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Inventory Management Practice in Micro and Small Enterprise: The Case of MSEs' Manufacturing Sub Sector Arsi Zone, Ethiopia

Daniel Atnafu*
Department of Logistics and Supply Chain Management, Arsi University, Ethiopia

Assefa Balda (PhD Candidate)
Department of Logistics and Supply Chain Management, Arsi University, Ethiopia

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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 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 enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance. Therefore, it is recommended for policy makers, universities, NGOs and any concerned party who are engaged in supporting of micro and small enterprises 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. 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.
Keywords: Inventory management; manufacturing, performance, competitiveness, SEM

1. Introduction

Micro and Small Enterprises have a strategic importance in developing countries Like Ethiopia; they contribute to national income, employment, exports, and entrepreneurship development. The development of Micro and Small Scale Enterprises (MSE) is the central focus of the Ethiopia industrial development strategy as it is stated in 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 (Adeyemi & Salami, 2010). On the other hand Deveshwar and Dhawal (2013) proposed that inventory management are methods 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 V.W. & G.S. Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms. According to Li *et al.*, (2006), competitive advantage includes capabilities that allow an organization to differentiate itself from its competitors and it is an outcome of important management decisions.

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. Poor inventory management translates directly into strains on a company's cash flow.

As to the knowledge of the researchers, in Ethiopia the inventory related aspects of SMEs have not yet attracted the attention of researchers and policy makers. The SMEs, specially manufacturing enterprises, which contribute significantly to the economy in several ways, In Ethiopia, MSEs sector is the second largest employment-generating sector following agriculture (CSA, 2005:34-35). However, the inventory management aspect of factor that affects the MSEs competitiveness and performance is not attracting the attention of researchers and policy makers. Taking this gap in to consideration this paper therefore examined the impact of inventory management practice on MSEs competitiveness and performance by targeting MSEs found in four selected towns in Arsi Zone, Oromia, Ethiopia. To this end, the following basic research questions are formulated.

- What are the Inventory Management practices followed by MSEs in Manufacturing Sub Sector?
- How does the Inventory Management Practiced by MSEs affect their competitiveness and performance?

- How does the competitive advantage gained through inventory management affect MSEs Performance?

2. Literature Review

An effective and efficient management inventor 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. 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 (Bowersox, 2002). 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 on the basis of traditional thumb rules. Inventory management according to Onyango (2013) is a fundamental pillar in an organization and it should be taken seriously.

The inventory related cost of small and micro enterprises takes the highest percentage of their total budget, yet but inventory management is one of the most neglected management areas in small firms. 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, which contribute significantly to the economy in several ways, In Ethiopia, MSEs sector is the second largest employment-generating sector following agriculture (CSA, 2005:34-35). The contribution of micro and small enterprises is more than double of the manufacturing sector. However, these enterprises are facing both financial and non-financial problems. Studies by Liedholm, MacPherson and Chuta, 1994, show a large number of small enterprises fail because of non-financial reasons. Furthermore, study by Tushabonwe 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 in to 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.

2.1 Conceptual framework and Hypothesis Development

2.1.1 Inventory management and Competitiveness

A study conducted in Kenya by Naliaka V.W. & G.S. 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 indicates capabilities of a firm to differentiate itself from its competitors and it is an outcome of important management decisions Li *et al.*, (2006). Effective inventory management provides opportunities to create sustainable competitive advantage and enhance the competitive position of companies. This indicates reduction in cost of holding inventory by maintaining enough inventories, in the right place and the right time and cost to make the right amount of required levels of inventory.

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

2.1.2 Inventory Management Practices and Organizational Competitiveness

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 effects 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 (Tumuhairwe, 2012). 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 centres 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, Ebrahimpour, & Birkholz (2006), expressed that the inventory management of inventory control is to meet customer demand. Further, Fawcett, Ogden, Magnan, and 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.

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

2.1.3 Competitive Advantage and Organizational Performance

According to Mentzer JT and S, Zacharia ZG (2000), 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. The same author indicates, competitive advantage can lead to high levels of organizational 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 F, et. Al (2002). Therefore, an organization providing better quality products can charge higher 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

Note that: In this study ABC analysis, vendor management inventory, demand forecasting, economic order quantity and computerized inventory management practices have been taken as key dimensions to represent the overall inventory management practice of firms.

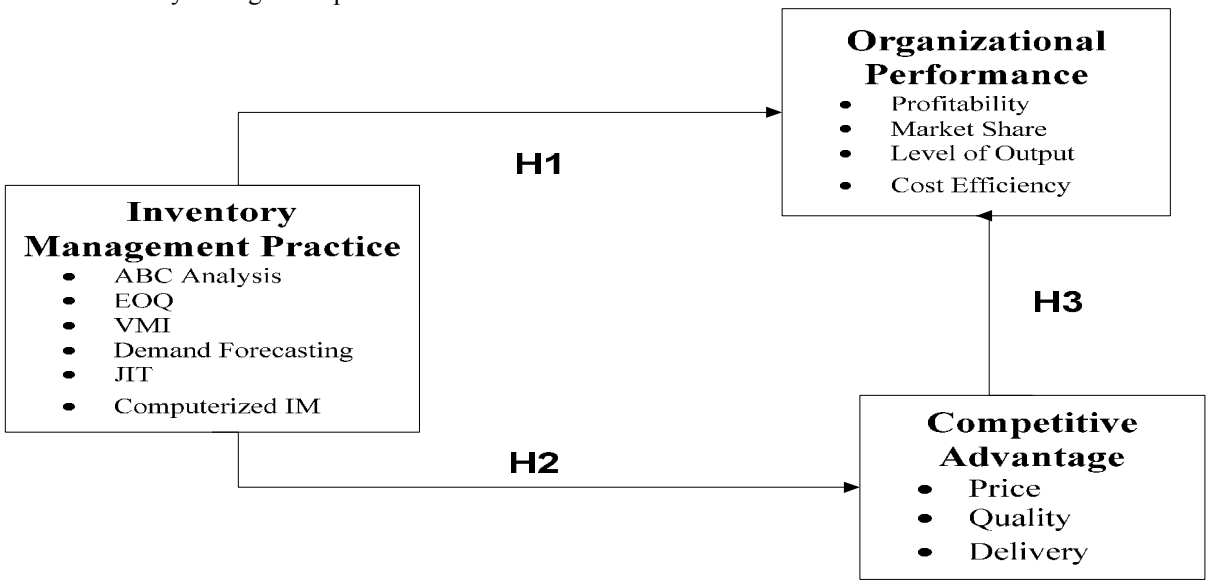

Figure 1 Conceptual Framework of The study

3. Methodology

The target population of this study were Micro and small scale Enterprise engaged in manufacturing sub sector in Arsi Zone four 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 informants (MSE owners). A set of questions on each aspect of the inventory management practice have 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 also addressed through questionnaire.The questionnaire has been translated in to local language. In order to ensure the reliability of

instrument, the researchers conducted a pilot test on 20 respondents and results were considered accordingly. A Cronbach's alpha 0.79 were obtained. A reliability coefficient of 0.70 or higher is considered "acceptable" in most social science research situations. In order to analyse 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.

4. Results and Discussion of the Structural Equation Model and Hypothesis Testing

Structural equation modelling (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 (Hair et al., 2006). 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 et al., 2006). Secondly, it offers powerful and rigorous statistical procedures to deal with complex models (Tabachnick and Fidell, 2001; Hair et al., 2006). In this study the measurement model was evaluated by using the maximum likelihood (ML) estimation techniques provided STATA Version13. Table 1 provides summarized results of the proposed models goodness of fit (GOF) test.

Table 1 Model Goodness of Fit Test

	X^2	DF	CFI	RMSEA	TLI
Criteria			*>= 0.9*	*<=0.05*	*>=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:X^2 =Chi Square DF= Degree of Freedom CFI= Comparative fit index
RMSEA= Root mean squared error of approximation
TLI= Tucker-Lewis Index

As shown it table 1 the overall model has 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. To determine whether the model in Fig 2 has the best fit, alternative models were evaluated by dropping one of the links between the constructs at one time as shown from Figure 3– 5.

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

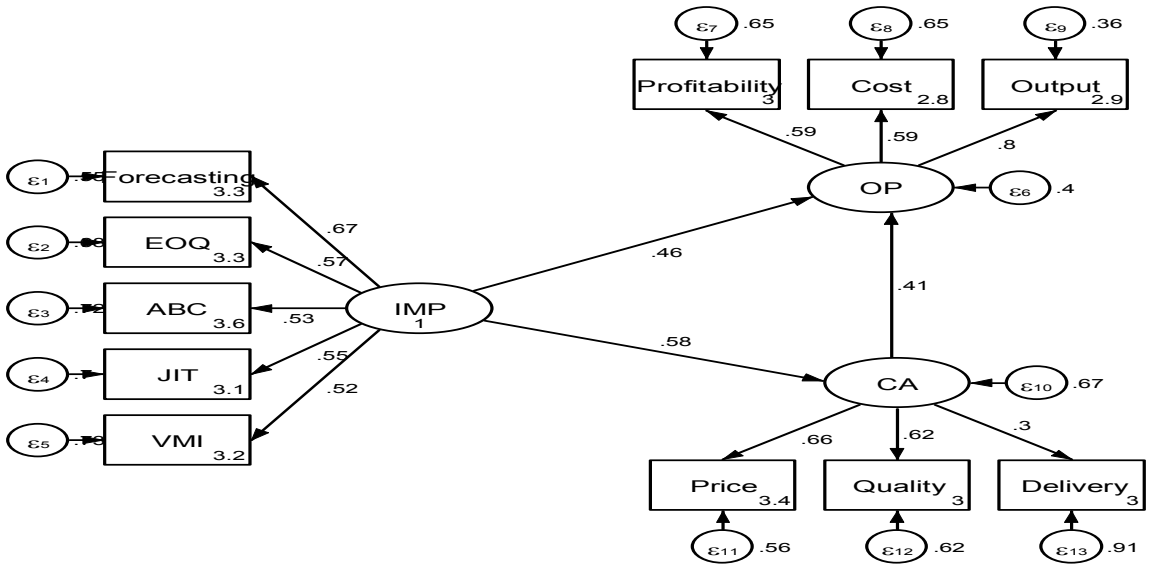

Figure 2 Proposed Model 1(M1)

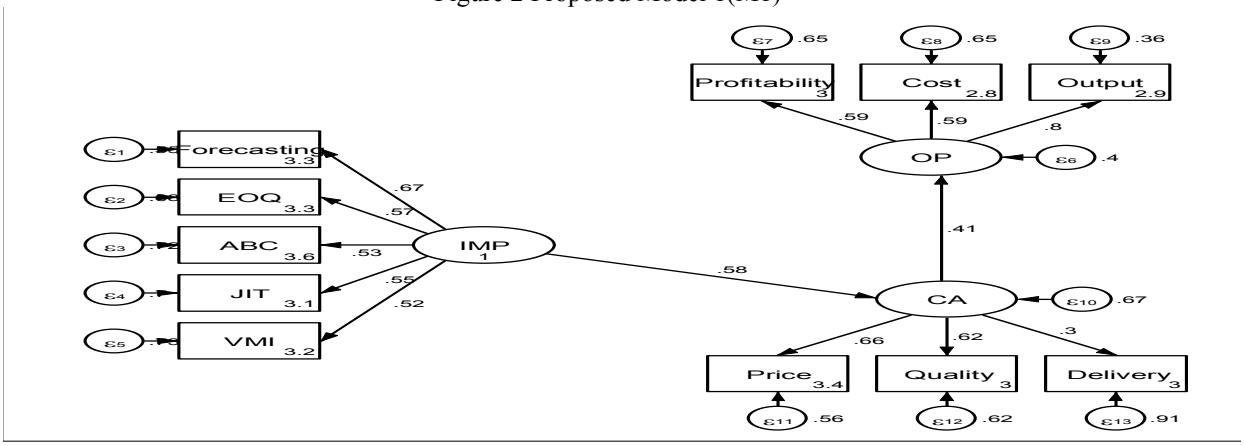

Figure 3 Proposed Model two (M2)

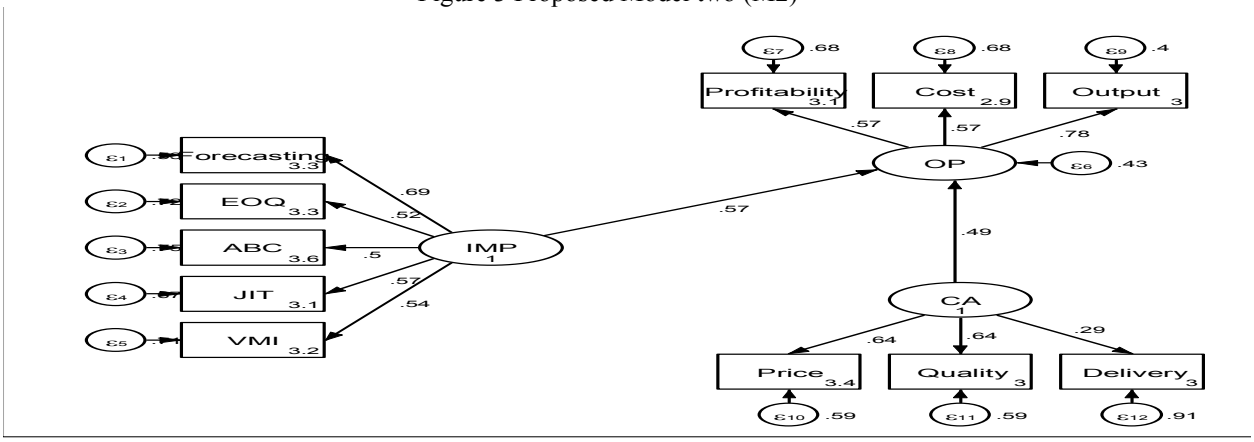

Figure 4 Proposed Model Three (M3)

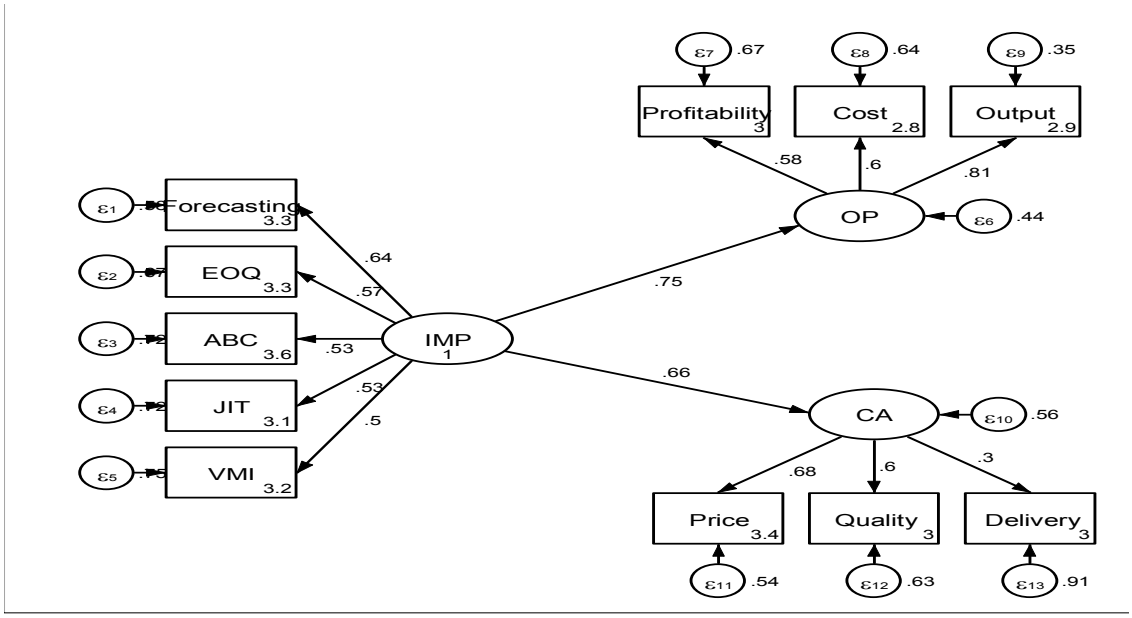

Figure 5 Proposed Model Four (M4)

Table 2 Result of Proposed Structural Equation Model and Hypothesis Testing

Hypothesis	Relationship	Total Effect	Direct Effect	Indirect Effect	Decision
H1	IMP-→ CA	0.594	0.594	0 (no path)	Accepted
	P-value	0.000	0.000		
H2	IMP-→ OP	0.665	0.438	0.227	Accepted
	P-value	0.000	0.001	0.012	
H3	CA-→ OP	0.382	0.382	0 (no path)	Accepted
	P-value	0.009	0.009		

As presented in table 2 the results of the proposed structural equation model analysis indicating 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 deliver of products to the market. This finding is consistent with a study conducted in Kenya by Naliaka V.W. & G.S. Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms.

Hypothesis 2 is also supported which indicates that inventory management practice have 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, Economic order quantity(EOQ) decision, customer relationship building, vendor management inventory and Just in time (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, & Birkholz (2006), Fawcett, Ogden, Magnan, and Cooper, (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 a study conducted by Mentzer JT and S, Zacharia ZG (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 empirical study was conducted on MSEs manufacturing subsector found in Arsi Zone some selected towns, to investigate the impact of inventory management practice on competitiveness and organizational performance. 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 respondent study reached on the following findings:

- All the hypothesis were supported and indicate the significant positive impact of inventory management practice on competitive advantage 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. In this regard, this study brought empirical evidence to support literature regarding the impact of inventory management practices on organizational competitiveness and performance.

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 expected to consider inventor 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 to enhance their overall organizational performance. In order to benefit once own enterprise; It is also recommended for policy makers, universities, NGOs who are engaged in supporting of micro and small enterprises 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 were 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 for the whole sectors at zonal or national level. This study is conducted by taking the context of manufacturers in micro and small enterprises. However, the finding may not work for medium and large scale manufacturing firms. Therefore, it is recommended for future research 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's recommended for further research to consider it by using objective measures by collecting and analysing secondary data.

References

Adeyemi, S. L and Salami, A. O. (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
Ballon R. H., (2004), Business Logistics/Supply Chain Management. Planning, Organizing and Controlling the Supply Chain (5th ed.), Pearsons-Prentice Hall. USA. Pg 326
Bowersox D J, CLOSS D J & Cooper M B.2002. Supply chain- Logistics management. International Edition. M C GRAW HILL. USA.
Deveshwar and Dhawal (2013). Inventory Management Delivering Profits through Stock Management. Ram University of Science and Technology, Murthal, India
Dimitrios, P. (2008). The effect of inventory management on firm performance. International journal of productivity and performance management, 57.
Gill, A., Biger, N., & Mathur, N. (2010). The relationship between working capital management and profitability evidence from the United States. Business and Economic Journal, July 31, 1-9.
Hair Joseph F. Jr., Black William C., Babin Barry J., Anderson Rolph E. & Tatham Ronald L. (2006) Multivariate
Data Analysis, 6th edn, Pearson Prentice Hall, Pearson Education, Inc.,Upper Saddle River, New Jersey 07458.
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.
Koh, L.S.C., Deirbag, M., Bayraktar, E., Tatoglou, E., & Zaim, S (2007). The impact of supply chain management practices on performance of SMEs. Industrial management & data system, 107(1), 103-124.
Koumanakos, D.P. (2008). The effect of IM on firm performance, International journal of productivity and performance management. 57(5), 335-369.
Li, S., 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, Vol 34 (No. 1), 107-124.
Liedholm C, MacPherson M and Chuta E (1994) „Small Enterprise Employment Growth in Rural Africa", American Journal of Agricultural Economics, Vol. 76, 10
Lin F., Huang S., Lin S. 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 JT., Min S., Zacharia ZG. 2000. The nature of inter-firm partnering in supply chain management. Journal of Retailing 76(4): 549-568.
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), 87104
Nzuza, Z, W. (2015). Factors affecting the success of inventory control in the Stores Division of the eThekwini
Municipality, Durban: A Case Study. A Project for Masters of Technology in Cost and Management Accounting in the Faculty of Accounting and Informatics, Durban University of Technology, Durban, South Africa.
Ogbo, A.I. (2011). Production and Operations Management. Enugu: De-verge Agencies Ltd. Supply Chain Management: An International Journal 12/4 (2007) 284– 296
Onyango R.M (2013) Lean Enterprise and Supply Chain Performance of Pharmaceutical Companies in Kenya. MBA Project. University of Nairobi.
Palmer, A., & Dean, H. (2000). How SMS Freed 40% Capacity and Slashed Throughput Times. Manufacturing Computer Solutions, 6(11), 127-134.
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., Ebrahimpour, M., & Birkholz, C. (2006). quality in supply chain: an empirical analysis SCM. An international journal, 11, 491-502.
Stevenson, B.U. (2010), Operations Management, 10th edition, N-Y McGrau Hill Publishing Inc- 321-340
Tabachnick, B. & Fidell, L. (2001), "Using multivariate statistics", Boston: Allyn and Bacon.
Teunter, R., Babai, M., & Syntetos, A. (2012). ABC Classification: Service Levels and Inventory Costs. Production and Operations Management, 19(3).
Teunter, R., Babai, M., & Syntetos, A. (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 University.
Tushabomwe Kazooba, C. (2006). Causes of Small Business failure in Uganda: A Case Study from Bushenyi and Mbarara Towns. African Studies Quarterly,