EFFECT OF INVENTORY MANAGEMENT PRACTICES ON PERFORMANCE OF MANUFACTURING FIRMS IN KENYA: A CASE STUDY OF SAMEER AFRICA

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ABSTRACT
The performance of manufacturing firms in Kenya has been unsteady. In the year 2014, while manufacturing output increased by 4.8 percent, agriculture output grew by 15.8 percent, building and construction grew by 13.1 percent, information and technology 12.7 percent, transport and storage 13.7 percent among others. These negative trends reflect structural issues such as struggling with low productivity and structural inefficiencies in the supply chains as suggested by firm-level analysis based on data from the Census of Industrial Production and the World Bank’s Enterprise Survey. The study was hinged on the EOQ theory, lean theory, Theory of constraints and Systems theory of Logistics. The primary motivation behind this study was the problem facing performance of manufacturing firms attributed to supply chain. The study sought to establish the effects of inventory management on performance of manufacturing firms. The study specifically sought to establish the effects of inventory stock takes, inventory information management system, supplier Partnership and lead time management practices on performance of manufacturing firms in Kenya. The research methodology involved collection of primary data through questionnaire. The study employed descriptive study design. The population of the study was 527 employees of Sameer Africa and the sample size was 96 managers and supervisors. The study used a multiple linear regression and correlation analysis to show the relationship between the variables. The study findings indicated a positive and significant correlation between all the predictor variables used and the performance of manufacturing firms. The study also established a positive and significant relationship between the variables and performance apart from inventory stock takes. Based on the study findings the study recommends that more inventory stock taking practices should be embraced by manufacturing firms in Kenya for instance development of new accession registers for stocks to replace the old one, entering the records captured into the automated systems, taking of stock differences at the end of each day, documenting all goods in the store by tracking and reconciling stock frequently. The study also recommends that manufacturing firms in Kenya should encourage more inventory information management practices for example automating inventory management system, ensuring sufficiency of inventory management systems and tools and using e-procurement.
Keywords: Inventory Stock takes, Inventory information management system, Supplier Partnership, lead time management practices, Performance of manufacturing firms in Kenya

INTRODUCTION
Historically, inventory management has been referred to as excess inventory and inadequate management or shortage of inventory and adequate management practice. Several penalties could be apportioned to excesses in either direction. Inventory problem has escalated as progress in technology increases the ability of organizations to produce goods faster in multiple design variation and greater quality (Letinkaya & Lee, 2000). In recent years, many of the firms have raised the bar in inventory management by coordinating with other firms in their supply chains. For instance, instead of responding to unknown and variable demand, they share information so that the variability of the demand they observe is significantly lower (Jay & Barry, 2006). Horngren, Datar & Forster (2004) states that inventory management is an area which requires increased attention because inventories account for more than 40 percent of the total costs of manufacturing companies and more than 70 percent of the total costs of merchandizing companies (Onyango, 2012). Poor inventory management practices leads to either over stocking or under stocking. Any of the two has a negative effect on financial performance of a retail firm. Overstocking, according to Kotler (2000) requires large space, appropriate storage facilities and substantial amount of funds tied up in the investment and yet the movement of the inventories depends on the speed at which the products are sold. In case of low sales the movement of inventories becomes slow and the risk of losing items pegged to expiry dates and perishability or obsolescence poses a major concern to firms. Poor financial performance can arise due to losses caused by perishability and expiry of stocks.

Kotler (2000) further states that carrying costs might run as high as 30 percent of inventory value. On the other hand, under stocking of inventories reduces the amount tied up while at the same time it increases the risk of running out of stock. It is costly to run out of stock due to possible loss of sales and goodwill. The management therefore has the two costly conflicting areas, overstocking versus under-stocking to contend with and strike a balance. That is the reason why proper inventory management for manufacturing firms, should be the first priority of any manufacturing firm which aspires to perform better. Many companies’ inventory policy is to hold sufficient finished stock to meet the market demand while minimizing the holding costs and to enable them meet their objectives. David, (1996) highlights the importance of inventory management in firms by stating that inventory is a very expensive asset that can be replaced with information which is a less expensive asset. He further states that, to do this, the information has to be accurate, timely, reliable and consistent. When this happens, you carry fewer inventories, reduce cost and get products to customers faster. This therefore implies that inventory management is very important if a company wants to achieve a balance between efficiency and responsiveness.

Inventory management involves a trade-off between the costs associated with keeping inventory versus the benefits of holding inventory. The benefit of an inventory is to assure that goods will be available as required. The primary costs of an inventory are the opportunity cost of the capital
used to finance the inventory, ordering costs, and storage costs. Inventory management seeks to maximize the net benefit (the benefits minus costs of the inventory) (Chambers & Lacey, 2011). According to Shim & Siegel (2008), a successful inventory management minimizes inventory, lowers cost and improves profitability hence the managers should appraise the adequacy of inventory levels, which depend on many factors, including sales, liquidity, available inventory financing, production, supplier reliability, delay in receiving new orders, and seasonality. An increase in inventory lowers the possibility of lost sales from stock outs. Inventory levels are also affected by short-term interest rates. As short term interest rates increase, the optimum level of holding inventory is reduced.

**STATEMENT OF THE PROBLEM**

The Vision 2030 stipulates that the manufacturing sector should account for 20 per cent of GDP by 2030. Achieving this ambitious goal largely depends on a competitive manufacturing sector (RoK, 2015). However the sector’s contribution to the GDP has stagnated at an average of 10 per cent for more than ten years with a growth of 3.1 percent, significantly lower than the overall economic growth of 5.0 percent (WB, 2014). Compared to the other sectors the manufacturing sector, which is dominated by large manufacturing firms lagged behind in output growth. For instance, in 2014, while manufacturing output increased by 4.8 percent, agriculture output grew by 15.8 percent, building and construction grew by 13.1 percent, information and technology 12.7 percent, transport and storage 13.7 percent among others (KNBS, 2015). These negative trends reflect structural issues such as struggling with low productivity and structural inefficiencies in the supply chains as suggested by firm-level analysis based on data from the Census of Industrial Production and the World Bank’s Enterprise Survey (2014). On the other hand KAM (2014) reiterates that the declining performance is disturbing for business and indicates eroded competitiveness and compromises the government’s aspirations of 20% growth that will enable Kenya to become prosperous. If this problem is not addressed it will cause low economic development leading to lack of achievement of the vision 2030 with regard to the manufacturing sector, lack of competitiveness in the global market, loss of jobs consequently creating social injustice in the society.

Proper inventory management has often been linked to performance. Since the problem of poor performance in the manufacturing sector is also attributed to supply chain performance, then an investigation of inventory management is a consideration. According to David & David (2002), better inventory management reduces the chances of uncertainties or lack of stocks and the costs that relate to stock outs and this enables any firm to attain a competitive advantage over competitors, thus performing well financially. Kontuš (2014) further states that successful inventory management minimizes inventory, lowers cost and improves profitability. An optimal inventory level can be based on consideration of the incremental profitability to the opportunity cost of carrying the higher inventory balances. Studies have been done in relation to inventory management and performance. Akintonye (2014) found that inventory management led to improved performance of German Service firms. Mehra (2014) & Lapide (2010) also concluded that use of technology in inventory management improved efficiency of manufacturing firms and service firms. Kitheka (2012) indicated that inventory management automation affected the performance of the supermarkets. The findings revealed that there was a positive linear relationship between inventory management automation and the performance of the supermarkets. The above studies have dwelt on inventory models and inventory management.
automation. They have presented both contextual and conceptual research gaps which the current study sought to fill. This study hence focused on inventory management practices and performance of manufacturing firms in Kenya.

RESEARCH OBJECTIVES

i. To establish the effect of inventory Stock takes on performance of manufacturing firms in Kenya

ii. To analyze the effect of inventory information management system on performance of manufacturing firms in Kenya

iii. To assess the effect of Supplier management on performance of manufacturing firms in Kenya

iv. To determine how lead time management practices affects performance of manufacturing firms in Kenya

LITERATURE REVIEW

Economic Order Quantity (EOQ)

Economic order quantity (EOQ) developed by Ford Harris in 1913 is an inventory management model that aims at minimizing total inventory holding costs and ordering costs. The Economic Order Quantity model of inventory management is used to mark the optimum size of delivery and to choose the cheapest deliverer which guarantees minimization of total costs of investments in inventories. EOQ model is a technique that determines the optimal amount of inventory to order each time the inventory of that item is depleted (Chambers & Lacey, 2011).

The Economic Order Quantity (EOQ) model considers the trade-off between ordering cost and storage cost in choosing the quantity to use in replenishing item inventories. A larger order quantity reduces ordering frequency and hence ordering cost, but requires holding a larger average inventory, which increases holding costs. On the other hand, a smaller order-quantity reduces average inventory, but requires more frequent ordering and higher ordering costs. The implication of EOQ is that it minimizes storage and holding costs. The model suggests buying a larger quantity in fewer orders to take advantage of bulk buying and minimize ordering costs. It smooths out the restocking process and results in better customer service as inventory is available when needed. The model requires continuous monitoring of inventory levels. Its effectiveness is limited by assumption of one product business and the model does not allow combination of several products in the same order (Pandey, 2006)

Lean Theory

Lean theory is an extension of ideas of just in time. The theory eliminates buffer stock and minimizes waste in production process (Green & Inman, 2005). Inventory leanness positively affects the profitability of a business firm and is the best inventory control tool. Firms that are leaner than industry average generally see positive returns to leanness (Eroglu & Hofer, 2011). The theory elaborates on how manufacturers gain flexibility in their ordering decisions, reduce the stocks of inventory held on site and eliminate inventory carrying
costs. Scholarly studies indicate that companies successfully optimize inventory through lean supply chains practices to achieve high levels of asset utilization and customer satisfaction leading to improved growth, profitability and market share (Waller, Tangari & Williams, 2008). Criticism leveled against the theory is that it can only be applicable when there is a close and long-term collaboration and sharing of information between a firm and its trading partners.

**Theory of Constraints**

The theory of constraints is a management philosophy that seeks to increase manufacturing throughout efficiency measured by sales through the identification of those processes that are constraining the manufacturing system. The difficulties in the theory of constraints are: very long lead times, large number of unfulfilled orders, high level of unnecessary inventories or lack of relevant inventories, wrong materials order, large number of emergency orders and expedition levels, lack of customers engagement, absence of control related to priority orders which implies on schedule conflicts of the resources (Goldratt, 2004). The theory emphasizes focus on effectively managing the capacity and capability of these constraints to improve productivity and this can be achieved by manufacturing firms applying appropriate inventory control practices. Theory of constraints is a methodology whose basis is applied to production for the minimization of the inventory (Cooper, 2006).

**System Theory of Logistics**

Professor Rainer Stank of the Michigan State University proposed that logistics is management of an organization as an integrated whole for the total optimal performance. He believed that organization is the integration of logistical related activities that are working together to achieve lowest total costs and optimum service level as opposed to managing discrete functions individually for the lowest costs (Harrington, 2002). According to him, companies will realize that effective logistics is all about managing the trade-offs (Harrington, 2002). Logistics in business must identify and determine several cost trade-offs in order to provide a positive benefit to the logistics systems as a whole (Rushton et al, 2006). The sum of all outcomes is greater than its individual parts. On the other hand, logistics scholars endorsed the relationship of logistics management to the firm logistics capabilities that is determined by the dynamics logistics capabilities.

**Research Methodology**

This study employed a descriptive case study design. Descriptive case study is conducted to describe the present situation, what people currently believe, what people are doing at the moment and so forth (Baumgartner, Strong & Hensley, 2002). According to the Human Resource report (2015) of Sameer Africa, there were 131 employees in managerial or supervisory positions. Therefore the target population for this study consisted of 131 employees of Sameer Africa who are in management positions. The study respondents were 96. The use of employees from the top and middle level management was justified on the basis that they have information concerning inventory management. The 96 respondents participated in responding to the questionnaire. The unit of analysis was managers and supervisors. The study used primary data gathered by use of closed ended questionnaires, which was self-administered. SPSS was used to produce frequencies, descriptive and inferential statistics which was used to derive conclusions and generalizations regarding the population. A multiple linear regression model was used to test the significance of the influence of the independent variables on the dependent variable. The multiple linear regression model used is shown below.

\[
Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e
\]
Where: \( Y = \) Performance, \( X_1 = \) Inventory Stock takes, \( X_2 = \) Inventory information management system, \( X_3 = \) Supplier management, \( X_4 = \) Lead time management practices, \( \beta_0 = \) Constant, \( \beta_1 \) to \( \beta_4 = \) Beta coefficients

**Inventory stock takes Practices**
- Development of accession registers
- Use of automated system
- Frequency of stock reconciliation

**Inventory information systems**
- Use of e procurement
- Automation of inventory management system
- Use of enterprise resource planning

**Supplier Management Practices**
- Prequalification of suppliers
- Continuous information sharing
- Partnership with suppliers

**Lead time management Practices**
- Order shipping lead time
- Order sorting lead time
- Order listing lead time

**Performance of manufacturing firms**
- Market share
- Return on investments
- Profitability

**Independent Variables**

**Dependent Variables**

**Figure 1 Conceptual framework**

**RESULTS**

**Demographics Analysis**

**Gender Composition of Respondents**

Results on Figure 2 shows that majority of the respondent as shown by 67% indicated that they were male whereas 33% of the respondents were female. Thus there was a significant gender disparity amongst the respondents and the indication is that majority of the respondents are male. This did not however affect results. The findings imply that manufacturing sector in Kenya is male dominated.
The study findings indicate that 78\% of the respondents were supervisors while 22\% were managers as indicated on Figure 4.3. This implies that majority of the respondents were supervisors. This implies that information was sought from the targeted respondents of supervisors and managers. There was also a better mix of opinion since both groups participated in the study.

Majority of the respondents had University level of education as represented by a percentage of 63\%. Those who had college level of education were 37 \% of the respondents. This implies that majority of the respondents are literate and could therefore read and understand the requirements of the questionnaire and issues of inventory management practices. This helped to improve the reliability (consistency) of the responses.
Figure 4: Level of education

Employees work experience
The study findings indicated that only 10% of the respondents had worked in the company for over 10 years and 20% had worked for less than one year. Majority of the respondents had worked for a period between 2 and 5 years. These findings imply that there is a low turnover rate in the manufacturing sector. Furthermore, the findings imply that the respondents had enough experience and information to participate and contribute the same in the study. Furthermore, the findings mean that very few people work in the industry beyond their 10th year in the industry. These findings consistent with the findings of a study by Bashir & Durrani (2014) that as people gain more experience in an industry, the rate of turnover decreases.

Figure 4.5: Employees work experience
Descriptive Findings and Analysis
Inventory Stock takes
Results on Table 1 show that majority 65.70 % of all the respondents felt that the company frequently develops a new accession register for stocks to replace the old one, 68.60% of all the respondents indicated that the company always enters the records captured into the automated system, 74.30% of all the respondents indicated that the company instructs store manager to always take stock differences at the end of each day, 48.60% of all the respondents indicated that the company documents all goods in the store by tracking and 42.90% agreed that the company reconciles its stock frequently. The average mean of the responses indicated from the results was 3.61 which show that the respondents were agreeing on most of the statements while the standard
deviation was 1.34 which indicates that the answers received were varied as they were dispersed far from the mean.
The study findings are consistent with an argument by Silver (2007) that some of the activities undertaken under inventory stock taking practices is taking stock differences, stock auditing and development of accession registers.

### Table 1: Inventory Stock Takes

<table>
<thead>
<tr>
<th>Statement</th>
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<th>Mean</th>
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<tbody>
<tr>
<td>The company frequently develops a new accession register for stocks to replace the old one</td>
<td>8.6%</td>
<td>14.3%</td>
<td>11.4%</td>
<td>34.3%</td>
<td>31.4%</td>
<td>3.66</td>
<td>1.30</td>
</tr>
<tr>
<td>The company always enters the records captured into the automated system</td>
<td>2.9%</td>
<td>22.9%</td>
<td>5.7%</td>
<td>8.6%</td>
<td>60.0%</td>
<td>4.00</td>
<td>1.37</td>
</tr>
<tr>
<td>The company instructs store manager to always take stock differences at the end of each day</td>
<td>5.7%</td>
<td>17.1%</td>
<td>2.9%</td>
<td>40.0%</td>
<td>34.3%</td>
<td>3.80</td>
<td>1.26</td>
</tr>
<tr>
<td>The company documents all goods in the store by tracking</td>
<td>14.3%</td>
<td>14.3%</td>
<td>22.9%</td>
<td>14.3%</td>
<td>34.3%</td>
<td>3.40</td>
<td>1.46</td>
</tr>
<tr>
<td>The company reconciles its stock frequently</td>
<td>11.4%</td>
<td>20.0%</td>
<td>25.7%</td>
<td>22.9%</td>
<td>20.0%</td>
<td>3.20</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.61</td>
<td>1.34</td>
</tr>
</tbody>
</table>

**Inventory information management system**

Results on Table 2 show that 44.8% of all the respondents agreed that the company has fully automated its inventory management system, 58.60% of the respondents indicated that the company has sufficient inventory management systems and tools, 51.70% of the respondents on the other hand indicated that the work of the store manager has been made easy because of the use of information technology and 50.6 % of the respondents stated that the company uses e-procurement. The average mean of the responses indicated from the results was 3.39 which show that the respondents were neutral on most of the statements while the standard deviation was 1.30 which indicates that the answers received were varied as they were dispersed far from the mean.

These findings are consistent with arguments by Lambert (2011) and Song & Zipkin (2011) that the use of ERP system and e-procurement improves decision making process since the supply chain partners can share information and this minimizes communication costs in the supply chain leading to better supply chain performance.
Table 2: Inventory information management system

<table>
<thead>
<tr>
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<th>4</th>
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<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>The company has fully automated its inventory management system</td>
<td>17.2%</td>
<td>13.8%</td>
<td>24.1%</td>
<td>20.7%</td>
<td>24.1%</td>
<td>3.21</td>
<td>1.41</td>
</tr>
<tr>
<td>The company has sufficient inventory management systems and tools</td>
<td>9.2%</td>
<td>14.9%</td>
<td>17.2%</td>
<td>34.5%</td>
<td>24.1%</td>
<td>3.49</td>
<td>1.27</td>
</tr>
<tr>
<td>The work of the store manager has been made easy because of the use of information technology</td>
<td>12.6%</td>
<td>16.1%</td>
<td>19.5%</td>
<td>31.0%</td>
<td>20.7%</td>
<td>3.31</td>
<td>1.31</td>
</tr>
<tr>
<td>The company uses ERP system</td>
<td>6.9%</td>
<td>19.5%</td>
<td>21.8%</td>
<td>23.0%</td>
<td>28.7%</td>
<td>3.47</td>
<td>1.28</td>
</tr>
<tr>
<td>The company uses e-procurement</td>
<td>5.7%</td>
<td>18.4%</td>
<td>25.3%</td>
<td>25.3%</td>
<td>25.3%</td>
<td>3.46</td>
<td>1.22</td>
</tr>
</tbody>
</table>

**Average** 3.39 1.30

**Supplier management**

Results on Table 3 show that majority 80% of all the respondents agreed that the company normally pre qualifies suppliers before they are contracted to supply, 74.3% of all the respondents stated that there is a close partnership between the company and their suppliers, 65.7% indicated that there is continuous information sharing between the company and suppliers while 62.9% agreed that the there is a better channel relationship between the suppliers and company. The average mean of the responses indicated from the results was 3.23 which show that the respondents were agreeing on most of the statements while the standard deviation was 1.205 which indicates that the answers received were varied as they were dispersed far from the mean.

The findings are consistent with an argument by Robinson & Malhotra (2005) who argue that the strategic supplier partnership identifies optimum practices that can facilitate supply chain process alignment and integration and that in order to expedite collaboration, it is necessary to implement the latest collaborative information systems that drive efficiencies, performance, and quality throughout a supply chain.
Table 3: Supplier management

<table>
<thead>
<tr>
<th>Statement</th>
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<th>4</th>
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<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>The company normally pre qualifies suppliers before they are contracted to supply</td>
<td>8.6%</td>
<td>2.9%</td>
<td>8.6%</td>
<td>37.1%</td>
<td>42.9%</td>
<td>4.03</td>
<td>1.20</td>
</tr>
<tr>
<td>There is a close partnership between the company and their suppliers.</td>
<td>5.7%</td>
<td>8.6%</td>
<td>11.4%</td>
<td>31.4%</td>
<td>42.9%</td>
<td>3.97</td>
<td>1.20</td>
</tr>
<tr>
<td>There is continuous information sharing between the company and suppliers</td>
<td>5.7%</td>
<td>8.6%</td>
<td>20.0%</td>
<td>25.7%</td>
<td>40.0%</td>
<td>3.86</td>
<td>1.22</td>
</tr>
<tr>
<td>There is a better channel relationship between the suppliers and company</td>
<td>2.9%</td>
<td>14.3%</td>
<td>20.0%</td>
<td>22.9%</td>
<td>40.0%</td>
<td>3.83</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>3.225</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>1.205</strong></td>
</tr>
</tbody>
</table>

**Lead time management practices**

Results on Table 4 show that 65.7% of the respondents indicated that favorable and well known time strategy affects performance of the Company, 85.8% agreed that creation of value affects the performance of the company while 62.9% of all the respondents said that improvement in continuity of supplies and lead time can influence the performance of the company. Those respondents who agreed that there the company maintains communication with the suppliers online in order to reduce the lead time were 62.9%. In addition, the average mean of the responses indicated from the results was 3.906 which show that the respondents were agreeing on most of the statements while the standard deviation was 1.115 which indicates that the answers received were varied as they were dispersed far from the mean.

The findings of the study are consistent with an argument Münster & Vestin (2012) that long lead times leads to increased costs due to larger buffers, increased uncertainty about requirements, larger safety stocks and broken delivery promises and consequently, lead times are inversely related to market shares and overall performance of the firm.

Table 4 Lead time management practices

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
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<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable and well known time strategy affects performance of the Company</td>
<td>0.0%</td>
<td>14.3%</td>
<td>20.0%</td>
<td>34.3%</td>
<td>31.4%</td>
<td>3.83</td>
<td>1.04</td>
</tr>
<tr>
<td>Creation of value affects the performance of the company</td>
<td>0.0%</td>
<td>8.6%</td>
<td>5.7%</td>
<td>42.9%</td>
<td>42.9%</td>
<td>4.20</td>
<td>0.90</td>
</tr>
<tr>
<td>Improvement in continuity of supplies and lead time can influence the performance of the company</td>
<td>2.9%</td>
<td>22.9%</td>
<td>11.4%</td>
<td>28.6%</td>
<td>34.3%</td>
<td>3.69</td>
<td>1.25</td>
</tr>
<tr>
<td>The company maintains communication with the suppliers online in order to reduce the lead time.</td>
<td>5.7%</td>
<td>8.6%</td>
<td>22.9%</td>
<td>14.3%</td>
<td>48.6%</td>
<td>3.91</td>
<td>1.27</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>3.906</strong></td>
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<td></td>
<td><strong>1.115</strong></td>
</tr>
</tbody>
</table>
Performance

The study sought to establish the performance of Sameer Company which is a manufacturing firm. Respondents were asked to indicate their agreement with statements on performance presented in a scale of 1 to 5. The results presented in Table 4.5 indicated that 44.8% of the respondents agreed that the company’s profitability has improved, 35.6% agreed that the company’s return on investment has improved while those respondents who stated that the company’s market value has improved were 40.2%. Those respondents who agreed that the company’s competitive position has improved were 43.7% and 36.8% agreed that the company’s market share has improved. The mean of 2.97 indicates that the respondents were neutral on most of the statements while a standard deviation of 1.44 indicates that the answers received were varied as they were dispersed far from the mean.

The findings are consistent with an argument by Adeyemi & Salami (2010) that in order to improve operational efficiency an organization has to measure both the input and the output side of the inventory management. Performance of a manufacturing organization heavily relies on its inventory management.

Table 5: Performance

<table>
<thead>
<tr>
<th>Statement</th>
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<th>5</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>The company’s profitability has improved</td>
<td>20.7%</td>
<td>17.2%</td>
<td>17.2%</td>
<td>24.1%</td>
<td>20.7%</td>
<td>3.07</td>
<td>1.45</td>
</tr>
<tr>
<td>The company’s return on investment has improved</td>
<td>27.6%</td>
<td>16.1%</td>
<td>20.7%</td>
<td>17.2%</td>
<td>18.4%</td>
<td>2.83</td>
<td>1.47</td>
</tr>
<tr>
<td>The company’s market value has improved</td>
<td>20.7%</td>
<td>21.8%</td>
<td>17.2%</td>
<td>25.3%</td>
<td>14.9%</td>
<td>2.92</td>
<td>1.38</td>
</tr>
<tr>
<td>The company’s competitive position has improved</td>
<td>23.0%</td>
<td>14.9%</td>
<td>18.4%</td>
<td>20.7%</td>
<td>23.0%</td>
<td>3.06</td>
<td>1.49</td>
</tr>
<tr>
<td>The company’s market share has improved</td>
<td>20.7%</td>
<td>16.1%</td>
<td>26.4%</td>
<td>16.1%</td>
<td>20.7%</td>
<td>3.00</td>
<td>1.41</td>
</tr>
<tr>
<td>Average</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.44</td>
</tr>
</tbody>
</table>

The respondents were also asked to indicate their scale regarding changes in lead time. A trend analysis was drawn based on the average response from the respondents. 1 was used to indicate a more than 50% increase in lead time, 2 indicated a less than 50% increase in lead time, 3 indicated a less than 50% decrease in lead time and 4 indicated a more than 50% decrease in lead time. The trends presented on Figure 4.6 indicate that the average lead time has been decreasing over the study period from a worse off point of 2.2 (a less than 50% increase in lead time) in the year 2011, 2.4 (a less than 50% increase in lead time) in the year 2012 to 3.3 (a less than 50% decrease in lead time) and finally 4.5 (a more than 50% decrease in lead time) in the year 2015. This indicates that on average, a lead time change of 3.22 (a less than 50% decrease in lead time) was recorded implying a better performance.
The respondents were also asked to indicate the approximate changes in market share where 4 was used to indicate a more than 50% increase, 3 indicated a less than 50% increase, 2 indicated a less than 50% decrease and 1 indicated a more than 50% decrease. The results on Figure 4.7 indicate that there was unsteady increase and decrease in market share over the study periods which confirm the unsteady performance of manufacturing firms. There was a decreasing market share from the year 2011 to the year 2013 before an increase in the year 2014 and finally a decrease in the year 2015.

The respondents were further asked to indicate the approximate changes in return on investments where 4 was used to indicate a more than 50% increase, 3 indicated a less than 50% increase, 2 indicated a less than 50% decrease and 1 indicated a more than 50% decrease. The results on Figure 4.8 indicate unsteady trends in ROI over the study period. There was a decrease in ROI from 3.3 in the year 2011 to 3.0 in the year 2012. In the years 2013 and 2014, there was a sharp increase in the ROI from 4.2 to 4.6 respectively before a slight decrease to 3.9 in the year 2015.
The respondents lastly indicated the approximate changes in profitability where 4 was used to indicate a more than 50% increase, 3 indicated a less than 50% increase, 2 indicated a less than 50% decrease and 1 indicated a more than 50% decrease. The results on Figure 4.9 indicate unsteady trends in profitability which confirms the problem statement of the study. There was a decrease in ROI from 4.0 in the year 2011 to 3.8 in the year 2012. In the years 2013 and 2014, there was a slow increase in the profitability from 4.1 to 4.2 respectively before a slight decrease to 4.0 again in the year 2015.

**Correlation Analysis**

The study conducted a correlation analysis to establish the association between the variables. Correlation is a measure of association between variables. It ranges from -1 to +1. A Pearson correlation of zero indicates that there is no association between the two variables. The results are as presented in Table 6.

**Table 6: Correlation Matrix**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Inventory stock takes</th>
<th>Inventory information management</th>
<th>Supplier management</th>
<th>Lead time management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory stock takes</td>
<td>Pearson</td>
<td>Correlation</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
The correlation results indicated that there is a positive and significant association between Inventory stock takes practices and performance (R = 0.302, Sig = 0.004). This implies that an improvement in inventory stock taking practices leads to better performance. The study findings are consistent with the findings of a study by Rajeev (2010) which showed that inventory management had really some impact on labor productivity, capital productivity and returns to scale in respondent companies.

The correlation between inventory information management and performance was also established to be positive and significant (R = 0.390, Sig = 0.000). This implies that an improvement in inventory information management system leads to better performance. The findings are consistent with Shah & Shin (2007) who examined the empirical associations among three constructs - inventory, IT investments and financial performance and concluded that reducing inventories has a significant and direct relationship with a firm’s financial and operational performance. The findings are also consistent with the findings of a study by Salawati et al (2012) who attempted to investigate the relationship between inventory management, firm performance and capital intensity and there is positive correlation between inventory management and firm’s performance.

The correlation findings also established that supplier management was positively and significantly associated with performance (R = 0.275, Sig = 0.010). This implies that an improvement in the supplier chain management leads to better performance of firms. The findings are consistent with the argument by Shin, Collier and Wilson (2000) ; Prasad & Tata (2000) who suggested that effective SCM practice has a direct impact on the overall financial and marketing performance of an organization.

Lead time management was also established to be positively and significantly associated with performance as indicated by a Pearson correlation of 0.281 and significance of 0.008. This implies that an improvement in lead time management practices leads to better performance of manufacturing firms in Kenya. The study findings are consistent with Münster & Vestin (2012) who indicated that poor lead time management practices which lead to high lead times are inversely related to market shares which is a measure of organizational performance in the current study.
Regression Analysis
The study used a regression model to establish the relationship between inventory management practices and performance of manufacturing firms in Kenya. The results for the model summary as presented indicated that inventory management practices are jointly positively associated with performance of manufacturing firms \( (R = 0.518) \). The coefficient of determination also called R-squared explains the percentage of variation in the dependent variable (performance of manufacturing firms) that is explained by all the four inventory management practices (Inventory stock takes, Inventory information management system, Supplier management and lead time management practices). The coefficient of determination \( (R^2) \) was 0.269. This means that the combined effect of the predictor variables (Inventory stock takes, Inventory information management system, Supplier management and lead time management practices) explains 26.9% of performance of manufacturing firms. This therefore means that other factors not studied in this research explain 73.1% of performance of manufacturing firms. Therefore, further research should be conducted to investigate the other factors that explain 73.10% of performance of manufacturing firms in Kenya.

Table 7: Model Summary

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.518</td>
</tr>
<tr>
<td>R Square</td>
<td>0.269</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.233</td>
</tr>
</tbody>
</table>

Model significance of whether the model linking inventory practices to performance was significant was also established under the ANOVA results on Table 4.8. The F value of 7.528 is significant at a significance value of 0.000 which is less than 0.05 at 1% level of significance. This shows that the overall model was significant. This shows that the combined effect of inventory stock takes, inventory information management system, supplier management and lead time management practices are statistically significant in explaining performance of manufacturing firms in Kenya.

Table 8: Analysis of Variance

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>8.69</td>
<td>4</td>
<td>2.173</td>
<td>7.528</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>23.666</td>
<td>82</td>
<td>0.289</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32.357</td>
<td>86</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results for regression of coefficients of the study shows that there is a positive relationship between inventory stock takes, inventory information management system, supplier management and lead time management practices as supported by beta coefficients of 0.227, 0.234, 0.221 and 0.146 respectively. This means that an increase in either of the variables will positively increase the performance of manufacturing firms in Kenya. The analysis also yields results that show that all variables used in the study are statistically significant apart from inventory stock takes as the probability \( (p) \) values were not more than the conventional value of 0.05 for the significant variables but more than 0.05 for the insignificant variable.

The model regression established was as indicated:
Performance of manufacturing firms = 0.566 + 0.146 (Inventory stock takes) + 0.234 (Inventory information management practices) + 0.221 (Supplier management) + 0.227 (Lead time management)

According to the regression equation established, taking all factors into account (Inventory stock takes, Inventory information management system, Supplier management and lead time management practices) constant at zero, performance of manufacturing firms is supposed to be 0.566.

The data findings analysed also shows that taking all other independent variables at zero, a unit increase in lead time management practices leads to a 0.227 units increase in performance of manufacturing firms. The relationship is significant at 5% level of significance. These findings are consistent with an argument by Bowersox & Closs (2002) who articulated that improvement in continuity of supplies with reduced lead times, will lead to improvement in cooperation and will also enhance cooperation’s and communications with reduced duplication of efforts, reduction in material costs and improvement in quality control, which are the main benefits of materials management hence the overall performance of the company.

Furthermore, a unit increase in inventory information management practices leads to a 0.234 units increase in performance of manufacturing firms. The relationship is also significant at 5% level of significance. The findings are consistent with a study by Roumiantsvev & Netessine (2005) which analyzed the relationship between companies’ inventory management policies/operational environment and accounting returns as reflected by return on assets and found that superior earnings are associated with the speed of change or responsiveness in inventory management after controlling for industry and firm-specific effects.

The results also indicated that a unit increase in supplier management practices leads to a 0.221 increase in performance of manufacturing firms in Kenya. This relationship is significant at 5% level of significance. These findings are consistent with an argument by Shin et al., 2000; Prasad & Tata (2000) who argue that SCM practice is expected to increase an organization’s market share, return on investment and improve overall competitive position. The findings are also consistent with Stanley & Wisner (2001); Sila, Ebrahimpour & Birkholz (2006) who points that in order to achieve high performance, companies need to integrate their supply chain partners into their operations.

The regression results also indicated that a unit increase in inventory stock takes leads to a 0.146 increase in performance of manufacturing firms in Kenya. This relationship is however not significant at 5% level of significance. The findings are consistent with Chen et al. (2005) who conducted a study to examine how the market values the firms with respect to their various inventories policies and reported that firms with abnormally high inventories have abnormally poor stock returns, firms with abnormally low inventories have ordinary stock returns while firms with slightly lower than average inventories perform best over time. The findings are also consistent with the findings of a study by Eroglu et al (2011) investigating the relationship between inventory management and performance and concluded that leanness positively affects financial performance.

Table 9: Regression Coefficients

<table>
<thead>
<tr>
<th>Indicator</th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.566</td>
<td>0.502</td>
<td>1.127</td>
<td>0.263</td>
</tr>
<tr>
<td>Inventory stock takes</td>
<td>0.146</td>
<td>0.100</td>
<td>1.472</td>
<td>0.145</td>
</tr>
</tbody>
</table>
The study findings indicated that in order of their effect on performance of manufacturing firms, inventory information management practices has the largest effect on performance of manufacturing firms (Beta = 0.234), lead time management practices has the second largest effect on performance of manufacturing firms (Beta = 0.227), Supplier management practices has the third largest effect on performance of manufacturing firms (Beta = 0.221) while inventory stock takes has the least effect on performance of manufacturing firms ( Beta = 0.146).

**Conclusions**

Based on the study findings, the study concludes that there is a positive and significant association between Inventory stocks takes practices and performance. The relationship between inventory stock takes and performance is also positive but not significant. The study also concludes that among the inventory stock takes practices in manufacturing firms in Kenya is development of new accession registers for stocks to replace the old one, entering the records captured into the automated systems, taking of stock differences at the end of each day, documenting all goods in the store by tracking and reconciling stock frequently.

Another conclusion by the study is that the correlation between inventory information management and performance is positive and significant. The relationship between inventory information management and performance is also positive and significant. Some of the inventory information management system practices in manufacturing firms in Kenya are automating inventory management system, ensuring sufficiency of inventory management systems and tools and using e-procurement.

The study findings also led to the conclusion that the correlation between supplier management and performance is positive and significant. The relationship between supplier management and performance is also positive and significant. Some of the supplier management practices in manufacturing firms in Kenya include pre-qualification of suppliers before they are contracted to supply, maintenance of a close partnership between the company and their suppliers, maintenance of a continuous information sharing system between the company and suppliers and maintenance of a better channel relationship between the suppliers and company.

The study also made a conclusion that lead time management is positively and significantly associated with performance. The relationship between lead time management and performance is also positive and significant. The study also concludes that some of the lead time management practices in manufacturing firms in Kenya are creation of value, improvement in continuity of supplies and maintenance of communication with the suppliers online.

Lastly the study concluded that having well developed inventory stock takes practices, inventory information management system, supplier management practices and lead time management practices accounts for up to 26.9% of the performance of manufacturing firms in Kenya.
Recommendations of the Study

**Inventory stock takes**
Based on the study findings that inventory stock takes affects performance positively, the study recommends that more inventory stock taking practices should be embraced by manufacturing firms in Kenya for instance development of new accession registers for stocks to replace the old one, entering the records captured into the automated systems, taking of stock differences at the end of each day, documenting all goods in the store by tracking and reconciling stock frequently.

**Inventory information management**
The study also recommends that since inventory information management and performance are positively and significantly related, the study recommends that manufacturing firms in Kenya should encourage more inventory information management practices for example automating inventory management system, ensuring sufficiency of inventory management systems and tools and using e-procurement.

**Supplier management**
The study also recommends that because the findings indicated that the relationship between supplier management and performance is also positive and significant, then manufacturing firms in Kenya should encourage more supplier management practices for instance pre-qualification of suppliers before they are contracted to supply, maintenance of a close partnership between the company and their suppliers, maintenance of a continuous information sharing system between the company and suppliers and maintenance of a better channel relationship between the suppliers and company.

**Lead time management practices**
Another recommendation is made based on the findings that lead time management positively and significantly influences performance of manufacturing firms in Kenya. The study recommends that manufacturing firms in Kenya should encourage participation in more lead time management practices for instance creation of value, improvement in continuity of supplies and maintenance of communication with the suppliers online.

**ACKNOWLEDGEMENT**
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**REFERENCES**