SMART

Journal of Business Management Studies

(A Professional, Refereed, International and Indexed Journal)

Vol-18 Number-2 **July - December 2022** **Rs.500**

ISSN 0973-1598 (Print) **ISSN 2321-2012 (Online)**

Professor MURUGESAN SELVAM, M.Com, MBA, Ph.D, D.Litt
Founder - Publisher and Chief Editor

SCIENTIFIC MANAGEMENT AND ADVANCED RESEARCH TRUST (SMART)

TIRUCHIRAPPALLI (INDIA)

www.smartjournalbms.org

SMART JOURNAL OF BUSINESS MANAGEMENT STUDIES
(A Professional, Refereed, International and Indexed Journal)
www.smartjournalbms.org

DOI : 10.5958/2321-2012.2022.00016.1

EVALUATION OF CRITICAL DETERMINANTS OF INVENTORY MANAGEMENT TECHNIQUES ON UNIVERSITIES' PERFORMANCE IN ETHIOPIA

Hamed M. S. Ahmed*
Department of Management, College of Business and Economics,
Werabe University, Ethiopia
hamedshamsaan@gmail.com

Mengistu Guliti Buba
Department of Management, College of Business and Economics
Wollo University, Ethiopia
mengistuguliti@gmil.com

Murad Thomran
Assistant Professor, CBA, University of Hail, Saudi Arabia
murad00967@gmail.com

Jemal Redwan Muzeyin
Department of Management , College of Business and Economics
Werabe University, Ethiopia
jemal.redwan@gmail.com

and

Muhaba Nuredin Ferejo
Department of Management, College of Business and Economics
Werabe University, Ethiopia
muhabanuredin753@gmail.com

Abstract

Inventory management is a way to increase customer service while maintaining lower stock levels. The purpose of this research was to see how inventory management techniques affected university performance in Ethiopia. The research findings revealed that inventory management techniques did have significant effect on universities' performance, indicating that a statistically substantial amount of the variance, associated with university

*** Corresponding Author**

performance, could be explained by inventory management practices. Since just-in-time inventory is a strategy for increasing efficiency and minimizing waste by obtaining things only when they are needed, it is an excellent way to save money on inventory. Hence universities should go through the idea of economic order quantity.

Keywords: *Ethiopian Universities, Inventory Management, Techniques and Performance.*

JEL Code : *I23*

Paper Received : *10-12-2021* ***Revised :*** *28-12-2021* ***Accepted :*** *22-03-2022*

1. Introduction

Inventory management was not recognized or considered as important for companies in general a few decades ago and the presence of excess inventories was even perceived as a sign of riches in some cases. According to **Eckert (2007),** inventory management, often known as stock control, is the science and art of keeping a specific institution's stock in order to incur the least or minimum charges while remaining consistent with other important items and management goals. Exact and good inventory management is a way to improve customer service while also lowering inventory and associated costs. In today's competitive environment, organizations are faced with a dilemma. Customers demand customized services and products, which necessitates that their demands be met quickly but at the same time, they do not want to pay economic value for this availability and customization **(Filbeck et al., 2005).**

Inventory management's goal is to keep inventories at the lowest possible cost, with the goal of having a continuous supply for ongoing operations **(Adeyemi and Salami, 2010)**. **Guajardo and Rönnqvist (2015)** assert that while making a stock selection, managers must strike a balance between a unique or incomparable cost feature such as holding expenses and the cost of insufficient inventories. According to **Nahmias and Cheng (2005),** the two commonly or mostly used inventory management strategies of an organization are Just-In-Time (JIT) and Materials Requirement Planning (MRP), with less attention to Order Quantity Technique (EOQ).

2. Review of Literature

Sasikumar and Kannan (2008) defined inventory management as ''the subdivision of management which deals with the planning and controlling of inventories.'' According to **Toomey (2000),** medium-sized or small businesses or companies consider stock control to be nitpicking management issue. According to **Kazare (2009),** inventories consist of goods, held for sale to customers or items which can be kept within the organization for normally running the organizations, partially completed goods, materials and supplies to be used in the organization for normal operations.

Based on the Pareto Analysis for inventory control in today's world, organizations employ various techniques like ABC Analysis, to properly manage and control their inventory **(Bozarth and Handfield, 2008)**. According to **Teunter, et al. (2010),** ABC techniques are a value based classifying of inventories, in which highly-priced and more treasured items are given extra interest and care. All items of materials in

an organization are classified or categorized in line with their value as low, medium and high values and they are known as A, B and C items. ABC methods are known as better control methods or strategies **(Chu et al., 2008)**.

According to **Torabi, et al. (2014),** the aim of ABC analysis is to offer service with the least amount of cost and which enables to stay efficient and effective for an organization rather than providing different types of service to clients. ABC analysis is an approach for prioritizing the managing of inventories in an organization. Managing attempts are spent mostly on handling 'A' class items while 'C' items get the least attention **(Chu et al., 2008)**.

Teunter et al. (2010) found that modern enterprises kept inventories of a wide range of products, including finished goods, replacement components, and raw materials. Since thousands of dollars are involved, handling those inventories includes answering questions like ''how plenty'' or ''an awful lot to reserve/order'' and ''when to reserve/order''. As stated by **Zimmerman (1975)**, ABC analysis appears to be vital for organizations. Pioneered by Vilfredo Pareto, ABC analysis or the 80/20 rule, as it is also called, facilitates identification of items in warehouse in terms of their usage and value.

According to **Wild (2017),** a successful or good inventory management is the means of having a purchasing plan to ensure that component parts are available, when they are needed. Since they should not be too much or too little during purchasing, the company should consider the use of inventory and keeping track of those inventories. **Kouvelis, et al. (2006)** identified that there are two commonly or mostly used inventory management strategies of an organizations. Those are the (JIT) just-in-time method and materials requirement planning (MRP). During the 19th Century, Villefredo Pareto, in the study of the statistical distribution of wealth in Milan, observed that 20 percent of human beings manage 80 percent of wealth. This phenomenon of few having great significance and many having little importance has been broadened to encompass mass situations and it is termed as Pareto Principle. This is true in our ordinary lives in which most of our decisions are not important while few shape our destiny and this is applicable to stocks also, in which some items account for the greater. **Hertog et al. (2014)** maintained that the primary intention was to reduce or limit inventory holding cost. According to **Vrat (2011),** the perfect example of a just-in-time or zero-inventory system is the supply of oxygen to the human body and from this analogy, a number of prerequisites for just-in-time or zero-inventory can be visualized because without ensuring the demand and supply environment, just in time is not feasible. The investigator should examine the content of the variables that have high loadings from each factor to see if they fit together conceptually and can be named **(Ahmed et. al, 2018)**. For this reason, to meet challenges of inventory control in uncertain supply environment, all the factors should be studied for taking the right decisions at the right time **(Thomran et. al, 2021)**.

3. Statement of the Problem

Previous studies assumed only bureaucratic procurement practice and inventory carrying cost ignored other variables like inventory management techniques, employee skills, etc. Based on the previous research works, a great gap was found to exist between inventory theory and its management practice. Hence the investigators wanted to examine the real practices in those selected study areas. Many

of the research on inventory were done only in manufacturing sectors. **Kariuki and Mburu (2013)** suggested that it should also be done in service institutions. In Ethiopia, some organizations are still using spreadsheets, or pen and paper to track inventory and some others do not track inventory. Hence this study in Ethiopia, where there is no sufficient study on inventory management techniques, specifically in service sectors.

4. Need of the Study

The study proposes to provide a new impact of theoretical framework on the inventory management techniques in Ethiopian universities. In addition to that, it proposes to offer some practical recommendations to policymakers to follow and improve the university performance.

5. Objectives of the Study

The aim of the study was to investigate the impact of critical determinants of inventory management techniques on universities' performance in Amhara region, Ethiopia.

6. Hypothesis of the Study

NH-1: There is statistically no significant effect of inventory management techniques on universities' performance.

7. Research Methodology

7.1 Sample Selection

The target population of the study was 3372, who were working in various universities, particularly, Bahirdar, Wollo and Woldiya universities. The sample size was calculated by using the Slovin's formula for the determination of the sample size. The sampling design, utilized in this study, was probabilistic sampling, with a stratified random sampling technique. Accordingly, 357 samples were selected as the sample size from those institutions and the valid responses, for the purpose of analysis, were 304.

7.2 Sources of Data

The study included both primary and secondary sources. The preliminary data were collected through a questionnaire whereas secondary data were collected from books, journals, magazines, websites and other relevant sources **(Argaw and Ahmed 2017)**.

7.3 Period of the Study

The study was conducted during the period 2017 and 2018.

7.4 Tools used in the Study

Descriptive analysis, correlation and multiple regression models were employed, by using SPSS software.

8. Data Analysis

According to **Table-1**, the university, using the economic order quantity (EOQ) technique, scored the largest mean, at 3.51. The university, using computerized system in managing inventories (such as EDI), recorded a mean of 3.37 and university, with a lean inventory system (such as JIT), obtained a mean of 3.31. In the university, inventory needed were mostly delivered in time at the precise amount to order and the accountable personnel were guided by means of a particular scientific model. Effective managing inventory practices of the university led to less delivery lead time, as demonstrated by the mean of 3.10.

While determining appropriate inventory levels, the management maintained a balance between minimal cost, as evident from the mean of 2.90. Stock replenishment in the university was done continuously, evident from the mean of 2.89. All inventory items inside the university

warehouses were categorized, according to their monetary value and significance (ABC), as shown by the mean of 2.83. Just-in-Time (JIT) was adopted in the university, where too much safety stock was not kept, revealed by the mean of 2.79. The university was holding the required amount of resource, to help them to normally run the organization, as evident from the mean of 2.62. **Table-1** displays the arithmetic mean value and the standard deviation value of the usage of inventory management techniques by universities under study and they ranged between arithmetic mean of 3.51 and 2.62, with a general arithmetic mean of 3.02, which was in the medium range.

The results of **Table-2** indicated the correlation between inventory management techniques and universities' performance. Since inventories are key to organizations' success, inventory management must be given high priority during decision making. There are different techniques and models, which can help inventory management practice of universities, like just-in-time (JIT), economic order quantity (EOQ), always best control (ABC) analysis etc. The study concluded that inventory management techniques did have a strong positive correlation with the overall performance of universities under study.

As it is revealed in **Table-3**, with an R^2 of 0.471, inventory management techniques, could explain 47.1 % of the variation in the organizational performance of those selected universities. But it also revealed that other factors were not studied and they could have explained the remaining 52.9 % of the variation in organizational performance of sample universities.

As per the regression equations, displayed in **Table-4**, taking the factors into consideration, inventory management technique constant at zero, sample universities' performance was 0.426. Taking the independent variable at zero, a unit increase in the inventory management technique of organizations, could lead to a 0.687 increase in the universities' performance. According to **Table-4**, the significance level value was less than 0.05 of inventory management technique and therefore, reject the **NH-1; There was statistically significant effect of inventory management techniques on universities' performance.**

9. Findings of the Study

- The results demonstrated that there was strong positive correlation between inventory management techniques of these study areas and universities' performance.
- The result revealed that proper inventory management technique did play pivotal role in improving the universities' performance.
- The results of regression indicated that inventory management techniques were statistically significant and a unit increase of inventory management could lead to an increase in universities' performance.

10. Suggestions

Sample Universities should try the idea of economic order quantity, which is an attempt to balance between inventory holding and carrying cost incurred from ordering. Therefore, the universities should properly determine optimum stock levels and maintain a balance between minimum cost of ordering and cost of holding stock.

11. Conclusion

The researchers had collected data about inventory management technique from 357 respondents of selected universities. The researchers employed in this study probabilistic

sampling, with a stratified random sampling technique, to select the sample size. The respondents of those selected universities affirmed that inventory management techniques were significant in increasing their institutions' performance. Correlation analysis of responses indicated that inventory management techniques did have positive correlation with the sample universities' performance. The results of regression analysis indicated that inventory management techniques were significant influencing factors of universities' performance. The regression coefficients of inventory management techniques and universities' performance were positive and significant. In other words, inventory management techniques were statistically significant and exercised positive effect on universities' performance.

The result further revealed that in figuring out the most fulfilling stock levels, managements strive to maintain a balance between minimal cost of ordering and cost of keeping stock and by employing computerized gadgets in handling inventories (such as EDI). The study showed positive relationship between inventory management techniques and universities' performance and when the universities did not adopt good inventory management techniques, universities' performance declined.

12. Limitation of the Study

The study was explanatory and descriptive with a limited sample size and restricted to service sector, which may limit its scope for generalization.

13. Scope for Further Research

The current study covered a selected sample of a few universities in Ethiopia. Future studies may focus on extending the regions of the research and increase the area of study and also increasing the sample size. It may also take into consideration the moderation effect of other variables.

14. 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.

Ahmed, H.M.S. and Ahmed, Y.A. (2021) 'Constraints of youth entrepreneurs in Ethiopia' *Journal of Global Entrepreneurship Research* (https://doi.org /10.1007/s40497-021-00292-z)

Ahmed, Y., Kar, B., & Ahmed, H. (2018). Critical factors of entrepreneurial competencies for successfully managing micro and small enterprise in Ethiopia. *International Journal of Business and Management Invention (IJBMI)*, 7(7), 79–87.

Argaw, M. A. and Ahmed H. M. S., (2017) "Factors that Affect Consumers' Tendency to buy Locally Assembled Mobile Phone", *IBMRD's Journal of Management & Research,* Vol. 6, (2).

Bozarth, C., and Handfield, R. (2008). Operations and supply chain management, *USA.*

Chu, C. W., Liang, G. S., and Liao, C. T. (2008). Controlling inventory by combining ABC analysis and fuzzy classification. *Computers and Industrial Engineering*, *55*(4), 841-851.

Eckert, S. G. (2007). Inventory management and its effects on customer satisfaction. *Journal of Business and Public Policy (ISSN: 1936-9794)*, *1*(3), 1.

Filbeck, G., Gorman, R., Greenlee, T., and Speh, T. (2005). The stock price reaction to supply chain management advertisements and company value. *Journal of Business Logistics*, *26*(1), 199-216.

Guajardo, M., and Rönnqvist, M. (2015). Cost allocation in inventory pools of spare parts with service-differentiated demand classes. *International Journal of Production Research*, *53*(1), 220-237.

Hertog, M. L., Uysal, I., McCarthy, U., Verlinden, B. M., and Nicolaï, B. M. (2014). Shelf life modelling for first-expired-first-out warehouse management. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *372* (2017), 20130306.

Kariuki, B. M., and Mburu, D. K. (2013). Role of Lean manufacturing on organization competitiveness. *Industrial Engineering Letters*, *3*(10), 81-82.

Kazare B. (2009). Assessment of the Effectiveness of Inventory Management and Control Process in Higher Learning Institutions in Tanzania, Saint Augustine University of Tanzania (SAUT) – Mwanza.

Kouvelis, P., Chambers, C., and Wang, H. (2006). Supply chain management research and production and operations management: Review, trends, and opportunities. *Production and Operations Management*, *15*(3), 449-469.

Lee, H. H., and Kleiner, B. H. (2001). Inventory management in the women's retail clothing industry. *Management Research News*, *24*(3/4), 40-44.

Nahmias, S., and Cheng, Y. (2005). *Production and operations analysis* (Vol. 6). New York: McGraw-hill.

Sasikumar, P., and Kannan, G. (2008). Issues in reverse supply chains, part I: end of life product recovery and inventory management–an overview. *International Journal of Sustainable Engineering*, *1*(3), 154-172.

Selvam, M., Babu, M., Indhumathi, G., & Ebenezer, B. (2009). Impact of mergers on the corporate performance of acquirer and target companies in India. *Journal of Modern Accounting and Auditing*, *5*(11), 55.

Selvam, M., Babu, M. M., & Raja, M. (2011). Caselets teaching in business education. *SMART Journal of Business Management Studies*, *2*(2), 70-72.

Selvam, M., Gayathri, J., Vasanth, V., Lingaraja, K., & Marxiaoli, S. (2016). Determinants of firm performance: A subjective model. *Int'l J. Soc. Sci. Stud.*, *4*, 90.

Teunter, R. H., Babai, M. Z., and Syntetos, A. A. (2010). ABC classification: service levels and inventory costs. *Production and Operations Management*, *19*(3), 343-352.

Thomran, M., Beshada, T., Alshebami, A.S., Alzain, E. and Ahmed, H.M.S (2021) 'Factors influencing management decisions of manufacturing companies in Ethiopia', SMART Journal of Business Management Studies, Vol. 17, No. 2, pp.86–93 [online] Retrieved on 28 May, 2021.https://www. indianjournals.com/ijor.aspx? target= ijor:sjbms&volume=17&issue=2&article= 010#aff005.

Torabi, S. A., Hatefi, S. M., and Pay, B. S. (2014). ABC inventory classification in the presence of both quantitative and qualitative criteria. *Computers and Industrial Engineering*, *63*(2), 530-537

Venkatraman, K., & Selvam, M. (2014). Impact of corporate governance practices and firm performance: An empirical study. *Indian Journal of Finance*, *8*(12), 34-45.

Vrat, P. (2011). Inventory models and human body food supply chain: some managerial insights. *Ind Eng J* II(27):8–16

Wild, T. (2017). *Best practice in inventory management*. Routledge. London, UK.

Zimmerman, G. W. (1975). The ABC's of Vilfredo Pareto. *Production and Inventory Management*, *16*(3), 1-9.

Table-1: Results of Descriptive Statistics showing the Inventory Management Techniques

Statements	Mean	Std. Dev.	Relative Importance
In your university most of inventory needed are timely delivered	3.10	1.277	Medium
Your university uses economic order quantity technique (EOQ)	3.51	1.186	Medium
Your university uses computerized system in managing inventories such as electronic data interchange (EDI)	3.37	1.295	Medium
Your university uses lean inventory system (like JIT)	3.31	1.371	Medium
All inventory items inside the university warehouses are categorized in line with their monetary value and significance (ABC)	2.83	1.201	Medium
In arriving at the precise amount to order and keep at any point in time, the accountable personnel is guided by means of a particular scientific version	3.10	1.251	Medium
In determining out most optimum and appropriate inventory levels, the management strives to keep a balance among a minimal cost of ordering and its holding cost	2.90	1.159	Medium
Stock replenishment in the university is done continuously	2.89	1.121	Medium
The University is holding the required amount of resource (not too much i.e. over stock or not too less I.e. under stock) which helps them to normally run the organization	2.62	1.169	Medium
Effective inventory management practices of the university leads it to have a reduced deliver time	3.10	1.257	Medium
There is good operation of Just-in-Time (JIT) in the university, where no safety stock are kept too much	2.79	1.352	Medium
Grand Mean	**3.02**	**1.244**	

Source: Primary data computed using SPSS

Table- 2: Results of Correlation between Inventory Management Techniques and Universities' Performance

		Inventory management techniques	Organizations Performance
Inventory Management Techniques	Pearson Correlation	1	0.784**
	Sig. (2-tailed)		0.000
	N	304	304
Universities Performance	Pearson Correlation	0.784**	1
	Sig. (2-tailed)	0.000	
	N	304	304
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Primary data computed using SPSS

Table-3: Results of Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.687[a]	0.471	0.470	0.581
a. Predictors: (Constant), inventory management techniques				

Source: Primary data computed using SPSS

Table-4: Results of Regression Coefficients measuring the Effect of Inventory Management Techniques on Universities' Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.426	0.087		4.916	0.000**
	Inventory management technique	0.687	0.0542	0.186	12.67	0.000**
a. Dependent Variable: universities' Performance						

Source: Primary data computed using SPSS