Research Paper   Open Access

Effect of Inventory Management Practices on Liquidity of Public Technical Training Institutions in Rift Valley Region, Kenya

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ABSTRACT: Technical training institutions in Kenya perform one of the major roles in educating highly skilled artisans, craftsmen, technicians and technologists with the aim of bringing economic growth. Public technical training institutions to operate normally, it should have enough liquidity capabilities. However, there has been occurrence of the liquidity problem in technical training institutions. This has led to early closure of technical training institution each term, none payment of suppliers on due date, shortage of practical materials used by students in workshops, shortage of food for boarding students, none payment of salaries to none teaching staff and delayed salaries for part time lecturers. Specifically, the study intended to determine the effect of inventory management practices on liquidity of public technical training institutions in Rift Valley Region, Kenya. This study was guided by Economic Order Quantity model which is aligned to objective of the study. The study adopted census survey due to fewer number of respondents. Accessible population was 38 respondents comprising of 19 principals and 19 accountants. Questionnaires were self-administered. The pilot test was administered using five questionnaires to public technical training institutions in Nyanza region. Cronbach's alpha coefficient above or equal to 0.70 was considered sufficient for reliability test. The data collected was analyzed, with respect to the study objectives, using both descriptive and inferential statistics. Descriptive statistics include frequencies, percentages, mean, standard deviation and variance. Inferential statistics included product moment correlation analysis and multiple regression. The study findings indicated that inventory management practices ($\beta = 0.344$; $\rho < 0.05$) was significant to liquidity of public Technical Training Institutions in Rift Valley Region. The study recommended that public technical training institution should put in place effective inventory control systems to their supply chain department.

KEY WORDS: Inventory Management Practices & Liquidity

I.   INTRODUCTION

Liquidity to institution commonly means its ability to meet its current liabilities and is usually measured by different financial ratios (Priya, 2013). Variables for Working Capital Management practices like receivables, inventory and payables may affect liquidity. Current assets are liquid hence keeping more current assets can lead to high liquidity. Remember also that current assets have got items like cash which can diminish firm's profitability (Panigrahi, 2012). Quick (acid test) is a measure of a company's short term liquidity and is calculated as current assets net of inventories divided by current liabilities. It can weigh a company's capability to meet its short-term obligations with its most liquid assets thus eliminating inventories. The quick ratio evaluates the shilling amount of liquid assets present for every shilling of current liabilities. Therefore, a quick ratio of 1.5 means that a company has Sh1.50 of liquid assets present to meet each Sh1 of current liabilities. The bigger the quick ratio the better the institution's liquidity position (Brealey, 2012).

Liquidity problem comes in if institutions do not have sufficient cash or liquid assets to fulfill its cash requirements (Singh & Shahid, 2016). For any institution to be stable in survival and put up with its activities as a going concern it must stay liquid and fulfill its commitments as and when they become due. Liquidity problem is the probability that an institution will not be in financial capability to settle down its current obligation on due date. It is a situation where an institution is unable to pay its liabilities without incurring any additional charges and penalties (Kesimli & Gunay, 2011). The liquidity problem has got major outcome on the institution's performance and is caused by poor inventory management practices. If the company fails to minimize its spending, the current liabilities will not be settled when they fall due, additional charges will be attached to the obligation hence reduce the institution's credit score to the fund providers and suppliers, (Mathuva, 2010).

Inventory management is the process of consistently having the optimal amount of raw materials for transformation and finished products available in order to deliver them rapidly to meet a customer's inventory

requirement in a competitive manner (Bowersox, Closs, & Cooper, 2010). Inventory management is increasingly regarded as a tool for achieving the overall operational efficiency across all organizations (Gordon & Gupte, 2016). The proper management or otherwise of inventory has a noteworthy outcome on the liquidity of the organization. Inventory management is a somewhat difficult task, as it relies on the ability to project future sales accurately, and align these sales to the inventory that must be kept at a time. Inventory storage takes place rather before consumption or sales, and therefore must be estimated accurately, in order to avoid excess stock that increases stock holding cost hence affecting the liquidity (Ebenezer & Asiedu, 2013).

Inventory is significant on the checks and balances side. Accountants examine inventory counts so as to be sure that deception or embezzlement is not happening which can affect liquidity capability of the institution. This also serves as a backing to check and ensure that everything is strategically placed and nothing that is unusual is taking place (Cachon & Olivares, 2010). Many books have been written regarding how to reconcile inventories, keeping an accurate store counts, reasons that faults happen, tools to utilize in helping to ensure inventories are delivered on time at the right place, and are of the right quantities and quality. Inventory should be reasonably modernized and simple, giving an institution a cost-effective and competitive advantage (Lysons & Farrington, 2012). In this respect, the secret behind inventory management (IM) practices is to improve on liquidity capability of the institution. Inventory control is a reliable approach in which organizations are being controlled to make sure that customers are satisfied and institutions stays in operations via minimization of liquidity problem (Ogbo, 2011).

STATEMENT OF THE PROBLEM

Technical training institutions in Kenya perform one of the major roles in educating highly skilled artisans, craftsmen, technicians and technologists with the aim of bringing about economic growth. Public technical training institutions to operate normally, it should have enough liquidity capabilities. The management of liquidity is critical for all institutions (Kungu, Njui & Kimani, 2014). However, there has been occurrence of the liquidity problem in technical training institutions (Ng'ang'a & Kibati, 2016). This has led to early closure of technical training institution each term, none payment of suppliers on due date, shortage of practical materials used by students in workshops, shortage of food for boarding students, none payment of salaries to none teaching staff and delayed salaries for part time lecturers (Musau, 2015). In the long run the objectives of technical training institutions will not be met. It can also lead to complete closure of the institution (Yator, 2018).

OBJECTIVE OF THE STUDY

To examine the effect of inventory management practices on liquidity of public Technical Training Institutions in Rift Valley Region, Kenya.

RESEARCH HYPOTHESES

H_o: There is no significant relationship between inventory management practices and liquidity of public Technical Training Institutions in Rift Valley Region, Kenya.

II.   THEORETICAL REVIEW

Economic order quantity model was developed by Harris in 1913. Using the model, the institution is provided with a desirable quantity to order. A point in quantity, where holding cost curve and ordering cost curve meet is where total cost is minimal and it is a desirable quantity. Institutions that are using this model can be able to minimize the costs associated with the ordering cost, stock holding cost and hence total cost. The Economic order quantity (EOQ) is a model that helps in the calculation of the optimal quantity that can be acquired or manufactured to lessen the cost of both the stock holding and the ordering or production setups (Edward, 2010). The following is the formula for the order quantity model:

$$Q = \sqrt{\frac{2DS}{H}}$$

Q represents optimal order quantity; D represents units of annual demand; S represents cost incurred to place a single order or setup and H represents stock holding cost per unit. Examples of ordering costs are: cost to prepare a purchase requisition, cost to prepare a purchase order, cost of the labor required to inspect goods when they are received, cost to put away goods once they have been received, cost to process the supplier invoice related to an order, cost to prepare and issue a payment to the supplier (Arslan & Turkay, 2013). Examples of holding costs are: storage costs such as the rent of the warehouse, handling costs such as the salaries of the stock-keeping team and the take-home pay of the staff associated with the inward and outward movement of the inventory, insurance costs, interest foregone on capital tied up in the inventory and Losses due to obsolescence, damages, deterioration or theft (Gitau, 2016).

EOQ model has the underlying assumptions that the cost of the ordering remains fixed, the quantity demand for the year is certain and uniformly spread all over the year, the lead time is constant, no discounts are obtainable and the buying price is fixed, the optimal plan is intended for a single product, replenishment of the stock is instantaneous and the quantity ordered is conveyed in the magnitude that was required, i.e. in whole batch. On the basis of these assumptions, employees do the further mathematical calculation for exact quantity of material. So it requires continuous monitoring of inventory level. Thus, the usefulness of the EOQ model is restricted by these assumptions (Salawati, Tinggi & Kadri, 2012).

The EOQ model is applicable in selecting the magnitude to use in refilling stock by bearing in mind the trade-off amongst storage cost and ordering cost. A bigger order-quantity lessens the number of orders and hence ordering cost per month, but needs holding a bigger average inventory, which rises storage cost per month. Also a smaller quantity to order lessens average inventory but needs many orders and hence higher ordering cost per month. The EOQ model helps organizations to reduce inventory management costs by reducing the cost of ordering and holding stock (Ziukov, 2015). The determination of when to place an order and what quantity will be required can be done by utilizing the computation of EOQ. EOQ enables institutions to develop a plan on stock replacement on an appropriate time base, which can be on quarterly basis, yearly basis, half yearly basis or monthly basis. If the institution does that, it is capable of having minimal costs or zero cost of storage within their warehouses because incoming stock is going out immediately (Mandal, 2012).

Criticism on this theory is that it requires the concepts of math like algebra and the employees of small organization are not too much perfect in math. It also requires the data in details for the computation. In addition, it is a very time taking process and need accuracy in calculation (Lwiki, Ojera, Mugenda & Wachira, 2013). The study will use this model to find out the effect of inventory management practices on liquidity of PTTI institutions in Rift Valley Region, Kenya.

III. EMPIRICAL REVIEW

Mulei and Were (2017) analyzed effect of inventory management on performance of the education sector in Kenya. The research took on census survey to gather data from all the 100 supply chain employees in the Ministry of Education headquarters in Nairobi forming the target population. The research study took on a descriptive study to collect data from all the 100 respondents using structured questionnaires. Data gathered was scrutinized using quantitative data analysis methods including the descriptive and inferential statistics. Inferential statistics involves the use of bivariate correlation and multiple linear regression model. Qualitative data was analyzed through content analysis and presented in continuous prose form. The findings revealed that inventory control helped the Ministry to achieve maximum performance in terms of service delivery. The study did not focus on how inventory management influence liquidity.

Gitau (2016) investigated inventory management practices and organizational productivity in parastatals in Kenya. A descriptive research design was used in that research. This research used a questionnaire containing both open and close-ended questions so as to capture more information from the respondents. Descriptive and inferential statistics were utilized in analyzing the data collected. The target population was all the parastatals in Kenya. The latest government list of parastatals was that by December, 2015, the number of parastatal corporations stood at 103 and is classified as Agriculture, Service, Industry, Banking and Finance and Education. A sample of parastatals within Nairobi County was selected using stratified sampling. The sample size was 53 respondents. The research results established that a significant and a positive relationship occurred between inventory management practices and organizational productivity of Parastatals in Kenya. The study did not consider inventory replenishment.

Panigrahi and Kumar (2013) researched on relationship between inventory management and profitability: An empirical analysis of Indian cement companies. Indian cement companies quoted in BSE was wisely selected for the research purpose and a sample size of five were adopted. The period for research were 2000-2001 to 2009-10 was assembled with their respective data. For evaluating the size, composition, circulation and growth of the inventory position, Mean, Standard deviation and Co-efficient of variation was used. To find out the relationship between sales and inventory linear regression analysis, Karl Pearson's co-efficient of correlation was used. To evaluate the outcome of regression and correlation co-efficient t test was applied. The findings indicate that Inventory conversion period has an inverse relationship with firm's profitability. The worth of research was poor as it was founded on secondary data only that was gathered from the website of the sample companies. The value of any given research is determined by the accuracy, reliability and supremacy of the secondary data source.

IV. RESEARCH METHODOLOGY

Research Design

Descriptive research design was utilized in this research. It means the assembling of evidence from a huge population and concentrating on the respondent's observations in order to acquire important information on independent and dependent variables using questionnaires to reach the research objectives. The most important

purpose of descriptive research is explanation of the state of affairs as it exists. Descriptive research includes survey method, observational method and case study method (Sekaran & Bougie 2010).

Target Population
Target population is made up of all members of actual or imaginary set of individuals, activities or matters from which a researcher needs to take an extensive view on the outcome of the study (Newing, 2011). The target population was principals and accountants of Public Technical Training Institutions (PTTI) in Kenya as per Technical and Vocational Education and Training Authority (TVETA) list of August 2017. Accessible population was 38 respondents composed of 19 principals and 19 accountants of PTTI institutions in Rift Valley Region, Kenya as per TVETA list of August 2017.

Sampling Size and Sampling Technique
This research utilized census survey method. It is a survey done on the whole set of observation objects for a given population or universe. This study interviewed all the 38 respondents composed of 19 principals and 19 accountants of PTTI institutions in Rift Valley Region, Kenya. This is as per the list of TVETA on August, 2017. The census method is reasonable because the data assembled using census contributes towards collection of unbiased data representing all participants' opinions in the study population on a research problem (Musau, 2015).

Research Instruments
This research study utilized primary and secondary data. Primary data is the one gathered for the first time by the researcher hence can be said to be original. Primary data was gathered from the principals and accountants of public technical training institutions. Secondary data was gathered from other prior research or sources such as published financial statements, documents and financial journals (Emory, 2011). The Secondary data gathered was used to enhancement and endorse the primary data collected. Secondary data include all the data collected for purposes other than the completion of a research questionnaires and it was used to gain initial insight into the research problem (Oso & Onen, 2011).

Data Processing and Analysis
Before any other dispensation, the responses on each filled questionnaire was tallied for every response. The responses were edited, coded and cleaned in case of any anomalies. It was typed into the computer and later on uploaded into statistical package for social sciences (SPSS) version 20.0 (cooper & schindler, 2011). The data gathered was analyzed using descriptive and inferential statistics. Descriptive statistics tools used included frequencies, percentages, mean, standard deviation and variance. Inferential statistics included use of product moment correlation analysis and multiple regression (Vance, 2011).

V.   RESEARCH FINDINGS AND DISCUSSIONS

Descriptive Analysis of Effect of Inventory Management Practices on Liquidity of Public Technical Training Institutions in Rift Valley Region, Kenya.
The study sought to examine the effect of Inventory Management (IM) practices on liquidity of Public Technical Training Institutions (PTTI) in Rift Valley Region, Kenya. The respondents were asked on how they agree with the statements. From the findings the respondents concurred (Mean =4.06; Std Dev =1.08) with the statement that liquidity capability of the institution is affected by inventory turnover period. These findings also indicated with (Mean =4.27; Std Dev =1.069) that the institution centralizes decisions on inventory replenishment. Further the finding showed that respondents were in agreement with a (Mean =4.08; Std Dev =0.911) that their institutions have a disposal procedure and is functioning well. In addition, the findings also indicated that the respondents admitted by (Mean =3.96; Std Dev =0.83) that implementation of reorder level is assisting institution to avoid shortages. The respondents were also in agreement (Mean =4.15; Std Dev =1.45) with the statement that the firm orders amount of inventory that minimizes the stock holding cost. The respondents generally agreed on the statements pertaining to effect of IM practices on liquidity of public Technical Training Institutions with an overall mean of 4.15. These findings are supported by previous works of Mulei and Were (2017) who revealed that inventory control helped the Ministry to achieve maximum performance in terms of service delivery. In addition, Panigrahi and Kumar (2013) differ to these findings by indicating that Inventory conversion period has an inverse relationship with firm's profitability. A grand mean of 4.15 showed that respondents agree to the statements. This means that efficiency in inventory management practices have got positive influences on liquidity.

Inferential Analysis
This section puts into viewpoint the relationship amongst the independent variables and the dependent variable. It also put into view the effect of the independent variable on the dependent variable. This part outlines the findings of both correlation and multiple regression analysis.

Table 1 Relationship between Inventory Management Practices and Liquidity

		Liquidity
Inventory Management	Pearson Correlation	.770**
	Sig. (2-tailed)	.000

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

These research findings indicated that the relationship between Inventory Management (IM) practices and liquidity of PTTI institutions was positive and statistically significant (r = .770; p< 0.05). This implies IM practices positively and significantly influences liquidity of PTTI Institutions in Rift Valley Region. These findings concur to those done by Mulei and Were (2017) who revealed that inventory control helped the Ministry to achieve maximum performance in terms of service delivery. In addition, Panigrahi and Kumar (2013) differ to these findings by indicating that inventory conversion period has an inverse relationship with firm's profitability.

Regression Analysis

The study sought to established the effect of inventory management practices on liquidity of Public Technical Training institutions in Rift Valley Region, Kenya.

Table 2 Multiple Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.860a	.739	.712	.34425

a. Predictor: (Constant), Inventory Management

b. Dependent Variable: Liquidity.

The findings indicate that the relationship between Inventory Management practices and liquidity of PTTI institutions was positive (Adj R^2=0.712). Findings indicated that 71.2% of the variation in liquidity of PTTI institutions is accounted for by inventory management practices. The 28.8 % of the liquidity of PTTI institutions resulted from other factors not investigated by the study.

Assessing the Fit of the Multiple Regression Model

Multiple regression analysis was conducted to test the influence of predictor variable on liquidity of PTTI institutions. The test results are shown in table 3.

Table 3 ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.722	3	3.241	92.346	.000b
	Residual	3.437	29	.119		
	Total	13.159	32			

a. Dependent Variable: Liquidity

b. b. Predictors: (Constant), Inventory Management Practices

The findings of the study in Table 3 showed that there was a statistically significant relationship between the independent variable and the dependent variable (F= 92.346; p< 0.05). This therefore indicates that the multiple regression model was a good fit for the data.

VI.   CONCLUSIONS

Inventory Management practices are predictors for liquidity of Public Technical Training Institutions in Rift Valley Region. The study concluded that, Liquidity capability of the institution is affected by inventory turnover period, the institution centralizes inventory replenishment decision, have a disposal procedure and is functioning well and orders amount of inventory that minimizes the stock holding cost.

VII.   RECCOMENDATIONS

The study recommends that principals of Public Technical Training Institution should put in place effective inventory control systems to their supply chain department, this ensures that the organizations maintain inventory levels which leads to the reduction of costs. Further, from the study the respondents agreed that Inventory Management practices affect liquidity of Public Technical Training Institution in Rift Valley Region. This is supported by Economic order quantity model. The EOQ model helps organizations to reduce Inventory Management costs by reducing the cost of ordering and holding stock.

REFERENCES

[1]. Arslan, M. C., & Turkay, M. (2013). EOQ Revisited with Sustainability Considerations. *Foundations of Computing and Decision Sciences, 38(4), 223-249.*

[2]. Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2010). *Supply Chain Logistics Management.* (3rd Ed.). Boston: McGraw-Hill.

[3]. Brealey, R. A. (2012). *Principles of Corporate Finance.* (11th Ed.). London: McGraw-Hill.

[4]. Cachon, G. P., & Olivares, M. (2010). Drivers of Finished-Goods Inventory in the US Automobile Industry. *Journal of Management Science*, *56* (1), 202-216.

[5]. Cooper, D. R., & Schindler, P. S. (2011). *Business Research Methods.* (11th Ed.). New York: Mcgraw-Hill/Irwin.

[6]. Ebenezer, A. B., & Asiedu, M. K. (2013). The Relationship Between Working Capital Management and Profitablity of Listed Manufacturing Companies in Ghana. *International Journal of Business and Social Research*, *3*(2), 25-34.

[7]. Emory, C. W. (2011). *Business Research Methods.* (3rd Ed.). New Delhi: Irwin.

[8]. Gitau, R. W. (2016). *Inventory Management Practices and Organizational Productivity in Parastatals in Kenya.* Unpublished MBA Project, University of Nairobi.

[9]. Gordon, S. A., & Gupte, J. (2016). Contemporary Inventory Management Techniques: A Conceptual Investigation. *International Conference on Operations Management and Research, 1(1),* 1-20.

[10]. Kesimli, I. G., & Gunay, S. G. (201l), The Impact of Global Economic Crisis on Working Capital of Real Sector in Turkey. *Business and Economic Horizon, 4*(1), 52-69.

[11]. Kungu, J. N., Njui, N. W., & Kimani, L.W. (2014). Working Capital Management in Government Technical Training Institutions in Kenya. *IOSR Journal of Economics and Finance, 5*(5), 134-142.

[12]. Lwiki, T., Ojera, P. B., Mugenda, N. G., & Wachira, V. K. (2013). The Impact of Inventory Management Practices on Financial Performance of Sugar Manufacturing Firms in Kenya. *International Journal of Business, Humanities and Technology, 3*(5), 75 – 85.

[13]. Lysons, K., & Farrington, B. (2012). *Purchasing and Supply Chain Management.* London: Prentice Hall.

[14]. Mandal, S. (2012). An Empirical Investigation into Supply Chain Resilience. *The IUP Journal of Supply Chain Management, 9*(4), 46-61.

[15]. Mathuva, M. D. (2010). The Influence of Working Capital Management Components on Corporate Profitability: A survey of Kenyan Listed Firms. *Journal of Financial Management*, *15*(2), 24-35.

[16]. Mulei, J. N., & Were, S. (2017). Effect of Inventory Management on Performance of the Education Sector in Kenya. *International Journal of Novel Research in Education and Learning, 6*(6), 48-59.

[17]. Musau, J. M. (2015). *The Effect of Working Capital Management Practices on Performance of Universities and Colleges in Kenya.* Unpublished Master's Thesis, University of Nairobi.

[18]. Newing, H. (2011). *Conducting Research in Conservation, Social Science Methods and Practice.* New York: Routledge.

[19]. Ng'ang'a, A. N., & Kibati, P. (2016). Determinants of Financial Sustainability in Private Middle Level Colleges in Nakuru County. *International Journal of Economics, Commerce and Management, 4*(10), 356-380.

[20]. Ogbo, A. I. (2011). *Production and Operations Management*. Enugu: De-verge Agencies Ltd.

[21]. Oso, W. Y., & Onen, D. (2011). *A General Guide to Writing Research Proposal and Report; Handbook for Beginning Researchers.* Nairobi: Jomo Kenyatta Foundation.

[22]. Panigrahi, A. K. (2012). Impact of Working Capital Management on Profitability–A Case Study of ACC Ltd. *Asian Journal of Management*, *3*(4), 210-218.

[23]. Panigrahi, D., & Kumar, A. (2013). Relationship between Inventory Management and Profitability: An empirical analysis of Indian Cement Companies. *Asia Pacific Journal of Marketing & Management Review, 2(7),* 107-120.

[24]. Priya, K. (2013). Liquidity Management and Profitability: A Case Study of Listed Manufacturing Companies in Srilanka. *International Journal of Technological Exploration and Learning, 2*(4)*,* 161-165.

[25]. Salawati, S., Tinggi, M., & Kadri, N. (2012). Inventory Management in Malaysian Construction Firms: Impact on Performance. *SIU Journal Management, 2*(1), 59-72.

[26].   Sekaran, U., & Bougie, R. (2010) *Research Methods for Business, a Skill Building Approach.* (5th Ed.). Hoboken: John Wiley and Sons.

[27].   Singh, D., & Shahid, I. M. (2016). Liquidity Management: A Comparative Study of Oman Banks and Multinational Banks. *International Journal of Applied Sciences and Management, 1*(2*), 157-170.

[28].   Vance, M. (2011). Data Analytics: Crunching the Future. Bloomberg Business week. Retrieved 26 September 2016 from www.bloomberg.com

[29].   Yator, P. (2018). Effects of Receivables Management Practises on Financial Performance of Private TVET Institutions in Eldoret Town. *Journal of Business and Management, 20*(7), 13-19*.

[30].   Ziukov, S. (2015). A Literature Review on Models of Inventory Management under Uncertainty. *Business Systems and Economics, 5* (1), 26-35.