THE EFFECT OF INVENTORY MANAGEMENT ON PERFORMANCE: THE CASE OF MANUFACTURING FIRMS IN THE KUMASI METROPOLIS

BY

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A thesis submitted to the Department of Accounting and Finance, Kwame Nkrumah University of Science and Technology, Institute of Distance Learning, in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE (ACCOUNTING AND FINANCE)

School of Business, KNUST

College of Humanities and Social Science

NOVEMBER, 2020

DECLARATION

I hereby declare that this submission is my own work toward the award of the Master of Science (Accounting and Finance) and that to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This work is dedicated to my husband Joshua Agyapong, my son Nana Yaw Adjei Agyapong, my mother Ruth Bentum, my father in-law Elder Michael Yaw Adjei and sister Rita Irene Johnfiah.

ACKNOWLEDGEMENT

I wish to express my sincerest gratitude to the Almighty God for his abundant grace he showered on me from the beginning of this course to the end of it culminating into writing of this thesis. I would also like to express my deep gratitude to my supervisor, Prof. Kingsley Opoku Appiah whose high level of expectation inspired me to get above myself to produce this material. I will never forget all the advice, the queries and the criticisms he made about the work without which I would not stay on track. I also thank my family for their love, understanding, support and encouragement throughout this thesis. Finally, I am equally thankful to my best friend Mr. George Owusu for his advice, support and encouragement. Finally, I am equally grateful to the management and staff of all Manufacturing Companies within the Kumasi Metropolis.

ABSTRACT

This study was conducted to assess how the inventory management practices of manufacturing companies in the Kumasi Metropolis influence their performance using quantitative research approach. The study also adopted both descriptive and explanatory research designs. Primary data and structured questionnaire was also used in the study. The study population was all the manufacturing firms in the Kumasi Metropolis of Ghana and the target population is all the employees that works in critical departments of the manufacturing firms located across the Assembly such as heads and officers of the logistics department, heads and officers of the finance departments, heads and officers of the marketing departments etc. numbered 71. The study used Yamane sample size determination formula to determine the sample size. This study used probability sampling since the population and location of manufacturing firms was known and a sample size of 60. The study found improvement in inventory management by one unit would lead to increase in market performance, financial performance and customer satisfaction by 20.3%, 31.9%, 21% units respectively. The study finally concludes that inventory management is a determinant of manufacturing firm's performance. Therefore it is recommended that there is the need to adopt best inventory management practices to enhance performance of manufacturing firms in the Kumasi Metropolis of Ghana.

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LIST OF ABBREVIATIONS

CS:	Customer Satisfaction
EOQ:	Economic Order Quantity
FP:	Financial Performance
GES:	Ghana Stock Exchange
IM:	Inventory Management
MP:	Market Performance
RFID:	Radio-frequency Identification System
ROA:	Return on Asset
ROCE:	Return on Capital Employed
ROE:	Return on Equity
SMEs:	Small and Medium Enterprises
SOP:	Standard Operation Procedure
UPC:	Universal Product Code

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Inventory management covers all of the activities undertaken by a firm to make sure that a customer receives the item that he / she requires. In doing so, it focuses on purchasing, manufacturing and distribution in an effort to move the end product to the end customer in a timely manner (Muller, 2011). The reason for managing of inventory is the minimization of cost and holding inventories in order to guarantee a consistent supply for successive operations (Silver et al., 2016). The reason for this is because inventory in many organizations covers a significant part of the overall cost, which can ultimately affect both an organization's financial and market performances. Usually, this significant cost comes as a result of bad inventory management or sourcing which can lead to wear, loss, theft, depreciation, total surplus or deficit (Subramanian, 2014).

The concept of inventory management came into existence before the Industrial Revolution. At first, it involved a rather archaic system in which merchants manually wrote down purchases and constantly observed how many sales were being made that same day and how many were left. By the 1930s, it had progressed to a punch card system in which punch cards were read by a computer before the information was eventually passed on to a storeroom (Agrawal, 2014).

This was succeeded by a much more improved Universal Product Code (UPC) system in the latter part of the 1940s which involved ultraviolet light-sensitive ink being decoded by a reader (Subramanian, 2014). Following this, there were a series of

constant improvements which eventually led to the radio-frequency identification system (RFID) that is being used today (Agrawal, 2014).

Although inventory management has been described as being pivotal to an effective and efficient organization, in recent times, it has been a concern for firms as to whether it actually leads to an increase in performance; whether it's in terms of financial performance, market performance or customer satisfaction (Alexander, 2018). As for financial performance, it measures the degree to which a company properly uses its resources to generate sales and maintain economic health (Alexander, 2018). Market performance refers to a firm's performance in achieving revenue, profits, market share, competitive advantage, customer satisfaction and customer loyalty (Merchant and Van der Stede, 2011). Furthermore, customer satisfaction is a term which measures the extent to which the goods and / or services that a firm offers meet or exceed the expectations of its customers (Kotler and Keller, 2015).

The term inventory management is a supervisory process which involves activities such as the ordering, storing and distribution of a firm's inventory whether it takes the form of raw materials, components or finished goods (Schreibfeder et al., 2017). This is important since inventory serves as more or less the buffer between what consumers demand and what a manufacturing company can produce (Alexander, 2018). Additionally, improperly managed inventory locks up a firm's capital, must be handled, consumes a firm's storage space, can deteriorate or become outdated, often times needs to be insured, incurs taxes, and can be pilfered or carelessly lost (Kotler & Keller, 2015; Agrawal, 2014).

Also, inventory management helps a company with forward planning which enables it to stay within budget; helps it to avoid unnecessary costs such as the expediting of inventory replenishment; increases manufacturers' efficiency, allowing their employees to spend their time on more profitable tasks; and increases customer service and satisfaction by enabling the quick identification of inventory availability, thus enabling fast response times to queries (Muller, 2011; Bragg, 2018; Schreibfeder et al., 2017).

For those companies that are profit driven and those that are not, their inventory levels can be found under the current assets section of their balance sheets. With that being said, the management of inventory is critical to the success of a firm's ongoing operations as it is used to earn revenue (Muller, 2011). For manufacturing companies, in particular, it is a necessary element for operating and filling customer orders (Subramanian, 2014).

1.2 Problem Statement

Since the introduction by the government of Ghana of making Ghana an industrial hub in West Africa, much investments and its accompanying infrastructure have been instituted. Despite such good policies and opportunities, there are still related challenges as inventory serves as more or less the buffer between what consumers demand and what the manufacturing firms can produce (Opoku et al., 2020). When reviewing the state of manufacturing firms in the Kumasi Metropolis, most of the manufacturing firms have low sales revenue as compared with their projected sales in the fourth quarter of 2019. This affected their market performance coupled with its associated high holding cost. Kim and Mauborgne (2017) on the other hand

emphasized that market performance of manufacturing firms can be measured by productive efficiency, distribution efficiency and technological progressiveness. Brigham and Ehrhardt (2016) suggest that, in measuring the financial performance of a firm, the firm's Return on Assets (ROA) supersedes income statement measurement of financial performance. In considering the activities of various manufacturing firms in the Kumasi Metropolis, the firms' assets are used to support its business activities. The volume of inventory in the manufacturing industry, usually serves as an indicator in measuring firm's profitability. Looking at empirical studies, Prempeh (2015) investigates the effect that inventory management had on the profitability of four manufacturing companies listed on the Ghana Stock Exchange (GSE). Through the study, it was found that inventory management had a significantly strong and positive impact on profitability. On the contrary, a study conducted by Bawa et al (2018), on management of inventory and the performance of Ghanaian manufacturing companies showed no significant effect on performance. Currently, there has been no agreement among researchers as to the actual relationship that exists between the variables of inventory management and financial performance, Nevertheless, some have argued that effective inventory contributes to company's profitability and an increase in its return on assets (Muller, 2011). This study will therefore seek whether these assertions is true amongst manufacturing firms in the Kumasi Metropolis. Based on these revealing facts, it creates a strong case for the researcher to empirically examine how inventory management influenced performance of manufacturing firms in the Kumasi Metropolis.

1.3 Research Objectives

1.3.1 General Objective

Based on the facts above, the general objective of the study is to examine how inventory management influenced performance of manufacturing firms in the Kumasi Metropolis.

1.3.2 Specific Objectives

But specifically, the study hopes to accomplish the following objectives;

1. To examine the effect of inventory management on the market performance of manufacturing firms in the Kumasi Metropolis of Ghana.
2. To examine the effect of inventory management on the financial performance of manufacturing firms in the Kumasi Metropolis of Ghana.
3. To examine the effect of inventory management on customer satisfaction for manufacturing firms in the Kumasi Metropolis of Ghana.

1.4 Research Questions

Given the research objectives outlined above, the following research questions are asked to guide the study.

1. What **is** the effect of inventory management on the market performance of manufacturing firms in the Kumasi Metropolis of Ghana?

2. What **is** the effect of inventory management on the financial performance of manufacturing firms in the Kumasi Metropolis of Ghana?

3. What is the effect of inventory management on customer satisfaction for manufacturing firms in the Kumasi Metropolis of Ghana?

1.5 Significance of the Study

It is being envisaged that certain members of society will benefit mostly from this study; among them being the general public, academia, and manufacturing firms in Ghana. Regarding the general public, the conduct of this research will provide both the citizens of Ghana as well as other countries with useful information dealing with the common inventory management practices of Ghana's manufacturing companies; specifically, those in the Ashanti Region. To be specific, it could enlighten them on the effect that inventory management has on these manufacturing firms' market performance, financial performance and customer satisfaction.

With respect to academia, this study adds to the quantum of literature on the topic under investigation and serves as a source of reference for current and future researchers. In addition, it could help academicians such as students, researchers and professors to have an in-depth knowledge on the problem area.

Finally, this study could benefit manufacturing firms by heightening their understanding on how and to what extent inventory management affects financial performance, market performance and customer satisfaction. Financial performance is important to all for-profit companies as it provides them with a means of survival. Market performance is important as it is necessary for these companies to outperform their competitors in order to survive and remain profitable. Also, customer satisfaction is important as it has been reported that the cost of attaining a new customer can reach five times that of retaining an existing one (Brigham and Ehrhardt, 2016; Kotler and Keller, 2015).

1.6 Summary of Methodology

This study therefore sought to examine how inventory management influenced the performance of manufacturing firms in the Kumasi Metropolis. The study adopted both descriptive and explanatory research designs. The study population is all the manufacturing firms in the Kumasi Metropolis. The target population is all the employees that works in critical departments of the manufacturing firms located across the Region such as heads and officers of the logistics department, heads and officers of the finance departments, heads and officers of the marketing departments etc. The study used Yamane sample size determination formula to determine the sample size. Stratified random sampling is used to select the sample size from the target population. Questionnaires were used to collect primary data from the respondents. A pilot study was administered in order to test for validity, reliability and practicability of the research instruments. Questionnaires were used to collect primary data and analysis was done in SPSS version 22. The study used both descriptive and inferential statistics. Descriptive statistics included percentages and frequencies while inferential statistics included a linear regression analysis.

1.7 Scope & Limitations of the Study

The scope of the study is limited to all the manufacturing firms in the Kumasi Metropolis of Ghana. These manufacturing firms' ranges from the beverage, pharmaceutical and textiles industries etc.

This research has identified among others the following limitations the study may encounter: In spite of the selected metropolis, a nationwide study would have been more appropriate. Limited time period and resources such as funds are also limiting factors to this research.

1.8 Organization of the Study

The study is carried out and presented in five distinct and coherent chapters. The first chapter introduces the research and highlights the problem that brought forth the research topic. It further states the research objectives, questions, relevance of this research, scope & limitations and the outline of the research. The second chapter is literature review. This section begins with, the conceptual review, this is where all the key concepts connected to the topic will be explained exhaustively, followed by theoretical framework, this shows the relevant theories underpinning the research understudy. In addition to the theoretical review, a review of existing literature on the topic is carried out, the researcher therefore tries to synthesize the various arguments of the relevant literature followed by a conceptual framework and finally provided a summary of the chapter. The chapter three depicts the methodology deployed in the research. This chapter presents the procedures and methods that the researcher intends to use to collect and analyze data. It also systematically outlines how the researcher intends to carry out the research including the kind of research instruments that will be used. Chapter four outlines the result & discussion of findings. Before discussion, the researcher analyzes the findings according to the methodologies stated earlier in chapter three and tests the propositions. A discussion of the findings is further made and the researcher therefore links the findings to existing literature for confirmation or disconfirmation of findings. Chapter five discusses the concluding outcome of the research as well as its implications. Recommendations and areas for further studies also indicated in this section.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section focuses on extant literature review on examining how inventory management influenced performance of manufacturing firms in the Kumasi Metropolis. According to (Saunders et al., 2009), there are two rationales for the review of literature. First is the primary perusal of literature in order to help conceptualize a research opportunity. Second is a thorough academic exercise which entails a critical analysis of a research thesis. Specifically, the chapter covers amongst others, the meaning of key terms, followed by a theoretical review that seeks to support the research objectives with relevant theories that would stimulate the researcher's understanding about the study; an empirical review of the study as well as a development of hypothesis that will justify the logic behind the objective hypothesized on; a conceptual framework that would guide the study. The researcher reviews literature of existing authors in a chronological perspective and finally provides a chapter summary in section 2.6.

2.2 Conceptual Review

2.2.1 Inventory Management

Before proceeding to examine the relationship between the study's variables, it is first necessary to arrive at a suitable definition for the term "inventory management" in order to fully comprehend what it entails. Over the years, different definitions for the term have been provided by different researchers. However, the most notable ones will be discussed in this section before a suitable one is arrived at.

Before looking at the various definitions for the actual term, the definitions for the words "inventory" and "management" will be looked at. According to Schreibfeder, Snawder, and Schreibfeder (2017), the term inventory can be used to describe tangible, physical goods of a company that lie dormant, have economic value, and are held in a number of different forms in its custody awaiting packing, processing, transformation, use or sale at a future date. Meanwhile, the term management was described by Kotler and Keller (2015) as the organization and coordination of the activities of an individual or an entity in order to achieve defined objectives. Combining the two definitions together, it appears that inventory management denotes the organization and coordination of the dormant physical goods of a company with economic value that awaits packing, processing, transformation, use or sale at a future date."

Now looking at proper definitions for the term "inventory management," Silver et al. (2016) explained that it is a science which deals with the specification of both the percentage and shape of goods in stock. However, a more descriptive definition was provided by Muller (2011) as the oversight and control of a company in its ordering, storage and use of the components that it will sell or of its finished goods that it will sell. It should be noted that an apparent issue with Muller's (2011) definition is that it assumes that a company will use its raw materials for the production of finished goods, which is not the case for all companies such as hospitals, etc.

In fact, Muller's (2011) definition is in line with Bragg's (2018) definition of inventory; namely, assets to be used in producing goods that are to be sold, assets presently involved in a firm's production process, or finished goods held by a firm to

be sold in its day-to-day operations. This definition identifies three inventory types; namely, (1) raw materials inventory, (2) work-in-process inventory and (3) finished goods inventory (as can be seen in Table 2.1).

Table 2.1: Characteristics of Different Types of Inventory

INPUT	PROCESS	OUTPUT
Raw Materials	Work-in-Process	Finished Goods
Consumables required for processing (i.e. fuel, stationary, bolts and nuts, etc. required in manufacturing).	Semi-finished production in various stages, lying with various departments like Production, WIP Stores, QC, Final Assembly, Paint Shop, Packing, Outbound Store, etc.	Finished goods at distribution centres throughout the supply chain.
Maintenance items / consumables	Production waste and scrap	Finished goods in transit
Packing materials	Rejections and defectives	Finished goods with stockiest and dealers
Local purchased items required for production		Spare parts stock and bought out items
		Defectives, rejects and sales returns
		Repaired stock and parts
		Sales promotion and sample stocks

Source: Adapted from Bragg, (2020).

The last definition of inventory management that will be looked at was provided by Agrawal (2014). The definition was given as a branch of business management specifically dealing with inventory planning and control. It was also mentioned that in addition to the previously discussed components of inventory management, the management of inventory can also involve the maintaining of effective internal controls for the sake of inventory. Examples include: protecting inventory against theft or damage; tracking the movement of inventory with the use of purchase orders; tracking inventory transactions with the use of an inventory ledger; and consistently comparing quantities of physical inventory with those that were recorded. After having reviewed and assessed all of the terms for inventory management, it can be concluded that it refers to a management science which deals specifically with a company's raw materials, work-in-process inventory, or finished goods inventory, as

well as its coordination and / or control of the ordering, storage and use of one or more of these components so that it can effectively package, process, transform, use or sell them at a future date.

2.2.2 Benefits of Inventory Management

Bawa et al. (2018) asserted that there are a significant number of benefits that arise from inventory management. They added that due to this mere fact, there are several companies around the world which utilize much time with the calculation of what they deem to be the ideal inventory levels that they should be maintaining at all times. One of the main advantages that Bawa et al. (2018) indicated was that the management of inventory is essential as the holding of too much or too little inventory by a company at any given point in time is one of the major direct causes of business failure. With that, they went on further to explain that inventory constitutes a major organizational asset, and also serves as a locked-up investment until the item is either sold or used to produce a product that is sold. Moreover, that because of this, the management of inventory is key as the storing, tracking and insuring of it carries a cost. Some of the key costs of inventory are displayed in Table 2.2 below.

Table 2.2: Different Classes of Inventory Costs

Ordering Costs	▪ Clerical costs of preparing purchase orders. ▪ Some spent finding suppliers and expediting orders. ▪ Transportation costs. ▪ Receiving costs (i.e. unloading and inspection).
Holding Costs	▪ Costs of storage space (i.e. warehouse depreciation). ▪ Security. ▪ Insurance. ▪ Forgone interest on working capital tied up in inventory. ▪ Deterioration, theft, spoilage or obsolescence.
Shortage Costs	▪ Disrupted production when raw materials are unavailable: (i) idle workers, (ii) extra machinery setups. ▪ Lost sales resulting in dissatisfied customers. ▪ Loss of quantity discounts on purchases.

Source: Adapted from Bawa et al, (2018).

Agrawal (2014) stated that if inventory is improperly managed, it could potentially create serious financial problems for a company such as an inventory surplus or an inventory shortage. This explanation further stresses Bawa et al.'s (2018) view that inventory levels should be optimal.

Agrawal (2014) further indicates that inventory surpluses result in more costs of funds being tied up so that it reduces a company's profitability; causes inventory to be misused, lost or damaged; and causes inventory to incur costs in terms of shipping, insurance and storage space. In addition, that the longer surplus inventory remains unsold, the higher the probability that it will never be sold at all. Regarding inventory shortages, on the other hand, Agrawal (2014) explained that it creates stock-out problems as well as an interruption in the production and selling operations of a company.

Another benefit of inventory management that was given by Relph and Milner (2015) was that a good inventory management system allows for a company to be fully aware of when it receives items, when it picks them up, when inventory is manufactured, when it is packed, shipped and kitted, among other things. They also indicated that it allows for a company to know when it needs to order more inventories, when it is overstocked and when it is under stocked. In line with this school of thought, they stated that "one of the worst things that a company can do is to turn away those who are ready to give them their money because they have run out of the items that they want" (p. 42).

Four other advantages of inventory management that were provided by Relph and Milner (2015) were that it: (1) leads to a reduction in lead times; (2) improves the flow of goods to customers; (3) lowers costs in terms of inventory write-offs and

inventory holding costs; and (4) increases employee efficiency in terms of less time being spent on managing inventory.

Another point that was provided by Muller (2011) was that not only does inventory management improve the accurate planning of a company's inventory, but it also increases the loyalty of customers as it satisfies customers and enhances their expectations by a company being more accurate and efficient. It also increases inventory turnover by minimizing the number of slow-moving products that are available while maximizing the number of profitable goods on hand (Muller, 2011).

2.2.3 Measurement of Performance

2.2.3.1 Market Performance

Looking at the study's independent variables, firstly, market performance (not to be confused with stock market performance), was defined by Leautire and Tirole (2019) as a firm's performance as measured by its sales revenue, profit figures, competitive advantage, customer satisfaction and customer loyalty. Important is the mention of the metrics of sales revenue, profitability and customer satisfaction as sales revenue and profitability are commonly considered to be measures of financial performance and customer satisfaction is being treated in this study as another category altogether.

Meanwhile, Rubin (2019) indicated that market performance includes the relationship of selling price to costs, the size of output, the efficiency of production, progressiveness in techniques and products, etc. Another definition was given by Kim and Mauborgne (2017) as the effectiveness with which the suppliers of an industry utilize economic resources to maximize efficiency and serve as a benefit to consumers in the process. According to Kim and Mauborgne (2017), market performance includes the following components:

Productive efficiency- How cost-effective firms are in producing their outputs.

Distributive efficiency- The ability to minimize distribution costs through utilizing cost-collective distribution channels and marketing strategies. Setting fair and equitable prices for consumers.

Product performance- Maximizing consumer choice and value-for-money attributes.

Technological progressiveness- The ability to provide consumers with goods that are superior in terms of technology through introducing process and product innovations which enable the reduction of supply costs and prices.

After looking at the above definitions and descriptions, it can be surmised that market performance deals mainly with productive efficiency, distributive efficiency, the setting of fair prices to consumers, product performance and technological progressiveness as was outlined by Kim and Mauborgne (2017).

2.2.3.2 Financial Performance

Looking at the different descriptions of financial performance, Brigham and Ehrhardt (2016) defined it as the degree to which a company makes use of its assets from its main line of business in order to earn revenues. Another definition was given by Higgins (2015) as the degree to which a firm accomplishes its financial objectives. According to Alexander (2018), it is the degree of success of the operations and policies of a company in monetary terms.

Now looking at some common measures of financial performance, through the review of literature, it was arrived at that despite the more sophisticated valuation techniques, the best measures of financial performance for a firm that deals in the manufacturing of products include the return on equity (ROE), return on assets (ROA) and return on company employed (ROCE) ratios with the following formulas.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Shareholders' Equity}} \text{----------(1)}$$

$$ROA = \frac{\text{Net Income}}{\text{Average Total Assets}} \text{----------(2)}$$

$$ROCE = \frac{\text{Operating Profit}}{\text{Capital Employed}} \text{----------(3)}$$

However, with respect to ROE, Higgins (2015) pointed out that a number of dubious strategies can be employed to manipulate its ROE figure to temporarily appear to be healthy, thus hiding poor performance. An example that Higgins (2015) provided was a firm increasing its leverage or buying back its stocks that funded through accumulated cash.

In the case of ROA, it was brought to light by Brigham and Ehrhardt (2016) that ROA supersedes income statement measures of financial performance such as return on sales. The reason given was due to the fact that it considers the assets of a firm that are used to support its business activities by determining the degree to which it is able to produce reasonable returns on these assets.

Finally, regarding the return on capital employed (ROCE) indicator, Alexander (2018) mentioned that it is used to show how efficiently a company makes use of its capital. Alexander (2018) further praised the indicator by mentioning that it measures profitability only after considering the amount of capital that is used to create that level of profitability. Nevertheless, Higgins (2015) strongly advised that ROCE should be used in conjunction with other measures of performance rather than being used alone.

2.2.3.3 Customer Satisfaction

Regarding the term customer satisfaction, Kotler and Keller (2015) explained that it is a judgment made by a consumer as to whether an experience was pleasurable and provided fulfillment after he / she has consumed a product or service. Solomon (2016) added that customer satisfaction judgments occur when consumers compare the experience of a product or service with their expected performance level.

From Ghimire's (2012) point of view, customer satisfaction measures the degree of satisfaction that products or services provide which is measured by the number of customers that repeatedly patronize a firm's products or services. The last definition that will be looked at was provided by Ako-Nai (2011) as the number of customers, or percentage of total customers, whose reported experience with a firm, its products or its services exceeds specified satisfaction goals.

With regard to how to measure customer satisfaction, one quantitative form of measurement that was found was the Customer Satisfaction (CSAT) survey. With that, it was recommended by Kotler and Keller (2015) that consumers should answer questions on a weighted scale. Another measurement, according to Ghimire (2012), is the number of repeat customers.

2.3 Theoretical Review

This section is an appraisal of the theoretical foundations upon which the research is built. The researcher aims at giving the research objectives backings based on existing and relevant theories. This would be executed by first given an overview of a theory followed by the relevance of a theory in an academic research and an explanation of the relevant theories appropriate for the research study on examining how inventory

management influenced performance of manufacturing firms in the Kumasi Metropolis.

2.3.1 The Concept of Theory

When defining what theory is, some of the most quoted scholars like Feigl, Rose and kerlinger who defined theory tend to show the basic meaning of a theory. To begin with, (Feigl, 1951) defines theory as a regular conjecture or notion that is emanated from a systematic scientific process and satisfies a number of existing '*laws*'. From Feigl's definition, it can deduced that a theory follows a systematic process that is backed by previous rulings or guidelines. A worthwhile definition of a theory according to (Rose, 1953) is that a theory is a body of interconnected ideologies, general practices and meanings about a particular topic from which a regular examination of hypothesis can be ascertained. Rose definition views a theory as general practices, experiences and meanings about a particular endeavour that pass through series of tests before they are either accepted or rejected.

However, kerlinger sounds more scientific and economists in the context of practicality. Recent definition of theory by (Beauchamp, 2009) is conceptualized as a structured description of experiential group of activities or status quo which requires 'explanation'. This definition sounds liberal by relegating a theory to be a mere repetition of practice or activities. Below are some relevance of theories to academic research works.

2.3.2 Relevance of Theory to academic research

The essence of a theory in an academic research is to express or link an overview of understanding about a topic to the appropriate theories that it fits. Its similitude is like a seed that germinates by generating its nutrients from a particular tree. It is from the

understanding of a theory that the human intellect is able to give meaning to what he/ she feels, perceives and experiences. Through theory that an individual moulds his thinking and his ability to analyse concepts critically (Deegan, C., 2013). In order to crystallise a theory, they decomposed to reduce their level of abstraction. This is known as an operationalization, that reducing a theory to concept, from a concept to constructs, and further move to variables. Concepts form the main elements to consider when developing a theory, they are the structures of a theory (Biggam, 2008; Saunders et al., 2009). As concepts are used as a component of a theory, they become simpler in the form of constructs. These constructs are further operationalized into variables. Variables are constituents of an indicator that be measured. The figure (2.1) below is a pyramidal representation of the relationship between a theory and its components.

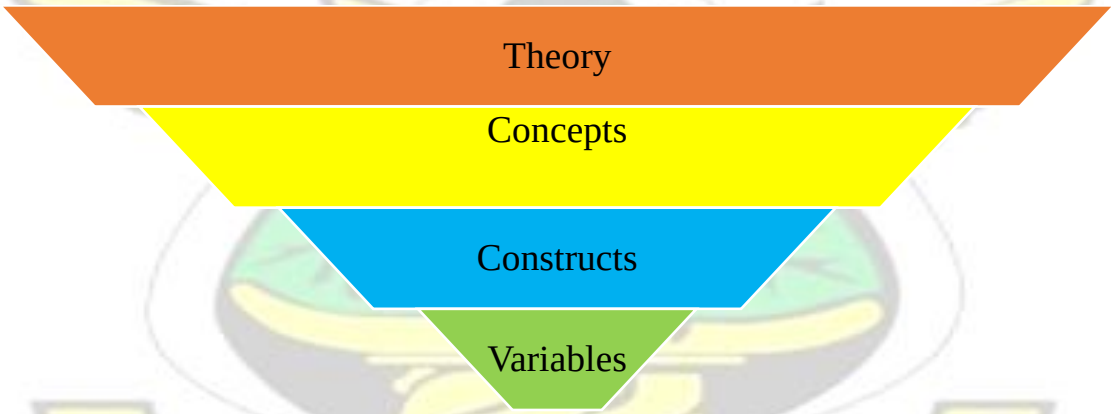

Figure 2.1: Relevance of Theory
Source: Author's work, (2020)

The figure above shows how theories are been narrowed down from a more abstract idea to a more concrete and specific research area. The downward pyramid shows that theories are generally broad and as a matter of fact can be interpreted differently, so for a research study to make use of theory, it is further adapted to fit more into the study area of the researcher.

Among the **relevant theories** reviewed that were related to the topical area of the study **includes:** Lean Manufacturing Theory, The Theory of Constraints and Resource Based View Theory.

2.3.3 Lean Manufacturing Theory

Lean Manufacturing Theory posits that continuous improvement in the form of systematic, small and incremental changes in manufacturing processes can be achieved in order to improve efficiency and quantity by identifying each step in the manufacturing process before revising or eliminating the steps that do not create value (Rashid, 2015). This study, however, does not seek to improve manufacturing processes, but rather seeks to arrive at the relationship that exists between inventory management, financial performance, market performance and customer satisfaction. Therefore, it has been surmised that the use of this theory is not appropriate for this particular study.

2.3.4 The Theory of Constraints

The Theory of Constraints is a management philosophy which posits that a limiting factor, constraint or bottleneck can be eliminated by identifying it as being the constraint that stands in the way of achieving a specific goal and then systematically improving upon it until it ceases to be a limiting factor (Rashid, 2015). According to Kimaiyo and Ochiri (2014), in a manufacturing setting, some specific constraints or processes that could hinder operations include excessive lead times, inventories and unfulfilled orders, the absence of inventories that are relevant, wrong materials orders, a surplus of emergency orders and expedition levels, the lack of customer engagement, and the absence of controls that are related to priority orders. However,

with regard to inventory management, this study does not examine the constraints within the inventory management process nor the effects of such constraints. It rather seeks to investigate how the inventory management systems of manufacturing companies influence their market performance, financial performance and customer satisfaction. Therefore, this theory will also not be used as a guide for this research.

2.3.5 The Resource Based View Theory

The Resource Based View Theory posits that it is the internal processes of a firm that can directly or indirectly provide it with a sustainable competitive advantage. This is based on the assertion that competitive advantage is attaining by a firm only when it is in possession of certain resources that other firms in its industry do not have. Such researches include human, physical, organizational and financial resources (Rashid, 2015). According to Ngumi (2015), the creation and maintenance of such a competitive advantage involves the identification, development, deployment and protection of a firm's internal resources.

This study investigates the extent to which the internal processes of manufacturing firms (in the form of inventory management systems) in the Kumasi Metropolis to provide them with a competitive advantage, among other things. It is in view of this that this theory is being used to guide this particular study.

2.4 Empirical Review

In an attempt to discuss previous empirical research related to the study objectives, this section focuses mainly on five main sub-sections, namely: (a) Inventory Management on the Market Performance (b) Inventory Management on the Financial

Performance (c) Inventory Management on Customer Satisfaction. These issues are discussed below:

2.4.1 Inventory Management on the Market Performance

A Malaysian study conducted by Theng (2016) investigated the manner in which inventory management influenced the competitive advantages of manufacturing SMEs operating in Malaysia. According to the results, inventory lead time, inventory management and systems used for this type of management were all responsible for their competitive advantages.

A study by Atnafu and Balda (2018) investigated the impact that inventory management had on the competitiveness and organizational performances of Ethiopian manufacturing companies. The research sample included a total of 188 micro and small enterprises involved in this sub-sector of the Ethiopian economy.

The results indicated that the more inventory management was adhered to, the more the firms in question experienced increased competitive advantages and organizational performances. In addition, it was brought to light that the firms' competitive advantages of the firms in question positively affected their performances. However, it was cautioned that the study's findings may not be generalizable to large and medium-sized firms in the industry, nor to the whole entire manufacturing sub-sector. Another related study by Ngumi (2015) researched the relationship between the inventory management and productivity levels of large, Kenyan manufacturing firms using a sample of 50 such firms. Through the study, it was found that their inventory management practices positively affected their productivity.

Another Kenyan study by Naliaka and Namusonge (2015) investigated the effect that inventory management had on the case study organization, Unga Group Limited, which was located in Kenya. To be specific, the extent to which its information technology used for inventory management affected its inventory lead time, control and practices, and thus its competitive advantage. The study revealed that the competitive advantage of the firm in question—Unga Group Limited—was influenced by information technology, inventory lead time, and inventory control systems and practices.

2.4.2 Inventory Management on the Financial Performance

Kimaiyo and Ochiri's (2014) study concerned Kenyan manufacturing firm's inventory management and performance similar to Ngumi's (2015) and Naliaka and Namusonge's (2015) studies. However, this study was concerned with the manner in which the cost reduction aspect of inventory management affected the performance of these manufacturing firms; how inventory control systems affected their performance; how lead time affected their performance; and how supplier demand affected their performance. Through the study, it was found that the inventory management systems of the firms in question had a positive effect on their being able to practice proper inventory management, and also assisted in their lowering of costs, and therefore, an increase in their profitability.

Another study by Karim, Nawawi & Salim (2018) examined the effect of standard operation procedure (SOP) on inventory management practices in a manufacturing firm in Malaysia; identified any weaknesses in these practices; and examined the overall effect of these practices on company performance. The study revealed that the

poor management of inventory did not have a significant effect on the financial performance of the case study organization.

A study by Mbula, Memba and Njeru (2016) investigated inventory management's impact on the financial performances of firms that were funded by Government Venture Capital in Kenya, with a focus on political environment as a moderating variable. As can be seen in Figure 2.1, obsolete inventory, control practices and the monitoring system were used to measure inventory management practices. Meanwhile, the current ratio and inventory turnover ratio were used to measure financial performance (see Figure 2.1). Regarding the results, it was found that most of the firms that were surveyed had decent inventory management practices. In addition, it was found that inventory management had a significant effect on the financial performances of the firms that were studied.

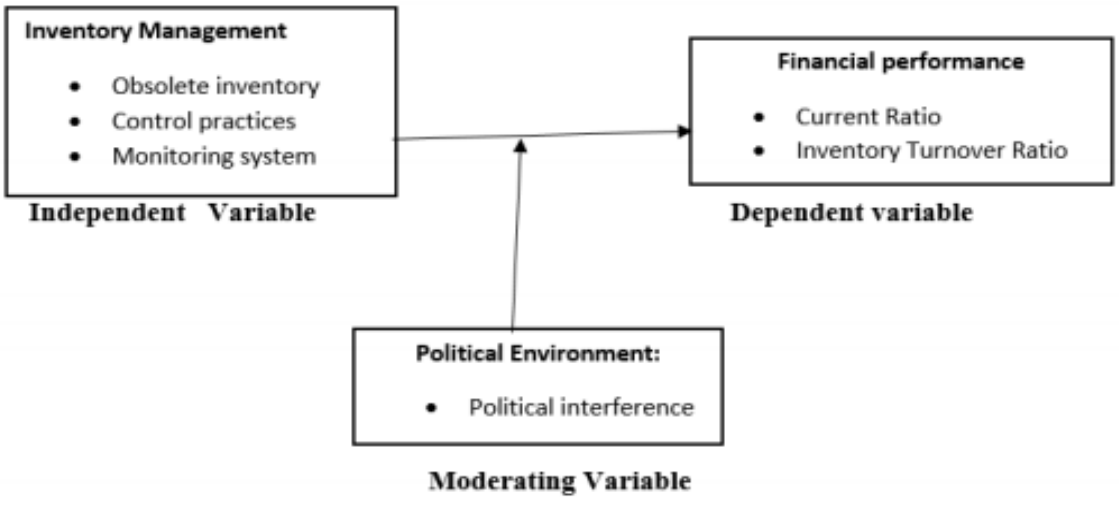

Figure 2.1: Interrelationships between the Study's Variables
Source: Mbula, 2016.

A study by Bawa et al. (2018) dealt with inventory management and financial performance, but was conducted in the Republic of Ghana using a sample of listed

manufacturing companies. The dependent variable—financial performance—is measured in terms of profitability and operating cash flows. Pearson's correlation analysis and multiple regression were used to reveal the relationship between the firm's financial performances and inventory management as negative, but insignificant.

Prempeh (2015) sought to determine how efficient inventory management affected the profitability of Ghanaian manufacturing companies. With that, the sample consisted of four listed manufacturing companies using figures for the time period from 2004 to 2014. Their annual reports were used as a major source of secondary data. Moreover, the study revealed that it was primarily the efficient management of raw materials which enhanced the profitability for Ghana's manufacturing industry.

2.3.3 Inventory Management on Customer Satisfaction

A Pakistani study conducted by Rashid (2015) dealt with an English biscuits manufacturing firm and was concerned with the impact that inventory management and customer collaboration had on the satisfaction of its customers. The study employed both Pearson's correlation and regression analysis to arrive at the fact that both of the study's independent variables had a significant effect on customer satisfaction.

Thogori and Gathenya (2014) conducted a study in Kenya for the purpose of investigating the effect that inventory management had on the satisfaction of the customers of manufacturing firms. The case study organization was Delmonte Kenya—a food processing company. It should be mentioned that this company

utilized a supply chain inventory information sharing system as part of its inventory management efforts.

The study revealed that the company's inventory management system was poor and often led to shortages of inventory and long lead times resulting in inventory delays. It was because of this that the inventory system generally led to customer dissatisfaction. There was also found to be a strong significantly negative relationship between delays in ordering and customer satisfaction (-0.718); a strong significant positive relationship between delays in order and customer dissatisfaction (0.652); a strong significant negative relationship between delays in ordering and customer loyalty (-0.610); and a strong negative relationship between delays in ordering and repeat purchases (-0.627).

Another study by Mensah (2015) dealt with the Nzoia Sugar Company in Uganda and sought to determine the inventory management techniques used by the company; the measures that it used for service quality; and the effect that inventory management had on customer satisfaction. Regarding inventory management's effect on customer satisfaction, it was discovered that with the company's use of the economic order quantity (EOQ) model, there was indeed a very strong relationship between inventory management and customer satisfaction judging from the correlation coefficient of 0.83 (see Table 2.2 above). No Ghanaian studies, however, could be found on the effect of inventory management on customer satisfaction in manufacturing companies. This could therefore be confirmed as a research gap.

2.5 Conceptual Framework

Drawing the basis from The Theory of Constraints and Resource Based View Theory, the conceptual framework was developed as shown in Figure. 2.2 Below. However, the framework model was also developed after a cursory review of the extant literature on examining how inventory management influenced performance (based on market, financial & customer satisfaction) of manufacturing firms in the Kumasi Metropolis.

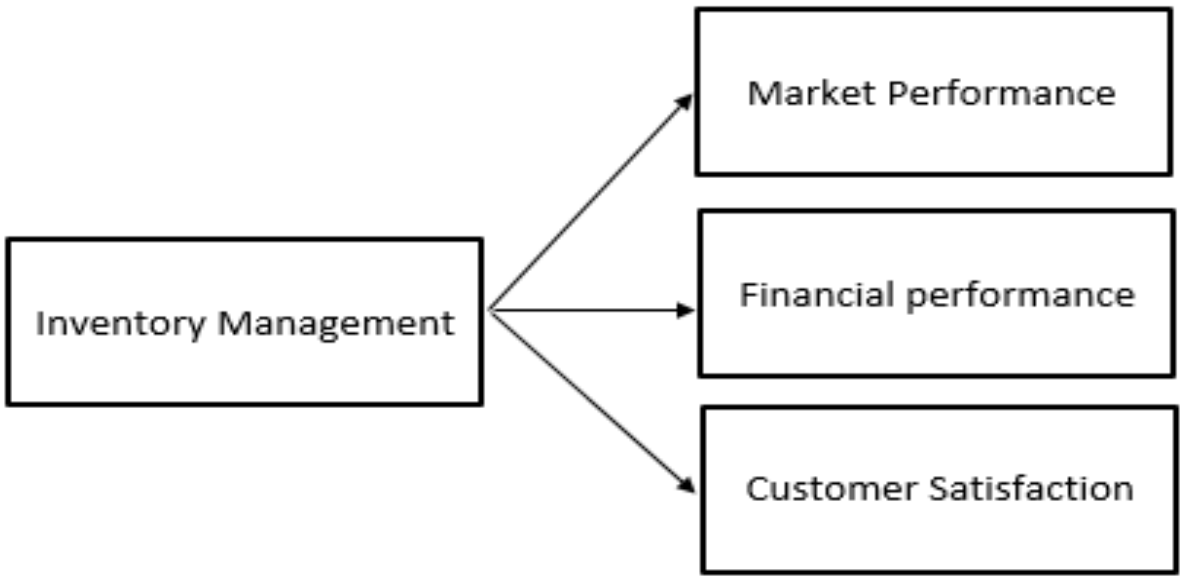

Figure 2.2: Conceptual Framework Diagram
Source: Author's Construct, (2020).

2.6 Chapter Summary

This section provides a summary of the review on the existing literature which has been conducted on the effect of inventory management on firm performance with a preferable focus on manufacturing firms. Through this research, it was determined that inventory management deals with the raw materials, work-in-process, or finished goods of an organization, as well as the coordination and / or control of the ordering,

storage and use of one or more of these components for the purpose of the packing, processing, transformation, use or sale at a future point in time.

Inventory management was found to be essential as a company having too much inventory on hand or not having enough inventory as one of the primary direct causes of business failure; allows for a company to be aware of when items are received, picked, packed, shipped, kitted and manufactured among other things; allows for a company to know when it needs to order more inventory, when it is overstocked and when it is under stocked; leads to a reduction in lead times; improves the flow of goods to customers; lowers costs in terms of inventory write-offs and inventory holding costs; increases employee efficiency in terms of less time being spend on managing inventory; improves the accurate planning of a company's inventory; increases the loyalty of customers; and increases inventory turnover.

After looking at different definitions and descriptions for the term market performance, it was concluded that it deals primarily with productive efficiency, distributive efficiency, the setting of fair prices to consumers, product performance and technological progressiveness. With regard to financial performance, it was found that despite the more sophisticated valuation techniques, the best measures of financial performance for a manufacturing company include the return on equity (ROE), return on assets (ROA) and return on company employed (ROCE) indicators. Furthermore, customer satisfaction compares consumers' experiences with products or services with their expected performance level.

Additionally, looking at related theories, it was arrived at that the Resourced Based View Theory was optimal as this study investigates the extent to which the internal processes of manufacturing firms in the Kumasi Metropolis of Ghana (in the form of

inventory management systems) provide them with a competitive advantage, among other things.

Finally, after having reviews number of studies on the subject matter, it was found that there were no Ghanaian studies which investigated the effect of inventory management on firm performance in terms of not only financial performance, but market performance and customer satisfaction as well; neither were there any studies which concentrated on only the Kumasi Metropolis of Ghana.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the procedures, techniques and assumptions that were used in the identification, selection, processing and analysis of the data that was used to arrive at the study's findings and conclusions. The chapter includes the research approach, research design, study population, sample size, sampling technique, sources and data collection method, reliability and validity techniques, ethical considerations and data analysis techniques.

3.2 Research Design

A research design is a coherent and logical strategy which serves as the overall blueprint for the manner in which a study's data will be collected, measured and analyzed (Creswell, 2013). Hence, the study employs both descriptive and explanatory research designs. On one hand, descriptive research design combined with graphical illustrations was used to describe various variables of interest. On the other hand, explanatory research design has been used to establish the magnitude, direction and significance of inventory management on performance of manufacturing firms in the Kumasi Metropolis.

A research approach is a research plan and procedure which comprises of techniques and broad assumptions for the collection, analysis and interpretation of data (Creswell, 2013). It is generally accepted that there are four key research approaches; namely, the quantitative, qualitative, mixed methods and emancipator approaches.

This was arrived at through studying the accounts of Creswell (2013), Graziano and Raulin (2012), Passer (2013) and Trochim, Donnelly and Arora (2015).

As it was discovered, the quantitative approach to research mainly involves the use of polls, surveys, questionnaires or statistical data for gathering objective measurements which is analyzed using mathematical, scientific, numerical or computational data analysis techniques. In addition, this often involves the use of hypotheses and deductive reasoning (Passer, 2013). This approach is commonly used in instances where a researcher intends to study the relationships between variables, make predictions, determine a cause and effect relations, or make generalizations about a larger population through utilizing a research sample (Creswell, 2013).

Alternatively, the qualitative approach makes use of non-numerical data about a social phenomenon which mainly comes in the form of a narrative about the knowledge, experiences and / or views of a group of individuals from their own perspectives. This approach is of aide when a researcher intends to gather much in-depth detail and explanation on a subject matter (Graziano and Raulin, 2012). Hence, the study employs the quantitative research approach in achieving the objectives of the study.

3.3 Study Population

The population for every study refers to the entire units from which data could be sourced to address the research objectives. Consistent with this, the population for this study is all the manufacturing firms in the Kumasi Metropolis of Ghana. The target population is all the employees that works in critical departments of the manufacturing firms located across the Metropolis such as heads and officers of the

logistics department, heads and officers of the finance departments, heads and officers of the marketing departments etc. This indicates that the population located across the Metropolis is numbered 71. However, due to the fact that some of these departments are quiet identical, not all of them were considered for this study with some being selected into the sample and the findings generalized.

3.4 Sample Size

Sampling refers to the process of picking a small number of cases to serve as representation from a particular population (universe). Walliman (2011, p. 93) asserts that sampling involves selecting a section of an entire universe with the view to portraying what the big picture is like. A sample size of 60 was selected for the study. Using Yamane sample size formula at 95% confidence level, a sample size of 60 was obtained. According to Yamane (1967), this formula may be used to determine sample size when the population is known. This is given as $n = N / (1+Ne^2)$, where n=Number of samples, N = total population, and e = error tolerance.

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{71}{1 + 71x(0.05)^2}$$

$$n = 60$$

Also, statisticians have proven that even for populations not normally distributed, a sample size of 30 or more will usually result in a sampling distribution for the mean that is very close to a normal distribution (Saunders et al, 2009). Based on this, Stutely (2003) advices a minimum number of 30 for statistical analysis. A sample size of 60 was therefore considered adequate for the study as per the calculations done above.

3.5 Sampling Procedure (Technique)

Saunders, Lewis and Thornhill, (2009, p. 212) have noted the need to adopt a sampling procedure so as to minimise the huge resources that would have been sacrificed in gathering data from the entire population. Again, Saunders, Lewis and Thornhill (2009) categorised the sampling procedures into two; probability and non-probability sampling. This study used probability sampling since the population and location of manufacturing firms was known. Specifically, the study used stratified random sampling in order to account for the uneven distribution of firms in various segments. This also allowed the researcher to measure inventory management influence on all manufacturing sector in the Metropolis. The uneven distribution of firms gives rise to heterogeneity which if not properly accounted would lead to biased parameter estimates. In this regard, stratified sampling enabled us to avoid biasness consequently having unbiased parameter estimates.

Table 3.1: Distribution of population and sample size of the Departments.

Area Drawn (Departments)	**POPULATION**	**SAMPLE SIZE**
Heads and officers of the logistics departments.	**25**	**24**
Heads and officers of the finance departments.	**23**	**18**
Heads and officers of the marketing departments.	**23**	**18**
TOTAL	**71**	**60**

Source: Field Study, 2020.

3.6 Data Sources and Collection Method

Data was obtained from only primary sources. Putting the research objectives into consideration, the survey method was employed using questionnaires. A total of 60 questionnaires were then administered in Google form. These were administered to heads and officers of logistics departments, heads and officers of finance departments, heads and officers of marketing department etc. However, out of the 60 questionnaires

administered to the respondents, only 54 completed questionnaires were retrieved representing about 90% response rate which is valid and used for the analysis.

Data was collected from the respondents through the use of questionnaires with a number of questions with choices of answers. These questions dealt with the demographic / personal information of respondents; the measures of their manufacturing companies' inventory management; and measures of their manufacturing companies' performances including market performance, financial performance and customer satisfaction. The questionnaire designed for this study included aspects based on Likert scale.

3.7 Reliability and Validity Test

Reliability is a term which in research denotes the degree to which a research method produces stable and consistent results. Meanwhile, validity denotes the extent to which a research method truly represents the phenomenon one claims to measure (Graziano & Raulin, 2012). A pilot study was administered in order to test for validity, reliability and practicability of the research instruments. The most important issue in the research is to ensure reliability and validity. The study randomly selected 10 firms (14 percent) of the firms for pilot study. The researcher administered the questionnaires to the head of logistics department, finance department and marketing department of the 10 firms in order to solicit responses for various questions. Once the data was coded the researcher conducted preliminary analysis to test for reliability using Cronbach's alpha. Cronbach's alpha is known as a good measure of reliability (Monette, *at el.*, 2002). To be specific, each of the Cronbach alpha figures was greater than or equal to 0.5 (as was suggested by Passer (2013)). The results from reliability analysis aided to suggest whether questionnaire should be reformulated or not. To

ensure the validity of the research instrument, the researcher also consulted experts in the area of logistics, finance, marketing management etc. and will adjust the questionnaire where necessary.

3.8 Ethical Considerations

A number of considerations were made to ensure that the Researcher followed certain methods and practices that were acceptable to her academic institution and to the research community as a whole. These included, among other things, informed consent in which respondents granted their consent to partake in the research only after being informed about the purpose, risks and benefits of the study. With that, they were allowed and informed that they could withdraw their participation at any point in time during the study.

Another important consideration was with regard to causing harm to respondents, which was not done Rather, all respondents were treated with the utmost respect and maximum consideration was given for their safety.

Anonymity and confidentiality were also ensured by the Researcher not publishing or writing down the names of any of the respondents; the completed questionnaires not being made accessible to any third parties; and the raw data being captured in password-protected spreadsheet files. These methods also helped to ensure respondents' privacy. Lastly, in recent times, plagiarism has been an important issue for many academic institutions in Ghana and for the research community as a whole. With that, the Researcher made sure that she did not copy the works or ideas of others

verbatim, but rather paraphrased; and quoted and / or citied all of the direct works and ideas of others.

3.9 Data Analysis Techniques

Following the completion of the questionnaires by the respondents, they were then submitted to the Researcher who organized the quantitative data before analyzing it. Descriptive and inferential statistics, tables and charts were used to analyze the data in addition to multiple linear regressions.

This study then used the indices generated from factor analysis to run a multiple regression analysis. This approach enabled us investigate the relationship between various measures of inventory management and firm performance as shown in equation 3.

$$\mathbf{MP_{ti}} = \alpha + \beta_1 IM_t + \varepsilon_t \quad \text{.....(3a)}$$
$$\mathbf{CS_{ti}} = \alpha + \beta_1 IM_t + \varepsilon_t \quad \text{.....(3b)}$$
$$\mathbf{FP_{ti}} = \alpha + \beta_1 IM_t + \varepsilon_t \quad \text{.....(3c)}$$

Where:

Variables	Definition and Measurement	Expected Signs
Inventory Management (IM)	The extent to which the firms manage their raw materials, components and finished products during time *t*	+
Constant term (C)	An algebraic expression which has a constant value because it does not contain any modifiable variables.	±
Idiosyncratic error term (ei)	A residual variable produced by the regression model.	±
B_i Coefficient for each of the independent variables	Coefficient for variable *i* which measures the probability of inventory management for every change in each of the explanatory variables	±
Market Performance (MP)	The performance of the firms in terms of sales revenue, profitability, market share and competitive advantage during time *t*.	+
Financial Performance (FP)	The effectiveness with which each of the firms utilizes its assets to generate revenues during time *t*	+

Customer Satisfaction (CS)	The extent to which the inventory of each the firms meets or exceeds customer expectations during time *t*	+

Source: Authors work, 2020.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the data analyses and discussions on how inventory management influenced performance of manufacturing firms in the Kumasi Metropolis. The data for the analyses have been validated using Cronbach Alpha and pilot study respectively for reliability test and validity test. The hypotheses of the study are tested using regression analysis. The individual constructs are described using means and standard deviations. However, out of the 60 questionnaires administered to the respondents in Google form, only 54 completed questionnaires were retrieved representing about 90% response rate which is valid and used for the analysis.

4.2 Demographics of Respondents

Table 4.1: Demographics

Variables	Frequency	Percentage
Gender of respondents		
Male	24	44.4
Female	30	55.6
Age of respondents		
18-30	12	22.2
31-40	19	35.2
41-50	18	33.3
Above 50	5	9.3
Educational respondents		
Diploma / HND	17	31.5
Bachelor's Degree	25	46.3
Master's Degree	9	16.7
Professional Certification	3	5.6

Source: Field Survey, 2020.

Table 4.1 above presents demographics information. The study found that most (55.6%) of the respondents were females while the least (44.4%) were males. Again,

study found that most (35.2%) of the participants were aged between 31-40 years, 33.3% were aged between 41-50 years, 22.2% were also aged between 18-30 years while the rest (9.3%) of the respondents were above 50 years. Furtherance, study showed that majority (46.3%) of the participants indicated that they have acquired their Bachelor's degree, 31.5% said they have had a Diploma\HND, 16.7% asserted that they have had their Master's degree and the least (5.6%) of the participants said they have acquired a professional certificate.

4.3 Inventory Management Measures

Table 4.2: Inventory Management

Statements	Min	Max	Mean	Std. D
Our inventory management system uses JIT replenishment	2	7	4.70	1.62
Our inventory management system uses automated recording	1	7	4.43	1.70
Our inventory management system uses cycle counting	1	7	4.59	1.54
Our inventory management system uses inventory control	1	7	5.11	1.73
Our inventory management system uses the EOQ model	1	7	4.52	1.66
Our inventory management system uses response based replenishment	1	7	4.37	1.70
Our inventory management system uses a fixed-period system	1	7	4.63	1.57
Our inventory management system uses periodic review	1	7	4.89	1.83

Source: Field Survey, 2020.

As observed in the Table 4.2 above, most participants had somewhat agreed that their company practiced inventory management. Items included; "Our inventory management system uses periodic review" (m=4.8, SD=1.8), "Our inventory management system uses JIT replenishment" (m=4.7, SD=1.6), "Our inventory management system uses a fixed-period system" (m=4.6, SD=1.5), "Our inventory management system uses the EOQ model" (m=4.5, SD=1.6), "Our inventory management system uses cycle counting" (m=4.5, SD=1.5), "Our inventory management system uses automated recording" (m=4.4, SD=1.7) and "Our inventory management system uses response based replenishment" (m=4.3, SD=1.6) while few

respondents agreed on the item "Our inventory management system uses inventory control" (m=5.1, SD=1.7).

4.4 Performance Measures

Table 4.3: Market Performance

Statements	Min	Max	Mean	Std. D
Our inventory management system has helped increase our organizational performance	1	7	5.37	1.61
Our inventory management system has helped increase our competitive advantage	1	7	5.37	1.48
Our inventory management system has helped increase our sale	2	7	5.56	1.61
Our inventory management system has helped increase our market share	2	7	5.28	1.38

Source: Field Survey, 2020.

As illustrated in the Table 4.3 above, respondents had agreed that inventory management practices improved their market performance. Items indicating this included; "Our inventory management system has helped increase our sale" (m=5.5, SD=1.6), "Our inventory management system has helped increase our competitive advantage" (m=5.3, SD=1.4), "Our inventory management system has helped increase our organizational performance" (M=5.3, SD=1.6) as well as "Our inventory management system has help increase our market share" (m=5.2, SD=1.3).

Table 4.4: Financial Performance

Statements	Min	Max	Mean	Std. D
Our inventory management system has lowered costs	1	7	5.28	1.74
Our inventory management system has increase profitability	1	7	5.35	1.66
Our inventory management system has led to a higher return on sales	1	7	5.43	1.51
Our inventory management system has led to a higher return on assets	1	7	4.94	1.46
Our inventory management system has led to a higher return on investment	1	7	4.91	1.70

Source: Field Survey, 2020.

As identified in the Table 4.4 above, majority of the respondents had agreed that inventory management practices have improved their financial performance. Items agreed consisted of; “Our inventory management system has led to a higher return on sales” (m=5.4, SD=1.5), “Our inventory management system has increase profitability” (m=5.3, SD=1.5) and “Our inventory management system has lowered costs” (m=5.2, SD=1.7). On the other hand, respondent somewhat agreed that inventory management had improved their market performance. Items were; “Our inventory management system has led to a higher return on assets” (m=4.9, SD=1.4) and “Our inventory management system has led to a higher return on investment” (m=4.9, SD=1.6).

Table 4.5: Customer Satisfaction

Statements	Min	Max	Mean	Std. D
Our inventory management system has led to an increase in quality products to customers	1	7	5.28	1.80
Our inventory management system has led to a decrease in customer complaints	1	7	4.52	1.97
Our inventory management system has led to an increase in customer compliments to the firm	1	7	3.30	1.94
Our inventory management system has led to a growth in value added productivity	1	7	4.52	2.20

Source: Field Survey, 2020.

The Table 4.5 above shows that, majority of the respondents somewhat agreed that inventory management had increased their satisfaction level. Items included; “Our inventory management system has led to a growth in value added productivity” (m=4.5, SD=2.2) and “Our inventory management system has led to a decrease in customer complaints” (m=4.2, SD=1.9). Participants had also agreed that inventory management had improved their satisfaction in terms of item “Our inventory management system has led to an increase in quality products to customers” (m=5.2,

SD=1.7) and item "Our inventory management system has led to an increase in customer customers" (m=3.3, SD=1.9) was disagreed upon.

4.5 Validity and Reliability Results

Table 4.6: Validity and Reliability Results

	Mean	Cronbach α	Marketing Performance	Financial Performance	Customer Satisfaction	Inventory Management
Market Performance	5.40	0.736	1			
Financial Performance	5.18	0.924	0.736* (0.000)	1		
Customer Satisfaction	4.41	0.817	0.042 (0.765)	0.072 (0.603)	1	
Inventory Management	4.66	0.949	0.512* (0.000)	0.516* (0.000)	0.378* (0.005)	1

*. Correlation is significant at the 0.01 level and ** Correlation is significant at the 0.05 level

As illustrated in the Table 4.6 the study found strong positive and significant correlation (R = 0.512, *p-value = 0.000 < 0.05*) between inventory management and marketing performance. Moreover, the study found strong positive and significant correlation (R = 0.516, *p-value = 0.000 < 0.05*) between inventory management and financial performance. Again, the study found positive and significant (R = 0.378, *p-value = 0.000 < 0.05*) correlation between inventory management and customer satisfaction. These results imply that there are fairly correlations between the variables. Moreover, no traces of multicollinearity were observed as all the intra item correlations were below the recommended minimum requirement (0.8). Regarding Cronbach alpha values all the constructs far exceeded the acceptable internal consistency limit (0.7)

4.6 Regression Results

Table 4.7: Model Fitness

Model	R Square	Adjusted R Square	F-Statistics	Sig (Decision)
Model 1	0.262	0.248	18.463	Supported
Model 2	0.262	0.252	18.857	Supported
Model 3	0.143	0.126	8.649	Supported

a. Predictors: (Constant), Inventory Management

As shown in the Table 4.7 above, the probability of the F- statistic in the model 1 was significant (*p-value = 0.000 < 0.05*). Meaning inventory management is fit to predict market performance as indicated in the model 1. Moreover, the R-square score indicates that 26.2% variability in market performance is explained by inventory management practices of the manufacturing firms. Moreover, the probability of the F-statistic in the model 2 was significant (*p-value = 0.000 < 0.05*). Meaning inventory management is fit to predict financial performance as indicated in the model 2. Moreover, the R-square score indicates that 26.2% variability in financial performance is explained by inventory management practices of the manufacturing firms. Similarly, the probability of the F- statistic in the model 3 was significant (*p-value = 0.000 < 0.05*). Meaning inventory management is fit to predict customer satisfaction as indicated in the model 3. Moreover, the R-square score indicates that 14.3% variability in customer satisfaction is explained by inventory management practices of the manufacturing firms.

Table 4.8: Regression Results

Model	β	Std. Error	T-statistics	P-value
Inventory management & Market Per	0.203	0.047	4.297	0.000
Inventory management & Finance Per	0.319	0.073	4.342	0.000
Inventory management & Satisfaction	0.210	0.071	2.941	0.005

Constants (Model 1, Market Performance: Model 2, Financial Performance: Model 3, Customer Satisfactions).

4.6.1 Effect of Inventory Management on Market Performance

As showed in the Table 4.8 above, the study found that inventory management is significant determinant (β = 0.203, *T-value* = 4.2 *p-value* < 0.05) of market performance. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 20.3% change in market performance. Therefore the null hypothesis 1 is rejected. The inventory management has a significant effect on the market performance of manufacturing firms in the Kumasi Metropolis. These findings are empirically supported. For example a study conducted in Malaysian by Theng (2016) investigated the manner in which inventory management influenced the competitive advantages of manufacturing SMEs operating in Malaysia. According to the results, inventory lead time, inventory management and systems used for this type of management were all responsible for their competitive advantages. Moreover, a study by Atnafu and Balda (2018) investigated the impact that inventory management had on the competitiveness and organizational performances of Ethiopian manufacturing companies. The research sample included a total of 188 micro and small enterprises involved in this sub-sector of the Ethiopian economy. The results indicated that the more inventory management was adhered to, the more the firms in question experienced increased competitive advantages and organizational performances. In addition, it was brought to light that the firms' competitive advantages of the firms in question positively affected their performances. However, it was cautioned that the study's findings may not be generalizable to large and medium-sized firms in the industry, nor to the whole entire manufacturing sub-sector. Another related study by Ngumi (2015) researched the relationship between the inventory management and productivity levels of large, Kenyan manufacturing firms using a sample of 50 such firms. Through the study, it

was found that their inventory management practices positively affected their productivity.

4.6.2 Effect of Inventory Management on Financial Performance

Again, the study found that inventory management is significant determinant (β = 0.319, *T-value* = 4.3 *p-value* < 0.05) of financial performance. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 31.9% change in market performance. Therefore the null hypothesis 2 is rejected. Inventory management has a significant effect on financial performance of manufacturing firms in the Kumasi Metropolis. These results are in agreements with most previous reports. For instance Kimaiyo and Ochiri's (2014) study concerned Kenyan manufacturing firm's inventory management and performance similar to Ngumi's (2015) and Naliaka and Namusonge's (2015) studies. However, this study was concerned with the manner in which the cost reduction aspect of inventory management affected the performance of these manufacturing firms; how inventory control systems affected their performance; how lead time affected their performance; and how supplier demand affected their performance. Through the study, it was found that the inventory management systems of the firms in question had a positive effect on their being able to practice proper inventory management, and also assisted in their lowering of costs, and therefore, an increase in their profitability. Another study by Karim, Nawawi & Salim (2018) examined the effect of standard operation procedure (SOP) on inventory management practices in a manufacturing firm in Malaysia; identified any weaknesses in these practices; and examined the overall effect of these practices on company performance. The study revealed that the poor management of inventory did not have a significant effect on the financial performance of the case

study organization. A study by Mbula, Memba and Njeru (2016) investigated inventory management's impact on the financial performances of firms that were funded by Government Venture Capital in Kenya, with a focus on political environment as a moderating variable and found that most of the firms that were surveyed had decent inventory management practices. In addition, it was found that inventory management had a significant effect on the financial performances of the firms that were studied. Prempeh (2015) sought to determine how efficient inventory management affected the profitability of Ghanaian manufacturing companies. With that, the sample consisted of four listed manufacturing companies using figures for the time period from 2004 to 2014. Their annual reports were used as a major source of secondary data. Moreover, the study revealed that it was primarily the efficient management of raw materials which enhanced the profitability for Ghana's manufacturing industry.

4.6.3 Effect of Inventory Management on Customer Satisfaction

Finally, the study found that inventory management is significant determinant (β = 0.210, *T-value* = 2.9, p-*value* < 0.05) of customer satisfaction. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 21% changes in customer satisfaction. Therefore the null hypothesis 3 is rejected. Inventory management has a significant effect on the customer satisfaction of manufacturing firms in the Kumasi Metropolis. These results relate to a Pakistani study conducted by Rashid (2015) dealt with an English biscuits manufacturing firm and was concerned with the impact that inventory management and customer collaboration had on the satisfaction of its customers. The study employed both Pearson's correlation and regression analysis to arrive at the fact that both of the

study's independent variables had a significant effect on customer satisfaction. Moreover, Thogori and Gathenya (2014) conducted a study in Kenya for the purpose of investigating the effect that inventory management had on the satisfaction of the customers of manufacturing firms. The case study organization was Delmonte Kenya—a food processing company. It should be mentioned that this company utilized a supply chain inventory information sharing system as part of its inventory management efforts. Similarly the study revealed that the company's inventory management system was poor and often led to shortages of inventory and long lead times resulting in inventory delays. It was because of this that the inventory system generally led to customer dissatisfaction. There was also found to be a strong significantly negative relationship between delays in ordering and customer satisfaction (-0.718); a strong significant positive relationship between delays in order and customer dissatisfaction (0.652); a strong significant negative relationship between delays in ordering and customer loyalty (-0.610); and a strong negative relationship between delays in ordering and repeat purchases (-0.627).

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the summary of findings, conclusion and recommendations with regards to the objectives of the study. Moreover, the recommended areas for future studies are also presented in this chapter.

5.2 Summary of Findings

5.2.1 Effect of Inventory Management on Market Performance

The study found that inventory management is significantly determinant ($\beta = 0.203$, *T-value* = 4.2 *p-value* < 0.05) of market performance. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 20.3% change in market performance. Therefore the null hypothesis 1 is rejected. Inventory management has a significant effect on the market performance of manufacturing firms in the Kumasi Metropolis. The result is empirically supported study conducted in Malaysian by Theng (2016) investigated the manner in which inventory management influenced the competitive advantages of manufacturing SMEs operating in Malaysia. According to the results, inventory lead time, inventory management and systems used for this type of management were all responsible for their competitive advantages. Moreover, Atnafu and Balda (2018) indicated that the more inventory management was adhered to, the more the firms in question experienced increased competitive advantages and organizational performances.

5.2.2 Effect of Inventory Management on Financial Performance

Again, the study found that inventory management is significantly determinant ($\beta = 0.319$, *T-value* = 4.3 *p-value* < 0.05) of financial performance. This implies that

holding all other variables at constant zero a unit changes in inventory management will lead to 31.9% change in market performance. Therefore the null hypothesis 2 is rejected. Inventory management has a significant effect on financial performance of manufacturing firms in the Kumasi Metropolis. The results are in agreements with Mbula, Memba and Njeru (2016) who investigated inventory management's impact on the financial performances of firms and found that inventory management had a significant effect on the financial performances of the firms that were studied. Prempeh (2015) sought to determine how efficient inventory management affected the profitability of Ghanaian manufacturing companies.

5.2.3 Effect of Inventory Management on Customer Satisfaction

Finally, the study found that inventory management is significantly determinant (β = 0.210, *T-value* = 2.9, *p-value* < 0.05) of customer satisfaction. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 21% changes in customer satisfaction. Therefore the null hypothesis 3 is rejected. Inventory management has a significant effect on the customer satisfaction of manufacturing firms in the Kumasi Metropolis. These results relate to a Pakistani study conducted by Rashid (2015) dealt with an English biscuits manufacturing firm and was concerned with the impact that inventory management and customer collaboration had on the satisfaction of its customers. The study employed both Pearson's correlation and regression analysis to arrive at the fact that both of the study's independent variables had a significant effect on customer satisfaction.

5.3 Conclusion

This study was conducted to assess how the inventory management influenced performance of manufacturing firms in the Kumasi Metropolis using primary data and quantitative research approach. The data for the analyses have been validated using Cronbach Alpha and pilot study respectively for reliability test and validity test. The hypotheses of the study are tested using regression analysis. The study found that inventory management is significantly determinant of market performance. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 20.3% change in market performance. Therefore the null hypothesis 1 is rejected. The inventory management has a significant effect on the market performance of manufacturing firms in the Kumasi Metropolis.

Again, the study found that inventory management is significantly determinant of financial performance. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 31.9% change in market performance. Therefore the null hypothesis 2 is rejected. Inventory management has a significant effect on financial performance of manufacturing firms in the Kumasi Metropolis.

Besides, the study found that inventory management is significantly determinant of customer satisfaction. This implies that holding all other variables at constant zero a unit changes in inventory management will lead to 21% changes in customer satisfaction. Therefore the null hypothesis 3 is rejected. Inventory management has a significant effect on the customer satisfaction of manufacturing firms in the Kumasi

Metropolis. The study finally concludes that inventory management is a determinant of manufacturing firm's performance.

5.4 Recommendations

Foremost, the study that inventory management is significantly determinant of market performance. The study recommends that there is therefore the need to expedite inventory management practices to improve market performance of manufacturing firms. The market performance includes the relationship of selling price to costs, the size of output, the efficiency of production, progressiveness in techniques and products, etc. Moreover the following are eminent when considering marketing performance. The ability to minimize distribution costs through utilizing cost-collective distribution channels and marketing strategies. Setting fair and equitable prices for consumers, Maximizing consumer choice and value-for-money attributes. The ability to provide consumers with goods that are superior in terms of technology through introducing process and product innovations which enable the reduction of supply costs and prices.

Moreover, the study found that inventory management is significant determinant of financial performance. The study recommends that management of manufacturing companies must ensure the need to adopt best inventory management practices in order to enhance financial performance such as return on equity, return on assets, net profit margin.

Again, the study found that inventory management is significant determinant of customer satisfaction. There is therefore the need to improve inventory management practices in order to enhance customer satisfaction because satisfaction leads to

customer retention. Regarding the term customer satisfaction, customer satisfaction measures the degree of satisfaction that products or services provide which is measured by the number of customers that repeatedly patronize a firm's products or services.

5.4.1 Areas for Future Studies

The present study focused on the how the inventory management practices of manufacturing companies in the Kumasi Metropolis of Ghana influence their performance. The study suggests that those future researchers should replicate the topic in different industry such as service and retailing. It further suggested that future studies should replicate the topic in different district or region. Moreover, comparative studies between regions are particularly encouraged.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF ACCOUNTING AND FINANCE

INSTITUTE OF DISTANCE LEARNING, IDL

This questionnaire is designed to gather information for a dissertation on the topic. "Effect of Inventory Management on the Performance of Manufacturing Companies in the Kumasi Metropolis of Ghana." Please answer all questions to the best if your ability. It is guaranteed that your response shall remain confidential and shall be used for research purposes only.

Section A: Demographic / Personal Information

1.	**Gender**	Male [ ]	Female [ ]				
2.	**Age**	18 – 30 [ ]	31 – 40 [ ]	41 – 50 [ ]	50+ [ ]		
3.	**Level of Education**	JHS or equivalent [ ]	SHS or equivalent [ ]	Diploma / HND [ ]	Bachelor's Degree [ ]	Master's Degree [ ]	Professional Certification [ ]

Section B: Inventory Management Measures

On a scale of 1 to 7 with 1 indicating "Not at All," 2 indicating "Small Extent," 3 indicating "Moderate Extent," 4 indicating "Great Extent," 5 indicating "Very Great Extent," 6 indicating "Very Very Great Extent," and 7 indicating "Extremely Great Extent," please indicate your agreement with the following statements.

Statements	**Strongly Disagree**						**Strongly Agree**
4. Our inventory management system uses JIT replenishment.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5. Our inventory management system uses automated recording.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6. Our inventory management system uses cycle counting.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7. Our inventory management system uses inventory control.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8. Our inventory management system uses the EOQ model.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9. Our inventory management system uses response-based replenishment.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10. Our inventory management system uses a fixed-period system.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11. Our inventory management system uses periodic review.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Section C: Performance Measures

On a scale of 1 to 7 with 1 indicating "Not at All," 2 indicating "Small Extent," 3 indicating "Moderate Extent," 4 indicating "Great Extent," 5 indicating "Very Great Extent," 6 indicating "Very Very Great Extent," and 7 indicating "Extremely Great Extent," please indicate your agreement with the following statements.

Statements	Strongly Disagree						Strongly Agree
Market Performance							
12. Our inventory management system has helped increase our organizational performance.	1	2	3	4	5	6	7
13. Our inventory management system has helped increase our competitive advantage.	1	2	3	4	5	6	7
14. Our inventory management system has helped increase our sales.	1	2	3	4	5	6	7
15. Our inventory management system has helped increase our market share.	1	2	3	4	5	6	7
Financial Performance							
16. Our inventory management system has lowered costs.	1	2	3	4	5	6	7
17. Our inventory management system has increased profitability.	1	2	3	4	5	6	7
18. Our inventory management system has led to a higher return on sales.	1	2	3	4	5	6	7
19. Our inventory management system has led to a higher return on assets.	1	2	3	4	5	6	7
20. Our inventory management system has led to a higher return on investment.	1	2	3	4	5	6	7
Customer Satisfaction							
21. Our inventory management system has led to an increase in quality products to customers.	1	2	3	4	5	6	7
22. Our inventory management system has led to a decrease in customer complaints.	1	2	3	4	5	6	7
23. Our inventory management system has led to an increase in customer compliments to the firm.	1	2	3	4	5	6	7
24. Our inventory management system has led to a growth in value added productivity.	1	2	3	4	5	6	7