IMPACT OF INVENTORY MANAGEMENT ON PROFITABILITY AND LIQUIDITY: A CASE OF LARGE SUPERMARKETS IN NAIROBI

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF
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KENYATTA UNIVERSITY
DECLARATION

This research project is my own original work and has not been presented by any other person for any examining body. No part of this research project can be copied without prior permission of the author and/or Kenyatta University.

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Dr. G Gongera
Chairman,
Department of Business Administration
Kenyatta University
To my

Daughter Diana,

Sons Victor and Phanuel, and

Nephew Bernard

I Love You All
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ABSTRACT

The primary motivation behind this study was the problem facing one of the retail chain supermarkets in Nairobi in the last few years. Uchumi Supermarkets Ltd. (USL) in the recent past experienced tight cash flow and slow moving stock due to decline in customer spending. The objectives of this study were: to establish the extent that inventory management affects the choice of inventories; to determine how the inventory mix between the slow and fast moving stock affects profitability and cash flow level; to suggest appropriate way of ensuring correct mix of inventory that will sustain optimal level of profitability and liquidity. The research methodology involved collection of data through questionnaire and standard face-to-face interview questions, which were developed by reviewing the effects of inventory management on profitability and liquidity.

Procedures employed by different supermarkets were found to range from informal mechanisms without written manuals and non-computerized systems to computerized inventory management systems capable of tracking the movement of stocks and re-order levels.

Overstocking was very frequently experienced in the supermarkets with suppliers connected to the extranet and occasionally more than one supplier could supply goods for the same automated order. This brought about situations of slowed down movement of stock and delay in payment to suppliers. The delay resulted in stock out due to suppliers holding stock for non-payment and the supermarkets in this category therefore ended up unable to avail stocks on the shelves as required by customers. In addition, the slow to
fast moving stock ratio reflecting the inventory mix increased to such levels that impacted negatively on the cash flow and profitability.

The study suggests that extranet connection to suppliers for automated orders should be reviewed and controls put in place. The revised inventory control will ensure that only one supplier is permitted to replenish the stock per each automated order. The study also recommends the procurement approach taken by some supermarkets which control slow to fast moving stocks to minimum (in case of expensive items only single units are in stock) and only place the order after selling what exists on the shop floor. The approach ensures funds are not tied up in stocks for long duration, and shrinkage, obsolescence, stock outs are at minimum level. This approach would enable supermarkets to determine appropriate inventory mix to sustain optimal profitability and liquidity level.

In addition, the retail chain supermarkets should explore ways and means of how they can sell the excess stock to small supermarkets in the rural areas at cost whenever they experience overstocking.
DEFINITION OF TERMS

ABC (Pareto) Analysis is used to adopt a selective approach for inventory control by identifying items and numbering a few, whose annual turnover is highest so that any marginal savings due to better inventory control will have higher savings in cost.

Averages inventory is the average balance of inventory on hand, but in case of constant demand, it is about half the maximum inventory.

Carrying Costs also referred to as holding stocks or inventories are the costs incurred in maintaining inventory in stores.

Cash flow refers to the net cash flow from operating activities.

Control comprises taking actions that implement the planning decisions and deciding how to evaluate performance and what feedback to provide that will help future decision-making.

Economic Order Quantity is that particular quantity which, if ordered every time the inventory is replenished, will minimize the total annual cost of ordering and carrying the inventory.

Inventory is stock of tangible goods to be sold at that store. This is referred to also as stocks.
Inventory control involves having knowledge of what is in the warehouse and shelves and their usable state to facilitate the determination of when to order.

Inventory management involves determining when to order the products and how much to order, as well as identifying the most effective source of supply for each item in each stocking location. It includes all of the activities of forecasting and replenishment.

Inventory turnover is the number of times the average inventory is sold.

Liquidity is the ability of an asset to be converted to cash quickly at low cost.

Management by exception is to concentrate on areas that deviate from the plan and ignore areas that are presumed to be running smoothly.

Merchandising The American Association has defined merchandizing as the planning involved in marketing the merchandise at the right place at the right time in the right quantities at the right price.

Ordering costs are costs involved in getting an item into the inventory; these costs are incurred each time an order is placed.
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tr>
<td>Policies</td>
<td>are broad precedent setting decision that guide or substitute for repetitive managerial decision-making.</td>
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<td>Profits</td>
<td>the excess of revenues over expenses</td>
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<td>Retail Chain</td>
<td>is an organization operating four or more retail locations in the same industry.</td>
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<td>Retailing</td>
<td>includes all the activities involved in selling of goods or services directly to final consumers for personal non-business use</td>
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<td>Safety Stock</td>
<td>is referred to, as buffer stock is the extra inventory held against the possibility of stock-out.</td>
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<tr>
<td>Stocks</td>
<td>are the items the supermarket intends to have in the central warehouse and on the shelves. These are the items anticipated the customers of the shop will want to buy anytime they visit the shop.</td>
</tr>
<tr>
<td>Stock-out costs</td>
<td>is referred to as shortage costs, that is, the costs incurred due to inadequate inventory to satisfy demand.</td>
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</table>
Stuff is everything else other than what the supermarket intends to have in the central warehouse or on shelves.

Supermarket is a store that sells a wide variety of goods including store food and alcohol, pharmaceutical, cosmetics, clothes, and other household products that are consumed regularly. It is often part of that chain that owns or controls (sometimes by franchise) other supermarkets located in the same or other towns; this increases the opportunities for economies of scale.

Net working capital is the difference between current assets and current liabilities and it roughly measures the reservoir of cash.
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LIST OF ABBREVIATIONS

EAS  East African Standard
CEO  Chief Executive Officer
COS  Cost of sales
EOQ  Economic Order Quantity
JIT  Just -in - Time
NSE  Nairobi Stock Exchange
USL  Uchumi Supermarkets Ltd.
CHAPTER ONE

1.0 INTRODUCTION

1.1 STUDY BACKGROUND

Inventory management is one area which requires increased attention because inventories account for more than 40 percent of the total costs of manufacturing companies and more than 70 percent of the total costs of merchandizing companies (Horngren, Datar and Forster 2004).

Firms are faced with the problem of separating the stock from the stuff as they consider large quantities of inventory vis-à-vis customer perception. The impact of internal and external factors on policies and controls designed to manage inventories needs to be assessed periodically to identify strengths versus weaknesses of, and opportunities versus threats to the inventory system in place. Some of the identifiable constraints in the management of inventories, which relate to internal factors like space, storage facilities, procurement facilities and their reliability, availability of capital and external factors like consumer demand and taste, and suppliers need to be critically assessed.

Overstocking of items requires large space, appropriate storage facilities and substantial amount of funds tied up in the investment yet the movement of the inventories depends on the speed at which the products are sold. Incase of low sales the movement of inventories becomes slow and the risk of losing items pegged to expiry dates and perishability or obsolescence poses a major concern to firms.
Carrying costs might run as high as 30 percent of inventory value (Kotler 2000). On the other hand, under stocking of inventories reduces the amount tied up while at the same time it increases the risk of running out of stock. It is costly to run out of stock due to possible loss of sales and goodwill. The management therefore has the two costly conflicting areas, overstocking versus under-stocking to contend with and strike a balance.

Another difficult area in decision-making is how to minimize shrinkage costs, i.e. losses attributable to breakage, expiry date, perishability, pilferage and theft. The problems encountered by firms are the risk of losing large amount of funds tied up in varied inventories held and in the relative reduction in customers when less stock exists. This situation can threaten the firm’s profitability and survival. A booster to efficiency in this area includes installation of appropriate programs and software to highlight the reorder point through exceptional reporting (Hasty and Reardon 1997)

Inventories, which are the least liquid assets (Hirt 1987), constitute a major portion of current assets. The speed at which stocks are turned over is very critical in inventory management since it determines the flow of funds and the ability of the firm to pay suppliers promptly so that no delay in supply of goods is experienced. Efficient and effective inventory management enables the organization to make the best use of its available resources to improve profitability and liquidity.
This study is focused on impact of inventory management on profitability and liquidity in large supermarkets in Nairobi. According to Munyoki (1997) beginning of self-service stores for consumers started in America between 1920 and 1950, and Britain in 1950s. In 1962 K&A was started followed by others like Ebrahim & Co Ltd. (1970) and USL (1975) all located in Nairobi and managed as family businesses except for the latter (Karemu 1993). Consumer demand, financing, procurement technology and inventory management through global chains which spread knowledge into the developing regions and made impact in 1990s contributed to the rapid growth of supermarkets (Reardon, Timmer and Berdegue 2004). Although the growth of supermarkets has been rapid some large supermarkets in Nairobi are experiencing tight cash flow and slow moving stock due to a decline in customer spending (The East African Standard (EAS) March 4, 2005).

1.2 STATEMENT OF THE PROBLEM

Inventory turnover ratio bears the direction of profitability of a business based on sales volume since inventory movement measures the demand for a particular product. Successful inventory management is evidenced by the available stocks on the shelves as required by the customers. A large proportion of outlets acquire inventory through credit arrangements. The creditors require payment when the accounts fall due.

In the event that stock turnover is low it is unlikely that suppliers will be paid on due dates. Between July and December 2004 when USL experienced a huge loss, it was attributed to tight cash flow and slow moving stock because of 11 per cent decline in customer spending (The EAS March 8, 2005). According to The Daily Nation (DN) dated March 8, 2005 the
elimination of dead stock has a major impact on the working capital of USL. It was therefore evident that some supermarkets in Nairobi are facing problems with regard to cash flow management and profitability.

This suggested that there was need to rationalize the movement of stocks. The problem of the study was the lack of choice of inventory mix between slow and fast moving stock, which would improve profitability and ensure adequate liquidity of the business.

1.3 OBJECTIVES OF THE STUDY

The main objective of this study was to determine whether or not inventory management affects profitability and liquidity.

Specifically, the study intended to

1. Establish the extent that inventory management system in place affects the choice of inventories.

2. Determine how the inventory mix between the slow and fast moving stock affects cash flow and profitability level.

3. Suggest an appropriate way for ensuring the correct mix of inventory that will sustain optimal level of profitability and liquidity.

1.4 RESEARCH QUESTIONS

The research questions, which were intended to establish whether the inventory management system affects profitability and liquidity, were:

1. To what extent does inventory management system in place affect the choice of inventories?
2. How does the inventory mix between the slow and fast moving stock affect cash flow and profitability level?

3. Can you suggest an appropriate way for ensuring the correct mix of inventory that will sustain optimal level of profitability and liquidity?

1.5 SCOPE OF THE STUDY

This study was on large supermarkets (retail chains) in Nairobi.

1.6 THE SIGNIFICANCE OF THE STUDY

The beneficiaries to this study would be:

Management: The findings and recommendation of this study would add to the body of knowledge in inventory management in supermarkets.

Suppliers: Suppliers are interested in firms, which make payments as they fall due.

Customers: Availability of the right product mix endeavors to meet customers' expectations.

Employees: Employees are interested in well-managed firms with job security.

Society: Well-managed firms can offer investment opportunities, job opportunities, and contributions to community development welfare.

Academics: The findings and recommendations of this study will be useful in future research.

1.7 LIMITATIONS OF THE STUDY

The following were some of the limitations anticipated as per the study were concerned.
1. Some of the respondents would not freely disclose quantitative information.

2. Time for this study would not be adequate.
CHAPTER TWO

1.0 LITERATURE REVIEW

2.1 INTRODUCTION

Inventory management studies have existed since 1915 when F. W. Harris (Srivastava et al, 2002) developed economic lot-size equation to help in establishing the right size of inventory level to order and to hold. This subject has been widely studied in the past with most of the existing literature focusing on theoretical models developed by operations researchers on inventory control applications practically geared towards the manufacturing sector. Financial management, Cost Accounting and Management Accounting have used the inventory models to produce further literature on the management of inventory.

This literature review will therefore address inventory management in large supermarkets under the following areas:

1. Inventory management and its importance
2. Inventory policies and controls
3. Inventory costs
4. Inventory management and Technology
5. The inventory turnover, profitability and liquidity
2.2 CONCEPTUAL FRAMEWORK: INVENTORY MANAGEMENT

**INVENTORY MANAGEMENT**

**POLICIES**

**CONTROLS**

**INVENTORY COSTS (INVENTORIES)**

**TURNOVER**

**PROFITABILITY**

**LIQUIDITY**

(INDEPENDENT VARIABLES)  (DEPENDENT VARIABLES)

Source: Author, 2005

**2.2.1 Introduction:** Today’s inventory management is dynamic, global, customer driven and competitive thus requiring special attention. Inventory consists of fast and slow moving products purchased from both local and international suppliers. The objective of management is to minimize inventory costs by using appropriate policies and controls to ensure that right items are always available at the shelves for the customers. Figure 4 shows that policies and controls are used as tools to manage inventory costs. Policies, controls, inventory costs and stock turnover rates, which are independent variables influence profitability and liquidity (dependent variables).
Explanation of Variables Relationship:

Independent variables are those variables, which can exist without dependent variables whereas dependent variables are those that cannot exist without other variables.

The conceptual framework above illustrates that the named variables, policies, controls, and inventory costs when brought to bear and interact with each other they lead to improvement in profitability and liquidity. At the same time when they are lacking in adequacy or completely absent they pose a challenge to the successful profitability and liquidity.

2.2.2 Inventory policies: Policies help management to establish how much to order, when to order, and how much to hold. Pandey (2002) emphasizes that a firm neglecting the management of inventories will be jeopardizing its long-run profitability and may fail ultimately. It is recommended that reduction in excessive inventories carry a favorable impact on a company’s profitability. The inventory policy will maximize the firm’s value at a point where marginal return from investment in inventory equals marginal cost of funds used to finance the investment. The ultimate goal of inventory management therefore aims at achieving the overall company objective, i.e. to maximize the shareholders’ wealth or the firm’s value.

The basic concern of management is to develop inventory policies that will minimize the total operating costs of a firm. Thus the two basic decisions concerning inventory levels that must be made can be classified as: the time at which orders for goods to be placed is fixed and the quantity to be ordered is determined; both the order quantity and time must be determined (Srivastava, Shenoy and Sharma 2002).
2.2.3 Inventory controls: Forgarty and Hoffman (1983) emphasize that a clear statement of the role which inventories and inventory control functions play in enhancing the company’s competitive advantage must exist. In the absence of this statement, individuals are likely to act on the basis of personal assumptions regarding functional priorities thereby establishing an inconsistent set of criteria against which their performance is to be evaluated.

According to Leenders and Fearon (1993) the appropriate inventory control designed to physical safeguards must be established to protect items from shrinkage (that is, damage, unnecessary obsolescence due to poor stock rotation procedures, and theft). A well-designed inventory management system aims at identifying and preventing product ageing and avoids under-performing products in the firm.

2.2.4 Inventory costs: Inventory cost increases at an increasing rate as the customer service level approaches 100 percent. Management would need to know what impact the varying level of inventory held has on sales and profits. Thus, marketing managers who want their companies to carry larger inventories need to show that larger inventories would produce incremental gross profit to exceed incremental inventory-carrying costs (Kotler 2000).

According to Srivastava et al (2002) stock-out costs are costs associated with either delay in meeting the demand or inability to meet it at all due to shortage of stocks. It leads to loss of contribution through the lost sale, loss of future sales because customers go elsewhere and the eventual loss of customer goodwill.
2.2.5 Inventory Turnover: Managers may monitor the rate at which the company is turning its inventories; efficient firms turn over their inventory rapidly without tying up the capital. Care has to be taken to ensure that firms that operate fewer inventories are not considered as managing their inventories well. Effective inventory management requires firms to establish the number of days inventories purchased should take to sell (Brealey, Myers and Marcus 2001).

According to Walters (1994), the characteristics of fast moving stock (such as perishable good products, e.g. milk, bread etc.) and stock turnover generated to exceed the payment cycles for the merchandize enable the retailer to use suppliers’ working capital (negative working capital) in developing the business, thereby reducing their own financing requirements and costs.

Horngren, Sundem and Stratton (2002) emphasize that retail stores must either focus on products taking up less space or using the space for shorter periods of time, that is, greater inventory turnover.

2.2.6 Profitability: Although stockholding needs to exist in organizations processing or selling the inventories, according to Lucey (2002) accumulation of stocks might lead to obsolete items in stock, unnecessary tie-up of the firms’ funds and loss of profit, excessive carrying costs and risk of liquidity.
Watching inventory turnover ratio is significant in the management of inventory since it brings to light the trend of inventory movement over time. A trend of deterioration may be an indication of obsolescence, which perhaps may result in write-off, and greater opportunity costs of funds invested inventory. Both the obsolescence problem and opportunity cost may have an impact on the profitability and liquidity of the firm (Van Horne, 2002).

2.2.7 Liquidity: To succeed in its operations, inventory management objective aims at minimizing inventory holding costs and maximizing return on inventory investment and ensuring a steady cash flow. In the theory of financial management a decision to determine or change the level of inventory is an investment decision and its analysis should involve evaluation of the profitability of investment in inventory. Inventory management policy aims at maximizing the firm’s value. It is desirable to have a change in the inventory policy when the incremental rate of return exceeds the required rate of return (Pandey 2002).

2.3 THE IMPORTANCE OF INVENTORY MANAGEMENT

According to Schreiberfeder though the system might be installed, effective management depends on the firm’s well-designed inventory management approach in establishing the reliability of inventory that is available in the warehouse and shelves for sale. Inventory management that is well designed with respect to products availability at right amount of each product helps the firm to exceed customer expectations and to achieve maximum returns on the inventory investments.

An aspect of inventory management is that there may be a possibility of conflict between what the decision model might indicate as the optimal action and what the manager might perceive as
optimal. Formal accounting system may record some inventory-related costs but ignore others, which could be relevant. Therefore in order to avoid conflict design performance evaluation system so that the carrying costs are charged to the appropriate manager (Horngren 1983).

Robert Collins (Chikan 1984) argues that it is those individuals who are directly involved in inventory management who should adopt general perspective in resolving, designing and implementing issues likely to have greater impact upon the effectiveness of the inventory management and not necessarily soliciting top management commitment and involvement.

Suresh of USL and Shah of Makro Supermarkets acknowledged that successful operation in retail establishments (whether large or small) require dynamic management (Karemi 1993).

Management is charged with the responsibility of designing inventory control systems to help manage the business in an orderly and efficient manner. The controls designed should ensure that the policies are adhered to and the assets of the company are safeguarded and properly accounted (Millichamp 2002).

In basic retailing management variables; none is more important than inventory. Thus, the decision a retailer makes regarding the size and composition of merchandize inventories have a profound influence on the effectiveness of the market program and on the soundness of the financial program (Davidson, Sweeney and Stampfl 1998).
Pandey (2002) emphasizes that a firm neglecting the management of inventories will be jeopardizing its long-run profitability and may fail ultimately. It is recommended that reduction in excessive inventories carry a favorable impact on a company’s profitability. The inventory policy will maximize the firm’s value at a point where marginal return from investment in inventory equals marginal cost of funds used to finance the investment. The ultimate goal of inventory management therefore aims at achieving the overall company objective, i.e. to maximize the shareholders’ wealth or the firm’s value.

Forgarty and Hoffman (1983) emphasize that a clear statement of the role which inventories and inventory control functions play in enhancing the company’s competitive advantage must exist. In the absence of this statement, individuals are likely to act on the basis of personal assumptions regarding functional priorities thereby establishing an inconsistent set of criteria against which their performance is to be evaluated.

According to Karemu (1993) the supermarkets in Nairobi vaguely state their objectives. The supermarkets neither write the objectives down nor communicate them to employees. Everything that is to be done depends on individuals’ intuition and visions with no form of reference existing to facilitate the operations.

Although it is the responsibility of Chief Executive Officers (CEOs) to ensure that the mission and vision of the organization is well defined; Baumol (Dwivedi 2002) remarks that firms and their executives are not always clear about their objectives. When they are interviewed they agree to every plausible goal about which they are asked.
2.4 INVENTORY POLICIES AND CONTROLS

Forecasting the future quantities to be purchased depending on demand followed by prompt replenishment in the inventory management ensures that quality products are available in right quantities at the shelves for customer shopping (Brigham 1986).

According to Munyoki's (1997) study on selected consumer goods in retail market it was established that rather than just increase or reduce the price of a commodity in anticipation of increased demand, many supermarkets first try to satisfy the customer. The supermarkets management interviewed in Nairobi said that it is achieved foremost by ensuring that the customers get what they want, in the right quantity at the right time and in the right place. It is therefore argued that many supermarkets do not adjust their prices in response to perceived change in consumer buying behavior but instead regulate the supply to ensure that there are sufficient stocks during periods of high demand such as on seasonal holidays (e.g. Christmas).

The basic concern of management is to develop inventory policies that will minimize the total operating costs of a firm. Thus the two basic decisions concerning inventory levels that must be made can be classified as: the time at which orders for goods to be placed is fixed and the quantity to be ordered is determined; both the order quantity and time must be determined (Srivastava, Shenoy and Sharma 2002).
On the study on retailers, Kiumbura (2003) observes that supermarkets thrive to satisfy their customers’ needs at whatever costs. When certain products are missing on the shelves, customers complain and may conclude that the supermarket is unable to stock full range.

Reorder point is commonly computed as safety stock plus average usage during the lead-time. The optimum safety stock level exists where the cost of carrying an extra unit is exactly counterbalanced by the expected stock out costs (Horngren 1983).

Horngren (1983) qualifies this formula by stating that ‘This handy but special formula does not apply where the receipt of the standard order fails to increase stocks to the order-point quantity; for example where the lead time is three months and the standard order is a one-month supply. The order point will be average usage during lead-time plus safety stock minus orders placed but not received. This is really the general formula for computing the re-order point. In most cases a simplified version is used because the last term in the general formula is zero.’

As a store is interested in carrying an optimal inventory, various factors such as having the necessary products in the right quantity, at the right time, while minimizing the cost of ordering and carrying the goods come into force when considering an ideal inventory level (Brigham 1986).

According to Brigham (1986) for safety stock to exist, all items in the store should be halfway through their replenishment. That is,
\[ OI = OP + \frac{1}{2} RQ \]

Where \( OI \) = optimal inventory, \( OP \) = order point and \( RQ \) = replenishment quantity.

But the intuition behind the reorder point formula according to Horngren et al (2004) is that re-order needs to be done when inventory on hand falls to the level at which it equals the amount needed for sales that will occur during the purchase-order lead time.

When to order a given product assuming certainty is a major decision in managing goods for sale, the reorder point, which is the inventory level appropriate to replenish the stock, triggers a new purchase order. Retailers, who are uncertain about demand, lead-time, or the quantity that suppliers can provide, hold safety stock (Horngren et al 2004).

According to Horngren (1983) retail merchants must contend with a major operating problem called shrinkage i.e. shoplifting by customers and embezzling by employees. Retailers must scrutinize their own personnel, because they account for 30 to 40 percent of inventory shortages. General characteristics that form a checklist for internal control to check effectiveness are: reliable personnel with clear responsibilities; separation of duties; proper authorization; adequate documents; proper procedures; physical safeguards; bonding; vacation, and rotation of duties; independent check; and cost - benefit analysis.

According to Adams (2004) the true test of an effectively managed inventory is not what has been sold but what should have been sold, the final area of inventory management being
turnover. Inventory is not worth what was paid for it at purchase but what somebody is willing
to pay for it (Schreibfeder).

2.5 INVENTORY COSTS

Schreibfeder established the inventory-related problems as excess inventories and dead
stock lead to decreased turnover and profitability. In addition stock-out results in
backorders, lost sales and an overall decrease in customer service; stock quantity on hand
in the computer does not agree with what is actually on shelf in the warehouse; and though
one may know of existence of stock, it is not known where they are located.

But Horngren (1983) states that two limits must be imposed in controlling inventory levels
because there are two danger points which management usually wants to avoid. The first
danger is that inadequate inventories disrupt production and may lose sales. The second
danger, excessive inventories, introduces unnecessary carrying costs and obsolescence
risks.

Inventory cost increases at an increasing rate as the customer service level approaches 100
percent. Management would need to know what impact the varying level of inventory held
has on sales and profits. Thus, marketing managers who want their companies to carry
larger inventories need to show that larger inventories would produce incremental gross
profit to exceed incremental inventory-carrying costs (Kotler 2000).
The overall objective of inventory control is to maintain stock at levels so that the combined ordering, holding and stock out costs are at minimum (Lucey 2002).

The following explains type of costs incurred under the classified inventory costs according to theoretical and research literature

**Purchasing costs:** Costs related to acquisition of purchased items are those of getting the items into the company’s inventory or stores (Srivastava, Shenoy and Sharma, 2002).

According to Horngren, Datar and Foster (2004) purchasing costs, which make the largest category of goods for sale, are the costs of goods acquired from suppliers and include incoming freight or transportation costs net of the discounts received for different purchase orders.

**Ordering costs:** According to Hilton (1999) ordering costs include clerical costs of preparing purchase orders, time spent finding suppliers and expediting orders, transportation costs and receiving costs (e.g., unloading and inspection).

Ordering costs incurred each time an order is placed with supplier starts with purchase requisition to the receiving of goods, inspection for quality control, placing them into stores, and paying vendors (Srivastava et al 2002).
Lucey (2002) infers rightly that ordering costs include clerical and administrative costs associated with purchasing, accounting and goods received departments and transport costs.

Ordering costs include the clerical costs of preparing and issuing purchase orders, receiving and inspecting the items included in the orders, matching invoices received to purchase orders and delivery records to make payments. The ordering costs include cost of obtaining approvals and processing any other special processing costs (Horngren, Datar and Foster 2004).

**Carrying costs:** Researching on inventory optimization Amoro (1991) observes that ordering costs involve major spending, whereas insurance and opportunity cost of tying up stock constitute a greater proportion of the carrying costs than any of its components.

Benefits accrue when stock levels are maintained at a level agreeable with the requirements of customer expectations for choice and availability cost (Walters 1994).

Holding costs include cost of storage space (e.g. warehouse depreciation), security, insurance, foregone interest on working capital tied up in inventory and deterioration obsolescence, theft or spoilage (Hilton 1999).

Companies incur carrying costs on products, which have been bought for resale but are still held in stock. Horngren et al (2004) analyzes these costs as opportunity costs of funds tied
up in inventories and the costs associated with storage facilities such as space rentals, insurance, obsolescence and shrinkage/spoilage.

**Stock-out costs:** According to Srivastava et al (2002) stock-out costs are costs associated with either delay in meeting the demand or inability to meet it at all due to shortage of stocks. It leads to loss of contribution through the lost sale, loss of future sales because customers go elsewhere and the eventual loss of customer goodwill.

In order to avoid such stock-outs a company may respond by expediting an extra order, which would involve incurring additional costs of ordering and transportation to meet the demand (Horngren et al 2004).

**Quality costs:** According to Weatherspoon and Reardon (2003), supplying some firms involves tough quality and safety standards. It demands expenditure to adapt to new practice and sale of company products.

Quality costs come about when features and characteristics of a product do not conform to customer specifications and costs incurred are to detect and prevent these shortcomings (Horngren et al 2004)

According to Hilton (1999), inventory costs can be computed using three methods, tabular approach (Table 1), equation approach (Appendix 4) and graphical method (Figure 1).
Figure 1 illustrates graphical approach of solving the EOQ and it shows ordering costs slanting down to the right as the order quantity size increases and the order frequency decreases. The increase in order quantity increases the average inventory on hand thus increasing the holding costs indicated by the positive slope as shown on Figure 1. The EOQ falls where the best balance is struck between the ordering and holding costs. It is also represented by the minimum point of the annual total cost curve i.e. $3,600.
The calculation of EOQ model depends on many assumptions like: stockholding cost is known and constant; ordering cost is known and constant; rates of demand is known, the price per unit is known and constant, replenishment is made instantaneously; and no stock-outs is allowed (Lucey 2002).

According to Srivastava et al (2002) in most of the realistic inventory situations certainty does not exist. Due to external forces, demand or usage can be greater or less than anticipated and the acquisition lead-time may vary from favorable to unfavorable due to supplier and/or shipment difficulties. But the management’s interest is to pick up the level of stock for which the total cost for stock-outs and inventory carrying costs of safety stock is minimal.
Periodic inventory system, which is based on determination of a fixed period at which the inventory is reviewed, is considered more suitable for all high value and fast depreciable items because it allows for close control. Although the system appears good, it is costly to operate and many firms operate perpetual inventory system, which although the reorder quantity is fixed at the EOQ level, the frequency of ordering varies depending upon the fluctuations in consumptions. Safety stock in both cases is the extra inventory held as a buffer stock or protection against the possibility of stock-out due to higher demand (Srivastava et al 2002).

The purpose for holding large inventories is explained in theoretical literature as follows: According to Pandey (2002) three general motives for holding inventories as stated by Starr, and David (1962) are: the need to maintain inventories to facilitate smooth operations known as transaction motive, the need to guard against risk of unpredictable changes in demand and supply forces and other factors known as precautionary motive; and speculative motive which influences the decision to reduce or increase inventory level to take advantage of price fluctuations.

Due to importance attached to inventory figures carried as per balance sheet, auditors verify the existence and check to ensure that procedures of physical stock count are followed by the client when they attend physical stock count. The verification is not enforced where the value of amount involved is not material or in exceptional circumstances where attendance is not practicable (Cooper 1982 and International Accounting Standards (IAS) 2 1993).
Inventories are cushions used to absorb planning errors and unforeseen fluctuations in supply and demand; they also facilitate firms' smooth operations (Horngren 1983).

According to Srivastava et al (2002), inventories are held to ensure that sufficient goods are available to meet both the anticipated demand and fluctuation in usage. Holding inventories allow the purchasing and distribution processes to function where significant amount of time is required to transport goods from one location to another (pipeline stocks). Firms hold inventories as deliberate investment policy particularly in times of inflation or possible shortage. Inventory can be obtained in larger quantities for the firm to take advantage of bulk purchasing discounts.

Inventories are carried to ensure sufficient stocks are available to meet anticipated demand; to absorb seasonal fluctuations in usage; to meet possible shortage in future; and as a deliberate investment policy in times of inflation (Lucey 2002).

According to Herbert Richmond's (Pandey 2002) Pareto Analysis (also referred to as ABC Analysis or control by importance and exception) philosophy, the firms should concentrate on the items with highest values when determining the inventory levels i.e. the firm should identify and select items with high values. Combined items on the basis of their relative value form the three categories: A class- high value items would be under the tightest control, B class- moderate value items would require reasonable control and C class- least value items would be under simple control.
Srivastava et al (2002) refers to Pareto Analysis as ABC Analysis, which stands for Always Better Control, and the analysis was first introduced by the General Electrical Company (USA) in some years back. It was found that; Out of a large range of inventory, 10% or so account for 70-80% of the annual inventory usage value whereas a relatively small inventory usage value of say only 5% is contributed by the bulk, 70% of the items in inventory. The analysis gives a deeper cost perspective to management; enables them to decide upon priorities to improve or cost reduction programme and reinforces management by exception theory.

According to Kyalo (2001), it would be more prudent for a discerning retailer to target all the classes of customers since no group is deemed too large to be exclusively profitable. A feel of all range of classes and a later decision on the segments of the market to target is more profitable.

Just-in-Time (JIT) purchasing reduces cost of carrying inventories and cost of purchasing order. The latter is effected by establishing long-term purchasing agreements defining price and quality terms over an extended period, by using electronic links such as the internet to place orders and by using purchase-order cards. In JIT purchasing quality materials and goods, receiving timely deliveries and avoiding stock-outs is important (Horngren et al 2004).
2.6 INVENTORY MANAGEMENT AND TECHNOLOGY

According to research on current practices in retail inventory management by Ghani (1996) improved access to information allows retailers to decrease stock outs, obsolescence, and the overall level of inventory while maintaining an acceptable level of customer service. The continued full involvement of owners in the day today operations of their stores together with lack of professional management or existence of large chain stores is further evidence of the difficulty the retail sector has in implementing improved inventory management and control systems. A more general obstacle is the lack of awareness of the various options available to retail organizations as they seek to improve the efficiency and effectiveness of their inventory management and control procedures.

Major technological improvement in retailing industry which has brought changes in ordering, tracking and controlling inventory, allows vendors to review the inventory position and also process reorders without the retailers' involvement. Electronic data interchange (EDI) and quick response (QR) has the benefits of allowing the supplier to know the level of inventory; increasing customer service with fewer stock-outs, fresher inventory, faster service and fewer returns; reducing inventory level and the risk of goods perishing on shelves; and reduction of storage room (Hasty and Reardon 1997).

To optimize stockholding less storage space is required. To achieve this, proper use of information technology can help to determine stockholding requirements very accurately, analyze demand and replenishment stock flows to ensure the stock levels and locations are such
that customer service aspects of inventory are maintained at the lowest possible costs (Walters 1994).

French (2000) states that the quality of inputs determines the quality of outputs that is, garbage in garbage out (GIGO). A well-designed inventory management system can only produce complete, relevant and timely information if right data is processed and analyzed.

Information gathering technology increases the reliability and timeliness of inventory information and reduces purchasing, ordering, holding, and stock out and quality costs. Bar coding technology allows a scanner to record purchase and sales of individual units. As soon as a unit is scanned, an instantaneous record of movements is created that helps in the management of purchasing, carrying and stock out costs Horngren et al (2004).

Enterprise Resource Planning (ERP) system comprises a single database, which collects data and feeds into applications supporting all of the company’s business activities. It gives all participants i.e., managers, employees and customers access to operating information. It is useful in forecasting demand and goods requirement plan (Horngren et al 2004).

2.7 INVENTORY TURNOVERS, PROFITABILITY AND LIQUIDITY

In retail sales, the limiting resource is often the floor space and therefore retail stores must either focus on products taking up less space or using the space for shorter periods. Profitability depends on the space occupied and the inventory turnover, but not the
conventional gross profit percentage (gross profit ÷ selling price). In general, retail companies seek faster inventory turnover (Horngren et al 2001).

Joseph Buchan and Ernest Koenigsberg’s (Horngren 1983) comments are:

“An infinite turnover can be achieved by carrying no inventory whatsoever. However, such an inventory policy would not be a good policy because a company with no inventory would be continuously buying and expediting. Turnover is worth improving, yes, but only if there is no substantial increase in ordering cost and only if there is no substantial loss of sales resulting from excessive stock outs.”

The stores (wholesalers, supermarkets, etc) must inventory products ahead of sales and forecast which products customers will purchase (when and how) to establish the appropriate levels for the various products they carry. Due to complexity of managing thousands of different types of products some of which are perishable (with very short shelf life) and forecasting sales, companies are increasingly using computer systems to control their inventory. Inventory is an area of great concern and any management has to contend with in monitoring its flow in order to avoid the losses, which might occur from the perishables, or the product with expiry dates (Brigham 1986).

According to Leenders and Fearon (1993) the appropriate inventory control designed to physical safeguards must be established to protect items from shrinkage (that is, damage, unnecessary obsolescence due to poor stock rotation procedures, and theft). A well-designed inventory management system aims at identifying and preventing product ageing and avoids under-performing products in the firm.
The cause of problems in management of stores as concluded by Odeny (1997) is the lack of technical and professional knowledge of the items by those involved in running the store and also dependence on instructions from a few who lack principles of inventory management.

According to findings on inventory management study by Odeny (1997), selection of suppliers is not well scrutinized and some who win tenders could be operating under fake names.

Davidson Sweeney and Stampfl (1998) emphasizes that the fundamental principles to an understanding of merchandizing is the concept of stock or inventory turnover, the method of its computation, and the decisions of operating at turnover rates that are not normal or reasonable. Turnover rate of stock which is subject to planning and control is determined by the speed at which inventory moves out of the firm.

Managers may monitor the rate at which the company is turning its inventories; efficient firms turn over their inventory rapidly without tying up the capital. Care has to be taken to ensure that firms that operate fewer inventories are not considered as managing their inventories well. Effective inventory management requires firms to establish the number of days inventories purchased should take to sell (Brealey, Myers and Marcus 2001).

Although stockholding needs to exist in organizations processing or selling the inventories, according to Lucey (2002) accumulation of stocks might lead to obsolete items in stock,
unnecessary tie-up of the firms’ funds and loss of profit, excessive carrying costs and risk of liquidity.

To succeed in its operations, inventory management objective aims at minimizing inventory holding costs and maximizing return on inventory investment and ensuring a steady cash flow. In the theory of financial management a decision to determine or change the level of inventory is an investment decision and its analysis should involve evaluation of the profitability of investment in inventory. Inventory management policy aims at maximizing the firm’s value. It is desirable to have a change in the inventory policy when the incremental rate of return exceeds the required rate of return (Pandey 2002).

Horngren, Sundem and Stratton (2002) emphasize that retail stores must either focus on products taking up less space or using the space for shorter periods of time, that is, greater inventory turnover.

Watching inventory turnover ratio is significant in the management of inventory since it brings to light the trend of inventory movement over time. A trend of deterioration may be an indication of obsolescence, which perhaps may result in write-off, and greater opportunity costs of funds invested inventory. Both the obsolescence problem and opportunity cost may have an impact on the profitability and liquidity of the firm (Van Horne, 2002).

Inventory can create financing and profit problems for a company if the discount given to attract sales is not designed to attract equivalent or better returns. Since inventory is the
least liquid of current assets, it should provide the highest yield to justify investment. While
the financial manager may have control over cash management, marketable securities, and
accounts receivable, control over inventory policy is generally shared with production
management and marketing (Block and Hirt 1987).

According to Walters (1994), the characteristics of fast moving stock (such as perishable
good products, e.g. milk, bread etc.) and stock turnover generated to exceed the payment
cycles for the merchandize enable the retailer to use suppliers' working capital (negative
working capital) in developing the business, thereby reducing their own financing requirements
and costs.

Woolf (1997) emphasizes that unlike other current assets, the proper determination of the value
of the inventory is a major problem since double entry principle does not apply to it, and so
establishing the balance is rather difficult. It is both a balance sheet and a profit and loss account
item and its proper management contributes to maintenance of a healthy flow of merchandise.
Figure 2: Simple Cycle of Operations (illustrates inventory conversion)

Source: Brealey, Myers and Marcus (2001). Page 548

Figure 3 depicts the four key areas in the cycle that influences the firm’s working capital: inventory period, accounts receivable period, cash conversion cycle (Figure 2) and accounts payable period. The longer the inventory period the more cash the firm keeps tied up in inventories. The financial manager therefore has the task of establishing the level of current assets that minimizes the sum of carrying and shortage costs (Brealey, Myers and Marcus 2001).
According to Van Horne (2002) liquidity ratios are used to judge a firm’s ability to meet short-term obligations and obtain an insight into the present cash solvency of a company and its ability to remain solvent in the event of adversities. Thus short-term obligations are compared with short-term resources available.

A financial manager is not only concerned with the cost of carrying but also with the risks involved in carrying inventory. The major risk is that the market value of specific inventories will be less than the value at which they were acquired (Van Horne 2002).
A commitment is made for items to be available for customers whenever inventories are stocked. But, the warehouse is actually filled with both “stocks” (inventories intended to be in warehouse and anticipated to be what the customer will want) and “stuff”, i.e. everything else. Although the firm’s goal of effective management is to meet or exceed customers’ expectations of product availability, the management’s priority is to liquidate stuff and arrange the stock items in the best way possible to facilitate customer spending (Schreibfelder).

The separation is done based on the usage (Pareto Analysis) of what is in the warehouse. Items falling in this “stuff” category are probably not generating enough profits to cover the carrying costs of these products. After separation, the stuff should be gotten rid of (Schreibfelder).

Schreibfelder suggests some strategies which have been proved successful for the liquidation of stuff are transfer of the excess stock to another branch where inventory is needed or return of goods to the vendor (prior arrangement with suppliers necessary). The reduction of the price to move the excess inventory and offer to salespeople a monetary reward or some other incentive to sell the product would be other strategies. Finally other strategies suggested are advertising the availability of these products to the other suppliers and retailers; substitution of the product with a less expensive item; donation of the products to a non-profit making organization (seek advise from tax consultants); in case there is space shortage, throw away what cannot be liquidated to gain free space in the warehouse.
Gachon (2001) states that retailers must constantly strive for excellence in operations since extremely narrow profit margins leave little room for waste and inefficiency.

Schreiberfeder concludes by saying that although management in many companies is convinced that the primary key to increasing corporate profitability is to encourage salespeople to increase sales and gross margins, the only path to success is effectively managing the inventory investment.
CHAPTER THREE

3.0 METHODOLOGY

3.1 INTRODUCTION
The study was undertaken in the following sections: Research design, Study Population, Sampling Strategy, Data Collection Instruments and Procedures.

3.2 RESEARCH DESIGN
This was an exploratory study, which intended to highlight impact of inventory management on profitability and liquidity. The study focused on inventory policies and controls, and inventory costs as independent variables; and profitability and liquidity as dependent variables in selected large supermarkets in Nairobi.

3.3 STUDY POPULATION
The population in this study consisted of 155 supermarkets, that is, all the supermarkets within Nairobi as listed in Appendix 5. Since comprehensive list of supermarkets in Nairobi does not exist details were compiled from Yellow Pages of Official Kenya Directories, Nairobi Edition (2004) and Virtual Nairobi kenyaweb.com. All the supermarkets are privately owned except USL, which is a public company.

3.4 SAMPLING STRATEGY
3.4.1 Sampling method
In this study proportionate stratified sampling was used to select a representation of the sample frame in terms of critical factor- supermarkets with at least five branches (that is, retail chain) - as a basis for stratification. Out of the population of one hundred fifty five

37
supermarkets in Nairobi, 20, which are classified as large, have been listed in Appendix 6 (Okwanyo 2003). From Appendix 6 supermarkets with a minimum of five branches also referred to as retail chains were selected (Appendix 7).

3.4.2 Sample Size

The East African March 1, 2005 and The EAS March 4, 2005 provide the first four large supermarkets (the retail chains) in their order of branches as listed in Appendix 7 and updated after the face-to-face interview.

The first four supermarkets in order of market size according to Weatherspoon and Reardon (2003) are USL, Nakumatt, Tusker Mattresses and Ukwala. USL and Nakumatt hold 70% of the market share; Tusker Mattresses and Ukwala hold 25%; and all the other supermarkets together hold 5% (Table 2). According to the researchers ten hypermarkets are within Nairobi and each of them is equivalent to ten supermarkets.

The selected sample consisting of four retail chains as listed in Appendix 7 was thus deemed as adequate to represent the entire population.

Table 2: The Market Share of Supermarkets in Kenya

a) Market Share of all Supermarkets in 2003

<table>
<thead>
<tr>
<th>Supermarkets</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uchumi &amp; Nakumatt</td>
<td>70</td>
</tr>
<tr>
<td>Tusker &amp; Ukwala</td>
<td>25</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
b) The Market Share of the Selected Supermarkets

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uchumi</td>
<td>47.80</td>
<td>28</td>
<td>-10</td>
<td>18</td>
<td>30.73</td>
<td>20.49</td>
</tr>
<tr>
<td>Nakumatt</td>
<td>22.20</td>
<td>13</td>
<td>2</td>
<td>15</td>
<td>25.61</td>
<td>17.07</td>
</tr>
<tr>
<td>Tusker</td>
<td>11.76</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td>16.18</td>
<td>11.76</td>
</tr>
<tr>
<td>Ukwala</td>
<td>13.24</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>14.71</td>
<td>7.35</td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>58</td>
<td>-4</td>
<td>54</td>
<td>87.22</td>
<td>56.68</td>
</tr>
</tbody>
</table>

Where A represents market share of selected supermarkets in 2003

B represents the number of branches in 2003

C represents the increase or decrease in branches between 2003 and 2005

D represents the number of branches in 2005

E represents the market share of each supermarket in 2005

F represents the market share of the branches in Nairobi (Appendix 7) in 2005

Table 2 indicates that in 2005 the selected supermarkets hold eighty seven point twenty two percent (87.22%) of the market share (i.e. USL and Nakumatt 56.34% and Tusker and Ukwala 30.88%) and Nairobi branches fifty six point sixty eight percent (56.68%). The sample size, which consists of four supermarkets, is therefore deemed adequate for this study.

3.5 DATA COLLECTION INSTRUMENTS AND PROCEDURES

The primary data was collected through questionnaire dropped and picked from the supermarkets, and face-to-face interview. The items used in the questionnaire are both closed and open-ended questions. The questionnaire was in two parts; Section A for bio data of the respondent and Section B for data of the supermarket. Part B sought to find how
policies and controls on inventory costs influence profitability and liquidity. Also the items of the questionnaire were intended to bring out the objective of the hypothesis of the study.

3.6 DATA ANALYSIS

Data collected was analyzed using descriptive statistics such as percentages, frequency distribution tables, pie and bar charts.
CHAPTER 4

4.0 DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 INTRODUCTION

The researcher organized findings of this study under various subheadings according to the research objectives. In this chapter the data are analyzed, presented in appropriate format and the findings are discussed. Also in this study the names of the supermarkets are not disclosed but instead hypothetical names Orange, Yellow, Pink and Peach are used.

4.2 RESEARCH FINDINGS

A total of four (4) questionnaires were issued to the large supermarkets in Nairobi.

A total of four questionnaires were returned.

4.2.1 DATA OF THE RESPONDENTS

Out of the four respondents 50% had degree and other unspecified level of education. They were in the age bracket 25-35 years, had worked below five years in the supermarkets and were employed by the supermarkets as purchasing manager and chief accountant. The other fifty percent both had diploma, they were in the age brackets 36-45 and 46-55 years, had worked for 10-15 years and 5-10 years in the supermarkets as director and general manager respectively. This implies there was existence of very strong family involvement in the day today business in the latter group.
4.2.2 THE INVENTORY MANAGEMENT SYSTEM IN PLACE

The table below shows the supermarkets ways of operations in regards to guiding written manuals and procedures. It show whether they complied with the procedures and had an individual to ensure the compliance or not. According to Forgarty and Hoffman (1983) in the absence of a clear statement of roles which inventory controls functions play, individuals are likely to act on the basis of personal assumptions which would establish inconsistent set of criteria against which their performance is to be evaluated.

Table 3: Supermarkets Guiding Manuals and Procedures

<table>
<thead>
<tr>
<th></th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written inventory management manual</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Compliance with policies and controls</td>
<td>75.00</td>
<td>25.00</td>
</tr>
<tr>
<td>An individual concerned with the procedures</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Procedures applied to purchases</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Procedures applied to receipts</td>
<td>100.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Author, 2005

The above table shows that fifty percent of the supermarkets that responded had written inventory management manuals containing policies and controls. This implies that the remaining fifty percent are undertaking their inventory procedures with no formal policies and controls, which in turn may weaken the effectiveness of inventory management.

Table 3 also shows that seventy five percent of the supermarkets that responded had policies and controls in place to ensure compliance with procedures. But the remaining twenty five percent had no documented policies and controls. This implies that they could be complying with individual verbal instructions which might weaken the effectiveness of inventory management.

In addition, out of the seventy five percent supermarkets which had policies and controls in
place to ensure compliance with procedures, twenty five percent did not document their procedures and there were possibilities of basis on personal assumptions which would establish inconsistent set of criteria against which their performance was to be evaluated.

The results of the analysis above show that of the supermarkets interviewed, fifty percent had an individual (systems administrator and operations manager) concerned with ensuring compliance procedures. This implies that the remaining fifty percent are guided by individual intuition and visions. This could be of negative impact to the future survival of the supermarkets since each succeeding CEO will have no document for reference and will hence execute duties based on individual intuition and vision.

All the supermarkets interviewed complied with purchases and receipts procedures. Fifty percent of the supermarkets had computerized inventory system. This implies that fifty percent of the supermarkets complied to defined procedures whereas the remaining had the routine procedures on assumptions. Due to the fact that these are large supermarkets with at least ten branches of which some are hypermarkets it follows that the size of inventories handled would be too large to handle manually in efficient and affective manner. Thus in this group of supermarkets there is need for computerization of the inventory system to facilitate efficiency.

Twenty five percent of the supermarkets inventory management systems conformed to their budgets fairly; fifty percent were good and twenty five percent very good. A budget is very crucial in the management of inventories since they serve as a map to achieving the goals and as a manager’s tool to understanding, planning, and controlling operations (Horngren et al, 2001).
For the twenty five percent, which conformed to the budget fairly, the variance could be attributed to economic factors like prices of imported items or relaxed controls in procurements.

All supermarkets interviewed indicated they experienced shrinkage. Seventy five percent of the supermarkets indicated that they experienced shrinkage very rarely but twenty five percent indicated very frequently. The remaining twenty five percent that experienced shrinkage very frequently had connected their suppliers to their extranet to monitor the stock re-order level. This implies that although the system was very efficient there were no controls to ensure that only one supplier could replenish stock for each automated order. The frequent experience of shrinkage could lead to losing of large amount of funds tied up in varied inventories held and the relative reduction in customers when stock out existed due to delay in payment to suppliers. This situation could easily threaten the firms profitability and survival.

Figure 4: Physical safeguards against shrinkage
Figure 4 above shows that twenty five percent of supermarkets had ledger and physical stock count as their method of physical safeguard against shrinkage, twenty five percent had physical stock count and fifty percent had TV surveillance and security. Researcher’s observation from visits to the supermarkets indicated that TV surveillance and security were in all of them. This implies that although supermarkets with computerized inventory system had physical stock count twenty five percent used both ledger and physical stock count to ensure that controls were reliable.

The respondents indicated that twenty five percent of the supermarkets conducted safeguard checks before business started, twenty five percent at close of the business, twenty five percent during the business hours and twenty five percent during business hours and at close of the business. This implies procedural controls for the safety of the stocks existed.

Twenty five percent of supermarkets indicated that re-order level was between two and four weeks and the remaining seventy five percent indicated that re-order level depended on the movement of the individual items. From face-to-face interview out the fifty percent supermarkets that operated computerized inventory systems twenty five percent indicated that their suppliers had the extranet connection to monitor their re-order level. This enabled the suppliers to replenish the stock whenever the re-order point was reached. But occasionally since each item had more than one supplier, two suppliers would replenish the stock at the same time. This implies that the supermarkets under this category used to experience overstocking, funds tied up in stock for long duration, limited or unavailable space for storage and increase in the
risk of shrinkage and obsolescence. In addition overstocking of one type of item could lead to understocking of the other thus resulting to stock out of some items.

Further implications would be inability of right choice of inventory to meet customer satisfaction and difficulty in fixing the appropriate inventory mix between slow and fast moving stock. The net result would be inadequate cash flow because of reduction in customer spending attributed to unavailability of right stock on the shelves of the supermarkets; delay in suppliers payment which would bring about stock out due to suppliers holding stock for non-payment; and losses attributed to low sales, write off of obsolete items and cost of borrowing finance to pay suppliers would impact negatively on profitability.

On the other hand the remaining twenty five percent of supermarkets with computerized systems monitored stock movements and placed orders depending on the individual items. Their approach was dependent on whether the item was slow or fast moving. For the expensive and slow moving items orders were placed for single units immediately after selling the ones in the supermarket.

The study revealed that the supermarkets under this category made prior arrangement with the supplier such that the stock was replenished immediately after selling the single unit in the shop. Also in case a customer or customers required many units the supplier was asked to supply immediately. This approach of procurement implies that existence of slow moving stock was checked and kept at minimum. In addition, the supermarkets’ policy aimed at improving profitability and liquidity by having the right choice of inventory; keeping slow moving items at
minimum; reducing the amount of funds tied up in stocks; reducing the risk of shrinkage and obsolescence and having enough space for storage and display of the stock varieties.

The benefit of this approach is that the supermarkets make profit on the suppliers working capital as long as they honour the payment agreement. According to Walter (1994) the stock turnover generated to exceed the payment cycles for the merchandize enables the retailer to use the supplier's working capital (negative working capital) in developing the business, thereby reducing their own financing requirements and costs.

4.2.3 CHOICE OF INVENTORY

Figure 5: Factors that affect inventory movement in supermarkets
The respondents ranked factors considered to be affecting inventory movement as depicted on Figure 5. Of those who mentioned economy as a factor, fifty percent ranked it as a key factor. Twenty five percent of the remaining fifty percent ranked it as number three and the other twenty five percent as number four. Customer taste was ranked in all levels while fifty percent, twenty five percent and further twenty five percent ranked competitions in the market as numbers two, three and four respectively. Fifty percent ranked stock type as number two while twenty five percent ranked it as number one and the remaining twenty five percent ranked it as number three.

This was a clear indication that supermarkets related choice of inventory to the following factors:

1. Economy factor: The supermarkets, which started as “dukawalas,” that is, as small shops and had grown into large supermarkets targeted the spending habits of the customer by selecting the inventory which their type of customers could afford.

2. Customer taste: There was a clear indication that supermarkets, which had documented and computerized their inventory systems, recognized this factor in selection of choice of inventories.

3. Competition in the market: External factors like new products coming into the markets would normally be sent to supermarkets viewed by manufacturers or vendors to be frequently visited, or in proportion with the product. Sales promotion in the supermarkets would then attract customers to buy other items. The sales promotion by the supermarkets or manufactures for new products would eventually influence inventory choice in the supermarkets.
4. Stock type: Supermarkets with documented and computerized systems preferred this factor for the choice of inventory in the supermarkets.

From the face-to-face interview, all the supermarkets indicated that location had influence on the movement of inventories in the supermarket. Location of the outlet influences the stock type suitable for the clientele living in the environment of each branch. This implies that supermarkets are located with understanding of the customer spending and taste. The supermarkets supported this fact by giving the illustrations below to explain how location influences movement of their inventories.

1. Some supermarkets aim at reaching customers with little income and who expect to save at least two to three percent of their spending. This type of supermarkets has branches located in estates or near the major bus and matatu terminus where the customers could easily find transportation to their residence. The inventories would be available on the shelves for the type of customers any time required.

2. The other larger retail chains incorporate the use of other services like ATMs within the premises and SMART cards to facilitate customer spending. In addition they provide a wide variety of services like the BATA shoes, airtime services, bakery, butchery and bookshop. This type of supermarkets ensure existence of parking bay in the neighborhood or within the premises. The attributes of this factor would then be used to decide on the right inventories to stock on the shelves as required by customers.

Twenty five percent of the supermarkets used periodic review system and twenty five percent used perpetual inventory review. The other fifty percent did not review their stock usage. This
implies that the non-computerized items had no formal review of the usage of stock and this in

turn may undermine the effectiveness of the inventory system. The review of usage of stock is
an inventory control, which helps the supermarkets to take care of fluctuations in customer
demand or requirement due to internal or external factors. The absence of usage review control
in a supermarket would establish inconsistent set of criteria against which their performance was
to be evaluated.

Figure 6: Periods of High Demand in Supermarkets

Supermarkets indicated that demand in the month of January is twenty five percent, August
twenty seven percent, Easter/April twenty percent, Christmas/December twenty seven percent
and Weekends six percent.

This implies that the supermarkets would ensure that stocking of the items is done to
accommodate periodic demand so that adequate inventories are available on the shelves as
required by the customers.
Therefore choice of inventory would also be influenced by the period of year, and the supermarkets ensure that the stocks are available on the shelves at the right quantity and right price.

Figure 7: Stock Turnover Ratios

Twenty five percent of the supermarkets indicated stock turnover ratio of point seven (0.7), twenty five percent indicate the ratio as four (4) and fifty percent indicated that it depended on the item. This implies that supermarkets with stock turnover of point seven had very high level of inventories (Appendix 4) held in stock as compared to the sales turnover. Thus the low turnover of point seven might have resulted in delay in payments to suppliers due to liquidity problems as funds were tied up in stock hence tight cash flow, huge losses incurred and possibility of huge quantities of slow moving stock and eventual obsolescence. This might have resulted to unavailability of adequate stocks on the shelves as required by customers leading to reduction in sales because of customer shift to other supermarkets.
All the supermarkets except twenty five percent indicated that stock turnover was not sufficient and inventory turnover was odd. This supports the trend of turnover ratio above. The twenty five percent supermarkets with stock turnover ratio of four (4) indicated that the ratio was sufficient and the inventory turnover was even. The results indicate that the twenty five percent supermarkets made profits and had adequate cash flow.

All the supermarkets indicated that supermarket/supplier relationship affects inventory management systems. Fifty percent of the supermarkets indicated that the good relationship ensures availability of products at all times even when the country is experiencing shortage of a particular commodity. Twenty five percent of the supermarkets indicated that the influence could have both positive and negative impact. The supermarkets under this category stated that a push policy could exist, that is, a situation where the suppliers supply a type of product to a level where excess stocks exist causing the supermarket to suffer. However, regular supply at re-order point is positive to the management of inventories. The remaining twenty five percent indicated that the effect of supermarket/supplier relationship influence inventory management as follows

i. Where delivery is prompt, less stock is held

ii. Where delivery is non immediate, higher level of stock is held

iii. Where high level of influence upon the supplier exists holding of stock is minimal

iv. When a commodity is scarce in the market, the degree of influence on supplier determines the supply

v. Where influence upon suppliers exist, the expired items and breakage can be returned but where the influence is absent return of items neither exists nor is guaranteed.
This implies that supermarkets/supplier facilitates effective inventory management. The minimal stockholding indicates existence of high profits and adequate cash flow. In addition the relationship might enable adequate stock to be available on the shelves for customers as they require. On the other hand the supermarkets with extranet experienced excess supply occasionally. This could be due to inventory control weakness which required to be reviewed to curb the situation.

Figure 8: Frequency of stock out

Twenty five percent of the supermarkets experienced stock out frequently, fifty percent rarely, and the remaining twenty five percent not at all. Fifty percent of the supermarkets which experienced stock out rarely indicated that the situation was because of other reasons like unavailability of stock. The twenty five percent indicated that the frequent stock out was as a result of suppliers holding stock due to non payment. This implies that stock out attributed to loss in sales due to customer shift to the other supermarkets in search for the availability of right items on the shelves to buy. The image name changed and as a result the twenty five percent
supermarkets in the category experienced loss of goodwill. The end result must have impacted on the liquidity and profitability.

All the supermarkets interviewed face-to-face indicated that ordering costs, stock out costs and inventory had impact on profitability and liquidity as follows

1. **Ordering Costs**: All the supermarkets except twenty five percent indicated that they purchased goods locally. Transportation and related charges for goods delivered to the central warehouse by suppliers were said to be minimal. The supermarkets indicated that the amount spent on purchase of the products depends on the stock type. Because the expenditure could involve huge funds, the supermarkets minimize the costs through the influence they have on suppliers. The greater the saving on costs, the higher the profitability.

2. **Stock out**: Although all the supermarkets except twenty five percent rarely experienced stock out, the supermarkets indicated that whenever it occurred they would urgently seek for replenishment from central warehouse, other branches or order from supplier on non-negotiated price. Time taken and cost would have a direct negative impact on both profitability and liquidity.

3. **Inventory turnover**:
   
   a) Too much stock or excess stockholding: Since this is an indication stock do not move faster, liquidity might be inadequate causing suppliers’ payments to be delayed. The delay might lead to borrowing to pay suppliers thus incurring finance costs. In addition space available to accommodate stock might not be sufficient.
   
   b) Less stock holding: This could increase the risk of having stock out and the supermarket have to pay more in order to obtain direct from suppliers incase the
other branches or central warehouse does not have. The absence of the required stock might lead to customers shifting to other supermarkets.

Fifty percent of the supermarkets employed trend analysis to assess their inventory performance, twenty five percent employed ratio analysis and twenty five did not assess their inventory performance. Twenty five percent of the supermarkets observed that inventory management affects profitability, twenty five percent observed that it affects liquidity and fifty percent observed that it affects both profitability and liquidity. Seventy five percent of the supermarkets ranked sales and cost of sales as having increased over the five years 2000 through 2004 and for the remaining twenty five percent sales and cost of sales fluctuated over the years (2000 ranked 5, 2001 ranked 3, 2002 ranked 4, 2003 ranked 1 and 2004 ranked 2). This implies that inventory management has a direct impact on the profitability and liquidity.

From the above analyses, when inventories are turned faster less funds are held and suppliers are paid promptly. Prompt payment to suppliers would facilitate regular replenishments/supplies and as a result enough stock will be available on the shelves for customer shopping as required.
4.2.4 INVENTORY MIX VERSUS CASH FLOW AND PROFITABILITY

All respondents interviewed indicated that their supermarkets had slow moving stock. Twenty five percent of the supermarkets had slow to fast moving ratio of 60:40, fifty percent had 1:10 and twenty five percent 50:50 as depicted on figure 9. The first ratio (60:40) implied that the twenty five percent supermarkets had more slow moving stocks than first moving stocks and the last ratio (50:50) had slow moving stock equal to fast moving stocks. The large portion of slow moving stock indicates that the supermarkets might have experienced tight cash flow and huge losses because the funds were tied up in the stocks.

As part of management procedures twenty five percent of the supermarkets conducted physical stock counts quarterly with some counts being done daily, twenty five percent semi annually and further twenty five percent monthly. All the supermarkets which performed physical stock
count prepared management reports to highlight exceptional areas. However the twenty five percent supermarkets which did not conduct physical stock count through out the year as a procedural policy and control stated that the exercise would be too costly and instead hired personnel who performed both security role and stock movement checks.

All the supermarkets indicated that staff involved in handling inventories were trained on the job and were encouraged to report on the existence of slow moving items or any anomalies identified in the course of their work. Also the reports were indicated to prompt an immediate investigation to establish the type of action to be taken.

The study established that exceptional areas contained in report were discrepancies, slow moving stock, overstocking and stock out identified. The study revealed that discrepancies highlighted as causing the variances were investigated and corrected to ensure that there was conformity with the budget failure to which disciplinary action would be taken on the branch manager.

All supermarkets interviewed indicated that actions taken to correct the areas highlighted in the reports included

1. Slow moving stocks: Items were returned to the suppliers (where prior arrangement existed); the items were sold at reduced or cost price; the items were used in sales promotion; food products were sold to animal food manufactures; the items were offered as donations; and expired items were disposed after obtaining authority for clearance from the Nairobi City Council. The aim of these actions would be to liquidate the stuff or dispose
stuff to create space for stock. Thus liquidation of the stuff would minimize losses, improve cash flow in the supermarkets and enable the supermarket to have the right inventory mix and hence increase the available stock on the shelves as required by customers.

2. **Overstocking:** The overstocked items were distributed to other branches to ease overstocking and create space for storage. This procedure aimed at clearing space for storage of stock, minimizing the risk of shrinkage and obsolescence, improving the stock turnover rate and minimizing costs attributable to tied up funds. Thus the distribution done to avoid overstocking would enable the supermarkets to improve the inventory mix and increase available stocks on the shelves for the customer.

3. **Discrepancies:** Investigate the differences between physical and record data to establish the cause. The discrepancies could be wrong entries in the physical stock count or data, pilferage, theft or breakage.

4. **Stock out:** Incase of stock out identified urgent replenishment was sought from the central warehouse or other branches. In the absence of transferrable stock, suppliers would be asked to supply. Occasionally supplies were received at non-negotiated prices because of the urgency to avail stock on the shelves for the customer. The aim of this action was to minimize loss of sales and goodwill attributed to stock out and improve both profitability and liquidity.

From the above analyses the study established that supermarkets considered physical stock count as a very important procedure in the inventory management system which they had to follow very carefully and consistently. This supports Woolf’s (1997) emphasis on importance of...
inventories. The feedback from physical stock count was used in management of stock to guide
the supermarket in determining the inventory mix and then facilitate the choice of inventories.

4.2.5 INVENTORY MIX TO SUSTAIN PROFITABILITY AND LIQUIDITY

Figure 10: The effect of slow to fast stock moving ratio on profitability and liquidity

Twenty five percent of the supermarkets which said profitability was affected by inventory
management had estimated ratio of slow to fast moving ratio of 1:10. Twenty five percent of the
supermarket which said that liquidity was affected by inventory management had estimated
ratio of slow to fast moving stock of 60:40 and the remaining fifty percent which said that both
profitability and liquidity were affected by inventory management twenty five percent had
estimated ratio of slow to fast moving ratio of 1:10 and twenty five percent had 50:50

The following ways outlines the approach to establishing the correct mix of inventory that
would sustain optimal level of profitability and liquidity:
1. The system used by supermarkets to review usage of inventory (section 4.2.3) and demand (figure 6) would help to determine how much should be ordered depending on the slow to fast moving ratio, when it should be ordered and how much would be held in stock. This would lead to establishing right inventory mix between slow and fast moving stock.

2. The assessment of re-order levels by the supermarkets depended on whether the inventory system was computerized or not. Computerized systems monitor re-order levels and movement of stock more efficiently. Of the computerized inventory systems some had supermarkets' suppliers connected to their extranet and would prepare in advance to receive the goods as soon as re-order point was reached (attained). In the other computerized inventory systems the supermarkets, which applied JIT procurement approach for slow moving stock only ordered when there was need.

3. Turnover rates would be applied to see how many days the stock in each category of slow or fast moving would be held before sale. Inventory turnover ratio would bear the direction of profitability of a business based on sales volume.

4. The slow to fast moving stock would enable the supermarkets to determine the inventory mix that will enable enough stock to be on the shelves as required by the customers.

5. Supermarkets should ensure payments to the suppliers are made promptly so that they do not withhold stocks, which could lead to stock out.
Based on the above analyses this study suggests that an appropriate inventory mix between slow and fast moving stock which would sustain optimal level of profitability and liquidity could be:

An optimal inventory turnover, which would minimize stockholding period and the turnover rate, would then cause enough funds to be available to pay suppliers promptly.

In addition, optimal inventory turnover would enable the supermarkets to keep minimum slow moving stock. The policy of keeping slow moving stock at a minimum in the supermarkets would allow more of the fast moving stock to be available on the shelves for the customers at any time they walk in for shopping.

Suppliers’ payments on due dates would ensure regular and timely replenishment of goods.

The availability of stocks on the shelves for the customers whenever they require will then improve customer spending which would improve cash flow and liquidity.

This implies that for the supermarkets to operate an appropriate inventory mix between slow and fast moving stock effective inventory management must be in place.

4.3 SUMMARY

The following is the summary of the findings:

1. Fifty percent of the supermarkets did not have written manuals for policies and controls and twenty five percent did not have policies and controls in place to ensure procedures. Fifty percent of the supermarkets indicated to have individuals concerned with the procedures (systems analyst and operations manager) and fifty
percent did not. However of the fifty percent without individuals twenty five percent indicated having individuals assigned in branch responsible for the stores. The supermarkets, which had written manuals, were also computerized.

2. All the supermarkets indicated procedures applied to purchases and receipts. The mode of the purchase indicated was either on credit, or both cash and credit.

3. Seventy five percent of the supermarkets indicated re-order levels that depended on individuals and twenty five percent two to four weeks. To review the usage of inventory twenty five percent used periodic review system, twenty five percent perpetual inventory review and fifty percent did not review.

4. Supermarkets indicated experience of high demands in either Christmas or Easter seasons or back to school period like January, April and August.

5. All the supermarkets did not have sufficient inventory turnover yet only two indicated stock turnover ratios. All the supermarkets experienced shrinkage but twenty five percent had it more often. All the supermarkets employed physical safeguards against shrinkage.

6. The inventory turnover was indicated as even by fifty percent supermarket, twenty percent indicated fluctuation with mid and end month earnings, but twenty five percent indicated odd.

7. Although supermarkets experienced stock out experience, it was rare in all of them except for twenty five percent which indicated that it was frequent due to suppliers holding stock for non payment.

8. All the supermarkets indicated that influence and good supplier/supermarkets realtionship was of great advance to them.
9. All the supermarkets experienced slow moving stock but fifty percent estimated slow to fast moving ratio as 60:40 and 50:50 indicating the possibility of having huge amounts of funds tied up in the slow moving stocks and the high risk of shrinkage.

10. Factors considered to affect movement of stock by supermarkets were economy, customer taste, competition in the market, stock type and location.

11. The main management objective in supermarkets was indicated as customer satisfaction.

12. Management observation indicated that inventory management had effect on profitability and liquidity. The methods used to assess inventory performance by the supermarkets were ratio and trend analyses, except for twenty five percent which did not assess the performance.

13. All supermarkets except twenty five percent indicated that their sales and cost of sales, which had direct impact on profitability and liquidity, increased over the last five years. The twenty five percent sales and cost of sales fluctuated throughout the five-year period (years 2000 through 2004).

14. There were no responses on the supermarkets’ and industry’s turnover rates except for twenty five percent that indicated 21 days and 5% respectively.

15. All the supermarkets indicated physical stock count conducted at least once in a year except for twenty five percent, which had no physical stock count through the year. All the supermarkets, which did stock count, responded to whatever was highlighted by exceptional reports on the results.
16. All the supermarkets indicated that inventory costs, stock out costs and holding costs had direct influence on profitability and liquidity.
CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter sets out to summarize the findings of the study in relation to the objectives of this research, present conclusions, recommendations and the limitation of the study and give suggestions for further research in this area. The objectives of this study were: to establish the extent that inventory management affects the choice of inventories; to determine how the inventory mix between the slow and fast moving stock affects profitability and cash flow level; to find out an appropriate way of ensuring correct mix of inventory that will sustain optimal level of profitability and liquidity.

5.2 SUMMARY OF THE STUDY

5.2.1 Effects inventory management on choice on inventories

According to supermarkets interviewed, twenty five percent experienced stock out frequently due to suppliers holding stock because of non-payment. The supermarkets, which had suppliers connected to the extranet, occasionally suffered overstocking when more than one supplier replenished stocks in response to one automated order. The overstocking thus caused their funds to be tied up sometimes forcing them to revert to borrowing. The overstocking led to increase in shrinkage and obsolescence yet the right inventories to attract customer spending would miss from the shelves. Thus, the customers shifting to other supermarkets and loss of goodwill resulted. This shows that inventory management policies in place should be reviewed regularly to ensure controls are
compatible with the prevailing conditions to achieve the objective of having the right choice of inventories at the shelves to attract customer spending.

5.2.2 Effects of Inventory Mix on Cash Flow and Profitability

Some of the supermarkets had estimated ratio between slow and fast moving stock as 60:40 and 50:50. These ratios were supported by the fact that stock turnover ratio was not sufficient and the experience of shrinkage was very frequent. High estimated ratio between slow and fast moving stock as shown above implies that slow moving stock were held in larger portion than the fast moving stock which resulted in funds tied up, increased shrinkage and obsolescence. Funds tied up impacted on the cash flow and high shrinkage and obsolescence affected the profitability.

5.2.3 Suggestion of Stock Mix to sustain Optimal Level of Profitability and Liquidity

According to supermarkets, the appropriate way of how to determine the right or optimal inventory mix is by ensuring that slow moving items are kept at minimum and orders are made only when the items are sold. This would ensure that losses from shrinkage and obsolescence are kept at minimum and funds are available throughout to enable the supermarkets to have the right inventory mix. The supermarkets, which have experienced even inventory turnover with estimated ratio of slow to fast moving ratio as 1:10 considered color and brand while keeping only one piece of the expensive slow moving products per time. In addition, their policy is to buy all their products locally, which enables immediate replenishment/supply whenever the items are sold or customers, are interested in buying many items at once.
This approach enables optimal liquidity and profitability to be sustained.

5.3 CONCLUSIONS

After studying the data analysis, the researcher came up with research findings and concludes that inventory management directly impacts on profitability and liquidity in the large supermarkets in Nairobi. That is, the level of profitability and liquidity depend on how inventories are managed.

Procedures employed by different supermarkets were found to range from informal mechanisms without written manuals and non-computerized to computerized inventory management systems capable of tracking the movement of stocks and re-order levels.

From the results of this study it can be concluded that all the systems indicated that inventory management in place enables the choice of inventories so long as the supermarkets measure the movement of stock with respect to demand and as they ensure that the right inventories are available on the shelves for customer shopping at any time. Unavailability of stock when required by customers would result in customers shifting to other supermarkets, decline in customer spending, funds tied up on the slow moving stock and write-offs attributed to obsolescence and unlikely payments to suppliers on due dates. Suppliers would withhold stock due to non-payment and as a result, there will be stock out of some items in the supermarkets. The extent of the impact would therefore be losses and liquidity problems threatening the survival of the supermarket.
This study also revealed that inventory mix between slow and fast moving stock affects cash flow and profitability. According to the findings low inventory turnover ratio would imply slow movement of a particular product. The reduction in turnover rate would then increase stockholding of which part of it becomes stuff. The risk of losing items pegged to expiry dates and perishability, obsolescence, or dead stock would be a major problem with which to contend. These would all impact on the profitability and liquidity of the supermarkets showing that resources were not efficiently and effectively utilized.

However maintaining the volume of slow moving stock at minimum implies availability of funds and prompt payment of suppliers. The payments on due dates ensure prompt and regular supplies of stocks. In addition, the good suppliers/supermarkets relationship guarantees return of the slow moving stocks thus enabling the supermarkets to maintain optimal inventory mix.

The supermarkets that maintained the estimated slow to fast moving stock low seemed to be earning profits from suppliers’ working capital since they were holding only single units of each item and would replace them as soon as they were sold. The supermarkets rarely experienced stock out and shrinkage, the behavior of inventory turnover being even, and stock turnover ratio sufficient. The sound working capital and high profitability of the supermarkets in the category were attributed to the efficient effective inventory management system in place. This approach suggests the appropriate way to determine the inventory mix to sustain optimal level of profitability and liquidity.
5.4 RECOMMENDATIONS TO THE SUPERMARKETS

1. Supermarkets should be encouraged to have written manuals for inventory management to enable consistency and objective evaluation.

2. To minimize the level of slow moving items supermarkets should be encouraged to avoid importation. It would be more advisable to contract suppliers who import.

3. Supermarkets with computerized inventory systems should review the connection of suppliers to the extranet and put measures to ensure that only one supplier is able supply stock at anytime an automated order is raised.

4. When overstocking occurs, the affected supermarkets should explore the possibility of selling to smaller supermarkets in the rural areas at cost price. This approach would enable the supermarkets to have enough space for storage of other products and reduce the time funds would be held up in the overstocking.

5. The supermarkets should be encouraged to computerize the inventory management system to enhance efficiency and effectiveness.

5.5 LIMITATIONS OF THE STUDY

This research study had limitation, which could have influenced or affected the outcome of this study. Time was not enough for this type of study.
However, the limitation was not significant enough to affect the overall findings.

5.6 SUGGESTIONS FOR FURTHER RESEARCH

Further research can be done on:

1. The influence of procurement procedures on inventory management in supermarkets

2. The influence of management styles on inventory system in supermarkets

3. Effects of marketing on inventory management in supermarkets
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JON SCHREIBFEDER http://www.effectiveinventory.com/whatis.html


Letter to respondent

Dear Respondent

I am an MBA student in the department of Business Administration, School of Business, Kenyatta University.

I am carrying out a research on inventory management with more emphasis on the controls instituted to monitor movement and techniques employed by the large supermarkets in Nairobi to achieve this.

The research is being undertaken to fulfill the partial requirement of the degree of Master of Business Administration (MBA) of Kenyatta University.

I highly appreciate you providing responses to the attached questionnaire and I assure you that the information obtained from your organization will be used as an aggregate that the data will be used only for academic purposes and will be held confidentially.

Please allow me to collect the completed questionnaire on or before August 3, 2005. In case, you decide to mail the completed questionnaire address to the following:

P.O. Box 67578 – 00200 City Square, Nairobi OR roseanne.onyango@unon.org

The results of this study will be sent to you at the end of the study.

Thank you in advance for your valuable time and effort.

Yours Faithfully,

ROSEANNE ONYANGO
MBA STUDENT
Appendix 2: Questionnaire

Section A: Bio data of the respondent

Please tick as appropriate.

1. Gender:
   - [ ] Male
   - [ ] Female

2. Age:
   - [ ] 25 - 35
   - [ ] 36-45
   - [ ] 46-55
   - [ ] 56-65

3. Position held in the organization:
   - [ ] Purchasing Manager
   - [ ] Warehouse Manager
   - [ ] Merchandizing Manager
   - [ ] Others (specify) _______________________

4. How long (duration) have you worked in this organization?
   - [ ] Below 5 years
   - [ ] 5 to 10 years
   - [ ] 10 to 15 years
   - [ ] 16 or more years

5. Highest level of education obtained:
   - [ ] Secondary
   - [ ] Diploma
   - [ ] Degree
   - [ ] Others (specify)

6. Which appointment in your career is the current one?
   - [ ] First
   - [ ] Second
   - [ ] Third
   - [ ] Others (specify)

Section B: Data of the supermarket

1. Do you have a written manual containing the policies and procedures of inventory management?
   - [ ] Yes
   - [ ] No
2. Are there policies and controls in place to ensure compliance with procedures
   □ Yes  □ No

3. Is there a particular individual concerned with the procedures?
   □ Yes
   □ No
   □ Others (specify) ________________________

4. If yes to (3) above, who is the person? ________________________

5. Do these procedures apply to purchases?
   □ Yes  □ No

6. Do these procedures apply to receipts?
   □ Yes  □ No

7. What is the mode of inventory purchase?
   □ Cash  □ Credit

8. What is your re-order level (average)? ______________

9. What is the stock turnover (cost of sales/average stock) ratio? ______________

10. Is the stock turnover ratio sufficient?
    □ Yes  □ No

11. Do you normally experience shrinkage?
    □ Yes  □ No

12. If yes to (11) above, how often?
    □ Very frequently
    □ Rarely
    □ Not at all
13. What physical safeguards against shrinkage (manipulation of records, theft, pilferage, breakage or expiry) do you have?

- ☐ Ledgers
- ☐ Verification
- ☐ Stock taking
- ☐ Others (specify) ______________

14. When are these safeguards conducted?

- ☐ Before business starts
- ☐ At close of business
- ☐ During the business hours
- ☐ Others (specify) ______________

15. Do you have stock that is considered slow moving?

- ☐ Yes  ☐ No

16. What is your estimated ratio between slow and fast moving stock?

- Slow moving __________
- Fast moving __________

17. Rank factors which affect the movement of inventory by numbers 1 - 4

- ☐ Economy  ☐ Competition in the market
- ☐ Customer taste  ☐ Stock type
18. What is the system used by your supermarket to review usage of inventory?

- Periodic Review System
- Perpetual Inventory System
- Others (specify) ________________

19. How often does the supermarket experience stock-out?

- Very frequently
- Rarely
- Not at all

20. What do you consider to bring about the situation in (19) above?

- Non-compliance with policies
- Suppliers holding stock due to non-payment
- Non-focus on customer demand
- Any other ____________

21. How is the behavior of your inventory turnover?

- Even
- Odd
- Others (specify) ______

22. During which periods of the year do you experience high demands?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________
23. What do you consider as the main management objective?

☐ Customer satisfaction
☐ Profit maximization
☐ Adequate level of liquidity
☐ Others (Specify) ________________

24. How does your inventory management conform to the budget (plan)?

☐ Fair
☐ Good
☐ Very good
☐ Excellent

25. What is your turnover rate (average days)? _____________

26. What is the industry turnover rate (average days)? _____________

27. What other methods do you employ to assess inventory performance of the supermarket?

☐ Ratio Analysis
☐ Trend Analysis
☐ Others (specify)

28. What is your observation on inventory management?

☐ It affects profits
☐ It affects liquidity
☐ Others (specify)
29. Based on 28 how do you rank (a) sales and (b) costs of sales of the supermarket in the last five years?

2000

2001

2002

2003

2004
Appendix 3: Face-to-face Interview

1. How often do you conduct physical stock count?

2. After physical stock count, do you receive management reports to show the status (slow moving, breakages, expiry etc) of the physical stock count and the inventory records?

3. Which areas does the report highlight?

4. What action do you take to correct the highlighted areas?

5. Are the participants involved in handling inventory trained and encouraged to report/inform the management of the existence of slow moving items?

6. If yes to (5) above, does the management take action on information reported by staff handling inventories?

7. Does the location of the supermarket influence inventory management?

8. Does the relationship between the suppliers and supermarkets have influence on the inventory management?

9. Is the supermarket’s inventory system computerized?

10. If yes to (9) above, what benefits do you derive from computerization?

11. In the absence of physical stock unit count, how do you ascertain the correctness of the stock data?

12. How do you control your stock in the absence of stock count and computerized inventory system?

13. How many branches do you have as at this date?

14. How do the following costs / variables affect your profitability and liquidity?

   a) Ordering costs
b) Stock-outs

c) Inventory turnover
Appendix 4: Models and Ratios for This Study

1. Inventory Control Model:

The formula for EOQ model according to Horngren et al (2004)

\[
EOQ = \sqrt{\frac{2DP}{C}}
\]

Where

\( D \) = Demand in units for a specified period (on year for example)

\( P \) = Relevant ordering costs per purchase order

\( C \) = Relevant carrying costs of one unit in stock for the time period for \( D \) (one year)

Annual Requirement = Number of orders (Brigham 1986)
Quantity per order

Annual ordering cost = Number of orders \( \times \) cost per order

Average quantity in inventory = \( \frac{\text{Quantity per order}}{2} \)

Annual holding cost = Average quantity in inventory \( \times \) Annual carrying cost per product unit

Total annual cost of inventory policy = Annual Ordering Cost + Annual Holding Cost

According to Horngren et al (2004), only relevant costs are considered.

\[
RTC = \frac{D \times P + Q \times C}{Q} \quad \text{(Horngren et al 2004)}
\]

Where RTC = Relevant Total cost

\( Q \) = order quantity

Re-order point = Number of units sold \( \times \) Purchase-order lead time

Per unit of time
2 Inventory Turnover Model

Inventory model according to Brealey et al (2001)

\[
\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}
\]

Therefore a days sales of inventory = \(\frac{\text{Average inventory}}{\frac{\text{Cost of goods sold}}{365}}\)

3 Cash Conversion Cycle (according to Brealey et al 2001)

Cash conversion cycle = (inventory period + receivables period) – (accounts payables period)

4 Liquidity ratios (according to Van Horne 2002)

Current Ratio = \(\frac{\text{Current assets}}{\text{Current Liabilities}}\)

Quick ratio = \(\frac{\text{Current assets less inventories}}{\text{Current liabilities}}\)

Interval measure = \(\frac{\text{Current assets} - \text{inventory}}{\text{Average daily cash operating expenses}}\) (Pandey 2002)

5 Profitability Ratios

Gross profit margin = \(\frac{\text{Sales less cost of goods sold}}{\text{Sales}}\)

Gross Margin Return on Investment (GMROI)

\[= \frac{\text{Annual Gross Profit}}{\text{Average Inventory Investment}}\] (Schreiberfeder)
<p>| 1 | Acacia Supermarkets Limited – Kawangware Satellite, Naivasha Road | 52 | Mustard Supermarket – Eastleigh, Major Kinyanjui Street | 103 | Janamu Supermarket |
| 2 | Access Supermarket Kawangware | 53 | Muthaiga Mini Market Ltd - Limuru Road | 104 | Jawa’s Supermarket Ltd – Park Place Magadi Road |
| 3 | African grocers Limited – Hurlingham Shopping Centre | 54 | Muthaite Trading Co Ltd – Nairobi West, Muthaite Avenue | 105 | Jemu Supermarkets |
| 4 | Alliance Supermarket Ltd. Nairobi | 55 | Nairobi Wholesalers - Koinange St. | 106 | Jessica Supermarket &amp; Wholesale – Mombasa Road |
| 5 | Amici Supermarket | 56 | Naivasha Self Service Stores Ltd – Ronald Ngala Street | 107 | Jeska Supermarket Ltd – Benrose Hse Kangundo Road |
| 6 | Andrew Selection ltd - Base Hse, Outer Ring Rd | 57 | Nakumatt Holdings Ltd | 108 | Jey Supermarket |
| 7 | Armed Forces Canteen Organization – Eastleigh, Off Juja Road | 58 | New Westlands Stores Ltd – Waiyaki Way | 109 | Jojakis Supermarket - Naivasha Rd, Kawangware |
| 8 | Ashut Engineers Ltd - Loitaung Rd, Off Likoni Rd | 59 | Niches Ltd – South B, Chumbi Road | 110 | Jopamapa Provision store – Muhuni Hse, Mchumbi Road |
| 9 | Baraniki Investments Ltd - Waiithaka, Kikuyu Rd | 60 | Nine Niner Enterprises - Mau Rd | 111 | Joster Mini Market – General Waruingi Street |
| 10 | Barns Supermarket Ltd - Gaberone Rd | 61 | Nine To Nine Supermarkets Ltd – Diamond Plaza, Parklands | 112 | Juja Road Fancy Store Ltd – Pangani |
| 11 | Betccam Savers Supermarkets | 62 | Njuki Wholesalers - Off Waiyaki Way | 113 | K &amp; A Shelf Selection Store Ltd – Koinange Street |
| 12 | Broadway Supermarkets – Thika Road | 63 | Noa Supermarket – Githurai, Progressive Kimbo | 114 | Kaaga Mini Market Ltd |
| 13 | Builders Supermarkets Limited – Sheikh Karume Road | 64 | Nova Supermarkets Ltd – Komarock/Kayole Road | 115 | Kahawa Gateway Supermarket |
| 14 | Buru Buru Mini Market – web Hotel Building, Mumias Road | 65 | Nyeri Supermarkets Ltd | 116 | Park &amp; Shop Supermarket Ltd – Super House, Outering Road |
| 15 | Caledonian Supermarkets Ltd - Dennis Pritt Rd* | 66 | Ongari Rongai Supermarkets | 117 | Parklands Pricerite Ltd - Parklands Road |
| 16 | Camesh Investments Ltd - Muigai Kenyatta Rd | 67 | Tusker Mattresses Ltd | 118 | Pawn Industries Ltd |
| 17 | Centraline Supermarkets – 2nd Avenue Street, Eastleigh | 68 | Uchumi Supermarkets Ltd | 119 | Peponi grocer Ltd – Peponi Road |
| 18 | Chandarana Supermarkets Limited – Yaya Centre Ground Floor (Also, in Parklands) | 69 | Uchuzi Supermarket Ltd | 120 | Parkway Stores Ltd - Uhuru Highway |
| 19 | City Mattresses Limited – Lusaka Road, Opposite City Stadium | 70 | Ukwala Supermarket | 121 | Rainbow Self Selection Store - Off Moi Drv |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Business Name</th>
<th>Nearest Road</th>
<th>Suburb</th>
<th>Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Clean Way Ltd – Valley Arcade, Gitanga Rd</td>
<td>Ukwala Variety Stores Ltd</td>
<td>71</td>
<td>Ngong Road</td>
</tr>
<tr>
<td>21</td>
<td>Clear Cut Supermarket Ltd – Kendi House, Dagoreti Corner</td>
<td>Umoja Mini Market – Outering Road</td>
<td>72</td>
<td>Ridgeways Supermarket – Ridgeways Road Off Kiambu Road</td>
</tr>
<tr>
<td>22</td>
<td>Continental Supermarket Ltd – ABC Place, Waiyaki Way</td>
<td>Uncle Jim’s Supermarket – Huruma Shopping Centre</td>
<td>73</td>
<td>Rikana Supermarkets - off Outering Road</td>
</tr>
<tr>
<td>23</td>
<td>Corner Supermarket _ Off Moi Drive</td>
<td>Uthiru Wayside Supermarket – Naivasha Road</td>
<td>74</td>
<td>Rosjam Supermarkets – South B Shopping Centre</td>
</tr>
<tr>
<td>24</td>
<td>Country Mattresses Ltd – Manam Building, Tom Mboya Street</td>
<td>Vantage Supermarket Ltd – Ruaraka/Garden Estate Road</td>
<td>75</td>
<td>Rupam Corner Traders Ltd - Amanai Plazza, 3rd Parklands Av</td>
</tr>
<tr>
<td>25</td>
<td>Crosby Supermarket Ltd - The Mall Base Flr, Chiromo Rd</td>
<td>Vishal Kenya Ltd – Ronald Ngala Street</td>
<td>76</td>
<td>Safeway Hypermarkets Ltd – Buru Buru Shopping Centre</td>
</tr>
<tr>
<td>26</td>
<td>Crown Supermarkets Ltd</td>
<td>Wamason Supermarket Ltd - Nairobi</td>
<td>77</td>
<td>Sai General Supply - Nyatatu Hse, Gr Fl, Argwings Kodhek Rd.</td>
</tr>
<tr>
<td>27</td>
<td>Cyfra Enterprises – Rhapta Rd/ Njema Rd</td>
<td>Wananchi Supermarket</td>
<td>78</td>
<td>Sainsbury self services Stores Ltd – Lavington Shopping Centre</td>
</tr>
<tr>
<td>28</td>
<td>Deepak Cash &amp; Carry Ltd – Ole Shapara Avenue</td>
<td>Westlands General Stores Ltd – Mpaka Road</td>
<td>79</td>
<td>Samga Supermarket - Kamiti Rd</td>
</tr>
<tr>
<td>29</td>
<td>Discount Supermarket – Thika Rd</td>
<td>Whitestar Supermarket</td>
<td>80</td>
<td>Sakim Supermarket</td>
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<tr>
<td>31</td>
<td>Eastleigh Mattresses Ltd – River Rd</td>
<td>Woolmatt Ltd – development Has, Moi Avenue</td>
<td>82</td>
<td>Savemore Supermarket - South C, Muhoho Avenue</td>
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<tr>
<td>32</td>
<td>Kaka Self Service Ltd</td>
<td>Yaya Selection Ltd – Diamond Plaza</td>
<td>83</td>
<td>Schilada Supermarkets Ltd – Thika Road</td>
</tr>
<tr>
<td>33</td>
<td>Kalumos Trading Co Ltd</td>
<td>Yetu Supermarket &amp; Distributions, Nairobi</td>
<td>84</td>
<td>Select ‘N’ Pay Supermarket Ltd – Odyssey Plaza, Mukoma Road</td>
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<tr>
<td>34</td>
<td>Kanyaki Supermarket – Tusker House, Ronald Ngala Street</td>
<td>Ebrahim &amp; Co Ltd – Moi Avenue</td>
<td>85</td>
<td>Select N pay Supermarket Ltd - Diamond Plaza, Highridge Shopping Centre</td>
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<tr>
<td>35</td>
<td>Karen Supermarkets</td>
<td>Esajo Supermarket – Githurai, Off Thika Rd</td>
<td>86</td>
<td>Shoppers Paradise – Esso Plaza, Muthaiga</td>
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<tr>
<td>36</td>
<td>Kenton Supermarket – Kawangware Shopping Centre</td>
<td>Fairdeal shop &amp; Save Ltd – Rahimitulla Trust Bldg, Tom Mboya St</td>
<td>87</td>
<td>Shoppers Paradise Excement Stores - Westlands, Mpaka Rd</td>
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<tr>
<td>37</td>
<td>Kihara Traders – Ngong Road</td>
<td>Fairlane Supermarkets Ltd – Fairlane Hse, Mbagathi Rd</td>
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<td>South ‘C’ Supermarket, Muhoho Rd</td>
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<td>38</td>
<td>Kilimanjaro Supermarket Ltd</td>
<td>Fairrose supermarket Ltd – Chai House, Koinange St</td>
<td>89</td>
<td>Spring Valley Supermarket (1979) – Lower Kabele Road</td>
</tr>
<tr>
<td>No.</td>
<td>Name of Supermarket</td>
<td>Street Address</td>
<td>No.</td>
<td>Name of Supermarket</td>
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<td>-----------------------------------------------------</td>
<td>-----</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>39</td>
<td>Lady-Wood Farm Shop Ltd</td>
<td>Westlands Arc, Chiromo</td>
<td>141</td>
<td>Slagen Enterprises Ltd</td>
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<tr>
<td>40</td>
<td>Leadway Supermarket Ltd – Thika Road</td>
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<td>142</td>
<td>Star Supermarket Ltd</td>
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<td>41</td>
<td>Lucky Stop Supermarket - Nairobi</td>
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<td>143</td>
<td>Starehe Supermarkets</td>
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<tr>
<td>42</td>
<td>Majic Super Stores Ltd - Nairobi</td>
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<td>144</td>
<td>Stellar Supermarket Ltd</td>
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<tr>
<td>43</td>
<td>Makro Supermarket Ltd – Mfangamano Street</td>
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<td>Sterling Supermarket – Mfangano Street</td>
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<td>44</td>
<td>Marketways Ltd – Gitanga Road</td>
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<td>Stuarts Supermarket</td>
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<tr>
<td>45</td>
<td>Mega Market Ltd - Mfangano St.</td>
<td></td>
<td>147</td>
<td>Sunshine Supermarket – Ngara Road</td>
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<tr>
<td>46</td>
<td>Mesora Supermarket Ltd – Buru Buru Phase I</td>
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<td>148</td>
<td>Susy Supermarket – Eastleigh Section III</td>
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<td>47</td>
<td>Metro Cash &amp; Carry (K) – Mombasa Road</td>
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<td>149</td>
<td>Supervalue Ltd – hurlingham Shopping Centre</td>
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<td>48</td>
<td>Mic Food Industries – Eastleigh Section III</td>
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<td>150</td>
<td>Tinara Supermarket Ltd</td>
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<tr>
<td>49</td>
<td>Midas Touch Supermarket Ltd – Vumira House South B</td>
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<td>151</td>
<td>Toyo Industries Ltd – Masari Road</td>
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<tr>
<td>50</td>
<td>Mulika Mini Market – off Thika Road</td>
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<td>152</td>
<td>Trolley &amp; Baskets – Kasuku Centre</td>
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<tr>
<td>51</td>
<td>Mumsies Supermarket – Mercantile House, Koinange Street</td>
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<td>153</td>
<td>Woolworths – Yaya Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>154</td>
<td>Sheela</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>155</td>
<td>Tristar</td>
</tr>
</tbody>
</table>
Appendix 6: Large Supermarkets in Nairobi

|    |    |                          |    |                          |    |                          |    |                          |    |                          |    |                          |    |                          |    |                          |    |                          |    |
|----|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|----|--------------------------|
| 2  | Nakumatt| Mega Market Ltd     | 12 | Mega Market Ltd           | 13 | Fairdeal Shop & Save Ltd | 14 | City Mattresses Ltd       | 15 | Metro Cash & Carry        | 16 | Sheela                   | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 3  | Tusker Mattresses | Fairdeal Shop & Save Ltd | 13 | Fairdeal Shop & Save Ltd | 14 | City Mattresses Ltd       | 15 | Metro Cash & Carry        | 16 | Sheela                   | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 4  | Ukwala | City Mattresses Ltd    | 14 | City Mattresses Ltd       | 15 | Metro Cash & Carry        | 16 | Sheela                   | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 5  | Select N Pay | Metro Cash & Carry | 15 | Metro Cash & Carry        | 16 | Sheela                   | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 6  | Mesora | Sheela                  | 16 | Sheela                   | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 7  | Jack & Jill | Woolworths           | 17 | Woolworths               | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 8  | Fairlane | Ebrahim & Co. Ltd    | 18 | Ebrahim & Co. Ltd        | 19 | Rikana                   |
| 9  | Safeway | Rikana                 | 19 | Rikana                   |
| 10 | Chandarana | Tristar             | 20 | Tristar                 |

Appendix 7: The Selected Supermarkets in Nairobi

<table>
<thead>
<tr>
<th></th>
<th>Nairobi</th>
<th>Mombasa</th>
<th>Kisumu</th>
<th>Nakuru</th>
<th>Eldoret</th>
<th>Karatina</th>
<th>Meru</th>
<th>Ongata R</th>
<th>Kampala</th>
<th>Branches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uchumi</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Nakumatt</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Tusker M.</td>
<td>8</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Ukwala</td>
<td>5</td>
<td></td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
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<tr>
<td>Total</td>
<td>35</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>53</td>
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Appendix 8: Time Frame

The research study is estimated to take a period of 28 weeks (starting February 2004)

Activity A – 8 weeks: Choose a research topic, formulate research problem, set research objectives and hypothesis, and develop research methodology and submit research proposal.

Activity B - 4 weeks: Literature Review in the area of Inventory Management

Activity C - 4 weeks: Develop data collection instruments and pilot testing

Activity D - 4 weeks: Dropping data collection instruments and data collection and face-to-face interview

Activity E - 4 weeks: Analyze data collected

Activity F - 4 weeks: Report writing, binding and submission of research report
## Appendix 9: Study Budget

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>Amount In KES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Printer</td>
<td>5000.00</td>
</tr>
<tr>
<td>Access to data</td>
<td>Transport – fuel</td>
<td>30,000.00</td>
</tr>
<tr>
<td></td>
<td>1,000 × 30 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assistant:</td>
<td>4,000.00</td>
</tr>
<tr>
<td></td>
<td>200 × 20 days</td>
<td></td>
</tr>
<tr>
<td>Stationery and resource material</td>
<td>Stationery, photocopying and resource material</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Printing and Binding</td>
<td></td>
<td>6,000.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50,000.00</td>
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</tbody>
</table>