A Study on Relationship between Inventory Management and Company Performance: A Case Study of Textile Chain Store

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Abstract—**This paper reports the findings of an applied research on inventory management at a textile chain store in Malaysia. It specifically examined the relationship between inventory management and company's performance. Interviews with the company management were conducted to identify the inventory management issues and system used by the company. The relationship between the inventory management and company performance was determined based on inventory days and return on asset (ROA) analysis. The research found that company X had a few inventory problems such as unorganized inventory arrangement, large amount of inventory days / no cycle counting and no accurate records balance due to unskilled workers. The study also proved that there was a significant relationship between return on asset (ROA) and inventory days. This paper also provides recommendation to the company and for further research.**

Index Terms—**inventory management, performance**

I. INTRODUCTION

A. Background of the Study

Inventory management plays an important role in every company as any ineffective inventory system will result in loss of customers and sales. An effective inventory management is able to generate more sales for the company which directly affects the performance of the company. Therefore it requires a systematic inventory management which is managed by a group of employees who are experts in this area.

Most studies in the manufacturing sector concentrate on the western companies as the awareness about systematic inventory management exist in the west. Therefore this research attempts to widen the geographical scope by examining a textile chain store in Malaysia

B. Problem Statement

There are two problems that underlie this research. The first one arose when the stakeholders raised the issue of inefficient inventory management that lead to the company losses as reported in The Star Online, that Company X's Managing Director, Mr. Y now feels insecure about his position in the company after an attempt by two shareholders to oust him from the company. The reason for the two shareholders wanted to oust Mr. Y as Managing Director was because they were unhappy with the way inventories and stocks were handled by company X [1].

The second problem based on the ratio of inventory turnover, which shows that company X having a low turnover of 1.26 starting in the years 2011 as compared in 2010 with 1.28. Furthermore, having a low turnover indicates that the company is experiencing inefficient performance since there are too many inventories left in a warehouse or storage.

To see further clarification in terms of the issues addressed, researchers had conducted a research with an aim to answer what is the problem with Company X's inventory management, what is the inventory system used what is the relationship between inventory days and return on asset and what is the best solution and recommendation should Company X apply to improve their inventory management?

C. Objectives of the Research

The general objective of this research is to examine the inventory management problems and seek the best recommendation to be practiced by company X to improve their inventory management by testing the relationship between inventory days and return on asset (ROA). Thus, this study specifically attempted to address the following objectives:

First Objective: To explore the problem in inventory management at company X.

Second Objective: To identify the system used by company X in managing their inventory management.

Third Objective: To examine the relationship between inventory days and return on asset (ROA) of company X.

Fourth Objective: To provide recommendation to the company Xin order to improve their inventory management.

D. Scope of the Study

The scope was focused on the inventory management problems, system used, relationship between inventory management and performance of company X Malaysia.

E. Significant of the Study

Theoretically, this study will add to the inventory management literature. Practically, it will also provide useful information to the company X as well as the practitioner to practice the same recommendation in order to improve their inventory management.

II. LITERATURE REVIEW

The purpose of this research is to study the best method of inventory management in order to recommend this to company X, where they can practice this to have a better management and control their losses and profit. In order to make the research more structured, the researchers discussed four types of literature reviews.

A. Inventory Management

Every company has their own inventory where each of the company manages the inventory by various ways of managing. However, the purpose of the inventory is the same, where the inventory must always ready to be used and the inventory cost must be low. Inventory management refers to all the activities involved in developing and managing the inventory levels either the inventory is raw materials, semi-finished material or finished good, so the adequate supplies must be always available and the form must make sure the cost of over or under stocks are always low [2]. The role of inventory management is to maintain a desired stock level for every specific product or items, where the systems that plan and control inventory must be based on the product, customer, and the process for product that available in the inventory [3]. Furthermore, based on the importance of inventory on the balance sheet of companies, inventory is an asset on the balance sheet of companies where has taken an increased significantly because of many firms play some strategies by reducing their investment in fixed assets, plants, warehouses, office buildings, equipment and machinery [4].

B. Relationship between Inventory Management & Company Performances

Company performance depends on many variables; either depends on sales, marketing, good human resource, less production cost, either success inventory [5]. For this research, it focuses on one of the variables which is inventory management. Inventory management is a crucial part of a firm because mismanagement of inventory threatens a firm's viability such as too much inventory consumes physical space, creates financial burden, and increases the possibility of damage, spoilage and loss [6]. To achieve good company performance, the company must able to create the highest profit at the lowest cost.

C. Inventories Days

Inventories Days can be defined as to measure how many days on average it takes for the inventory to turnover [7], which means how long the company or firms takes in order to make the next ordering stock. The highest number of inventory days may incur because of overstock in the inventory and possessing a high amount of inventory for long periods of time is not good for business because of inventory storage, obsolescence, and expiry, spoilage costs and undoubtedly more business failures can be caused by an overstocked or under stocked condition than any other factor [8].

D. Return on Asset (ROA)

From a journal written by [9], mentioned return on assets is a ratio that calculated as net profit after tax divided by the total assets and this ratio measure for the operating efficiency for the company based on the firm's generated profits from its total assets. The research used ROA because asset turnover is another factor for overcoming the pressures on profitability due to competition or customer demand for lower price [10]. Where is the ROA percentage is a baseline that can be used to measure the profit contribution required for new investment, as such, it identifies the rate of return needed at least to maintain current performance arid can be used to establish a hurdle rates all new investment must meet for approval stated [11].

III. RESEARCH METHODOLOGY

A. Research Design

Both qualitative and quantitative were deployed to address the research objectives. The qualitative research was conducted to understand the problem in inventory management by conducting a structured interview with Company X and for the quantitative research design needed to quantify the data and researchers calculate ratio analysis which is the information obtained from annual report.

B. Research Population and Sample Size

Since company X applied the same systems to all chain stores in order to monitor their inventory, researchers picked one branch for interview method in order for the respondent to answer the entire question regarding the inventory management which is branch at Johor Bahru.

C. Sources of Data Collection

For the purpose of this study, the researchers used both primary and secondary data to complete this study as required for both qualitative and quantitative methods has been used which data was obtained from structured interview as primary sources and secondary sources such as annual report, journal, article and textbook.

D. Data Collection Methods

In this study, the researchers obtain the data from interviewing the respondent on the issues of interest and documented information from annual report had been used to calculate ratio analysis. Results from ratio

analysis then will regress using E-view 7.0 to test the relationship between two variable of this research.

E. Unit of Analysis

The unit of analysis in this study is the inventory management system conducted in company X The information about an inventory management system in company X obtained from company X's representative because it involves the discussion between representative and researchers.

F. Limitation

There were several limitations that the researcher faced in completing this study such as information accuracy where there was certain area where the information was considered private and confidential, lack of prior reference sources and lack of skill and experiences.

G. Variable and Measurement

The conceptual framework of this study consists of inventory management as the independent variable and company X performance as dependent variable. As suggested from previous research, inventory management can be measured by inventory days and performance of the company can be measured as the return of the asset (ROA) [12].

H. Hypothesis

The literature indicates that there is positive relationship between inventory management and performance [13]. Therefore, based on this previous research, the researchers expect that there is a relationship between inventory management in company X and performance. Therefore, that is hypothesized that:

Hypothesis 1

H0: There is no relationship between inventory management and performance of company X.

H1: There is a relationship between inventory management and performance of company X.

I. Data Analysis

For qualitative data, the researchers summarized some highlighted points to answer the objectives of the study. For quantitative research, information has been analyzed using statistical data, such as ratio analysis of data that obtained from financial statement in five years starting from year 2008 until 2012 to see in clear picture how does inventory management affect the company performance. After data were obtained from ratio analysis, the researchers then regressed the relationship to analyze descriptive statistics, and correlation coefficient in order to test the validity and reliability of the data for this study. This model of analysis was intended to examine the effects of independent variables on dependent variables. All the data collected were analyzed using E-Views 7.0 for windows.

IV. DATA ANALYSIS AND FINDINGS

First Objective: To explore the problems in inventory management at company X

The Fishbone Diagram as shown in Fig. I below depicts the findings of objective one.
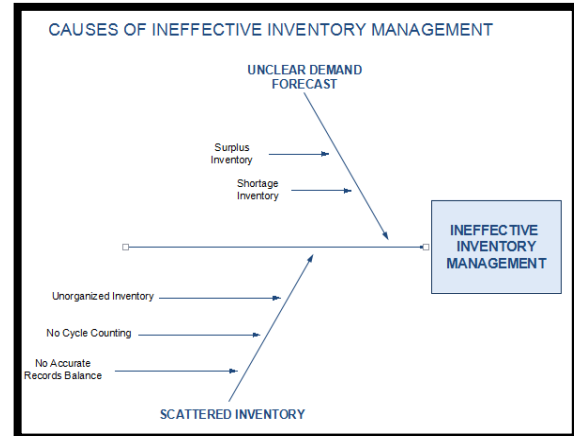

Figure 1.   Fishbone diagram

The first problem identified was unclear demand forecast, where company X can't forecast the exact demand for their upcoming season and make company X facing with sub-cause problem like surplus inventory and also shortage inventory. This surplus inventory and shortage inventory make company X failed to meet the market requirement during the right time with the right quantity of stock. The researchers believe if company X manage to meet the market requirement perfectly by knowing the demand forecast of the market, company X able to make more profit because company X can fulfill the customer's demand.

The second factor that caused ineffective inventory management was the scattered inventory. Scattered inventory that the researchers find out was company Xhas no specific class of inventory, where company X simply made their inventory as one element of business. The sub-cause of the scattered inventory was unorganized inventory, where company X left the inventory as what company X received from suppliers.

The second sub-cause was no cycle counting where company X has no specific cycle counting where it can help company X to identify the specific cycle inventory for them. The third sub-cause was no accurate records balance, where the researchers believe the data of records inventory balance will help company X to find out the tracking of inventory movement in the business. The researchers believe, if company X categorized the inventory, company X can make better plans for their business movement.

Second Objective: To identify the system used by company XIn managing their inventory management

The interviews revealed that the company X used Retail POS (Retail Point-of-Sales) inventory system that company X bought from Company ABC. The company's representative shared their full report of inventory management system with the researchers. Retail POS system allows users to create, modify, view and delete the inventory stock and item in one report.

Retail POS system also provides fully functional of managing the inventories. One of the Retail POS functions is merchandise master. Merchandise Master allowed the user to insert changes, and delete to insert the new stock. Merchandise Master has possibility of data

redundancy, especially when they need to insert a lot of data in one time. As mentioned by company X's representative, rotation of workers affected their inventory management system because there is a lack of professional workers to handle Retail POS due to frequent rotation of workers.

A. Quantitative Result

Third Objective: To Examine The Relationship Between Inventory Days and Return On Asset (ROA) of Company X.

Inventory days show how many days on average it takes for the inventory to turnover. It indicates how many days the company takes to replace the new order. Meanwhile, ROA Measures Company's performance which is an accounting based measure. It is able to measure a firm's performance change in inventory turnover as a measurement for inventory management towards return on assets (ROA). The study by Cannon [12], indicates that when the effects of time were taken into account turnover improvement on average held a slightly negative on ROA. The quantitative results were measured by ratio analysis, descriptive statistic, correlation analysis and hypothesis testing.

B. Ratio Analysis

Table I shows the result of measurement of inventory turnover and inventory days from2008 to 2012.

TABLE I.   INVENTORY DAYS AND RETURN ON ASSET (ROA)

	2008	2009	2010	2011	2012
Return on Assets (ROA), %	2.9	6.67	4.62	4.93	5.07
Inventory Days, Days	299	292	283	289	319

Table I shows that company X has poor inventory management. The inventory days started to increase in 2010 until 2012, which the value started to increase from 283 days to 319 days. This means that company X has slow inventory activity in term of replacing new order where it took almost one year to meet their next inventory order point. For a textile company this could be indicated that previous season fashion was still in the stock which usually increases the holding cost.

Table I shows that company X performance is not consistent. The result showed that Return on Asset (ROA) was decreasing in 2010 from 6.67% to 4.621% but slightly increased in 2011. In 2011 until 2012 the profitability ratio of the company had improved, but in small percentages. Meaning that the company had generate profit but in a small amount as compared in 2009 where company X managed to generate profit up to 6.67%.

C. Descriptive Statistic

Descriptive statistics table as shown in Table II is obtained from E-view 7.0 which is to determine the minimum and maximum days (Column ID) company X

takes to replace new order, while column ROA is to determine minimum losses and maximum profit that company X will gain if maintain the current pattern of replacing order days.

TABLE II.   DESCRIPTIVE STATISTIC; RELATIONSHIP BETWEEN RETURN ON ASSET AND INVENTORY DAYS

	ID	ROA
Average	296.5306	4.8395
Std deviation	13.9133	1.3451
Minimum	283.118	-2.9
Maximum	319.154	6.67

Based on the measurement of how inventory days been calculated, the results can be summarized as it will take minimum 283 days and maximum 319 days for company X to replace new order. The result also stated that the minimum losses that the company X will get if company X still maintain the pattern of replacing days of inventory is 2.9% and the maximum profit that company X may gain is 6.67% annually. It means that if company X still practicing the long inventory days for replacing the new inventory, company X only can gain maximum profit of 6.67% and not more than that. If company X wants to achieve more than 6.67%, profit, company X must change the cycle of inventory days shorter than 283.118 days annually.

D. Correlation Analysis

This correlation analysis as shown in Table III revealed consistent result as past research such as by Cannon [12] and other studies which found that inventory turnover ratio was negative correlated with gross margin [14]. Based on econometric, analysis conducted on the sample financial data for the Greek retail firm for the period of 2000-2005 [14]. They found a negative relationship between gross margin and inventory turnover.

TABLE III.   CORRELATION ANALYSIS; RELATIONSHIP BETWEEN RETURN ON ASSET (ROA) AND INVENTORY DAYS

ROA		
	Correlation Coefficient	Sig (2-tail)
ID	-0.0787	0.00

[1]Notes: Correlation is significant at Alpha level 0.05*

From the results obtained, it showed that there was a relationship between inventory days and return on asset (ROA) in company X. This result supports the Descriptive table as shown in Table II which means that if the company X still maintain the pattern of managing the inventory, the maximum profit that company X may get only 6.67% annually. Result showed, inventory days and return on asset in company X were consistent with previous research. The lower the number of days the inventory is held in a firm before its turnover, the better the performance of the firm [7].

E. Testing of Hypothesis

This section will discuss the testing of the hypothesis result using the regression equation model. Hypothesis

testing used to examine two variables in this study. Table IV showed simple linear regression at 5% Alpha level.

TABLE IV. SIMPLE LINEAR REGRESSION TABLE: RELATION BETWEEN RETURN ON ASSET AND INVENTORY DAYS.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.098235	16.51448	0.429819	0.6963
I0.6963D	-0.07617 1	0.055643	-0.136895	0.0358

[1]Notes: Correlation is significant at Alpha level 0.05

Hypothesis 1

H0: There is no relationship between return on asset (ROA) and inventory days of company X.

H0: There is relationship between return on asset (ROA) and inventory days of company X.

The analysis shows that there is relationship negative significant relationship between return on asset (ROA) and inventory days. It indicates that 1% increases in inventory days will decrease the return on asset by 0.0761%. This is consistent with the previous study stated by Sahari *et al.* [7] which stated that efficient inventory management, it would be expected that the number of inventory days will be lower where it will increase firm performance. This also indicates that inventory management only give minor impact to company performance and company X should consider other factors.

V. CONCLUSION AND RECOMMENDATIONS

For the first two research objectives there are a few minor problems affected the ineffective inventory management at Company X that are unorganized inventory, no accurate record balance and there is no cycle of re-counting. The third research objective seems to support allegation made by the company X's shareholders which stated that Company X had inventory problem that lead to shut down several branches. The ratio analysis proved that the company turnover result shows Company X took longer period to meet their next turn over for the inventory.

The hypothesis testing failed to accept Ho which means that there is a relationship between the inventory management and their performance. The result is consistent with the previous study by Cannon [12], who stated that inventory turnover ratio and inventory days are negative correlation with gross margin [12]. This is important for any company to achieve lower inventory days because it showed that the company does not have high holding cost for handling inventory and it brings the definition of frequent re-stock reflecting a good in product sales. For the textile industry, if the inventory days take longer, it indicates that the company holds an outdated fashion.

A. Recommendations for Company X and Future Research

After conducting some analysis and observation on the current studies, the researchers provide some recommendations for Company X and as well as for future research. The Company X is recommended to

1) Improve demand forecasting

This will help Company X to estimate demand such as using sales force composite. It is a forecasting technique which based on sales person's estimates of expected sales. The information gathered through this method can be used by the management to forecast demand using Jury Executive Opinion method.

2) Improve scattered inventory

Company X is recommended to classify the inventory based on cost which provides Company X which product gives high profit. So the inventory is suggested to be segregated into high, medium and low price before it can be rearrange based on department, brand, merchandise and category.

3) Inventory cycle counting

The Company X also is suggested to improve cycle counting where a small subset of inventory, in a specific location, is counted on a specified day. So the company has to record the inventory by skilled worker.

B. For Future Research

1) Include more sample

The researchers suggest to include more samples in future research because one sample might not reflect the actual problem of the company. It also generates better statistical analysis results especially testing relationships between inventory management and company performance.

C. Conclusion

The researchers believe that if the recommendations are applied by the company Xit should be able to improve the inventory management practice and lead to better performance in terms of profits, reducing inventory cost and maximize utilization of resources.

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