

UNIVERSITY OF CAPE COAST

EFFECT OF INVENTORY MANAGEMENT PRACTICES ON
PERFORMANCE OF SMALL AND MEDIUM-SCALE ENTREPRISES IN
THE CAPE COAST METROPOLIS

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature Date:

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Supervisors' Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature Date:

Name: Dr. Clement Lamboi Arthur

ABSTRACT

This study examined the effect of inventory management practices on the performance of small and medium-scale enterprises in the Cape Coast Metropolis. The study adopted the descriptive and correlational study designs and used the proportional stratified sampling technique to select 341 small and medium enterprises in the Cape Coast Metropolis, who served as sample size for the study. Respondents constituted owners/managers of SMEs. Questionnaires were designed based on past empirical studies and data collection was aided by enumerator. The data collected were analysed using descriptive statistical tools (frequencies, percentages, mean scores) as well as inferential statistics (Pearson's correlation coefficient, regression analysis) using SPSS for windows, version 21. The findings revealed that SMEs in the Cape Coast Metropolis apply information technology, lean inventory systems and strategic supplier partnership in their firms. Also, inventory management practices had a positive and significant relationship with the performance of SMEs in the Cape Coast Metropolis. Finally, there was positive effect of inventory management practices (information technology, lean inventory system, strategic supplier partnership) on the performance of SMEs in the Cape Coast Metropolis. The study recommended that the state agencies that seek the welfare of SMEs, for instance, NBSSI and Ghana Chamber of Commerce should encourage owner/managers of small and medium sized enterprises to embrace inventory innovations in order to generate long term stability and for the firm to have competences.

KEY WORDS

Information technology

Inventory management practices

Lean inventory system

Performance

Small and medium-scale enterprises

Strategic supplier partnership

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DEDICATION

To my children, Paa Kwasi Adofo and Maame Yaa Asantewah

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LIST OF ACRONYMS

CCMA	Cape Coast Metropolitan Assembly
EDI	The Electronic Data interchange
EIM	Efficiency of Inventory Management
EOQ	Economic Order Quantity
EPOS	Electronic Point of Sale
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
GSE	Ghana Stock Exchange
GSGDA	Ghana Shared Growth and Development Agenda
JIT	Just-In-Time
MRO	Maintenance, Repair and Operating
MRP	Materials Requirements Planning Systems
OLS	Ordinary Least Squares
ROA	Return on Assets
ROI	Return on Investment
ROS	Return on Sales
SMEs	Small and Medium-Sized Enterprises
SPSS	Statistical Package for Social Sciences
SSEs	Small Scale Enterprises
VMI	Vendor Managed Inventory
WIP	Work-in-Progress

CHAPTER ONE

INTRODUCTION

Ineffective inventory system could result in loss of customers and sales. Therefore, organisations especially small and medium-scale enterprises (SMEs) need to understand exactly how their inventory management practices can make or mar their businesses. Although some empirical investigations have been carried out on the subject, most of them were conducted in the context of developed countries. As a result, extending findings of those studies in Ghana would be quite inappropriate, particularly due to the differences in socio-economic and business environment. Hence, this study sought to examine the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis with the aim of making recommendations to improve the existing situation.

Background to the Study

Inventories constitute a major component of the total assets of every business organisation. They include stock of raw materials, work in progress, and finished goods as well as other supplies held by a firm to facilitate their operations. As indicated by Bevilacqua, Ciarapica and Paciarotti (2015), inventories comprise both assets and other items held in the ordinary course of business. Like other forms of assets, inventories are held by business organisations to benefit their future operations. Inadequate inventory could disturb the smooth running of a firm, while excess inventory could also lead to needless holding cost, which can consequently cause a firm to experience a dip in both its profitability and overall performance. As indicated Koliass,

Dimelis and Filios (2011), excessive stock is not desirable, especially for longer periods as high inventory levels lead to high carrying cost and a reduction in profitability.

It is, therefore, absolutely imperative for organisations to maintain an ideal size of inventory at all times so as to avoid extra holding cost and stock out. As reiterated by Abdulrashee, Yahaya, Isiaka and Aliu (2011), firms must hold an appropriate level of stock so as to meet both production and sales needs. This is because insufficient stock puts a firm at a risk of incurring stock out, while extreme level of stock might also lead to waste. Shortage of finished goods, for instance, could create a feeling of disappointment among customers, a situation which could possibly lead to loss of customers and sales. Too much inventory, on the other hand, consumes physical space, creates financial burden, and increases possibility of damage, spoilage and loss (Lwiki, Ojera, Mugenda, & Wachira, 2013).

In order to achieve an ideal level of inventory, firms need to constantly undertake sound and time-tested inventory management practices. Inventory management refers to the system used by a firm to control its investment in inventory (Thürer *et al.*, 2014). It entails a planned method of purchasing and storing materials or items to prevent both stock out and excessive stock level. It involves the recording and monitoring of stock level, forecasting future demand and deciding on when and how to order (Adeyemi & Salami, 2010). According to Mathuva (2013), inventory management involves making decisions that are in line with basic trade off among firm's objectives, costs and other constraints. Basic activities undertaken within the sphere of inventory management include purchasing, classification, inspection,

codifications, store keeping, stock taking and stock control (Kamau & Kagiri, 2015).

Inventory management is critical to the effective and efficient functioning of a firm. It helps in the determination of the optimal amount of materials and goods that a firm should hold at any given time (Kumar & Bahl, 2014). According to Ahmed (2016), effective inventory management helps to ensure adequate supply of high quality products that can satisfy the needs of customers whilst minimizing the carrying cost of a firm's inventory. A well-functioning inventory management system has a great effect on a firm's total performance (Akindipe, 2014). According to Mahidin, Othman and Saifudin (2016), an effective inventory management improves a firm's total performance through matching inventory management practices with competitive advantages. A well-managed inventory system is often a key to meeting profit margin objectives (Mwangi & Nyambura, 2015). This is because good inventory management practices help to ensure regular supply of materials as and when needed (Kamau & Kagiri, 2015).

The above discussion underscores the significant role that inventory management practices play when it comes to the smooth operation of businesses. Nonetheless, reports suggest that most firms have failed to give inventory management the desired attention. For example, a survey conducted by Mwangi, Makau and Kosimbei (2014) among selected firms in Kenya revealed that the sector has suffered so much over the past years due to poor material planning, poor inventory control, purchasing problems, quality control problems, stores control problems, among others.

Similarly, Temeng, Eshun and Essey (2010) contends that historically, organizations have ignored the potential cost savings from proper inventory management, treating inventory as a necessary evil and not as an asset that requires proper management. Consequently, many inventory systems are based on arbitrary rules. This practice has caused some organizations to have more funds invested in inventory than necessary and yet, they are still not able to meet customers' demand due to poor distribution of investment and inventory items. Temanget *al.* further posit that some problems associated with inventory management occur due to lack of effective and efficient inventory management arising mainly from the inability of management to identify proper inventory management practices that need to be adopted or even where identified, the application is often inadequate.

Firms adopt diverse techniques vis-à-vis the management of their inventories. According to Lwiki *et al.* (2013), the various practices adopted by firms in managing their inventory have significant impact on returns, profitability and volume of sales. Hence, the need for firms to take inventory management practices very seriously.

As revealed by Augestine and Agu (2013), studies abound on the subject of inventory management practices and organizational performance. However, it appears the subject has not received the desired attention from researchers in Ghana as the researcher has, so far, not been able to locate any study on the subject from the Ghanaian perspective. It is, therefore, in the bid to fill this knowledge gap that this study intends to examine the effect of inventory management practices on organisational performance in Ghana, with particular focus on SMEs operating in the Cape Coast Metropolis.

Statement of the Problem

Inventories are vital to the successful functioning of both manufacturing and retailing organizations (Augustine & Agu, 2013). Ineffective inventory system could result in loss of customers and sales (Syed, Mohamad, Rahman, & Suhaimi, 2016). Victoire (2015) argues that, the life blood of any organization is inventory. Adequate and appropriate movement of inventory is critical to the growth and financial success of every organisation (Panigrahi, 2013). Better management of inventories helps organizations to release capital for use elsewhere productively (Akindipe, 2014). The profitability of any organisation is directly or indirectly affected by the kind of inventory management system being operated. An effective inventory management helps to generate more sales for a company which directly affects the company's performance (Keitany, Wanyoike, & Richu, 2014).

Notwithstanding, studies suggest that a number of firms face numerous challenges when it comes to inventory management, a situation that hamper their performance. Munyao, Omulo, Mwithiga and Chepkulei (2015) suggests that there have been cases of materials overstocking, which eventually get expired; under stocking; lack of stock-taking; theft of materials by workers ; and delays in the delivery of materials into organisations, among others. Maniet *al.* (2016) added that, nearly 60 percent to 70 percent of the total funds employed by firms are tied up in current assets, of which inventory is the most significant component. Similarly, Etale and Lingilar (2016) contend that inventory represents close to 33 percent of a firm's total assets and as much as 90 percent of its working capital.

Considering the fact inventory constitutes a major segment of a firm's assets, it is crucial that good inventory management practice is put in place to ensure the firm's growth and profitability. In other words, it is important for firms to have sound, effective and well-coordinated inventory management systems to facilitate their long-term survival. As reiterated Victoire (2015), organisations must view inventory management as a serious stabilising and economic growth factor than a mere drain-pipe. With the application of proper inventory management techniques, the right materials will be available at the right time, with the minimum storage costs and investment.

The prime objective of any business organisation is to get the best return on every little investment made, and one sure way of achieving this goal is through proper and effective inventory management (Munyao *et al.*, 2015). According to Zariyawati, Hirnissa and Diana-Rose (2017), the management of inventory can positively affect how profit-making organisations maximize their earnings. However, if inventory is not properly managed, it can result in liquidity crisis which may eventually bring a firm to its knees. It is, therefore, against this backdrop that this study sought to examine the effect of inventory management practices on the performance of Small and Medium Enterprises using evidence from Cape Coast Metropolis.

Research Objectives

The primary goal of this study was to examine the effect of inventory management practices on the performance of SMEs in Cape Coast Metropolis. Specifically, the study seeks to:

1. assess the inventory management practices adopted by SMEs in the Cape Coast Metropolis;
2. test the relationship between inventory management practices and performance of SMEs in the Cape Coast Metropolis.
3. establish the effect of inventory management practices (information technology, lean inventory system, strategic supplier partnership) on the performance of SMEs in the Cape Coast Metropolis.

Research Questions

The study is guided by the following research questions:

1. What are the inventory practices adopted by SMEs in the Cape Coast Metropolis?
2. What relationship exists between inventory management practices and performance of SMEs in the Cape Coast Metropolis?

Hypotheses

H₀: There is no significant effect of inventory management practices (information technology, lean inventory system, strategic supplier partnership) on the performance of SMEs in the Cape Coast Metropolis.

H₁: There is significant effect of inventory management practices (information technology, lean inventory system, strategic supplier partnership) on the performance of SMEs in the Cape Coast Metropolis.

Significance of the Study

The study would be of great significance in a number of ways. First of all, the study will enable managers/owners of the various SMEs understand exactly how their inventory management practices can make or mar their businesses. Resultantly, they would be encouraged to adopt those practices that are more likely to enhance their performance. Moreover, the findings of this study will serve as a reliable source of information to other researchers who may be interested in investigating the subject of inventory management practices and organisational performance in the future, especially in Ghana and other developing countries.

Delimitations

Only owner/managers of SMEs that were currently operating within the Cape Coast Metropolis were used as subjects for the study. Also, due to the limited period within which the study ought to be completed, the researcher was unable to use all SMEs in the Cape Coast Metropolis as subjects for the study. This situation is likely pose a challenge regarding the generalization of the study findings. Hence, one must be very circumvent when extending the findings of the study other geographical locations.

Organisation of the Study

This study wasorganised into five main chapters. Chapter one presented the introduction which comprised background of the study, statement of the problem, purpose of the study, researchers objectives, research questions, hypotheses, significance of the study, delimitations, and

organisation of the study. Chapter two reviewed various literatures relevant to this research project and Chapter three described the research methodology adopted for the study. Chapter four captured the results and discussion while Chapter five finalised the report with the summary, conclusions and recommendations.

Chapter Summary

This study sought to examine the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis. This chapter began with a short introduction that presented the problem under study, why the problem was important, how the study related to previous work. After that, background to the study was presented, where the study highlighted the relevance of inventory management practices to the performance of organizations in general and specifically, SMEs and spelling out the purpose of the study. Afterwards, this chapter stated the problem under study; followed by the research objectives, which were further translated to research questions and hypothesis; significance of the study; delimitations; and finally, organisation of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter covered theoretical review, conceptual review, empirical review, and conceptual framework. The theoretical review explained the four theories of modern operations management, the concept of inventory management, Wilson's economic order quantity model, objectives of inventory management, inventory management practices. Afterwards, the conceptual review explained the concept of inventory management, Wilson's economic order quantity model, objectives of inventory management, inventory management practices, definition and classification of SMEs globally, and definition of SMEs in Ghana. Subsequently, empirical review documented the results of other studies that were closely related to inventory management practices and business performance both in Sub-Saharan Africa and developed nations as well as identifying the similarities, contradictions and gap in such studies. Finally, conceptual framework showed the researchers' idea on how the research topic is explored. It dwelled on time tested theories that embody the findings of numerous investigations on how phenomena occur.

Theoretical Review

The theoretical review explained the four theories of modern operations management (business process redesign, reconfigurable manufacturing systems, six sigma, and lean manufacturing theories) and how they related to the current study.

Theories in operations management

Operations management involves certain responsibilities. One of those responsibilities is ensuring the business operates efficiently, both in terms of using the least amount of resources necessary and in meeting customers' requirements to the highest standard economically viable. Operations management involves managing the process by which raw materials, labour and energy are converted into goods and services. People skills, creativity, rational analysis and technological knowledge are all important for success in operations management. In the history of business and manufacturing operations, divisions of labour and technological advancements have benefited company productivity.

Modern operations management (which involves inventory management) revolves around four theories: business process redesign (BPR), reconfigurable manufacturing systems, six sigma and lean manufacturing (Voss, Tsiriktsis, & Frohlich, 2015). BPR was formulated in 1993 and is a business management strategy that focuses on analyzing and designing workflow and business processes within a company. The goal of BPR is to help companies dramatically restructure organization by designing the business process from the ground up (Davenport & Short, 2013). Reconfigurable manufacturing systems are production systems designed to incorporate accelerated change in structure, hardware and software components. This allows systems to adjust rapidly to the capacity to which they can continue production and how efficiently they function in response to market or intrinsic system changes (Koren, 2014).

Six sigma is an approach that focuses on quality. It was primarily developed from 1985 to 1987 at Motorola. The word "six" references the

control limits, which are placed at six standard deviations from the normal distribution mean. Jack Welch of General Electric started an initiative to adopt the six sigma method in 1995, which brought the approach a great deal of popularity. Every six sigma project within a company has a defined step sequence and financial targets, such as increasing profits or reducing costs. Tools used within the six sigma processes include trending charts, potential defect calculations and other ratios. Finally, lean manufacturing is a systematic method of eliminating waste within the manufacturing process (Pyzdek & Keller, 2014). The lean theory accounts for waste that is created through overburdening or uneven workloads. This theory sees resource use for any reason other than value creation for customers as wasteful and seeks to eliminate wasteful resource expenditures as much as possible (Mourtzis, Papathanasiou, & Fotia, 2016). Consequently, this study adopts the theories of operation management in explaining inventory management practices and performance nexus.

Conceptual Review

The conceptual review explained the concept of inventory management, Wilson's economic order quantity model, objectives of inventory management, inventory management practices, definition and classification of SMEs globally, and definition of SMEs in Ghana.

The concept of inventory management

Inventory refers to the value or quantity of raw materials, supplies, work in progress (WIP) and finished stock that are kept or stored for use as

need arises (Thürer *et al.*, 2014). Raw materials are commodities such as steel and lumber that go into the final product. Supplies include items such as Maintenance, Repair and Operating (MRO) inventory that do not go into the final product. Work in progress is materials that have been partly fabricated but are not yet completed. Finished goods are completed items ready for shipment (Koren, 2014).

In view of this, inventory management is the art and science of maintaining stock levels of a given group of items incurring the least cost consistent with other relevant targets and objectives set by management (Keitany, Wanyoike, & Richu, 2014). It is important that managers in organisations that deals with inventory, have in mind, the objective of satisfying customer needs and keeping inventory costs at a minimum level. Kamau and Kagiri (2015) assert that inventory costs include holding costs, ordering costs and shortage costs.

Holding costs relate to costs of having physical items in stock. These include insurance, obsolescence and opportunity costs associated with having funds which could be elsewhere but are tied up in inventory. Ordering costs are costs of placing an order and receiving inventory. These include determining how much is needed, preparing invoices, transport costs and the cost of inspecting goods. Shortage costs result when demand exceeds the supply of inventory on hand. The costs include opportunity costs of making a sale, loss of customer goodwill, late charges and similar costs (Kamau & Kagiri, 2015).

Wilson's EOQ model

Mathematical models have been developed within the scope of operations management to determine the optimal inventory level. The most widely used model is the economic order quantity (EOQ) model. This model was developed by F.W. Haris in 1913. But still R. H. Wilson is given credit for his early in- depth analysis of the model (Oballah, Waiganjo, &Wachiuri, 2015). The model is also known as the Wilson EOQ model. According to this model, some costs (ordering costs) decline with inventory holdings, while others (holding costs) rise and that the total inventory-associated cost curve has a minimum point. This is the point where total inventory costs are minimized. The economic order quantity is the level of inventory that minimizes the total of the inventory holding cost and ordering cost. The graphical representation of EOQ model is shown in Figure 1.

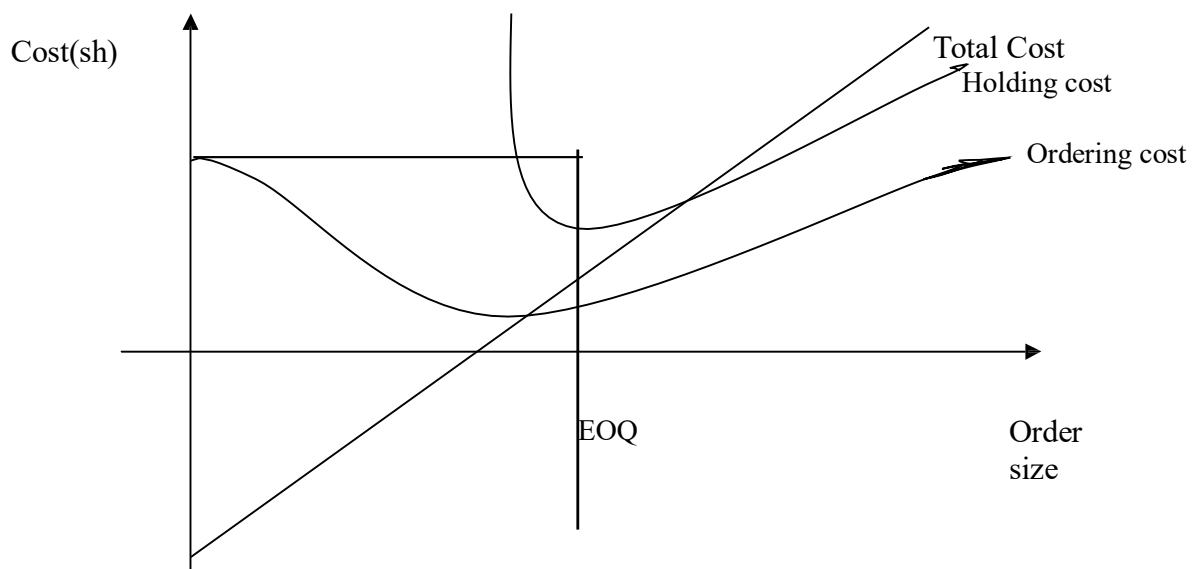


Figure 1: Economic order quantity model

Source: Adopted from Lwiki *et al.* (2013, p. 77).

Objectives of inventory management

Enow and Isaacs (2016) assert that the primary objective of inventory management is to improve customer service. This is done through protection against stock out due to demand variability in the market place. Kumar, P., & Bahl (2014) assert that the aim of inventory management is to increase production efficiency. Closely related to the function of production control, maintaining an inventory allows for efficient materials management. Enow and Isaacs (2016) further argued that the key issue to be considered in formulating inventory policy is cost minimization. Therefore the objective of inventory management is to minimize inventory investment. One benefit of good inventory control is improved managerial efficiency in all functional areas of management.

Inventory management practices

Inventory management practices used in this study include information technology, lean inventory system, and strategic supplier partnership.

Information technology

Lin, Karim and Carter (2015) assert that information is the life blood of all organisations. Every inventory manager needs information technology in order to succeed in his work. Computers can assist stock control in calculating the optimum amount of stocks to hold and dispatch in order to satisfy the users requirements. The computer can do this by comparing inventory variables (stock levels, demand and delivery dates). The Electronic Data interchange (EDI) is a system which enables direct communication between organisations

without there being any human intervention. This technology has revolutionized inventory management.

EDI is the name given to the transmission and receipt of structured data by the computer systems of trading partners, often without human intervention. The International Data Interchange Association defines EDI as the transfer of structured data, by agreed message standards from one computer system to another, by electronic means. With the EDI system linking the buying organisation with its suppliers, the replenishment can be triggered instantly when the need arises and the message is transferred from the original destination without further possibility of corruption (Jonsson & Holmström, 2016).

An EDI link also enables the computers of suppliers and customers to interrogate each other about stock levels, production plans and similar information so that activities are appropriately synchronized. This brings potential benefits in form of reduced paper work, greater accuracy of information, reduced staff costs and shorter lead times arising from instantaneous communication. Electronic point of sale (EPOS) is another technology used in inventory management. The purpose of EPOS is to scan and capture information relating to goods sold. An EPOS systems verifies checks and provides instant sales reports, charges transactions and sends out intra- and inter- stores messages (Sarpong, Guo, Khan, Acheampong, & Musah, 2017).

The EPOS technology allows substantial cost savings and gives “real time” information on sale of goods patterns of stores traffic, and popularity and profitability of every line carried. It enables stock to be limited to demand,

reduces the risk of obsolescence and deterioration of stocks, reduced chances of theft and provides information to buyers. This leads to improved customer service and hence improved financial performance (Sarpong *et al.*, 2017)).

Bar coding is a technology that is employed in counting raw materials and finished goods inventory. It gives the level of inventories, facilitates faster data entry with greater accuracy. Its benefits include reduced labour costs through time saving and productivity. It also enables greater responsiveness to customers and supplies (Lwiki *et al.*, 2013).

Lean inventory system

Lean production principle was pioneered by Enow and Isaacs (2016). This principle was linked with reduced inventories. The argument is that as inventory is reduced there will be profit improvement due to interest savings as well as a reduction in storage fees, handling and waste. These savings have been estimated by literature to be in the range of 20-30 per cent. Lean Management means getting more and more attention in today's highly competitive environment. The proponents of Lean Inventory system argue that excess inventory will adversely affect the net cash flows- of a firm (Oballah, Waiganjo, & Wachiuri, 2015).

On the cost side, most obvious are the costs of holding inventory, which include the capital costs (interest or opportunity) and the physical cost (storage, insurance and spoilage). In recent years, a number of systems have been developed in the field of operations management to deal with excess inventory problem. Management-oriented systems include the Just-In-Time (JIT), the Materials Requirements Planning systems (MRP) and Enterprise

resource planning, ERP. Just-In-Time refers to a collection of practices that eliminate waste. These organisation-wide practices encompass the entire supply chain. The elements of JIT include shared product design with suppliers and customers, movement towards single sourcing proximate suppliers, reduced machine set-up times and total preventive maintenance (Lwiki *et al.*, 2013).

It is an inventory strategy that is implemented to improve the return on investment of a business by reducing inventory and its associated carrying costs. In order to achieve JIT, the process must have signals of what is going on everywhere within the process. JIT can lead to dramatic improvements in a manufacturing organisation's return on investments, quality and efficiency. It emphasizes that production should create items that arrive when needed, neither earlier nor later (Lwikiet *al.*, 2013). Quick communication of the consumption of old stock, which triggers new stock to be ordered, is key to JIT and inventory reduction. This saves warehouse space and costs. The basic philosophy of JIT is that inventory is defined as waste. The technique was first used by Ford motor company. It was subsequently adopted and publicized by Toyota Motor Corporation of Japan in the 1950s.

MRP system is defined as product-oriented computerized technology aimed at minimizing inventory and maintaining delivery schedules. It relates to the dependent requirements for materials and components comprising an end product to time periods over planned horizon on the basis of forecasts provided by marketing and sales and other input information (Etale & Bingilar, 2016).

This system is based on the recognition that, demand for an item may be dependent on the demand for other inventory items. The emphasis is on the end product into which related parts are incorporated. The inventory quantities required are specified on the basis of future demand. The demand for inventory items is precisely determined from the master production schedule for the end products. The operation of a lean inventory system such as JIT and MRP result in relatively low inventory levels. The warehousing costs and material handling costs are significantly reduced. This increases return on assets through decreased conversion costs (Etale & Bingilar, 2016).

Strategic supplier partnership

Lwiki *et al.* (2013) defines partnering as a commitment by both customers and suppliers, regardless of size, to a long term relationship based on clear, mutually agreed objectives to strive for world class capability. The emphasis is on good working relations between customers and suppliers. The concept of supplier partners developed strongly in the 1980s as a result of the movement towards just-in-time (JIT) manufacturing. JIT emphasis reduction in waste, shortening of lead times, improvement and simplicity. These are also the goals of supplier partnership (Oballah *et al.*, 2015). The philosophy is that through co-operation rather than confrontation both parties benefit.

In the partnership, long terms table relationships are sought rather than short term and adversarial relations. The contracts are longer term in order to give the supplier confidence and the motivation to invest and improve. For partnership to work, proper communication is an important factor. The suppliers and customers who communicate clearly and directly are judged to

be more effective. Personal connections with supplier's representatives remain important despite the increasing use of electronic communication of all kinds. There is also need to embrace the principle of early supplier involvement in design. This reduces the chances to defective items and the risk of obsolescence because the supplier is involved in the design process (Lwika *et al.*, 2013).

Vendor Managed Inventory (VMI) is a new feature of supplier partnerships. In a VMI relationship, the supplier holds inventory on site or near the customer, allowing the customer instant access to the inventory. This immediate access allows the customer to pull inventory as needed and only pay for that which is consumed, thus reducing inventory investment and increasing inventory turns. In VMI arrangements, the supplier has a responsibility for replenishing stock, which would include ordering, managing the logistics to shipping of the material and counting inventory. By passing these costs normally managed by the customer on the supplier, the customer is able to reduce the overall cost of their product and increase their margins. The supplier benefits from a higher share of the purchaser's total purchase requirements (Oballah *et al.*, 2015).

Definition and classification of SMEs globally

Definitions of SMEs vary from country to country, depending on one or more thresholds laid down in respect of investment, employment and turnover. The issue of what constitutes a small or micro enterprise is a major concern in literature. Different writers have usually given different definitions to this category of business. SMEs have indeed not been spared with the

definition problem that is usually associated with concepts which have many components. The definition of firms by size varies among researchers as well as writers. Others define SMEs in terms of their legal status and method of production. Some attempt to use the capital assets while others use labour and turnover level (Cacciolatti & Lee, 2015).

Bolton Report first formulated an “economic” and “statistical” definition of a small firm. Under the “economic” definition, a firm is said to be small if it meets the following three criteria: it has a relatively small share of their market place; it is managed by owners or part owners in a personalized way, and not through the medium of a formalized management structure; and it is independent, in the sense of not forming part of a large enterprise. Under the “statistical” definition, the Committee proposed the following criteria: the size of the small firm sector and its contribution to GDP, employment and exports; the extent to which the small firm sector’s economic contribution has changed over time; and applying the statistical definition in a cross-country comparison of the small firm’s economic contribution (Afrifa, 2015).

The Bolton Committee applied different definitions of the small firm to different sectors. Whereas firms in manufacturing, construction and mining were defined in terms of number of employees (in which case, 200 or less qualified the firm to be a small firm), those in the retail, services, and wholesale were defined in terms of monetary turnover (in which case the range is 50,000-200,000 British Pounds to be classified as small firm). Firms in the road transport industry are classified as small if they have five or fewer vehicles. There have been criticisms of the Bolton definitions. These centre

mainly on the apparent inconsistencies between defining characteristics based on number of employees and those based on managerial approach.

In Japan, small-scale industry is defined according to the type of industry, paid-up capital and number of paid employees. Consequently, small and medium-scale enterprises are defined as: those in manufacturing with 100 million yen paid-up capital and 300 employees, those in wholesale trade with 30 million yen paid-up capital and 100 employees, and those in the retail and service trades with 10 million yen paid-up capital and 50 employees (Cacciolatti & Lee, 2015).

European Union (EU) Member States, traditionally have their own definition of what constitutes an SME, for example the traditional definition in Germany had a limit of 250 employees, while, for example, in Belgium it could have been 100. But now the European Union (EU) has started to standardize the concept. Its current definition categorizes companies with fewer than 10 employees as “micro”, those with fewer than 50 employees as “small”, and those with fewer than 250 as “medium”. By contrast, in the United States, when small business is defined by the number of employees, it often refers to those with fewer than 100 employees, while medium-sized business often refers to those with fewer than 500 employees. Canada also defines a small business as one that has fewer than 100 employees (if the business is a goods-producing business) or fewer than 50 employees (if the business is a service-based business), and a medium-sized business as fewer than 500 (Harney, 2015).

Small-scale industries are defined as manufacturing units employing not more than 30 persons. For the purpose of differentiating them from the

other small-scale non-farm economic activities, the emphasis is placed on the manufacturing aspect. Manufacturing means producing or making physical items. This means that pure service activities such as government services, retail trade, banking, recreation and insurance services are not included. However, repair services are included in the manufacturing enterprises because they have something to do with formally manufactured goods. The argument is that manufacturers do not always produce a finished good but only perform one stage in a sequence of a process. The fact that an item can be repaired implies that there is a further stage in the manufacturing process (Cacciolatti & Lee, 2015). After looking at the definitions and classifications of SMEs in the global perspective, it is proper to examine definitions of SMEs given in the context of Ghana since the study covers that jurisdiction.

Definition of SMEs in Ghana

In Ghana, various definitions have been given for SMEs but the most commonly used criterion is the number of employees of the enterprise (Augustine & Asiedu, 2017). By using this definition, confusion often arises in respect of the unpredictability and cut off points used by the various official sources.

According to the National Board for Small Scale Industries (NBSSI), a small business is any business that employs up to 29 people, and small business is divided into: the micro, small and medium enterprises. The micro enterprises employ up to five employees with fixed assets (excluding land and building) not exceeding the value of \$10,000; small enterprises are those employing between six and twenty-nine employees or having fixed assets

excluding land and building not exceeding \$100,000 and; a medium enterprises employ between 30 and 99 employees with fixed assets of up to \$1m (Selase-Asamoah, 2014).

According to Haselip, Desgain and Mackenzie (2014), SMEs are dominated by one person, with the owner/manager taking all major decisions. The entrepreneur may possess limited formal education, access to and use of new technology, market information, and access to credit from the banking sector is severely limited; they have weak management skills, thus inhibiting the development of a strategic plan for sustainable growth; they experience extreme working capital volatility; and lack of technical know-how and inability to acquire skills and modern technology impede growth opportunities.

The Ghana Enterprise Development Commission (GEDC), on the other hand, uses a 10 million Ghanaian cedis upper limit definition for plant and machinery. It is important to caution that the process of valuing fixed assets poses a problem. Secondly, the continuous depreciation of the local currency as against major trading currencies often makes such definitions outdated (Selase-Asamoah, 2014).

In defining small-scale enterprises in Ghana, Augustine and Asiedu (2017) used an employment cut-off point of 30 employees and however, classified small-scale enterprises into three categories. These are: micro-employing less than 6 people; very small - employing 6-9 people; and small - between 10 and 29 employees. In the present study, the definition of SMEs by NBSSI in Ghana is adopted.

Empirical Review

Empirical review documents the results of other studies that are closely related to inventory management practices and its components (information technology, lean inventory system, strategic supplier partnership) and performance of SMEs both in Sub-Saharan Africa and developed nations.

Inventory management practices and performance

In Malaysia, Agus and Noor (2006) examined the relationship between inventory management practices and financial performance. The study measured manager's perceptions of inventory and supply chain management practices and the level of performance in the industry. The practices include lean inventory systems, technology and strategic supplier partnerships. They employed a structured questionnaire, which was designed to assess the companies in terms of the described dimensions. The sample companies were randomly chosen from manufacturing companies (non-food based manufacturing companies with medium to high technology) in Klang Valley, Malaysia. The findings suggest that inventory management practices have significant correlations with profitability and return on sales (ROS).

In addition, Roumiantsev and Netessine (2005) investigated the association between inventory management policies and the financial performance of a firm. The purpose of their study was to assess the impact of inventory management practices on financial performance across the period 1992-2002. They used conventional firm specific variables (inventory levels, margins, and lead times) as explanatory variables. They found no evidence that smaller relative levels are associated with financial performance as

measured by return on assets. Also, Eckert (2007) examined inventory management and role it plays in improving customer satisfaction. He found a positive relationship between customer satisfaction and supplier partnerships, education and training of employees, and technology.

In another study, Nyabwanga and Ojera (2012) investigated the relationship between inventory management practices and business performance of small scale enterprises (SSEs) in Kisii Municipality in Kenya. The relationship was probed based on primary data gathered by use of a structured questionnaire from 70 SSEs. The empirical results revealed a positive significant relationship between business performance and effective inventory management practices at 0.05 significance level. Further, they showed that inventory budgeting had the largest effect on business performance with a beta coefficient of 0.329, followed by shelf-space management with a beta coefficient of 0.30. Inventory level management had the least but significant effect with a beta coefficient of 0.297. The study suggests that owners/managers of SSEs embrace effective inventory management practices as a tactic to further their business performance.

In Kenya, Lwika *et al.* (2013) looked at the impact of inventory management practices on financial performance of sugar manufacturing firms, by analysing the extent to which lean inventory system, strategic supplier partnership and information technology are being applied in these firms. The research survey was conducted in all the eight operating sugar manufacturing firms from the period 2002-2007. The primary data was collected using structured and semi-structured questionnaires administered to key informants in the organisations. Secondary data was obtained from annual

financial performance statements available in the year Book sugar statistics. Descriptive statistics was used to test the impact of inventory management practices and Correlation analysis was used to determine the nature and magnitude of the relationship among inventory management variables. The results indicate that there exists a positive correlation between inventory management and Return on Sales ($r=0.740$) and also with Return on Equity ($r=0.653$) which were found to be statistically significant at 5% level.

In Ghana, Kasim, Zubieru and Antwi (2015) assessed the inventory management practices of small and medium enterprises in the northern region of Ghana. The purpose of their study was to assess inventory management practices and its effect on the financial performance of SMEs in the Northern Region of Ghana. The study adopted a descriptive cross-sectional survey research design which allowed the collection of primary quantitative data through structured questionnaires. The target population was 1000 owner/managers of SMEs. Stratified random sampling technique was used to obtain a sample of 300 SMEs comprising 164 trading, 26 manufacturing, 10 hairstyling, 62 dressmaking, and 38 carpentry enterprises.

The data was analysed using both descriptive and inferential statistics. The study revealed that SME financial performance was positively related to efficiency of inventory management (EIM) at 1 percent significance level. The study concluded that stock management practices have influence on the financial performance of SMEs hence there was the need for SME managers to embrace efficient stock management practices as a strategy to improve their financial performance and survive in the uncertain business environment (Kasim *et al.*, 2015).

In Ghana, Prempeh (2016) investigated the impact of efficient inventory management on the profitability of manufacturing firms in Ghana. The study design was cross sectional. The study employed the use of secondary data. Cross sectional data from 2004 to 2014 was gathered for the analysis from the annual reports of four manufacturing companies listed on the Ghana Stock Exchange. Judgmental sampling was used to select the four manufacturing companies listed on the Ghana Stock Exchange (GSE). Companies whose data were up to date were considered. Measures of profitability were examined and related to proxies for efficient inventory management by manufacturers. The Ordinary Least Squares (OLS) stated in the form of a multiple regression model was used in the data analysis.

The study revealed that there is a significantly strong correlation between the main variable, raw materials inventory management and profitability of manufacturing firms in Ghana and it is positive. Therefore, efficient management of raw material inventory is a major factor to be considered by Ghanaian manufacturers in enhancing or boosting their profitability (Prempeh, 2016).

In Kenya, Munyao, Omulo, Mwithiga and Chepkulei (2015) examined the role of inventory management practices in the performance of the production department. The study sought to find the inventory management techniques used by manufacturing firms in Mombasa County, and established the level of effectiveness of inventory management practices of manufacturing firms in Mombasa County. It also determined the level of performance of production departments of manufacturing firms in Mombasa County and finally, determined whether computerized inventory management influences

the performance of the production department. The study adopted the descriptive research design. The target population was textile, rolling mills and food and beverage manufacturing firms in Mombasa County.

A survey was conducted which adopted stratified random sampling technique. Out of 150 manufacturing firms, a sample size of 45 manufacturing firms was used. A questionnaire was used as data collection instrument. One questionnaire was issued to one respondent at random from each of the forty five manufacturing firms included in the sample. Reliability of research instruments was tested using Split Half Reliability Test. The study found out that manufacturing firms used various inventory management techniques such as the action level methods, just-in-time, periodic review technique, material requirement planning 1 and economic order quantity. The study found that despite the fact that MRP 1 was most effective in contributing to performance of the production department, most organisations in the manufacturing industry used action level methods (Munyao *et al.*, 2015).

Information technology and performance

In Kenya, Lwiki *et al.* (2013) found a positive relationship between information technology and Return on Sales and also with Return on Equity which were found to be statistically significant at 5% level.

Lean inventory system and performance

In Greece, Koumanakos (2008) studied the effect of inventory management on firm performance using 1358 manufacturing firms operating in three industrial sectors in Greece, food textiles and chemicals were used in

the study covering 2000–2002 period. The hypothesis that lean inventory management leads to an improvement in a firm's financial performance was tested. The findings suggest that the higher the level of inventories preserved (departing from lean operations) by a firm, the lower the rate of return. On the contrary, Lwika *et al.* (2013) found a positive relationship between lean inventory system and Return on Sales and also with Return on Equity which were found to be statistically significant at 5% level.

Strategic supplier partnership and performance

In Kenya, Lwika *et al.* (2013) found a positive relationship between information technology and Return on Sales and also with Return on Equity which were found to be statistically significant at 5% level.

Conceptual Framework

The conceptual framework showed how the researcher intended to explore the research topic under study, that is, “Effect of inventory management practices on performance of SMEs in the Cape Coast Metropolis”. Figure 2, therefore, demonstrated the components of inventory management practices (information technology, lean inventory system, and strategic supplier partnership) emanating from the four theories of modern operations management (business process redesign, reconfigurable manufacturing systems, six sigma, and lean manufacturing). Further, it showed the relationship between inventory management practices and its components, and the performance of SMEs. Inventory management practices

and its components were used as independent variables while performance of SMEs was used as dependent variable.

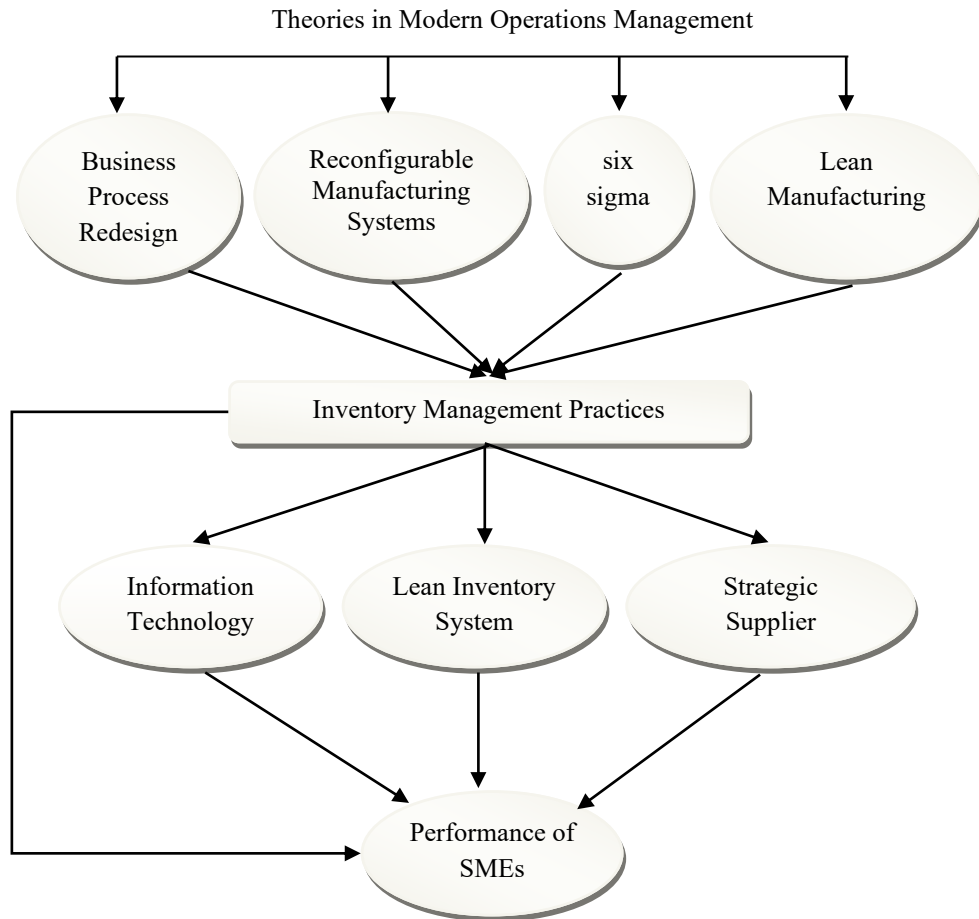


Figure 2: Conceptual framework of the study

Source: Author's construct (2018) based on literature

Chapter Summary

This chapter covered theoretical review, conceptual review, empirical review, and conceptual framework. The theoretical review explained the four theories of modern operations management, the concept of inventory management, Wilson's economic order quantity model, objectives of inventory management, inventory management practices. Then, the conceptual

review explained the concept of inventory management, Wilson's economic order quantity model, objectives of inventory management, inventory management practices, definition and classification of SMEs globally, and definition of SMEs in Ghana. Successively, the empirical review documented the results of other studies that were closely related to inventory management practices and its dimensions, and performance. Finally, the conceptual framework showed the researchers' idea on how the research topic is explored.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter sought to present the research design, study area, population of the study, sampling procedure and sample size, data collection instrument, validity and reliability of research instrument, data analysis procedures, ethical issues, and chapter summary. It was important to follow these academic research procedures to ensure that it is replicable, easy to understand and can be compared to any other research work.

Research Design

The study adopts the quantitative research approach. Among the many advantages of quantitative research approach is its ability to enhance speed of conducting a research. Further, it offers a broader coverage of a series of events where statistics are combined from a larger sample (Amarantunga & Baldry, 2002). In addition, quantitative approach enhances the use of statistical data analysis methods, thus, making it easier to generalise the findings from the study. In addition, quantitative approaches take the guesswork to a more concrete conclusion. This is because the results are usually based on quantitative measures rather than mere interpretation and therefore enables future application and comparison with other works.

It should however be noted that, this approach to research approach lacks flexibility and, thus, makes it very challenging to apply same in assessing or gauging human behaviour (Crotty, 1998). According to Boohene (2006), the choice of research approach should be based on the researcher's

discretion, depending on the nature of a particular study. Therefore, given the purpose and nature of this study where most of the analyses are quantitative in nature, quantitative research approach is deemed the most appropriate and therefore adopted.

In terms of study design, the correlational study design was adopted for this study. The correlational study design was selected mainly because it comprises a cross-sectional design in relation to which data is collected predominantly by questionnaire or by structured interview (Bryman & Bell, 2007). It also provides evidence concerning an existing situation or current conditions; hence surveys provide a more accurate picture of events and seek to explain people's perception and behaviour on the basis of data gathered at a point in time. In addition, it has the advantage of producing good responses from a wide range of people in a highly economical way and also it involves accurate and objective collection of data to describe an existing phenomenon (Nwandinigwe, 2005).

Furthermore, the correlational study design was employed because of its suitability in ascertaining relationship and the strength of relationship between variables. This approach again was used to enable the researcher to get detail answers to the research objective two and three, that is, to test the relationship between inventory management practices and performance of SMEs in the Cape Coast Metropolis, and to establish the effect of inventory management practices (information technology, lean inventory system, strategic supplier partnership) and performance of SMEs in the Cape Coast Metropolis, respectively. This makes the choice of the correlational study design the most appropriate.

Study Area

The area under study is Cape Coast Metropolis. The Cape Coast Metropolitan Assembly (CCMA) was established as a Municipality by LI 1373 in 1987. In February 2007, it was elevated to a Metropolitan status by LI 1927. In 2012, the Metropolis was separated into two (2) constituencies or sub-metros namely the Cape Coast South Sub Metropolitan Assembly and the Cape Coast North Sub Metropolitan Assembly. The Cape Coast Metropolis is bounded to the south by the Gulf of Guinea, West by the Komenda Edina Eguafo Abrem District (at Iture Bridge), East by the Abura Asebu Kwamankese District and to the North by the Twifu Heman Lower Denkyira District. The District occupies an Area of approximately 122 square kilometres, with the farthest point at Brabedze, about 17 kilometres from Cape Coast, the capital of the Metropolis as well as the Central Region (CCMA, 2015).

The population engaged in; self-employment is 7.4%, government employment is 33%; agriculture is 10.7% and the overall population in private sector employment is 63.0%. The total unemployment rate in the metropolis is 11.3%. The vision of the metropolis is to ensure the total transformation of Cape Coast into a peaceful and progressive Metropolis with a high standard of living, basic infrastructure and social services, and a conducive atmosphere where the hopes and aspirations of the people can be realized in full. Its mission is to improve the quality of life of the people in the Metropolis through the provision of social & other amenities and good governance in partnership with the communities and other stake holders. One of the broad objectives of the metropolis under the thematic areas from Ghana Shared

Growth and Development Agenda (GSGDA) II is to enhance competitiveness in Ghana's private sector by expanding opportunities for job creation (CCMA, 2015)

Population of the Study

A population was made up of all the units of the group that the research emphasizes on. Malhotra (1996) opined that the members or units of the group should possess material facts relevant to the study and the researcher. Further to that, Rubin and Babbie (2001) stated that a target population is “the theoretically specified aggregation of study elements”. Consequently, all 3,343 small and medium-scale enterprises operating in the Cape Coast Metropolis (Table 2) constituted the target population of the study. The target population was made up of 1,869 males (constituting 6.5%) and 1,474 females (constituting 4.7%). In addition, the target population was made up of members who were 15 years and older. Data was sourced from the 2010 population and housing report of Ghana (Ghana Statistical Service, 2014).

Table 1: Employed Population in Cape Coast Metropolis

Employment Status	Both Sexes		Male		Female	
	Number	%	Number	Per cent	Number	Per cent
Total Employed	60,330	100.0	28,900	100.0	31,430	100.0
Employee	23,556	39.0	15,340	53.1	8,216	26.1
Self-employed without employee(s)	28,331	47.0	9,187	31.8	19,144	60.9
SMEs	3,343	5.5	1,869	6.5	1,474	4.7

Table 1, continued

Casual worker	1,070	1.8	791	2.7	279	0.9
Contributing family worker	1,546	2.6	470	1.6	1,076	3.4
Apprentice	2,105	3.5	1,087	3.8	1,018	3.2
Domestic employee (House help)	265	0.4	101	0.3	164	0.5
Other	114	0.2	55	0.2	59	0.2

Source: Ghana Statistical Service (2014)

Sampling Procedure and Sample Size

According to Evans, Hastings and Peacock (2000), sample size is the number of observations in a sample. It is commonly denoted by n or N . The study adopts the sample size formula for finite population proposed by Krejcie and Morgan (1970). From their table, a sample size of 341 is appropriate for a finite or known target population of 3,343 (approximately 3,000) as seen in Table 3. In other words, Krejcie and Morgan argued that there is no need of using sample size determination formula for 'known' population since the table has all the provisions one requires to arrive at the required sample size.

Table 2: Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384
<i>Note: N is Population Size; S is Sample Size</i>					<i>Source: Krejcie & Morgan, 1970</i>				

Regarding sampling method, the researcher adopted the proportional stratified sampling method of the probability sampling technique to select 341 small and medium-scale enterprises operating within the Cape Coast Metropolis. Stratified sampling method is a method of dividing the population into two or more segments called strata (plural). Afterwards, simple random samples were drawn from each stratum (singular) and these sub-samples were put together to form the complete stratified sample. It could be proportional or disproportional.

Using the total population in each of the 20 communities (Ghana Statistical Service, 2014) in the Cape Coast Metropolis, the researcher used the proportional stratified sampling method to show how the 341 SMEs were

selected to form a complete stratified sample. This sampling method allowed for SMEs operating in each of the 20 communities to have equal and independent chance of being selected, making it more accurate and representative. This is shown in Table 4.

Table 3: Proportional Stratified Sampling Method

Communities	Population	Workings	Sample Size
1. Cape Coast	108,374	$(108,374/163,253)*341$	226
2. Amamoma (Kwesipra)	7,689	$(7,689/163,253)*341$	16
3. Kakumdo	7,559	$(7,559/163,253)*341$	16
4. Ekon	5,506	$(5,506/163,253)*341$	12
5. Nkanfoa	4,683	$(4,683/163,253)*341$	10
6. Akotokyere	3,092	$(3,092/163,253)*341$	6
7. AntoEssuekyir	3,050	$(3,050/163,253)*341$	6
8. Kwapro	2,917	$(2,917/163,253)*341$	6
9. Kokoado	2,870	$(2,870/163,253)*341$	6
10. Apewosika	2,792	$(2,792/163,253)*341$	6
11. Ankaful Village	2,674	$(2,674/163,253)*341$	6
12. Senewin	1,662	$(1,662/163,253)*341$	3
13. Essuekyir	1,634	$(1,634/163,253)*341$	3
14. Amisano	1,501	$(1,501/163,253)*341$	3
15. Amoyaw	1,410	$(1,410/163,253)*341$	3
16. Duakor	1,351	$(1,351/163,253)*341$	3
17. Kwesipra/Amamoma	1,262	$(1,262/163,253)*341$	3

Table 3, continued

18. Nanabakrom	1,177	(1,177/163,253)*341	2
19. Mpeasem	1,089	(1,089/163,253)*341	2
20. Ebobonko	961	(961/163,253)*341	2
Total	163,253		341

Source: Ghana Statistical Service (2014)

Data Collection Instrument

Primary data were collected by the use of a structured questionnaire. Respondents constituted owners/managers of SMEs in Cape Coast Metropolis. Data collection was aided by enumerators from 21st February to 14th March, 2018 (three weeks). Indicators/statements on the questionnaire were translated into the local dialect to the understanding of some respondents. The questionnaire was designed in a way so as to provide specific responses to answer the research questions formulated. The questionnaire was developed by the researcher based on past empirical studies (Kasimet *al.*, 2015; Lwicket *al.*, 2013).

The questionnaire consisted of 17 items which are divided into three sections: 'Section A' collected the background information (three items); 'Section B' focused on inventory management practices adopted by small and medium-scale enterprises in the Cape Coast Metropolis (10 items) while 'Section C' captured the performance of small and medium-scale enterprises in the Cape Coast Metropolis (four items). Statements on 'Section B' on the questionnaire were used to answer objective one and objectives two and three were answered using statements/indicators on 'Section B' and 'Section

C'. Statements that made up Sections B on the questionnaire were measured on a five-point likert scale with Score '1' indicating '*Least Agreement*' and Score '5' indicating '*Strong Agreement*'. Similarly, indicators in Sections C on the questionnaire were measured on a five-point likert scale with Score '1' indicating '*Much Worse*' and Score '5' indicating '*Much Better*'.

Validity and Reliability of Research Instrument

Validity and reliability of a study are two key elements in ensuring that the study is valid and scientific. A pre-test was done to test instrument validity and reliability.

Validity of research instrument

A pre-test to establish the instrument's validity was carried out on 25 respondents (more than 5% of the sample size) with the aim to improve the use of the primary data. All 25 questionnaires issued to the respondents were recovered. This improved the validity, which made the quality of research trustworthy and scientific.

As explained by Mugenda and Mugenda (2003), pre-test allows errors to be discovered enabling effective revision as it results in determination of participants interest, discovering if the questions have meaning for the participants, checking for the participants modification of the question intent and whether what the researcher is measuring is what was intended to be measured. The instrument was found to measure what the study intended to measure and the questions were clear and easily understood by the

respondents. The research tool was also verified by a supervisor in the form of expert judgement.

Instrument reliability

In order to validate internal consistency of the research constructs, the researcher used SPSS version 21 to generate Cronbach's alpha co-efficient for the constructs on the pre-test data. The reliability co-efficients for the pre-test data was shown in Table 5. Research has shown that scales with Cronbach's alpha co-efficient of 0.70 or more are considered reliable (Pallant, 2007). Results from the pre-test as indicated in the Table 5 showed Cronbach's Alpha of 0.781 and 0.725 for each constructs (Section B and C) respectively. This, therefore, suggests that all the two constructs of the study have good internal consistency reliability.

Table 4: Computed Reliability Co-efficients for Pre-Test Data Collected

Questionnaire Section	No. of Items	Sample Size	Cronbach's Alpha
Section B	10	25	0.781
Section C	4	25	0.725

Source: Field survey, (2018)

Data Analysis Procedure

Quantitative data obtained from the questionnaires were coded and analysed with the help of Statistical Software for Social Sciences (SPSS) for windows, version 21. Each of the questions/statements was coded in variable

view of the SPSS and the responses from the respondents were entered at data view of the SPSS. Data were analysed based on the stated objectives of the study. Descriptive statistics (mean scores) as well as inferential statistics (Pearson's Correlation Coefficient, regression analysis) were used to describe continuous data. For categorical data, frequency tables with their associated percentages were used. Specifically, mean scores were used to analyse objective one whereas correlation and regression analysis were used to analyse objective two.

Ethical Issues

In order to ensure strict compliance with ethical standards of research, the researcher's student ID was shown to the owner/managers of SMEs in the Cape Coast Metropolis before questionnaires were administered. Moreover, there was a clause in the introductory paragraph of the questionnaire assuring respondents of anonymity and confidentiality. Finally, the time required for filling the questionnaire was mutually agreed between the respondents and the researcher.

Chapter Summary

The study examined the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis. The section looked at the research design adopted for the study, the study area, population of the study, sampling procedure and sample size, data collection instrument, validity and reliability of research instrument, data analysis procedures, ethical issues, and chapter summary. In terms of the research design, the quantitative research methodology was adopted for the study. Also, the study adopted the

descriptive and correlation study designs. The study area was Cape Coast Metropolis. Using a target population of 3,343 SMEs operating in the Cape Coast Metropolis, a total number of 341 SMEs were selected to form the sample size of the study. Respondents constituted owners/managers of SMEs. A structured questionnaire was used for data collection. The questionnaire was pre-tested to ensure validity of results. Data was analysed using descriptive and inferential statistics of SPSS for windows, version 21.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter covered the SPSS analysis and interpretation of data collected through questionnaire administered to owners/managers of small and medium enterprises in the Cape Coast Metropolis, Ghana. The data collected were analysed in line with the research questions and hypotheses enumerated. The information presented in this chapter served as inputs for discussion.

Background Information

This section highlighted the background information of owner/managers of SMEs in the Cape Coast Metropolis. It described their gender, age, and highest educational qualification achieved. It must be said that out of the 341 questionnaire administered, 285 of them were retrieved hence a response rate of 83.58% ($285/341 \times 100\%$). However, only 273 questionnaires were valid and usable for the purposes of data analysis.

Regarding gender, males constituted 81.68% ($n=223$) while females constituted 18.32% ($n=50$) signifying that the respondents were male dominated (Table 1). With respect to respondent's age, it came to light that majority of respondents ($n=173$, representing 63.74%) fell within the "36-45 years" age category and the remaining 99 respondents (representing 36.26%) were 46 years and above. This indicates that all the respondents were adults hence their responses can be seen as the true reflection regarding the research questions (Table 1).

Moreover, the highest educational qualification achieved by respondents as shown in Table 1 suggested that, majority of them (n=147, representing 53.84%) have attained Secondary/Technical education, followed by diploma certifications (n=76, representing 27.84%), and the remaining 50 respondents (representing 18.32%) have attained Tertiary education. This presumes that, all of the respondents have had some form of formal education which facilitated their understanding of the questions upon which they were able to make informed contributions to the study.

Table 1: Background Information

Details	F	%
Gender:		
Male	223	81.68
Female	50	18.32
Age:		
36 – 45 years	173	63.74
46 and above	99	36.26
Highest educational qualification achieved:		
Secondary/Technical	147	53.84
Diploma	76	27.84
Bachelor's Degree	50	18.32

Source: Field survey (2018)

Inventory Management Practices Adopted by SMEs

The first objective of this dissertation sought to assess the inventory management practices adopted by SMEs in the Cape Coast Metropolis. To accomplish this objective, the descriptive statistics for each of the study indicators were determined. To be specific, the data for each of the study indicators were analysed into means on a mean scale of 1.00 to 5.00 with 1.00 to 2.90 indicating low levels and 3.00 to 5.00 indicating high levels (adopted by Koomson, 2017; Mohammed, 2017; Scott, 2017; Tweneboah-Koduah, 2017). This was done in order to enhance the understanding of the differences that exist among the study indicators.

In view of this, three indicators were measured on a five-point likert scale. Score '5' shows the strongest agreement and score '1' shows the least agreement. With this measurement scale, the highest overall score is 15.00 (three indicators * five scale) and the lowest is three. These scores were generalised based on the extent to which respondents agree or disagree with the statements provided under "Inventory management practices" on the questionnaire.

Table 2 showed the ranked averages of inventory management practices adopted by SMEs in Cape Coast Metropolis as determined by the various indicators that measure it. In Table 2, the average value of "Information Technology" from a sample of 273 is the mean value of 3.22. The average value of "Lean Inventory System" from a sample of 273 is the mean value of 3.17. Lastly, the average value of "Strategic Supplier Partnership" from a sample of 273 is the mean value of 3.02.

Consequently, it can be said that “Information Technology” as an indicator, had the highest mean of 3.22; followed by “Lean Inventory System” ($\bar{X} = 3.17$), and then “Strategic Supplier Partnership” ($\bar{X} = 3.02$). This indicated that information technology, lean inventory system, and strategic supplier partnership (as inventory management practices) were highly adopted by SMEs in the Cape Coast Metropolis since the mean value of those indicator were more than 3.00.

This finding is in agreement with a study conducted by Lwiki *et al.* (2013) in Kenya where researchers found that lean inventory system, strategic supplier partnership and information technology are being applied in eight operating sugar manufacturing firms from the period 2002-2007. Similar results was recorded by Agus and Noor (2006) in Malaysia, where the researchers measured manager’s perceptions of inventory and supply chain management practices and the level of performance in the industry. The researchers found that, non-food based manufacturing companies in Klang Valley in Malaysi practiced lean inventory systems, technology and strategic supplier partnerships as their inventory management practices.

Likewise, Munyao *et al.* (2015) revealed that manufacturing firms Mombasa County in Kenya used various inventory management techniques such as the action level methods, just-in-time, periodic review technique, material requirement planning 1 and economic order quantity.

Table 2: Inventory Management Practices Adopted by SMEs

Indicators	N	Mean
Information Technology.	273	3.22

Table 2, continued

Lean Inventory System.	273	3.17
Strategic Supplier Partnership.	273	3.02

Scale (Mean): Low = 1.00 – 2.90; High = 3.00 – 5.00

Source: Field survey (2018)

Relationship between Inventory Management Practices and Performance of SMEs

The second objective of this dissertation sought to test the relationship between inventory management practices and performance of SMEs in the Cape Coast Metropolis. Inferential statistics specifically Pearson's correlation was employed for this analysis. Correlation analysis was used to determine the relationships that exist among the two variables of interest (inventory management practices as well as performance of SMEs). The simple bivariate correlation (also known as zero-order correlation) of SPSS version 21 was employed for this analysis and it was subject to two-tailed test of statistical significance. Correlation was considered significant at $p < 0.01$ probability level. As recommended by Pallant (2007), correlation values (r) were interpreted according to Cohen's (2004) guidelines: Very weak ($r = .10$ to $.29$ or $r = -.10$ to $-.29$); weak ($r = .30$ to $.49$ or $r = -.30$ to $-.49$); moderate ($r = .50$ to $.69$ or $r = -.50$ to $-.69$); and large ($r = .70$ to $.99$ or $r = -.70$ to $-.99$). These guidelines apply whether or not there is a negative sign in front of the r value.

Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homogeneity of variance.

The result obtained indicated that inventory management practices have a positive and significant relationship with the performance of SMEs in the Cape Coast Metropolis as manifested in Table 3. Specifically, the relationship between inventory management practices and performance of SMEs in Cape Coast Metropolis was moderate and positive ($r = 0.521$, $n = 273$, sig value < 0.01).

Table 3: Inventory Management Practices and Performance Nexus

		Inventory management practices	Performance of SMEs
Inventory management practices.	Pearson Correlation.	1	
	Sig. (2-tailed).		
	N	273	
Performance of SMEs.	Pearson Correlation.	.521**	1
	Sig. (2-tailed).	.000	
	N	273	273

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field survey (2018)

This result conforms to the results of Agus and Noor (2006) in Malaysia, where they examined the relationship between inventory management practices and financial performance of non-food based manufacturing companies in Klang Valley. Agus and Noor found that inventory management practices have significant correlations with profitability and return on sales.

Same can be said for the study conducted by Nyabwanga and Ojera (2012) in Kenya, where they investigated the relationship between inventory management practices and business performance of small scale enterprises (SSEs). Nyabwanga and Ojerarevealed a positive significant relationship between business performance and effective inventory management practices at 0.05 significance level. In the same vein, Lwiki *et al.* (2013) in Kenya found a positive correlationbetween inventory management and Return on Sales ($r=0.740$) in all the eight operating sugar manufacturing firms from the period 2002-2007 and also with Return on Equity ($r=0.653$) whichwere found to be statistically significant at 5% level. Similar findings were recorded by Munyao *et al.* (2015) in Kenya and Kasim *et al.* (2015) in Ghana not too long ago.

Effect of Inventory Management Practices on the Performance of SMEs

The last and final objective sought to establish the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis. Inferential statistics, specifically regression analysis was employed for this analysis. Regarding the regression analysis, Table 4 provided information on the relationship between the dependent variable (performance of SMEs) and independent variable (inventory management practices) indicated as (R); information on the amount of variation in the

dependent variable explained by the independent variable indicated as (R-Square); information on the amount of variation in the dependent variable explained by the independent variable as a result of an Adjustment indicated as (Adjusted R-Square); and finally information on Autocorrelation in the residual or error term indicated by Durbin Watson.

Table 4: Relationship, Amount of Variation and Autocorrelation Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.573 ^a	.637	.504	2.11062	1.512

a. Predictors: (Constant), information technology, lean inventory system, strategic supplier partnership

b. Dependent Variable: Performance of SMEs

Source: Field survey (2018)

From Table 4, the R value of .573 indicated the relationship that exists between the dependent variable and the independent variables (all put together). Thus, there is a moderate positive effect (.573) of inventory management practices (all put together) on the performance of SMEs in the Cape Coast Metropolis. To add, the R Square explains the amount of variation that exists in the dependent variable caused by the independent variables. Therefore, the result further indicated that 63.7% variation in performance of SMEs as the dependent variable is explained by the independent variables of

inventory management practices. The remaining 36.3% of the variation in performance of SMEs is explained by the residual.

The implication was that an increase in the adoption of inventory management practices would result in an increase in performance of SMEs in the Cape Coast Metropolis. Thus, SMEs in Cape Coast should continually adopt inventory management practices since they would be able improve performance levels. Besides, the result from the Durbin Watson of 1.512 indicated that there was no autocorrelation among the residuals in the regression model or equation. This was because the Durbin Watson statistics was greater than 1.5 and less than 2.5 as explained in the assumption of the test tool in Table 4.

From Table 5, the test of multicollinearity can be assessed using the Tolerance and the VIF (Variance Inflation Factor) from the collinearity diagnostics section. Since the Tolerance values are all greater than 0.10, it suggested that there was no multicollinearity among the independent variables. The VIF also indicated that there was no multicollinearity among the independent variables since the VIF values were all less than 10. In conclusion, the independent variables were not highly correlated among themselves.

Secondly, estimating the functional regression equation using the Unstandardized Coefficient implies that the researcher intended to predict and forecast, therefore, the constant term from the results was 3.568, the coefficient of information technology was .272, the coefficient of Lean inventory system was .031, and the coefficient of Strategic supplier partnership was .261. From the decision rule, when Sig. values are less than

0.05, reject the null hypothesis and when Sig. values are greater than 0.05, fail to reject null hypothesis.

The Sig. value of Information technology coefficient is .021 which is less than 0.05 hence we reject null hypothesis and conclude that the coefficient of Information technology is significant. The Sig. value of Lean inventory system coefficient is .000 which is less than 0.05 hence we reject null hypothesis and conclude that the coefficient of Sales incentives significant. The Sig value of Strategic supplier partnership coefficient is .014 which is less than 0.05 hence we reject null hypothesis and conclude that the coefficient of Strategic supplier partnership is significant. Hence, estimating the Final Regression Equation Model becomes,

$$PF = 3.568 + .272IT + .031LI + .261SP + \varepsilon, \text{ where:}$$

PF = Performance of SMEs, IT =Information technology, LI =Lean inventory system, SP =Strategic supplier partnership, and ε = Error or residual term.

Table 5: Coefficient and Multicollinearity Test

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error	Beta	T		Tolerance	VIF
1 (Constant)	3.568	.514		10.248	.000		
Information technology.	.272	.047	.359	5.814	.021	.714	1.142
Lean inventory system.	.031	.070	.032	.452	.000	.314	2.147
Strategic supplier partnership.	.261	.045	.349	4.214	.014	.723	2.102

a. Dependent Variable: Performance of SMEs

Source: Field survey (2018)

Chapter Summary

First and foremost, the background information of owner/managers of SMEs in the Cape Coast Metropolis was presented using frequency tables and their associated percentages. It comprised respondents' gender, age, and highest educational qualification achieved. Afterwards, mean scores were to assess the inventory management practices adopted by SMEs in the Cape Coast Metropolis. After that, the simple bivariate correlation (also known as zero-order correlation) was employed to test the relationship between inventory management practices and performance of SMEs in the Cape Coast Metropolis. Finally, regression analysis was used to establish the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presented the summary of the study including major findings derived from the study. Conclusions arrived and recommendations arising from the findings were provided in this chapter.

Summary of the Study

This study examined the effect of inventory management practices on the performance of SMEs in Cape Coast Metropolis. Quantitative research methodology was deemed the most appropriate and therefore adopted hence the analyses were quantitative in nature. The study adopted the correlational study design. The target population constituted 3,343 small and medium-scale enterprises operating within the Cape Coast Metropolis. Using Krejcie and Morgan's (1970) sample size formula for finite population, a sample size of 341 was deemed appropriate for the study. Regarding sampling method, the researcher adopted the proportional stratified sampling method of the probability sampling technique to select 341 small and medium-scale enterprises operating within the Cape Coast Metropolis.

Out of the 341 questionnaire administered, 285 of them were retrieved hence a response rate of 83.58% ($285/341 \times 100\%$). Nevertheless, only 273 questionnaires were valid and usable for the purposes of data analysis. Respondents constituted owners/managers of SMEs in the Cape Coast Metropolis. Primary data were collected by the use of a structured questionnaire. Data collection was aided by enumerators from 21st February to

14th March, 2018 (three weeks). Indicators/statements on the questionnaire were translated into the local dialect to the understanding of some respondents. The questionnaire was designed in a way so as to provide specific responses to answer the research questions formulated. The questionnaire was developed by the researcher based on past empirical studies (Kasim *et al.*, 2015; Lwika *et al.*, 2013).

The questionnaire consisted of 17 items which are divided into three sections: 'Section A' collected the background information (three items); 'Section B' focused on inventory management practices adopted by small and medium-scale enterprises in the Cape Coast Metropolis (10 items) while 'Section C' captured the performance of small and medium-scale enterprises in the Cape Coast Metropolis (four items). Statements on 'Section B' on the questionnaire were used to answer Objective one whereas objectives two and three were answered using statements/indicators on 'Section B' and 'Section C'. The questionnaire was pre-tested to ensure validity and reliability of results. The instrument was found to measure what the study intended to measure and the questions were clear and easily understood by the respondents. The research tool was also verified by a supervisor in the form of expert judgement.

Descriptive statistics (mean scores) as well as inferential statistics (Pearson's correlation coefficient, regression analysis) were used to describe continuous data. For categorical data, frequency tables with their associated percentages were used. Specifically, mean scores were used to analyse objective one whereas correlation and regression analysis were used to analyse objectives two and three respectively. In order to ensure strict compliance with

ethical standards of research, the researcher's student identification card was shown to the owner/managers of SMEs in the Cape Coast Metropolis before questionnaires were administered. Moreover, there was a clause in the introductory paragraph of the questionnaire assuring respondents of anonymity and confidentiality. Finally, the time required for filling the questionnaire was mutually agreed between the respondents and the researcher.

The findings of the study were organised in line with the research objectives which were formulated to guide and give the study direction. The results showed that:

- 1) Information technology, lean inventory system, and strategic supplier partnership were the inventory management practices highly adopted by SMEs in the Cape Coast Metropolis.
- 2) Inventory management practices had a positive and significant relationship with the performance of SMEs in the Cape Coast Metropolis ($r = 0.521$, $n = 273$, sig value < 0.01).
- 3) There is significant positive relationship between information technology and performance of SMEs in the Cape Coast Metropolis.
- 4) There is significant positive effect of lean inventory system on the performance of SMEs in the Cape Coast Metropolis.
- 5) There is significant positive effect of strategic supplier partnership on the performance of SMEs in the Cape Coast Metropolis.
- 6) There is a moderate positive effect of inventory management practices (all put together) on the performance of SMEs in the Cape Coast Metropolis.

Conclusions

The study examined the effect of inventory management practices on the performance of SMEs in Cape Coast Metropolis. The study concluded that SMEs in Cape Coast Metropolis apply information technology, lean inventory systems and strategic supplier partnership in their firms since it is a tactic to further increase their return on asset, return on investment, sales volume, and net profits. In other words, inventory management practices aid the achievement of organisational goals and objectives among SMEs in the Cape Coast Metropolis. Consequently, a significant relationship exists between inventory management practices and performance of SMEs in the Cape Coast Metropolis. The implication is that an increase in the adoption of inventory management practices would result in an increase in performance of SMEs in the Cape Coast Metropolis.

Recommendations

After examining the effect of inventory management practices on the performance of SMEs in the Cape Coast Metropolis, it is appropriate to make recommendations to help promote the survival, growth, and performance of SMEs in the Cape Coast Metropolis and beyond. The study recommended that the state agencies that seek the welfare of SMEs, for instance, NBSSI and Ghana Chamber of Commerce should encourage owner/managers of small and medium sized enterprises to embrace inventory innovations in order to generate long term stability and for the firm to have competences.

Suggestion for Future Research

The study recommends further studies to be conducted on each of the components of inventory management practices, that is, information technology, lean inventory system and strategic supplier partnership vis-à-vis performance of SMEs in other jurisdictions aside the Cape Coast Metropolis since scanty literature exist in such areas.

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APPENDIX

Appendix A: Questionnaire

**EFFECT OF INVENTORY MANAGEMENT PRACTICES ON
PERFORMANCE OF SMALL AND MEDIUM-SCALE ENTREPRISES
IN THE CAPE COAST METROPOLIS**

This questionnaire is designed to gather information for a research project in partial fulfilment of the requirement for Master of Business Administration (General Management) degree from the University of Cape Coast (UCC). Your participation is necessary and your responses will be treated confidential and for academic purpose only.

Name of Researcher: Hayford Kwame Kwakye Ampadu

Mobile: (+233) 0244-527-292/ 0268-250-142

Please tick [√] the appropriate response where options are provided and write your response where spaces are provided.

SECTION A: BACKGROUND INFORMATION

1. Gender: a. Male [] b. Female []
2. Age [years]:
3. What is your highest educational qualification achieved?
a. Basic [] b. Secondary/Technical [] c. Diploma [] d. Bachelors []
e. Master's Degree [] f. None [] g. Other(s) []

SECTION B: INVENTORY MANAGEMENT PRACTICES

Each of the following statements relates to the inventory management practices adopted by small and medium enterprises (SMEs) in Cape Coast Metropolis. Please indicate your level of agreement to each of the following statements anchored on the scale:

‘1: Least Agreement’ to ‘Strong Agreement’

Information Technology					
The firm I work for....					
4. Uses computers to assist stock control by calculating the optimum amount of stocks to hold in order to satisfy the users' requirements.	1	2	3	4	5
5. Uses computers to assist stock control by calculating the optimum amount of stocks to dispatch in order to satisfy the users' requirements.	1	2	3	4	5
6. Uses bar coding in counting raw materials and finished goods inventory.	1	2	3	4	5
Lean Inventory System					
The firm I work for....					
7. Uses Just-In-Time inventory strategy to reduce inventory and its associated carrying costs.	1	2	3	4	5
8. Adopts Materials Requirements Planning systems to reduce inventory and its associated carrying costs.	1	2	3	4	5
9. Uses Enterprise Resource Planning to reduce inventory and its associated carrying costs.	1	2	3	4	5
Strategic Supplier Partnership					
The firm I work for....					
10. Maintains good working relationship with its suppliers.	1	2	3	4	5
11. Communicates effectively and properly with its suppliers.	1	2	3	4	5
12. Embrace the principle of early supplier involvement in its design and this reduces the chances to defective items and the risk of obsolescence.	1	2	3	4	5
13. Adopts the Vendor Managed Inventory where the supplier has a responsibility for replenishing stock.	1	2	3	4	5

SECTION C: PERFORMANCE OF SMALL AND MEDIUM-SCALE ENTERPRISES

Each of the following indicators relate to the performance of small and medium-scale enterprises in the Cape Coast Metropolis. Please indicate your level of performance (*over the past two years*) regarding each of the following performance indicators anchored on the scale:

“1: *Much Worse*; 2: *Worse*; 3: *Moderate*; 4: *Better*; 5: *Much Better*”

Performance Indicators					
14. Return on Assets	1	2	3	4	5
15. Return on Investment	1	2	3	4	5
16. Sales Volume	1	2	3	4	5
17. Net Profit	1	2	3	4	5