logistics as one of the logistics practices. The table of findings above confirms that more than 50% of the companies strongly agreed that they have in place the channel.

**Table 4.7: Re-use and recycling**

|                   | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------------------|-----------|---------|---------------|--------------------|
| strongly agree    | 29        | 34.5    | 34.5          | 34.5               |
| Agree             | 16        | 19.0    | 19.0          | 53.6               |
| Not sure          | 8         | 9.5     | 9.5           | 63.1               |
| Disagree          | 3         | 3.6     | 3.6           | 66.7               |
| Strongly disagree | 28        | 33.3    | 33.3          | 100.0              |
| Total             | 84        | 100.0   | 100.0         |                    |

The researcher investigated whether re-use and recycling is common among the water bottling companies in Nairobi. It is evident that 34.5% of the respondents indicated that their companies encourage reuse and recycling of various materials such as water bottles.

**Table 4.8: Recruitment of qualified staff**

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| strongly agree | 15        | 17.9    | 17.9          | 17.9               |
| Agree          | 69        | 82.1    | 82.1          | 100.0              |
| Total          | 84        | 100.0   | 100.0         |                    |

It was also established from the respondents who participated in the study that 82.1% of the water bottling companies in Nairobi recruit qualified staff in logistics. This is one way of ensuring that they are able to enhance professionalism in the field of reverse logistics.

**Table 4.9: Good relationship with stakeholders**

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| strongly agree | 36        | 42.9    | 42.9          | 42.9               |
| Agree          | 44        | 52.4    | 52.4          | 95.2               |
| Disagree       | 4         | 4.8     | 4.8           | 100.0              |
| Total          | 84        | 100.0   | 100.0         |                    |

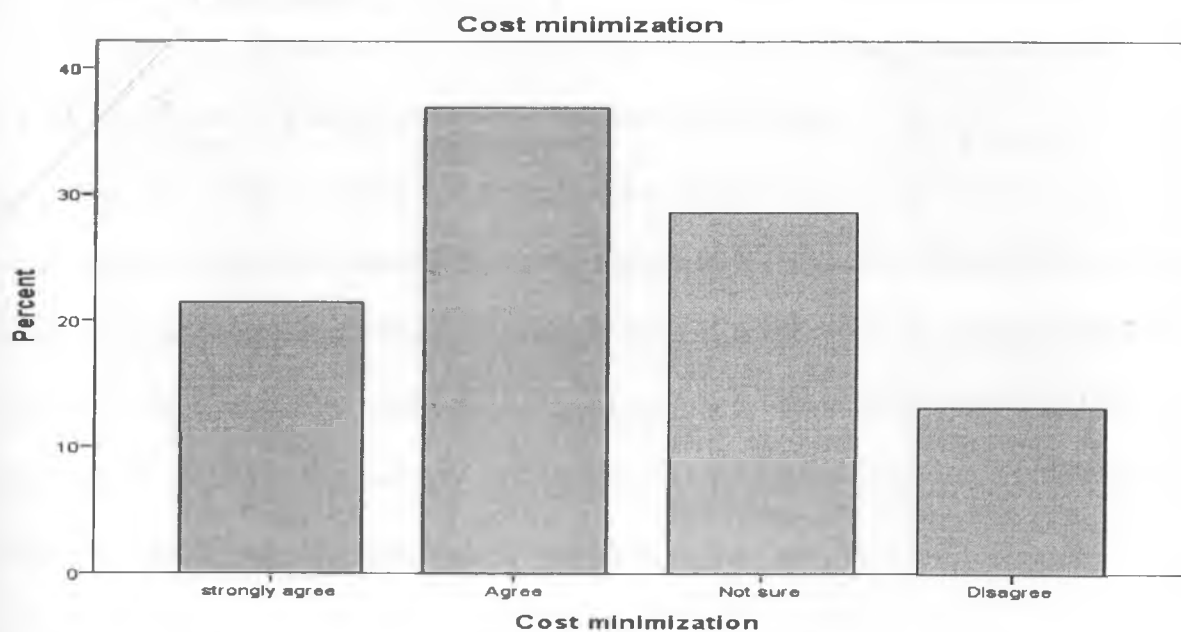
Maintaining a good relationship with stakeholders enables an organization to have efficient reverse logistics operations. The researcher sought to find out whether water bottling companies in Nairobi maintain good relationships with all their stakeholders in reverse logistics. The findings illustrate that 52.4% of the respondents confirmed that their organizations have good relationships with their stakeholders.

**Table 4.10: After sales support**

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| strongly agree | 32        | 38.1    | 38.1          | 38.1               |
| Agree          | 52        | 61.9    | 61.9          | 100.0              |
| Total          | 84        | 100.0   | 100.0         |                    |

The study sought to find out from the water bottling companies in Nairobi whether they offer their customers after sales services on products purchased from them such as water dispensers and refrigerators. The findings tabulated above indicate that 61.9% of the respondents agreed that their companies offer after sales service to the customers.

**Figure 4.3: Cost minimization**



**Table 4.11: ISO certification**

|                   | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------------------|-----------|---------|---------------|--------------------|
| strongly agree    | 40        | 47.6    | 47.6          | 47.6               |
| Agree             | 4         | 4.8     | 4.8           | 52.4               |
| Not sure          | 12        | 14.3    | 14.3          | 66.7               |
| Disagree          | 20        | 23.8    | 23.8          | 90.5               |
| Strongly disagree | 8         | 9.5     | 9.5           | 100.0              |
| Total             | 84        | 100.0   | 100.0         |                    |

ISO certification is one of the ways of ensuring that companies adhere to internationally accepted standards. The researcher sought to establish whether water bottling companies sought after ISO certification in their operations. The table of findings above indicates that 47.6% of the companies have achieved ISO certification.

#### **4.4 Effect of reverse logistics on competitive advantage**

In order for the study to establish the effect of reverse logistics on competitive advantage among water bottling companies in Nairobi, the researcher conducted a multivariate regression analysis where Competitive advantage was the dependent variable while ensuring customer satisfaction, enhancing customer loyalty, reduction in operating costs, Re-use and recycling, Improving market share, remanufacture and refurbishment were the dependent variables in the regression model. The results of the regression were presented in the tables below.

**TABLE 4.12: Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .925 <sup>a</sup> | .856     | .341              | .689                       |



- a. Predictors: (Constant), Ensures customer satisfaction, Enhances customer loyalty, Reduces operating costs, Re-use and recycling, Improves market share, Remanufacture and refurbishment
- b. Dependent Variable: Competitive advantage

The model summary above indicates the variance that is explained by the predictors in the model or the dependent variables. It is evident that the R square value is .856 which can be translated into 85.6%. This is can be taken to mean that the independent variables: ensuring customer satisfaction, enhancing customer loyalty, reduction in operating costs, Re-use and recycling, Improving market share, remanufacture and refurbishment account for 85.6% of the companies' competitive advantage. This is an indication that they play a very significant role in determining the competitive position of the companies.

**Table 4.13: ANOVA<sup>a</sup>**

| Model        | Sum of Squares | df | Mean Square | F     | Sig.              |
|--------------|----------------|----|-------------|-------|-------------------|
| 1 Regression | 23.222         | 6  | 3.870       | 8.145 | .000 <sup>b</sup> |
| Residual     | 36.588         | 77 | .475        |       |                   |
| Total        | 59.810         | 83 |             |       |                   |

- a. Dependent Variable: Competitive advantage
- b. Predictors: (Constant), Ensures customer satisfaction, Enhances customer loyalty, Reduces operating costs, Re-use and recycling, Improves market share, Remanufacture and refurbishment

From the Anova table above it is clear that the regression results can be considered to be significant due to the percentage the predictors represent.

**Table: Coefficients**

| Model                           | Unstandardized Coefficients |            | Standardized Coefficients |
|---------------------------------|-----------------------------|------------|---------------------------|
|                                 | B                           | Std. Error | Beta                      |
| (Constant)                      | 1.185                       | 1.131      |                           |
| Remanufacture and refurbishment | .276                        | .390       | -.110                     |
| Re-use and recycling            | .149                        | .063       | .301                      |
| Improves market share           | .398                        | .120       | -.413                     |
| Reduces operating costs         | .318                        | .131       | .282                      |
| Enhances customer loyalty       | .468                        | .110       | .415                      |
| Ensures customer satisfaction   | .097                        | .145       | -.126                     |

The table above shows the weights of the various variables that were subjected to regression analysis. It is evident that there is a constant value of 1.185 which denotes the competitive advantage value when the independent variables are held constant. The independent variables have B values which indicate the weights that each is given. Based on the above results, the study derived a model that can be used to measure the performance of competitive advantage among water bottling companies in Nairobi. The following is the model:  $C=1.185+.276x_1+.149x_2+.398x_3+.318x_4+.468x_5+.097x_6+1.131$

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

In this chapter, the study presents the summary of findings on reverse logistics and competitive advantage among water bottling companies in Nairobi. It also includes the conclusion and recommendations made based on the findings of the study. The chapter also gives suggestions for further study.

### **5.2 Summary of Findings**

The study revealed that most of the water bottling companies in Nairobi considered themselves to be much higher than their competitors in terms of competitive advantage. This therefore implied that they considered themselves better placed to compete effectively than their competitors in the business.

The study also sought to investigate from the respondents the various types of reverse logistics practices that were prevalent among water bottling companies in Nairobi. It was revealed that there are several reverse logistics practices that have been adopted by the companies. For instance it was clear from the findings that when there is need, the companies have to remanufacture and refurbish their products so that they can maintain good quality. The companies also indicated that they allow their customers to return defective merchandise to them. This practice allows the customers to return products with defects for replacement thus maintaining good relations between the customers and the companies.

It was also evident from the findings that the water bottling companies in Nairobi conduct an exercise of screening of the defective products. This enables them to be able to establish the source or cause of the defects in order to curb a repeat of the same. Re-use and recycling were also found to be prevalent among the companies. They encourage re-use and recycling of various products such as the water bottles for packaging their products. This is made possible by having the empty containers resold back to the companies for re-use. In order to make this happen, the respondents confirmed that the companies have in place a well organized channel for reverse logistics. This channel enables the companies to be able to achieve return of defective merchandise as well as other items for re-use and recycling.

The other important reverse logistics practice that was found to be common among the water bottling companies in Nairobi was recruitment of qualified staff to work in the field of reverse logistics. Employment of qualified staff enables the companies to maintain professionalism in this field. The study also confirmed that maintaining good relationships with all stakeholders in the reverse logistics cycle is very significant. This is important because stakeholders largely determine the success achieved in reverse logistics activities. The water bottling companies were also found to offer after sales support to their customers as one way of keeping good relations with stakeholders.

Seeking after ISO certification was also found to be an important practice in reverse logistics. The companies seek for this type of certification since it is an indication that they comply with internationally accepted standards in reverse logistics. The study also confirmed that the water bottling companies in Nairobi embark on cost minimization as one of the reverse logistics practices. The essence therefore of reverse logistics is to minimize costs in the supply chain. The

study also confirmed that there was a very strong relationship between competitive advantage and reverse logistics practices among the water bottling companies in Nairobi. The study was able to come up with this model:  $C=1.185+.276 x_1+.149x_2+.398x_3+.318x_4+ .468x_5+ .097x_6 + 1.131$ . The model explains the relationship between competitive advantage and reverse logistics practices.

### **5.3 Conclusion**

The study concluded that there exists a very strong and significant relationship between reverse logistics practices and competitive advantage among the water bottling companies in Nairobi. It was clear that the most prevalent practices include: return of defective merchandise; screening of defective merchandise; re-use and recycling; remanufacture and recycling after sales support as well as employment of qualified staff.

### **5.4 Recommendation**

Since the study confirmed that there was a significant relationship between competitive advantage and reverse logistics practices, water bottling companies should be encouraged to embrace reverse logistics more in order to benefit from the concept.

Reverse logistics has been associated with cost minimization, it will be important for the water bottling companies to look for areas in reverse logistics where they can optimize on cost minimization so that they can improve on their net incomes.

It will also be prudent for other organizations to emulate the example of water bottling companies in Nairobi in adopting reverse logistics as a competitive tool.

## **5.5 Suggestions for Further Research**

There is need to conduct a study among water bottling companies in other regions of the country in order to establish whether there is any uniformity in the reverse logistics practices that exist among all the water bottling companies in the country.

A comparative study can also be carried out to establish the similarities and differences in reverse logistics practices among water bottling companies in Kenya and other countries.

Since times change and new concepts arise, it will be important to replicate this study in the future so as to establish whether the situation will still be the same.

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## APPENDICES

### Appendix II: Questionnaire

#### SECTION A

##### COMPANY PROFILE

1. Company Name (optional).....
2. What is your gender? Tick where applicable Male  Female
3. How old are you? Tick where applicable 25-29  30-34   
35-39  40-44  45-49  50- and above
4. Duration of operation since inception  
.....
5. What is the approximate number of employees in your company?.....
6. What is the nature of the company structure?  
Centralized  Decentralized
7. Where can you rank your company compared to its competitors?  
Much higher  Higher than others  same as others  Lower than others   
Much lower than others

## SECTION B: THE TYPES OF REVERSE LOGISTICS PRACTICES

Indicate by ticking in the appropriate space in the tables below concerning reverse logistics practices and role of reverse logistics.

Use the scale of: 1. Strongly agree 2. Agree 3. Not sure 4. Disagree 5. Strongly disagree

| No. |   | 1 | 2 | 3 | 4 | 5 |
|-----|---|---|---|---|---|---|
| 1   | Remanufacture and Refurbishment                             |   |   |   |   |   |
| 2   | Return of defective merchandise                             |   |   |   |   |   |
| 3   | screening of defective and unwarranted returned merchandise |   |   |   |   |   |
| 4   | Well organized channel for reverse logistics                |   |   |   |   |   |
| 5   | Re-use and recycling of returned items                      |   |   |   |   |   |
| 6   | Recruitment of qualified staff (in reverse logistics)       |   |   |   |   |   |
| 7   | Promotion of an ongoing relationships with stakeholders     |   |   |   |   |   |
| 8   | After sales support eg. Repairs                             |   |   |   |   |   |
| 9   | Cost minimization   |   |   |   |   |   |
| 10  | ISO certification for quality                               |   |   |   |   |   |
| 11  | Others (specify)  |   |   |   |   |   |

**SECTION C: ROLES OF REVERSE LOGISTICS IN ACHIEVING COMPETITIVE ADVANTAGE**

| No. |  | 1 | 2 | 3 | 4 | 5 |
|-----|--|---|---|---|---|---|
| 1   | Gives the company the ability to recapture value that would be otherwise lost                          |   |   |   |   |   |
| 2   | Creates uniqueness in developing brand image   |   |   |   |   |   |
| 3   | Ensures customer satisfaction, hence repeat purchase   |   |   |   |   |   |
| 4   | Enables the company to gather vital information that leads to the identification of pattern of defects |   |   |   |   |   |
| 5   | Helps the company in making cost savings   |   |   |   |   |   |
| 6   | Assists in enhancing company profitability   |   |   |   |   |   |
| 7   | Leads to faster reverse movement of products   |   |   |   |   |   |
| 8   | Enhances customer loyalty  |   |   |   |   |   |
| 9   | Improves market share  |   |   |   |   |   |
| 10  | Reduces operating costs  |   |   |   |   |   |
| 11  | Others (specify)   |   |   |   |   |   |

### Appendix III: Water companies in Nairobi

| NO | WATER COMPANY                        | PLACE   |
|----|--------------------------------------|---------|
| 1  | Aberdares Water Ltd                  | Nairobi |
| 2  | African Oasis Spring Water Ltd,      | Nairobi |
| 3  | Alpine Coolers Ltd                   | Nairobi |
| 4  | American Bottling Co.Ltd             | Nairobi |
| 5  | Aquamist Ltd                         | Nairobi |
| 6  | Aviano East Africa Ltd               | Nairobi |
| 7  | Broomhill Springs Water              | Nairobi |
| 8  | Dasani                               | Nairobi |
| 9  | Delsa Ltd                            | Nairobi |
| 10 | E & A Industries Ltd                 | Nairobi |
| 11 | Grange Park Mineral Water            | Nairobi |
| 12 | Highlands Mineral Water Co Ltd-Depot | Nairobi |
| 13 | Intelecom Africa Ltd                 | Nairobi |
| 14 | Keringet Pure Natural Mineral Water  | Nairobi |
| 15 | Kilimanjaro Beverage Co Ltd          | Nairobi |
| 16 | Kisima Mineral Water Ltd             | Nairobi |
| 17 | Liztan Enterprises Ltd               | Nairobi |
| 18 | Morning Dew Mineral Waters           | Nairobi |
| 19 | Quencher                             | Nairobi |

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