



# THE EFFECT OF INVENTORY MANAGEMENT ON THE INVENTORY TURNOVER RATIO OF ORGANIZATION” CASE OF ADMA

RUZIGANA UMUTONI ANGELE

## ABSTRACT

The main purpose of this research was to analyze Inventory Management and inventory turnover ratio case of ADMA. The research guided by the following specific objectives: i) Analyze the effect of lean manufacturing on lead time, ii) Study the effect of bulk purchase on cost of goods sold and iii) Examine the effect of demand forecasting on average inventory. Descriptive survey used in this study to collect information. The total population for this study was 200 Person from whom a sample of 103 respondents calculated using Yamane formula. The purposive sampling technique used to select the participants. Data collected using questionnaire and analyzed using descriptive statistics mean and standard

deviation. The significant change in inventory turnover ratio due to the change of Lean manufacturing, because of the Sig. value is 0.021, which is less than the acceptable value of 0.05. The significant change in inventory turnover ratio due to the Bulk purchase change, because of the Sig. value is 0.017, which is less than the acceptable value of 0.05. The significant change in inventory turnover ratio due to the Inventory forecasting change, because of the Sig. value is 0.038, which is less than the acceptable value of 0.05.

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## CHAPTER ONE:

### GENERAL INTRODUCTION

#### Introduction

The study was about inventory management and inventory turnover ratio of manufacturing firms in Rwanda. This chapter deals with the background, statement of the problem, purpose and objectives of the study, research questions, and scope of the study, significance of study.

#### Background of the study

Over the years the nature of competition has changed to the extent that companies no longer compete against each other on the basis of quality as traditionally practiced in the 80`s (Fawcett, 2014). However the new sources of business competition link their operation with their inventory partners; suppliers, distributors, wholesalers, retailers and end customers (Petrovic, 2010). Being able to create business relationships with customers, suppliers and other strategic partners anchored on trust and long term commitment then becomes a crucial competitive parameter (Mattson, 2012). For this and other factors like shorter product lifecycle and customer expectation, businesses have had to invest and re-focus greater attention on relationship with customers and suppliers. Consequently an organization inventory has become a strategic agenda driving decision making at senior

management level. In the 1990s organizations began to realize that it is not enough to improve efficiencies within an organization but their whole inventory has to be made competitive. The understanding and practicing of inventory management practices has become an essential for staying competitive in the global market and for enhancing profitability (Storey, 2010). Alvarado and Kotzab (2010) focused on inter-organizational system use, core competencies, and elimination of excess inventory through postponement, as inventory management practices. Using factor analysis, Tanet al. (2012) identified: supply chain integration, information sharing, customer service management, geographic proximity, and JIT capability, as the key aspects of inventory management practice. Lee (2014) in his case study based research identified five practices at the supply chain level that are a key to creating supply chain responsiveness. They include: outsourcing, strategic supplier partnerships, customer relationships, information sharing, and product modularity. Inventory practices impact not only overall organizational performance, but also competitive advantage of an organization.

Rwanda manufacturing industry is still small but growing as it contributed about 17 % to the country's GDP in 2019. The sector is characterized by gradual diversification from basic manufacturing

to more value-adding activities in other sub-sectors (RDB, 2012)

Researcher choose ADMA as case of study and ADMA International Ltd was established in 2003 to serve the Rwandan market mainly, ADMA has acquired superb and long reputation history as a private biscuits manufacturer company. They bake unique and quality biscuits to satisfy people of different ages and are committed to continuing to amazing our clientele with reasonably priced products across Rwanda and East Africa.

## 1.2. Statement of the problem

Effective inventory flow management in supply chains is one of the key factors for success. The challenge in managing inventory is to balance the supply of inventory with demand. the costs included in the acquisition cost, the valuation basis used for items in inventory, the frequency with which inventory computations occur, perpetual or periodic and the cost flow assumption used to trace the movement of costs into and out of inventory, which doesn't necessarily represent physical flow of inventory. Inefficiency is also challenge to inventory management where Managing inventory manually is a cumbersome and tedious process. Even the routine tasks become slower than they should be. As companies scale up, the process becomes more inefficient and slow. Manual inventory management becomes even more

challenging to implement across multiple warehouse locations. Inefficient inventory management slows down operations.

Overstocking can impact the profitability of a business which is also bad. This is because more stock is bought than being sold. Management of inventory to stock the correct quantity of items is essential to a company's financial well-being. Overstocking also results in the buildup of obsolete stock. This is the material that has been bought or stocked in excess and is no longer in demand.

Understocking can slow down production or even bring it to a halt. Not utilizing the available warehouse space is also money wasted. Improper inventory management does not make the best use of all the available warehousing space that the company is paying for or bearing overheads on.

Lack of trend forecasting, Trend forecasting is essential to managing a business. Projections and forecasts for inventory stocks are accurate when based on actual numbers and trends. Manual systems cannot quickly deliver summaries and reports. Inaccurate forecasting of trends could also lead to the company not anticipating seasonal rises and falls in demand. Lack of historical data to forecast trends is essential to avoid both overstocking and understocking.

### 1.3. Purpose of the study

The purpose of this research to analyzed the effect of inventory management and inventory turnover Ratio.

### 1.4 Objectives of the Study

This study guided by the following objectives:

#### 1.4.1 General Objective

The reason of this research become to find out the effect of inventory management and inventory turnover Ratio case of ADMA

#### 1.4.2 Specific objective

- a. Analyze the effect of lean manufacturing on lead time
- b. Study the effect of bulk purchase on cost of goods sold
- c. Examine the effect of demand forecasting on average inventory

#### 1.4 Researcher question

- a. Is there any effect of lean manufacturing on lead time?
- b. Does bulk purchase have effect on cost of goods sold?
- c. Is there any effect of demand forecasting on average inventory?

#### 1.5 hypothesis

- a. There is an effect of lean manufacturing on lead time
- b. There is an effect bulk purchase have effect on cost of goods sold
- c. there any effect of demand forecasting on average inventory

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0. Introduction

The chapter review as part of this research provides theoretical review of the dependent and independent variable. On the other hand, it provided the review of what other author have written on inventory management and inventory turnover ratio in manufacturing companies.

#### 2.1 Conceptual review

A conceptual framework is important to a researcher because it helps in limiting the scope of data relevant to the study by focusing on specific variables and viewpoint. As defined by Cherry (2015) concept as a fixed principle that has been developed to elucidate some characteristic of the natural world. A conceptual framework should reveal an understanding of concepts that are relevant to the research topic. The concepts reviewed for this study was based on the relevant theories that explain Inventory management, and inventory turnover ratio.

### 2.1.1 Inventory Management

According to Chase, Jacobs and Aquilano (2004), inventory is the stock of any item or resource used in an organization. An inventory system is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained, when stock should be replenished, and how large orders should be. Finally, Pycraft et al (2000) defined inventory or stock as “the stored accumulation of material resources in transformation system. So, a manufacturing company was hold stocks of materials, a tax office hold stocks of information and a theme park hold stocks of customer.

### 2.1.2 Inventory Turnover ratio

Inventory turnover ratio showing how many times a company's inventory is sold and replaced over a period of time (Padachi, 2006). Inventory turnover indicates the efficiency of the firm in producing and selling its products (Manasseh, 2007). The importance of inventory turnover is to indicate how rapidly the inventory is turning into receivables through sales. Generally, a high turnover is indicative of good inventory management. A low inventory turnover implies excessive inventory levels than warranted by sales activities, slow moving or obsolete inventory. However, a relatively high inventory turnover may be a result of low

levels of inventory resulted in frequent stock outs; the firm may be living from hand to mouth. The turnover al- so be high if the firm replenishes the inventory in small batches (Salawati, 2012).

The need to maintain inventory of raw materials, work in progress, loose tools and other components is to ensure that there is enough safety stock. Companies should however not keep large inventory for safety purposes to reduce the cost of operations and of maintaining inventory. In the recent past, companies have changed their strategies in inventory management by maintaining low levels of inventory hence the adoption of just in time (J-I-T) system. This system is a situation where inventory is only acquired when needed (Kolias et al., 2011).

The inventory turnover ratio is a key measure for evaluating just how efficient management is at managing company inventory and generating sales from it. It is calculated by dividing the cost of goods by the average inventory. Usually, a higher inventory turnover ratio is preferred, as it indicates that more sales are being generated given a certain amount of inventory. Alternatively, for a given amount of sales, using fewer inventories to do so improved the ratio. Sometimes a very high inventory ratio could result in lost sales, as there are not enough inventories to meet demand. It is always important to compare the inventory turnover ratio to the industry benchmark to asses if a company is

successfully managing its inventory (Manasseh, 2007).

### **2.1.1. Inventory forecasting**

Inventory control has become an important component in supply chain management. One of the critical success factors in inventory management is accurate inventory forecasting. Many researchers had use different approaches' to generate forecast of product demand for inventory control purpose. According to Kerkanen et al.(2009), inventory forecasting is commonly applied in companies that operate in consumer markets. When demand patterns are relatively smooth and continuous, demand forecasts based on historical demand are usually quite accurate. Success stories about inventory forecasting typically report lower inventory levels and improved customer service

## **2.2. Theoretical review**

A literature review is Theories which are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the

structure that can hold or support a theory of a research study.

### **2.2. 1 Transaction Cost Analysis theory**

According to Hall (2014) Transaction Cost Analysis (TCA) is a theory that guarantees expenses of the supply chain are maintained to a minimal level TCA was widely adopted in a number of areas, specifically in the study of economics and organizational structures and performance In the beginning of 1970s, the mathematicians and economist, Williamson, integrated TCA into the model of general equilibrium and established his transaction costs economics in the novel theory of an organization. Williamson (2015) argued that firms can reduce their costs of transaction via vertical integration, as well as enhancing the degree trust simultaneously.

### **2.2.2 Trade-Off Theory**

This theory was proposed by Myers (1984). Trade-off model shows that a firm determines its optimal level of holding cash based on a comparison of the marginal costs and the benefits of holding cash. Investing heavily in current assets in certainty translate to low ROA of the firm since over investing in current assets was not bring sufficient returns. The most crucial goal of a firm is to maximize profits but it also has to ensure that it maintains favorable liquidity at all times. An attempt to increase profits by writing down liquidity

can result in detrimental results to the firm (Shin & Soenen, 1998).

economic order quantity (EOQ) model that seeks to optimize the quantity of any individual item ordered

### **2.2.3 Operating Cycle Theory**

Richards and Laughlin (1980) developed this theoretical approach where they focused their attention at looking at management of working capital and its individual elements. The liquidity flow concept development is through the extension of the analysis of static balance sheet to identify the capability of liquidation coverage of the value including measures of income statement of the operating activity of a firm. Specifically, receivable accounts and measures of the inventory turnover when incorporated into the concept of operating cycle gives a more precise perception of management of liquidity than the solvency indicators which are the current and acid taste ratio.

### **2.2.4. Lean theory**

Heizer and Render (2016) indicate that “inventory management or “inventory planning and control” refers to the ongoing provision of standard items with independent demand, where some speculative quantity should always be on hand. Lean theory therefore focuses on optimization of costs in inventory systems. It is posited that through this theory, decisions on manufacturing, warehousing, and general supply chain concerns can be expedited (Tempelmeier, 2011). The theory builds upon the



## 2.3 Empirical studies of inventory management

Researcher reviewed works done by other researcher related to the same topic with reasons of relate theoretical literature reviews of another researcher.

### 2.3.1 Effect lean manufacturing on lead time

Jelena Kurilova-Pališaitienė (2018) investigated on Lean manufacturing, Reducing Process Lead

Time. When analyzing the case companies' process lead times, it was found that there is a need to reduce waiting times, which account for 95 to 99 per cent of process lead times at three of the four companies. To improve remanufacturing process efficiency and reduce remanufacturing process lead Time six lean practices are suggested: product families; layout for continuous flow; cross functional teams; standard operating procedures; and supplier partnerships. The suggested lean practices have a key focus on reducing waiting time since it prolongs the process lead time

### 2.3.2 Effect of bulk purchase on cost of goods sold

Lingyan Qu (2014), investigated the bulk purchase, cost of goods sold in china and he concluded that the ability to ship oversized goods without breaking them down into smaller shipments, purchasing at bulk you reduced both your packaging and your

waste and this automatically affect price of your product. Buying in bulk removes the need for unnecessary packaging which also affect cost of goods sold. Bulk goods require less overall transportation because there are less packaging components that must be produced and transported before to being filled. The transportation of bulk products is more efficient because they can be packed more densely on a truck and bulk is cheaper than buying in a traditional because you aren't paying for excessive packaging.

### 2.3.3 Effect of demand forecasting on average inventory

Gaurav Chawla (2007) Demand Forecasting and Inventory Management for Spare Parts, by reporting on the findings the company has seen increased costs with a lower service level. Therefore, the aim of this project was to improve the demand forecast accuracy and the spare parts service level of the company while optimizing inventory costs. For this purpose, we used SKU classification for demand categorization and inventory control. With these categorizations, we then allocate the recommended demand forecasting techniques and optimize the inventory levels of the company. By following these processes, we achieved an improvement between 7% to 14% in forecasting accuracy measured by the Root Mean Squared Error (RMSE). We could also gain up

to 3% improvement in service level leading to \$1.3 M additional revenue opportunity.

#### **2.4. Research Gap**

The past researches indicated that the adoption and effective implementation of inventory management techniques impact positively the performance of manufacturing firms. And all researchers focused on other countries such as Greece, Malaysia, Kenya, and Ghana, no one focused on manufacturing companies worked in Rwanda during COVID-19 period. The researcher in this study has put emphasis on inventory management and inventory turnover companies in Rwanda specifically ADMA as a case study during pandemic. This research study aims at filling these knowledge research gaps.

### **CHAPTER THREE:**

#### **RESEARCH METHODOLOGY**

##### **3.0 Introduction**

Research methodology is a systematic technique used to gather information both from the field (primary records) and from other resources (secondary

information). The observe used to explain how the required data became received, from wherein, how pattern turned into taken, techniques of statistics collection and the way information had been analyzed. The essential items dealt with consist of the research design, target population, sample layout, facts collection methods, statistics evaluation strategies, and ethical consideration.

##### **3.1. Research Design**

Research design is a plan and structure of investigation to obtain answers to research questions. The have a look at used descriptive research design. This form of research design aims at producing records after the incident has occurred. The studies layout looked at the reasons why the state of affairs behaves the manner it turned into. Both primary were the main sources of data to be used in the study the layout exploited quantitative approaches. Quantitative tactics involved use of descriptive records generated with frequency tables, graphs, and Charts. These

processes were followed to allow the researcher get and examine relevant data concerning human being's reviews about the position of Effect of inventory management on the inventory turnover ratio like ADMA.

Data became analyzed with the use of a statistical package for social sciences (SPSS).

### 3.2. Study population

Study population is a whole set of individuals, instances or objects with a few not unusual observable characteristics (Young, 2003). The researcher acquired information from ADMA the researcher concerned these categories in the examine due to the fact I believe that they possess the important examine fact has 200.

### 3.3. Sample size

Sample size is part of the population that the researcher chooses to use in a research as a representation of the total population. The population of the study selected using Yamane

$$\text{Formula } n = \frac{N}{1+N(e)^2} (\text{Yamane 1976})$$

whereby n is the sample size, N is the total population and

e is the sampling error (0.05)

$$= 200 / 1 + 200 * (0.05)^2 = 104$$

### 3.4. Sampling technique

Kothari (2007) defines sampling design/technique as a definite plan for obtaining a sample from the sampling frame. The sampling techniques used be purposive sampling technique, whereby the participant of the research was selected based on the purpose of this research.

### 3.5. Data collection method

Both primary and secondary data were the main sources of data to be used in the study. For the secondary data, the researcher reviewed books, articles and documents from university library and other libraries in Kigali related to the topic under the study; secondly the researcher used questionnaire as a major tool of primary data collection.

### 3.5.1 Questionnaire

The questionnaire included closed-ended questions where respondents chose from the alternative answers. Questionnaire is chosen because of the following advantages: it saves time since many respondents can be dealt with at once, it allows easy analysis of data collected, it is easy to administer when the sample is literate.

In designing questionnaires, the researcher used Likert scale to measure the respondents' views on the critical factors of inventory management and inventory turnover ratio. The same rating scale also used for the factors of performance of public institutions. Using Likert Scale, the respondent indicated whether he/she strongly agree (SA), agree (A), disagree (D), or strongly disagree (SD).

### 3.6. Reliability and validity

Mugenda & Mugenda (2008), emphasized that reliability is done using Cronbach's Alpha Model on SPSS and that consistency is the

assessment of the degree to which study instrument gives reliable results or data after repetitive trials. Reliability is the consistency of measurement, or the extent to which an instrument measures the same method every time it is used under the same circumstance with the similar subject (Bryman, 2015). The questionnaire's reliability was statistically measured by measuring the internal consistency using Cronbach's alpha. Cronbach alpha, which is a measure of internal consistency, was used to test the internal reliability of the measurement instrument.

### 3.7. Data processing

Raw data transformed into meaningful interpreted report using different techniques. In order to get quality information, there is generally need for standard checking so that the researcher could end up with realistic data, which clearly reflect the depicted situation. Thus, stand checking done through editing, coding, and tabulation. This is done in order to reduce detailed data to

manageable proportions through editing of data, the coding the data and make the tabulation of data.

### 3.8. Data analysis

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire population or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability (spread). Measures of central tendency include the mean, median, and mode, while measures of variability include standard deviation, variance, minimum and maximum variables. Data analysis done based on descriptive statistics particularly means and standard deviation.

### 3.9. Description of Descriptive statistics

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire population or a sample of a population. Descriptive statistics are broken down into measures

of central tendency and measures of variability (spread). Measures of central tendency include the mean, median, and mode, while measures of variability include standard deviation, variance, minimum and maximum variables.

$1.0 \leq \mu \leq 1.8$ : Very low mean i.e the fact is not apparent

$1.9 \leq \mu \leq 2.6$ : Low mean i.e the fact appears less

$2.7 \leq \mu \leq 3.4$ : Neutrality

$3.5 \leq \mu \leq 4.2$ : High mean i.e the fact appears more

heterogeneity  
of responses

### 3.10. Anticipated of Limitation

Different business companies don't allow to researchers to get confidential information especially those related to the financial status. In this case the researcher decided to measure the business success without using financial information.

Even though the data collection exercise was successful, the researcher met some challenges. First

of all, most respondents complained of not having enough time to answer the questionnaires and this compelled to the researcher to exercise a lot of patience as it is a usual routine while conducting a research. Therefore the researcher had to be flexible in order to counter any reluctance on the part of some respondents until the completion of exercise. The researcher provided further explanations to respondents with some direct and probing questions to get quality data related to the topic. Financial constraint arose since research required money for printing and transport.

However, the researcher tried to minimize the costs as lowest as possible.

### **3.11. Ethical Consideration**

The researcher ensured that all respondents were given free to participate and contribute voluntarily to the study, and all respondents accepted easily to participate. In addition, the researcher ensured that necessary research authorities were consulted (University of Kigali and ADMA authorities) and permission

granted and due explanations given to the respondents before commencement of the study.

All the rights of respondent were respected. A researcher explained about the research and its objectives. Different languages were used where necessary to facilitate respondents.

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

#### **4.0. Introduction**

This chapter presents the findings from primary data which is presented in form of descriptive statistics. The chapter is based on the findings from the respondents who are 104 those all staff who were given a questionnaire and both responded to the same questionnaire. The analysis and interpretation was based on the information collected from ADMA where the purposive sampling was used to select the important respondents.

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	1.629	.274		5.945	.000
INDV1	.127	.103	.126	1.232	.021
INDV2	.053	.065	.080	.815	.017
INDIV3	.166	.079	.214	2.099	.038

Lean manufacturing have P value of 0.021 then we choose alternative hypothesis which mean The significant change in inventory turnover ratio due to the change of Lean manufacturing, because of the Sig. value is 0.021, which is less than the acceptable value of 0.05.

Bulk purchase have P value 0.017 then we choose alternative hypothesis which mean The significant change in inventory turnover ratio due to the Bulk purchase change, because of the Sig. value is 0.017, which is less than the acceptable value of 0.05.

Inventory forecasting have P value 0.038 then we choose alternative hypothesis which mean The significant change in inventory turnover ratio due to the Inventory forecasting change, because of the Sig. value is 0.038, which is less than the acceptable value of 0.05.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1. Introduction**

This chapter summarizes the major findings presented in chapter four in line with the research objectives. The objectives of the study were achieved by answering the research questions thereafter the conclusion was made from the research findings. The research findings and the general conclusion were based on to give recommendation. The purpose of this study was to examine effect of inventory management on the inventory turnover ratio of organization Industry.

#### **5.2. Summary of findings**

The study was conducted on the basis of three objectives which are to identify approaches to the effect of inventory forecasting on average inventory, lean manufacturing on lead time and bulk purchase on cost of goods sold.



For the objective one: to study effect of lean manufacturing on lead time, the significant change in inventory turnover ratio due to the change of Lean manufacturing because of the Sig. value is 0.021, which is less than the acceptable value of 0.05. More productivity with less waste and better quality ultimately makes for a more profitable company. As manufacturing processes are streamlined, businesses can better respond to fluctuations in demand and other market variables, resulting in fewer delays and better lead times

For the objective two: The significant change in inventory turnover ratio due to the Bulk purchase because of the Sig. value is 0.017, which is less than the acceptable value of 0.05. Bulk buying reduces the cost per unit and can reduce how much you pay in the long run on the products use. They saved money, reduced packaging, make a little easier and have peace of mind about having a bit of extra product in stock which have any impact on inventory turnover ratio.

According to objective three the significant change in inventory turnover ratio due to the Inventory forecasting change, because of the Sig. value is 0.038, which is less than the acceptable value of 0.05. Demand forecasting helps reduce risks and make efficient financial decisions that impact profit margins, cash flow, allocation of resources, opportunities for expansion, inventory accounting, operating costs, staffing, and overall spend. All strategic and operational plans are formulated around forecasting demand which also affect stock.

### 5.3. Conclusion

The research was carried out to examine the effect of inventory management on the inventory turnover ratio of organization Industry .The study was conducted using ADMA Industry Ltd as a case study. The target population was 104 respondents.

### 5.4. Recommendations

At the end of this study, some recommendations were put forward by the researcher basing on the research objectives, major findings and general conclusion of the study: There should be periodical trainings to all staff in inventory management concerning methods and techniques of inventory control management in order to reduce the costs associate with inventory holding especially on

inventory levels management to reduce or to prevent the damaged goods that are sometimes available in stores. Employees should be trained not only on lean principles, but on the specific lean methods and processes to be utilized moving forward. They might also finance external researcher because forecasting is valuable to businesses because it gives the ability to make informed business decisions and develop data-driven strategies.

ADMA should also enforce inventory forecasting because this practice of using past data, trends and known upcoming events to predict needed inventory levels for a future period. Accurate forecasting ensures businesses have enough product to fulfill customer orders while not tying up cash in unnecessary inventory.



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