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## Article

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## OPERATIONS MANAGEMENT | RESEARCH ARTICLE

# The impact of inventory management practice on firms' competitiveness and organizational performance: Empirical evidence from micro and small enterprises in Ethiopia

Daniel Atnafu<sup>1\*</sup> and Assefa Balda<sup>1</sup>

**Abstract:** This study aimed to empirically examine the impact of inventory management practice on firms' competitiveness and organizational performance. Data for the study were collected from 188 micro and small enterprises (MSEs) operating in the manufacturing sub-sector and the relationships and hypothesis proposed in the conceptual framework were tested using structural equation modeling (SEM). The results indicate that higher levels of inventory management practice can lead to an enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance. Therefore, it is recommended that policy makers, universities, NGOs and any concerned party who are engaged in supporting of MSEs need to work on providing the necessary training and resource to promote the inventory management practice of MSEs which will result in increasing their competitiveness and organizational performance. That would enhance their contribution to the economic development of the country. Note that, the conclusion obtained from this study may not be used to generalize to large and medium scale as well as overall sectors since its focus is only from the MSEs' manufacturing sub-sector points of view.

**Subjects:** Production, Operations & Information Management; Operations Management; Quality Management; Supply Chain Management; Organizational Studies

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### PUBLIC INTEREST STATEMENT

The main objective of this study was to examine the impact of inventory management practice of micro and small enterprises competitiveness and performance. The results of the study indicate that higher levels of inventory management practice can lead to an enhanced competitive advantage and improved organizational performance. The study also found a competitive advantage maintained, though the inventory management practice has a direct positive impact on organizational performance. Therefore, it is recommended for owners and managers of micro and small enterprises to promote the inventory management practice by using different scientific tools which will result in increasing their competitiveness and organizational performance.

| **Keywords:** inventory management; manufacturing; performance; competitiveness; SEM

## 1. Introduction

Micro and Small Enterprises (MSEs) have a strategic importance in developing countries like Ethiopia; they contribute to national income, employment, exports, and entrepreneurship development. The development of MSEs is the central focus of the Ethiopia industrial development strategy as it is stated in Growth and Transformation Plan (GTP). Therefore, in the development process of any country, the performance of MSEs based on competition, productivity, and efficiency will play a significant role in the economy. It is observed from literature that making use of formal inventory management practices is one of the ways to acquire competitiveness.

According to Stevenson (2010), Inventory Management is defined as a framework employed in firms in controlling its interest in inventory. It includes the recording and observing of stock level, estimating future request, and settling on when and how to arrange. On the other hand, Deveshwar and Dhawal (2013) proposed that inventory management is a method that companies use to organize, store, and replace inventory, to keep an adequate supply of goods at the same time minimizing cost.

A study conducted in Kenya by Naliaka and Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms. The same study further concludes that the firm is able to compete based on quality and delivery of customer orders on time. Competitive advantage comprises capabilities that allow an organization to differentiate itself from its competitors and is an outcome of critical management decisions (Li, Ragu-Nathan, Ragu-Nathan, & Subba Rao, 2006).

The inventory investment for a small business takes up a big percentage of the total budget, yet inventory control is one of the most neglected management areas in small firms. Many small firms have an excessive amount of cash tied up to accumulation of inventory sitting for a long period because of the slack inventory management or inability to control the inventory efficiently. Poor inventory management translates directly into strains on a company's cash flow.

As to the knowledge of the researcher, in Ethiopia the inventory-related aspects of SMEs have not yet attracted the attention of researchers and policy makers. The SMEs, specially manufacturing enterprises, contribute significantly to the economy in several ways.

An effective and efficient management inventory flow across the value chain is one of the key factors for success of large and small enterprises. The challenge in managing inventory is to balance the tradeoff between the supplies of inventory with demand. Ideally a company wants to have enough inventories to satisfy the demands of its customers no lost sales due to inventory stock-outs. On the other hand, the company does not want to have too much inventory staying on hand because of the cost of carrying inventory. Inventory decisions are high risk and high impact for the supply chain management of an organization. According to Dimitrios (2008), inventory management practices have come to be recognized as a vital problem area needing top priority.

As a rule of thumb in most manufacturing organizations, direct materials represent up to 50% of the total product cost, as a result of the money entrusted on inventory, thereby affecting the profitability and competitiveness of the organization. According to Sander, Matthias, and Geoff (2010), historically, however, organizations have ignored the potential savings from proper inventory management, treating inventory as a necessary evil and not as an asset requiring management. As a result, many inventory systems are based on arbitrary rules. Inventory management according to R.M, Onyango (2013) is a fundamental pillar in an organization and it should be taken seriously.

The inventory investment for a small business takes up a big percentage of the total budget, yet inventory control is one of the most neglected management areas in small firms. Many small firms have an excessive amount of cash tied up to accumulation of inventory sitting for a long period because of the slack inventory management or inability to control the inventory efficiently. Poor inventory management translates directly into strains on a company's cash flow.

As to the knowledge of the researcher, in Ethiopia the inventory-related aspects of SMEs have not yet attracted the attention of researchers and policy makers. The SMEs, specially manufacturing enterprises, contribute significantly to the economy in several ways. In Ethiopia, MSE sector is the second largest employment-generating sector following agriculture. The contribution of MSEs is more than double of the manufacturing sector. However, these enterprises are facing both financial and non-financial problems. Some studies show a large number of small enterprises fail because of non-financial reasons Liedholm, MacPherson and Chuta (1994). Furthermore, study by Tushabomwe Kazooba (2006) revealed that poor record keeping and lack of basic business management experience and skills are major contributors to failure of small business.

Micro and small scale manufacturing industries are in most cases faced with the problems of inadequate inventory of raw materials and spare parts. These shortages often lead to breaks in production schedule, machine breakdown, and low capacity utilization and thus constituted a barrier to their effective growth. Taking this scenario into consideration, this paper therefore examined the impact of inventory management practice on MSEs' competitiveness and performance by targeting MSEs found in some selected town in Arsi Zone, Ethiopia. Based on the gap identified and discussions made on empirical and theoretical evidences, the following basic research questions were formulated.

- (1) What are the Inventory Management practices followed by MSEs in Manufacturing Sub-Sector?
- (2) How does the Inventory Management practised by MSEs affect their competitiveness and performance?
- (3) How does the competitive advantage gained through inventory management affect MSEs' performance?

## 2. Literature review

### 2.1. Theoretical review

According to Stevenson (2010), Inventory Management is defined as a framework employed in firms in controlling its interest in inventory. It includes the recording and observing of stock level, estimating future request, and settling on when and how to arrange (Adeyemi & Salami, 2010). On the other hand, Deveshwar and Dhawal (2013) proposed that inventory management is a method that companies use to organize, store, and replace inventory, to keep an adequate supply of goods at the same time minimizing cost. Choi (2012) indicates that effective inventory management is essential in the operation of any business. Thus, keeping stock is used as an important strategy by companies to meet customers' needs without taking the risk of frequent shortages while maintaining high service level. As Axsäter (2006) describes, inventories make high cost, both in the sense of tied up capital and also operating and administrating the inventory itself. It is argued that time from ordering to delivery of replenishing the inventory, referred to as the lead time, is often long and the demand from customers is almost never completely known (Axsäter, 2006). Therefore, managers should consider how to achieve the balance between good customer service and reasonable cost, which is the purpose of inventory management, involving the time and volume of replenishment.

To this end, inventory in many small business owners is one of the most visible and tangible aspects of doing business. Raw materials, goods in process, and finished goods all represent various forms of inventory. Each type represents money tied up until the inventory leaves the

company as purchased products. Likewise, merchandise stocks in a retail store contribute to profits only when their sale puts money into the cash register. In a literal sense, inventory refers to stocks of anything necessary to do business. These stocks represent a large portion of the business investment and must be well managed in order to maximize profits. In fact, many small businesses cannot absorb the types of losses arising from poor inventory management. Unless inventories are controlled, they are unreliable, inefficient, and costly. Inventory is an idle stock of physical goods that contain economic value, and are held in various forms by an organization in its custody awaiting packing, processing, transformation, use or sale in a future point of time.

Ballon (2004) defined inventories as stockpiles of raw materials, supplies, components, work-in-process, and finished goods that appear at numerous points throughout a firm's production and logistics channels. Inventory is the stock of any item or resource used in an organization.

Inventory is generally made up of three elements such as raw materials, work-in-progress (WIP), and finished goods (Arnold, 2008; Cinnamon, Helweg-Larsen, & Cinnamon, 2010; Gitman, 2009). Raw materials are concerned with the goods that have been delivered by the supplier to purchaser's warehouse but have not yet been taken into the production area for conversion process (Cinnamon et al., 2010). WIP concerns are when the product has left the raw material storage area, until it is declared for sale and delivery to customers. In this process, the working capital must be considered in terms of reducing the buffer stocks, eliminating the production process, reducing the overall production cycle time. The raw materials and finished goods must be minimized in the production area. WIP must be carefully examined to justify how long it takes for products to be cleared for sale. This stage is normally done by the quality control procedures (Birt et al., 2011; Cinnamon et al., 2010). Finished goods refer to the stock sitting in the warehouse waiting for sale and delivery to customers.

They could be sitting in the warehouse or on the shelf for quite some time. The owner/manager of the business should find what options are available to dispose the slow moving items. Should the stock be repacked or reprocessed, and sold at lower discount prices? Sales and operations planning can reduce or eliminate the need for finished goods. The best example of stock management is car manufacturing. The manufacturers normally used the Just in Time (JIT) system to deliver finished products. In this way they minimize or eliminate both raw material stock and work in progress, as the stock is now in finished goods (Brealey et al., 2006; Cinnamon et al., 2010; Van Horne & Wachowicz, 2008).

There are theories utilized in carrying clarity to the investigation of the role of stock administration on operational performance. The major theories include the theory of Constraints and Lean Theory to build the critical concerns regarding the impacts of inventory management approaches on the profitability of manufacturing firms.

#### 2.1.1. *Theory of constraints*

The Theory of Constraints is an administration reasoning that looks to expand manufacturing throughput proficiency evaluated on the bases of recognizable proof of those procedures that are obliging the industrial system. There are various challenges experienced in the application of the Theory of Constraints. For instance, there is a long lead time, significant number of unsatisfied requests, irregular state of meaningless inventories or nonexistence of appropriate inventories, wrong materials request, expansive number of crisis requests and endeavor levels, absence of clients engagement, nonattendance of control identified with need orders which suggests on timetable clashes of the assets. The theory focuses on adequately dealing with the limit and ability of these limitations to enhance efficiency and this can be accomplished by manufacturing firms applying fitting inventory control practices. Theory of constraints is an approach whose proposition is connected to generation aimed at achieving a reduction of the organizational inventory.

### 2.1.2. *Lean theory*

Lean theory is an augmentation of thoughts of JIT. The theory disposes of buffer stock and minimizes waste in production procedure. Inventory leanness decidedly influences the productivity of a business firm and is the best inventory control tool.

The theory expounds on how manufacturers' adaptability in their requesting choices diminish the supplies of stock aimed at eliminating costs associated with the transportation of inventory. Feedback presented against the theory insinuates that materials must be available when dealing in long haul cooperation constituting data and information sharing and the exchange of accomplices between firms.

## 2.2. *Inventory management techniques*

Inventory management is very vital to an enterprise since it is custom-made to reducing costs or proliferating profits while satisfying customer's demands by guaranteeing that balanced items of stock are sustained at the right quality, quantity, and that are obtainable at the right time and in the right place. This section will review the literature on the techniques used in inventory management.

### 2.2.1. *Economic order quantity*

According to Bowersox (2002), the inventory management needs to be organized in a logical way so that the organization can be able to know when to order and how much to order. This must be attained through calculating the Economic Order Quantity (EOQ). Monetary request amount engages correlation to arrange their stock re-establishment on an ideal premise. For instance, the arrangement can be scheduled to happen from month to month, quarterly, half yearly, or yearly. By so doing, it enables firms to have insignificant limit costs or zero inside their circulation focuses. Along these lines, as associations attempt to enhance the stock administration, the EOQ and Re-Order Point (ROP) are necessary instruments that associations can utilize.

### 2.2.2. *Just in time technique*

The JIT technique is a Japanese philosophy, rationality associated with assembling which comprises having the right things in the right quality and amount in the correct place and at the opportune time. Utilization of JIT technique brings about the increment in quality, profitability, and effectiveness, enhanced correspondence, and abatements in expenses and squanders. Hutchins (1999) characterizes JIT as a process that is prepared for moment response to the request without the necessity for any overstocking, either in the desire of the application being approaching or as a concern of improvident characteristics all the while.

Hutchins (1999) additionally concentrated on that the prime objective of JIT technique is the accomplishment of zero stock, not simply inside the bounds of a single association at the end of the day all through the whole production network. It can be connected to the assembling procedure inside any organization as it is additionally being adjusted inside administration associations.

The components of JIT technique incorporate consistent change, taking out the seven sorts of squanders among others. The fundamental reason of JIT is to have as of late the proper measure of stock, whether rough materials or finished stock, open to meet the solicitations of your creation strategy and the solicitations of the enterprise's end customers. The less a firm spends to store and pass on the stock, the less obsolete quality it has to markdown. Finally, this all culminates into saving the company's honest to goodness money.

### 2.2.3. *Vendor managed inventory*

Vendor Managed Inventory is a streamlined way to deal with inventory management and request satisfaction whereby the merchant is completely in charge of the recharging of stock in light of opportune point of all data to the purchasers (retailer). This idea builds the client responsiveness



by lessening the free market activity hole consequently giving the fulfilment to end client by benefiting the coveted item when required. Store network accomplices must share their vision of interest, necessity, and requirement to set the regular destinations. Kazim (2008) identifies that upstream information exchanged to suppliers such as the current stock level and precise deals conjecture is the most vital element for the effective usage of Vendor Management Inventory.

#### 2.2.4. ABC analysis

The ABC stock control technique relies on that the decision a little bundle of the things may usually address the weight of money estimation of the total stock. It is used as a part of the era method, while a tremendous number of things may happen from a little part of the money estimation of stores. Accordingly, to manage stock control high regard things are more solidly controlled than low regard things. ABC examination is an essential action method that follows the Pareto Principle concerning an organization's arrangement of stock. Most organization attempts and oversights are depleted on managing A things. C things get the base thought, and B things are in the centers. The ABC approach ranks using the following criteria: A things represent 70–80% of the firm's annual consumption approximation and just 10–20% of aggregate stocked items. B things represent 15–25% of annual use esteem and 30% of aggregate the stock, and C things characterize 5% of the annual application of esteem and half of total stocked items.

### 2.3. Empirical review

#### 2.3.1. Inventory management in SMEs

Many researchers have analyzed different inventory management practices and performance and these studies have amassed an enormous knowledge related to inventory management and organizational performance. Maria and Jones (2003) argue that implementation of proper inventory management practice involves providing high-quality products at relatively less cost. They further point out that it is essential to establish a daily ordering and frequent calculation of inventory turns. On the other hand, Ballon (2000) argues that inventory cost should be considered while taking inventory decisions. He found that inventory carrying costs typically range from 20% to 40% of inventory value. Palmer, and Dean (2000) are of the opinion that selection of right inventory management practice is a must for a company's inventory management performance.

Gill, Biger, and Mathur (2010) argue that excess inventory is an operational liability, because it uses valuable storage space and increases inventory costs. Raw material ordering frequency is identified as an important factor contributing to inventory cost. Frequent ordering in small quantity is considered as an important strategy. This is very relevant in the context of SMEs. This is because SMEs generally do not get the benefits of quantity discount. Their purchase requirement quantity of material is normally less to enable them to get these benefits. Hence for SMEs, frequent purchasing is appreciated.

The management of SME studies viewed the need for a more formal procedure to calculate its inventory policy parameters. The growing investment in inventory combined with an increasing number of backorders and lost sales lead to lower profitability. Therefore, it was decided to follow a more scientific approach than the currently used rules of thumb to establish inventory policy parameters with the objective of optimizing inventory cost.

Koumanakos (2008) in his study aimed at testing the hypothesis that efficient inventory management leads to an improvement in a firm's financial performance. The results revealed that the higher the level of inventories preserved, departing from a lean manufacturing, by an enterprise the lower is its rate of returns. Jonsson and Mattsson (2008) studied the use of material planning methods to control material flow inventories of purchased items. The study explored the perceived planning performance of material planning methods used to control material flow in different types in manufacturing and distribution companies. They also evaluated the difference in perceived planning performance depending on the way planning parameters are determined and the methods used.

Altogether, five material planning methods were studied based on a survey data. However, Koh, Demirbag, Bayraktar, Tatoglu, and Zaim (2007) probed a more prominent issue regarding the underlying dimensions of Supply Chain Management (SCM) practices and to test a framework identifying the relationships among various SCM practices, operational performance, and SCM-related organizational performance. The survey study was conducted on SMEs in Turkey. The study brought out that both strategic collaboration and lean practices (SCLP) and outsourcing and multi suppliers (OMS) factors have direct positive and significant impact on operational performance of SMEs. However, the study found that both factors have no direct impact on SCM-related organizational performance and only indirect and significant positive effect. Whereas, the observation by Teunter et al. (2012) was that ABC analysis is commonly used as an inventory management practice in SMEs worldwide.

To exercise inventory planning and control, the understanding of the factors influencing inventory management is necessary. This will enable SMEs to select an appropriate inventory management practice in their enterprise.

Through the role of inventory management practices of a firm, their inventory cost on order quantity and hence on inventory performance is well explained in theory; an empirical evaluation of the same is not done so far in the context of SMEs, particularly in developing countries.

## **2.4. Conceptual framework and hypothesis development**

### **2.4.1. Inventory management and competitiveness**

A study conducted in Kenya by Naliaka and Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms. The study further concludes that the firm is able to compete based on quality and that it delivers customer orders on time. Competitive advantage comprises capabilities that allow an organization to differentiate itself from its competitors and is an outcome of critical management decisions (Li et al. 2006). Effective inventory management provides opportunities to create sustainable competitive advantage and enhance the competitive position of companies. This entails reduction in cost of holding stocks by maintaining just enough inventories, in the right place and the right time and cost to make the right amount of needed products.

**H1:** Firms with high levels of Inventory Management Practices will have high levels of competitive advantage

### **2.4.2. Inventory management practices and organizational competitiveness**

Inventory management is very crucial to any organization that is improving on its performance and attaining high levels of customer satisfaction. According to Nzuza (2015), the material held by an organization makes up for most of the organization assets. Most organization invests so much money in materials and it is important for the organization to put in place a good material management system in order to manage the stock properly. Poor inventory management system can negatively affect the profitability of an organization. The management has very devastating effect on the performance of the organization about the material management system put in place to determine the performance of the said material and the general performance of the organization.

In most cases where inventory management decisions have been effective, inventory planning models have been developed and implemented focusing especially on the twin problems of inventory size and timing. Usually, inventory management models are designed to achieve a balance between the costs of acquiring and holding inventory and in so doing it makes it possible to know whether companies are earning profits or not. Variability of inventory majorly results due to firms not applying the inventory control systems in accordance with the baseline principles. According to Ogbo (2011), the information flow between leaf collection centers and factories is



inadequate contributing significantly to high operational costs. Inventory of tea leaves is a requirement for the efficient operational performance; hence, inventory needs proper control as it is one of the largest assets of the factory. To excel in competitive environment, companies have to design and operate materials management and product distribution functions effectively.

Inventory control systems enable a business to determine and maintain an optimum level of investment in inventory in order to achieve required operational performance. Sila (2006) expressed that the inventory management of inventory control is to meet customer demand. Further, Fawcett, Ogden, Magnan, and Bixby Cooper (2006) argue that to meet customer demand, firms have to ensure that stock-outs are avoided without incurring high inventory costs. Stocking level variability is caused by factors such as deficient information sharing and deficient forecasts. He found out that variability of inventory majorly results due to firms not applying the inventory control systems. He enumerated the effects of inventory variability as inaccurate forecasting leading to periods of not having enough capacity leading to inadequate customer service and high inventory costs.

**H2:** Firms with high levels of Inventory Management Practices will have high levels of organizational Performance

#### *2.4.3. Competitive advantage and organizational performance*

Having a competitive advantage generally suggests that an organization can have one or more of the following capabilities when compared to its competitors: lower prices, higher quality, higher dependability, and shorter delivery time. These capabilities will, in turn, enhance the organization's overall performance (Mentzer et al. 2000). Competitive advantage can lead to high levels of economic performance, customer satisfaction and loyalty, and relationship effectiveness. Brands with higher consumer loyalty face less competitive switching in their target segments thereby increasing sales and profitability (Lin et al. 2002).

An organization offering high-quality products can charge premium prices and thus increase its profit margin on sales and return on investment. An organization having a short time-to-market and rapid product innovation can be the first in the market thus enjoying a higher market share and sales volume. Therefore, a positive relationship between competitive advantage and organizational performance can be proposed.

**H3:** Firms with high levels of competitive advantage will have high levels of Organizational Performance

### **3. Methodology**

The study fall under quantitative survey approach; this approach enables to quantify and describe the existing practice, as well as to measure the impact of the actual inventory management practice on competitiveness and organizational performance of firms.

The target population of this study was micro and small scale enterprise engaged in manufacturing sub-sector in Arsi Zone in some selected towns. Four towns were selected purposively. Target sample sizes of 200 MSEs in manufacturing sub-sector were selected using stratified random sampling techniques as respondent for this study. The strata were manufacturers of metal, wood, handicraft, food processing, construction, and local-made electronics products.

For this study, questionnaire has been designed and distributed to collect information from selected sample respondents/informants (MSE owners). A set of questions on each aspect of the inventory management practice has been derived from extensive literature review. All questions have been organized by using Likert scale ranging from 1 to 5 points. The competitiveness and performance of MSEs are also addressed through questionnaire. The questionnaire has been translated into Amharic language. The data collection was also assisted by local enumerators. In

order to analyze the data obtained through questionnaire, STATA version 13 Science software was used for input/output analysis of descriptive and inferential statistics. To test the hypothesis and examine the relationship between the variables, Structural Equation Model was adopted.

### 3.1. Factor analysis

Exploratory factor analysis (EFA) was conducted to investigate whether the factors derived from the EFA fitted the constructs as described theoretically in the literature. The result indicated that all items had significant loadings on their respective factors with Eigenvalues above 1(one), loading factors above 0.4 and the values of cumulative variance explained ranged from 32.93 to 53.31 present as depicted in Table 1. In addition, the KMO (Kaiser–Meyer–Olkin) measure was 0.8284 which is above the recommended threshold value of 0.50 and the reliability measure of Cronbach's alpha was 0.79, which is considered acceptable. All constructs exhibited relatively high factor loadings and fell into the designated factors. The result provided evidence to support the theoretical conceptualization of the three constructs.

### 4. Results for the structural equation model and hypothesis testing

Structural equation modeling (SEM) is a collection of statistical models that seeks to explain relationships among multiple variables. It enables researchers to examine interrelationships among multiple dependent and independent variables simultaneously. The reasons for selecting SEM for data analysis were, firstly, SEM has the ability to test causal relationships between constructs with multiple measurement items (Hair, Black, Babin, & Anderson, 2006). Secondly, it offers powerful and rigorous statistical procedures to deal with complex models (Hair et al., 2006; Tabachnick & Fidell, 2009). In this study, the measurement model was evaluated by using the maximum likelihood (ML) estimation techniques provided STATA Version13. Table 2 provides summarized results of the proposed models goodness of fit (GOF) test.

As shown it Table 2, the overall model nicely fit with CFI = 0.983, TLI = 0.977, and RMSEA = 0.029, which is excellent. The theoretical framework illustrated in Figure 1 in the literature part has three hypothesized relationships among the variables Inventory management practices, Competitive Advantage, and Organizational Performance. Figure 2 displays the path diagram resulting from the structural modelling analysis using STATA.

**Table 1. Explanatory factor analysis**

| Construct                     | Dimensions                  | Factor 1       | Factor 2       | Factor 3       |
|-------------------------------|-----------------------------|----------------|----------------|----------------|
| Competitive Advantage         | Price                       | <b>0.7156</b>  |                |                |
|                               | Quality                     | <b>0.6504</b>  |                |                |
|                               | Delivery                    | <b>0.5452</b>  |                |                |
| Inventory Management Practice | ABC Analysis                |                | <b>0.4324</b>  |                |
|                               | Economic Order Quantity     |                | <b>0.4114</b>  |                |
|                               | Demand Forecasting          |                | <b>0.7106</b>  |                |
|                               | Just in time                |                | <b>0.7288</b>  |                |
|                               | Vendor Management Inventory |                | <b>0.6908</b>  |                |
| Organizational Performance    | OP/Profitability            |                |                | <b>0.4164</b>  |
|                               | OP/Cost                     |                |                | <b>0.8736</b>  |
|                               | OP/Output                   |                |                | <b>0.6891</b>  |
| <b>Eigenvalue</b>             |                             | <b>3.62236</b> | <b>1.23287</b> | <b>1.00892</b> |
| <b>Variance %</b>             |                             | <b>32.93</b>   | <b>11.21</b>   | <b>9.17</b>    |
| <b>Variance Cumulative</b>    |                             | <b>32.93</b>   | <b>44.14</b>   | <b>53.31</b>   |

Overall, Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) test = 0.8284.

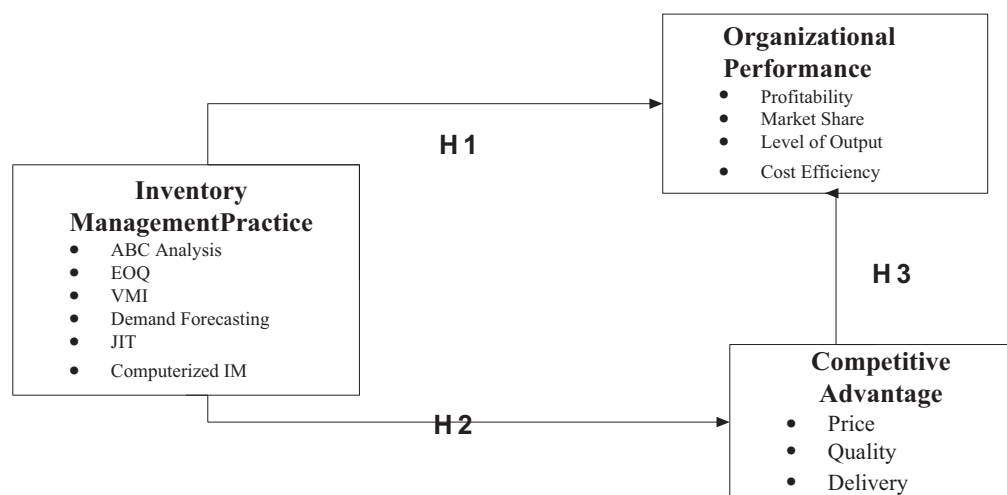
Overall Cronbach's alpha = 0.79.

**Table 2. Model goodness of fit test**

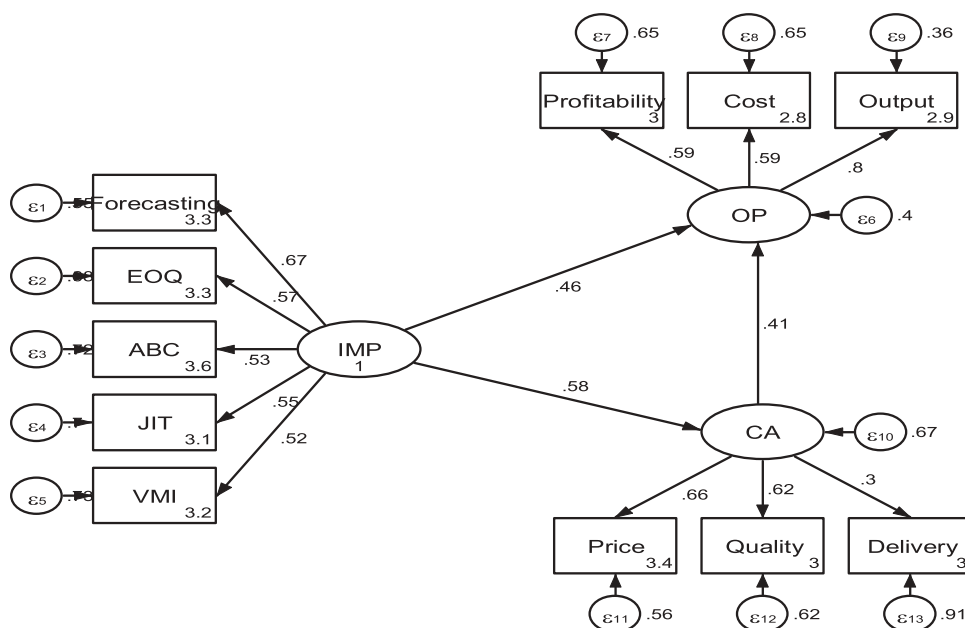
|                  |          |    | CFI        | RMSEA       | TLI        |
|------------------|----------|----|------------|-------------|------------|
| Criteria         | $\chi^2$ | DF | $\geq 0.9$ | $\leq 0.05$ | $\geq 0.9$ |
| Obtained Model 1 | 47.38    | 41 | 0.983      | 0.029       | 0.977      |
| Mode 2           | 55.913   | 42 | 0.963      | 0.042       | 0.952      |
| Model 3          | 75.34    | 42 | 0.912      | 0.065       | 0.885      |
| Model 4          | 56.25    | 42 | 0.962      | 0.042       | 0.951      |

where  $\chi^2$  = Chi Square; DF = Degree of Freedom; CFI = comparative fit index; RMSEA = root mean squared error of approximation; TLI = Tucker-Lewis Index.

**Figure 1. Conceptual framework of the study.**



**Figure 2. Proposed model one (M1).**

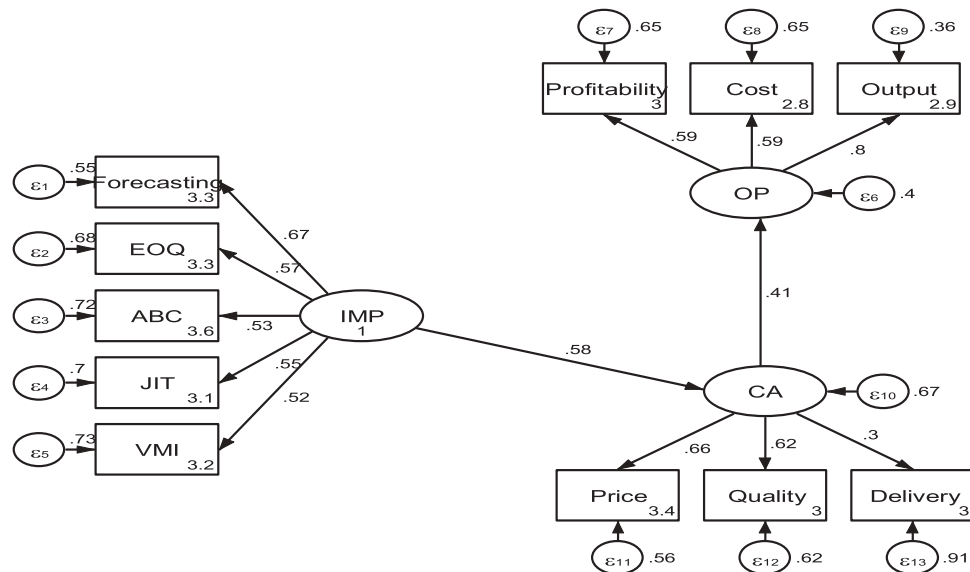


To determine whether the model in Figure 2 has the best fit, alternative models were evaluated by dropping one of the links between the constructs at one time as shown from Figures 3–5.

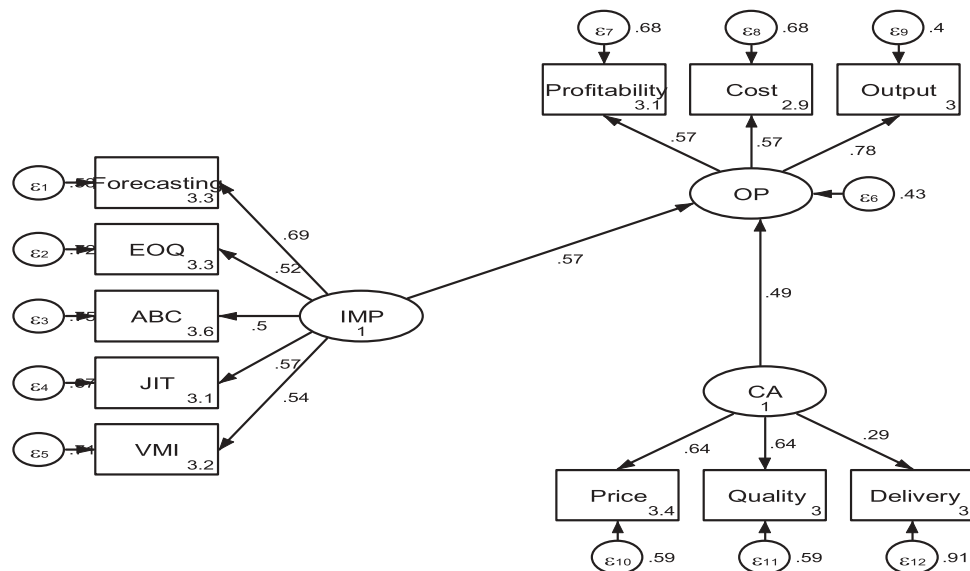
In Figure 3, the direct link between inventory management practice and organizational performance was dropped. The path coefficient between competitive advantage and organizational performance became much stronger. In Figure 4, inventory management practice and competitive advantage were treated as independent constructs; the path coefficients for Inventory Management practice on organizational performance and competitive advantage on organizational performance are both significant, indicating that inventory management practice and competitive advantage have independent effects on organizational performance.

In Figure 5, the link between competitive advantage and organizational performance was removed; the path coefficient for Inventory Management practice on competitive advantage and Inventory management practice on organizational performance are both significant, indicating

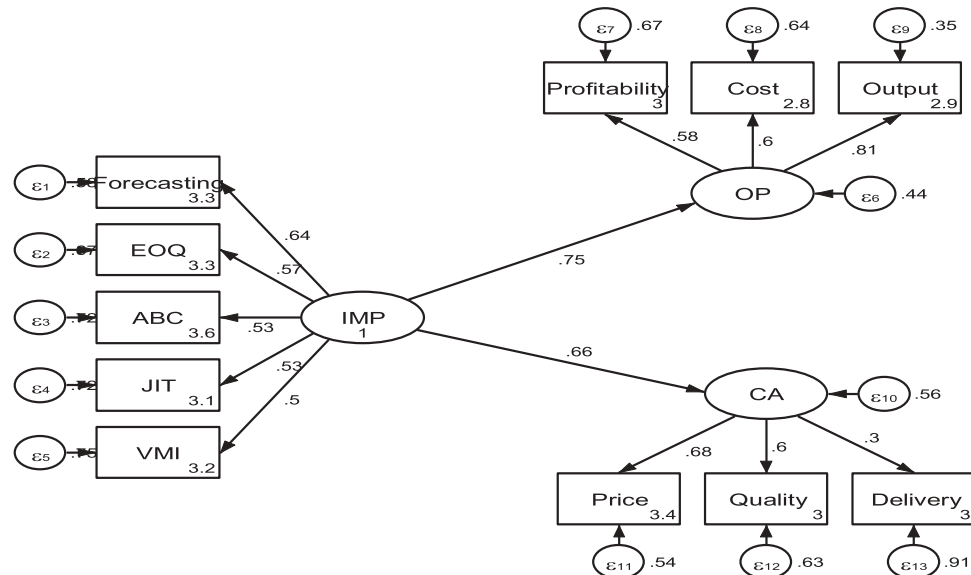
**Figure 3. Proposed model two (M2).**



**Figure 4. Proposed model three (M3).**



**Figure 5. Proposed model four (M4).**



**Table 3. Result of proposed structural equation model and hypothesis testing**

| Hypothesis | Relationship | Total Effect | Direct Effect | Indirect Effect | Decision |
|------------|--------------|--------------|---------------|-----------------|----------|
| <b>H1</b>  | IMP→ CA      | 0.594        | 0.594         | 0 (no path)     | Accepted |
|            | p-Value      | 0.000        | 0.000         |                 |          |
| <b>H2</b>  | IMP→ OP      | 0.665        | 0.438         | 0.227           | Accepted |
|            | p-Value      | 0.000        | 0.001         | 0.012           |          |
| <b>H3</b>  | CA→ OP       | 0.382        | 0.382         | 0 (no path)     | Accepted |
|            | p-Value      | 0.009        | 0.009         |                 |          |

that inventory management practice has direct impact on both competitive advantage and organizational performance. The fit statistics for the models in Figure 4 is not as good as the fit statistics for the other three models had almost the same fit indices.

As presented in Table 3, the results of the proposed structural equation model analysis indicate support for all the hypotheses. The results support Hypothesis 1, which states that organizations with high levels of inventory management practice have high levels of competitive advantage. The standardized coefficient is 0.594 which is statistically significant at  $p < .01(0.000)$ . The statistical significance of Hypothesis 1 confirms that inventory management practice have a direct positive impact on competitive advantage. The implementation of inventory management practice may directly improve an organization's competitiveness in providing better price, quality, and delivery of products to the market. This finding is consistent with a study conducted in Kenya by Naliaka and Namusonge (2015) who identified that inventory management affects competitive advantage of manufacturing firms.

Hypothesis 2 is also supported which indicates that inventory management practice has a direct impact on organizational performance. The standardized coefficient is 0.438 which is statistically significant at  $p < .01(0.001)$ . The implementation of various inventory management practices, such as ABC analysis, EOQ decision, customer relationship building, vendor management inventory, and JIT techniques, may provide the organization to enhance performance in maintaining or increasing profitability, output level, and cost efficiency.

The findings of this research indicate the presence of an intermediate measure of competitive advantage between inventory management practices and organizational performance. The finding is consistent with other similar studies (Sila, Ebrahimpour, and Birkholz, 2006, Fawcett et al., 2006).

The standardized coefficient of the indirect effect of inventory management practice on organizational performance is 0.227, which is significant at .05 levels (0.012). This shows that inventory management practices can have a direct, positive influence on organizational performance as well as an indirect one through competitive advantage.

The results also indicate that higher levels of competitive advantage may lead to improved organizational performance, thus confirming Hypothesis 3. The standardized coefficient is 0.382 which is statistically significant at  $p < .01$  (0.009). The result is consistent with a study conducted by Mentzer and Zacharia (2000).

Based on the standardized coefficients of the three hypotheses, inventory management practice may have a greater direct impact on competitive advantage which is 0.594 than on organizational performance that of 0.438. This could be true since organizational performance is usually influenced by many factors and it is hard to see whether anyone factor such as inventory management practices will dominantly determine the overall performance of an organization.

The results also show that organizational performance is less influenced by competitive advantage which is 0.382 than by inventory management practice with coefficient of 0.438. This indicates that inventory management practices, mostly, have been linked directly to organizational performance.

## 5. Conclusion

This paper provides empirical justification for a framework that identifies five key dimensions of inventory management practices and describes the relationship among inventory management practices, competitive advantage, and organizational performance. On the basis of data obtained from respondents, the study reached on the following findings: All the hypothesis were supported and indicate the significant positive impact of inventory management practice on competitive advantage of organizational performance of MSEs under manufacturing sub-sector. The findings of this research also indicate the presence of an intermediate measure of competitive advantage between inventory management practices and organizational performance.

Generally, the finding of this study implies that enhanced competitive advantage and increased organizational performance could have improved the levels of inventory management practice. The increased competitiveness of a firm may enable a firm to implement higher level of inventory management practice due to the need to outperform its competitors constantly and keep its competitive position. On the other hand, enhanced organizational performance provides a firm increased capital to implement various scientific inventory management techniques. To this end, this study provides empirical evidence to support the literature regarding the impact of inventory management practices.

## 6. Implication for MSE owner and other stakeholders

Based on the finding of this study, it is justified that inventory management practices have a direct positive impact on the competitive advantage and organizational performance of MSE firms. Therefore, owners or manager of MSE manufacturing firms are expected to consider inventory management practice as a one core enterprise objective in order to excel their competitiveness through providing quality customer service, quality product, reduction of cost, meet market demand in a flexible manner, and also enhance their overall organizational performance. In order to benefit one's own enterprise:

- MSEs need to have the necessary skills and knowledge about the use of scientific inventory management techniques and decision models.



- Accurate information flow and recording inventory-related data is critical for the successful management of inventories in an enterprise. Therefore, MSEs should make a change from manual record keeping to the application of Information Communication Technology (ICT) -based or computerized inventory management system. Even though companies have some financial limitation, this ICT-based platform can bring a lot benefits for their future inventory management.

It is also recommended that policy makers, universities, NGOs who are engaged in supporting MSEs need to work in providing the necessary training and resource to promote the inventory management practice of MSEs which will result in increasing their competitiveness and organizational performance. That would enhance their contribution to economic development of the country.

### 7. Limitation and recommendation for future research

Like any other study, this study has several limitations. Instrument as a questionnaire for the measurement constructs are not standardized items. However, they are abstained through intensive literature review and statically validated. Yet, it is recommended for future research to revalidate measurement scales used under this research with better representative observations.

A single respondent in a firm was asked to respond to overall aspect of inventory management practice. But, in reality, no person in a firm is in charge of inventory management practice. Future research should seek to utilize multiple respondents from each participating enterprises to enhance the research findings. In this study, structural equation model was applied with a relatively lower sample size. Hence, future researchers can consider it with larger sample size for better findings.

Data were also collected from MSEs found in four selected towns in Arsi zone manufacturing sub-sector. Therefore, it may not be used to generalize the whole sector at zonal or national level. This study is conducted by taking the context of manufacturers in MSEs. However, the finding may not work for medium- and large-scale manufacturing firms. Therefore, it is recommended for future researchers to investigate it in the context of large- and medium-size manufacturing industry.

Another limitation of this study is the measurement of organizational performance constructs. The study had to ask respondents to evaluate their performance regarding profitability, levels of output, and cost efficiency subjectively. The subjective evaluation may increase measurement error due to relative low reliability. It is recommended for further research to consider it by using objective measures by collecting and analyzing secondary data.

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### References

Adeyemi, S. L. (2010). Inventory management: A tool of optimizing resources in a manufacturing industry a

case study of Coca-Cola Bottling Company, Ilorin plant. *Journal of Social Sciences*, 23(2), 135–142. doi:[10.1080/09718923.2010.11892822](https://doi.org/10.1080/09718923.2010.11892822)

Arnold, G. (2008). *Corporate financial management* (4th ed.). England: Financial Times/Prentice Hall.

Axsäter, S. (2006). A simple procedure for determining order quantities under a fill rate constraint and normally distributed lead-time demand. *European Journal of Operational Research*, 174(1), 480–491. doi:[10.1016/j.ejor.2005.01.037](https://doi.org/10.1016/j.ejor.2005.01.037)

Ballon, R. H. (2000). *Business logistics/supply chain management. Planning, organizing and controlling the supply chain* (5th ed.). USA: Pearsons-Prentice Hall.

Ballon, R. H. (2004). *Business logistics/supply chain management. Planning, organizing and controlling the supply chain* (5th ed.). USA: Pearsons-Prentice Hall.

Birt, J. C. (2011). *Accounting: Business reporting for decision making* (3rd ed.). Milton, Australia: John Wiley & Sons.

- Borowiec, P., & Liedberg, C. (2009). *Benefits and challenges with coordinated inventory control at Volvo parts*. Germany: Lund University.
- Bowersox, D. J. (2002). *Supply chain – Logistics management. International edition*. USA: M C Graw Hill.
- Brealey, R. A. (2006). *Corporate finance*. New York, McGraw-Hill/Irwin.
- Choi, T. (2012). *Handbook of EOQ inventory problems – Stochastic and deterministic models and applications*. New York, Heidelberg, Dordrecht, London: Springer.
- Cinnamon, R., Helweg-Larsen, B., & Cinnamon, P. (2010). *How to understand business finance: Understand the business cycle; manage your assets; measure business performance* (2nd ed.). London, UK: Kogan Page Ltd.
- Cooper, D. &. (2006). *Business research methods* (9th ed.). New Delhi, India: Published by Tata McGraw Hill Education Private Limited.
- Deveshwar, A., & Dhawal, M. (2013). *Inventory management delivering profits through stock management*. World Trade Centre, Dubai: Ram University of Science and Technology.
- Dimitrios, P. (2008). The effect of inventory management on firm performance. *International Journal of Productivity and Performance Management*, 57(5), 355–369.
- Ethiopia Central Statistical Agency. (2005). *Report on micro and small enterprises*, 34–35.
- Fawcett, S. E., Ogden, J. A., Magnan, G. M., & Bixby Cooper, M. (2006). Organization commitment and governance for supply chain success. *International Journal of Physical Distribution and Logistics Management*, 36, 22–35. doi:10.1108/09600030610642913
- Gill, A., Bigger, N., & Mathur, N. (2010). The relationship between working capital management and profitability evidence from the United States. *Business and Economic Journal*, 31, 1–9.
- Gitman, L. J. (2009). *Principles of managerial finance* (12th ed.). Boston, MA: Pearson Prentice Hall.
- Goldratt, M. E. (2004). *The goal: A process of ongoing improvement*. New York: North River Press.
- Green, K. W., & Inman, R. A. (2005). Using a JIT selling strategy to strengthen supply chain linkages. *International Journal of Production Research*, 43, 3437–3453. doi:10.1080/00207540500118035
- Hair, J. F., Jr., Black, B., Babin, B., & Anderson, R. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, New Jersey: Pearson Prentice Hall, Pearson Education, Inc.
- Heizer, J., & Render, B. (2006). *Principles of operation management* (6th ed.). New Jersey, USA: Pearson Prentice Hall.
- Hutchins, D. (1999). *Just in time*. UK: Gower Publishing, Ltd.
- Jonsson, P., & Mattsson, S. A. (2008). Inventory management practices and their implications on perceived planning performance. *International Journal of Production Research*, 46(7), 1787–1812. doi:10.1080/00207540600988071
- Kazim, S. (2008). Inventory inaccuracy and performance of collaborative supply chain practices. *Industrial Management and Data Systems*, 108, 495–509. doi:10.1108/02635570810868353
- Koh, L. D., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management & Data System*, 107(1), 103–124. doi:10.1108/02635570710719089
- Koumanakos, D. P. (2008). The effect of IM on firm performance. *International Journal of Productivity and Performance Management*, 57(5), 335–369. doi:10.1108/17410400810881827
- Li, S. R., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107–124. doi:10.1016/j.omega.2004.08.002
- Liedholm, C., MacPherson, M., & Chuta, E. (1994). Small enterprise employment growth in rural Africa. *American Journal of Agricultural Economics*, 76, 10. doi:10.2307/1243413
- Lin, F.-R., Huang, S.-H., & Lin, S.-C. (2002). Effects of information sharing on supply chain performance in electronic commerce. *IEEE Transactions on Engineering Management*.
- Maria, X. L., & Jones, J. T. (2003). Quality initiatives and business growth in Australian manufacturing SMEs: An exploratory investigation. *School of Commerce Research Paper Series*, 03-3.
- Mentzer, J. T., Min, S., & Zacharia, Z. G. (2000). The nature of inter-firm partnering in supply chain management. *Journal of Retailing*, 76(4), 549–568. doi:10.1016/S0022-4359(00)00040-3
- Naliaka, V. W., & Namusonge, G. S. (2015). Role of inventory management on competitive advantage among manufacturing firms in Kenya: A case study of Unga Group Limited. *International Journal of Academic Research in Business and Social Sciences*, 5(5), 87–104.
- Nzuza, Z. W. (2015). *Factors affecting the success of inventory control in the stores division of the Thekwini Municipality Durban: A case study*. Durban, South Africa: Durban University of Technology.
- Ogbo, A. (2011). Production and operations management. *Supply Chain Management: An International Journal*. Enugu: De-verge Agencies Ltd. 12(4), 284–296. (2007).
- Onyango, R. M. (2013). *Lean enterprise and supply chain performance of pharmaceutical companies in Kenya*. MBA Project, University of Nairobi, Kenya.
- Palmer, A., & Dean, H. (2000). How SMS freed 40% capacity and slashed throughput times. *Manufacturing Computer Solutions*, 6(11), 127–134.
- Ramanathan, R. (2006). ABC inventory classification with multiple criteria using weighted linear optimization. *Computers & Operations Research*, 33(3), 695–700.
- Sander, L., Matthias, H., & Geoff, W. (2010). The impact of decentralized control on firm-level inventory evidence from the automotive industry. *International Journal of Physical Distribution and Logistics Management*, 41, 435–456.
- Sila, I. E. (2006). Quality in supply chain: An empirical analysis. *SCM. An International Journal*, 11, 491–502.
- Stevenson, B. (2010). *Operations management* (10th ed.). New York: McGraw Hill Publishing.
- Tabachnick, B., & Fidell, L. (2009). *Using multivariate statistics*. Boston: Allyn and Bacon.
- Teunter, R. B. (2012). ABC classification: Service levels and inventory costs. *Production and Operations Management*, 19, 3.
- Tumuhairwe, S. (2012). *Inventory management and profitability: A case study of Roofings Ltd Uganda*. Research Project Masters of Science, Makerere, Uganda.
- Tushabomwe Kazooba, C. (2006). Causes of small business failure in Uganda: A case study from Bushenyi and Mbarara towns. *African Studies Quarterly*, 8(4).
- Van Horne, J. C., & Wachowicz, J. M. (2008). *Fundamentals of financial management*. England: Financial Times/Prentice Hall.



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