

Impact of Inventory Management on Firm's Efficiency – A Quantitative Research Study on Departmental Stores Operating in Karachi

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Abstract: - This study investigated the effect of various inventory management factors on firm's efficiency. These factors included Capacity Utilization, Inventory Accuracy, Lean Inventory, and Stock Availability. Data was collected by the use of liker scale questionnaire from 250 individuals from different departmental stores in Karachi. Data was analysed using Structural Equation Modelling. The results showed Inventory Accuracy, Lean Inventory, and Stock Availability has positive and significant impact on efficiency. However, Capacity Utilization doesn't seem to affect efficiency. Hence, main indicator of inventory control comes out to be inventory accuracy which allows having an effective control of the outputs of the different goods.

Keywords: - Supply Chain Management, Capacity Utilization, Inventory Accuracy, Lean Inventory, Stock Availability, and Inventory Management.

1. Introduction

1.1 Background of the study

Inventory plays a significant role in the survival and growth of any business in the sense that inefficient and ineffective inventory management will imply that the organization loses customers with a decline in sales. Inventory control involves the coordination of availability of material, utilization, controlling and procurement of materials. Inventory control is the combination of activities with the primary goal of getting the right inventory in the right place, at the right time and in the right quantity. Moreover, it is directly associated to organization's production function which means that the inventory management system will directly or indirectly affect the profitability of an organization.

Inventories are an asset that represents a relevant amount of short-term investments for the firms, the study of the existence of an optimal level of inventory investments in relation to the firm's performance and value creation is justified as a collaboration to the understanding of whether there is an optimal level of inventory or not. Inventory management is the optimization of stocks of goods produced, work in progress, raw materials and other objects of activity by enterprises in order to reduce

storage costs while ensuring the level of service and uninterrupted operation of the enterprise (Wisner, Tan, & Leong, 2014). Inventory management in logistics - optimization of operations directly related to the processing and clearance of goods and coordination with the procurement and sales services, the calculation of the optimal number of warehouses and their location.

Effective inventory management allows an organization to meet or exceed customer expectations by creating stocks of each product that maximize net income. Corporate policy that promotes efficient inventory management is the first component of successful inventory management (Graves, & Willems, 2000). Other essential ingredients are good hardware and software and the knowledge necessary to use the software.

The value of a well-thought-out corporate policy in effective inventory management is invaluable. All employees of the organization must understand the fundamental basis on which a corporate business plan is drawn up. Before studying new revolutionary ways of determining when and how many goods to order, a business need to make sure that the stock is in order; and for this the firm needs to follow certain corporate policies and procedures and monitor and manage stocks.

Inventory management is an area of management in which you can greatly benefit from the use of effective methods, and this gain is directly measured in monetary terms. These methods are outlined by Ballou (2007) in an accessible and complete way. However, it should be noted that the application of a particular approach to inventory management should be determined by the strategy of the company and the resulting strategy of inventory management. The cost of storing raw materials, semi-finished products and finished products are often dangerously high. Studies conducted by large companies have shown that annual storage costs range from 30 to 45% of their value (Ballou, 2007). In other words, each \$ 1 million of raw materials and materials requires another 250-400 thousand dollars a year in the form of storage costs. At first glance, these numbers are hard to believe. However, if various cost elements are listed, their reality becomes apparent. The cost of storing inventory and work in progress includes:

- Interest on attracted financial resources;
- Storage costs, such as rent, local taxes and payment of various services related to the occupied premises;
- Heating and lighting of the room;
- Insurance;
- Damage and theft of stored property;
- Costs of storage equipment and loading and unloading mechanisms.

1.2 Problem Statement

Effective inventory management requires continuous interaction between marketing, sales, manufacturing and supply departments. Despite the fact that companies develop detailed plans for production and supply, the actual volume of sales or their structure often differ significantly from those planned. Therefore it is necessary that the marketing service warn other departments in advance about upcoming campaigns to promote goods and predicted their impact on sales; and the sales department constantly inform both production and supply divisions about changes in the volume of requests and orders received in order to adjust the plans accordingly.

It is necessary to make all possible efforts to reduce the production cycle: “raw materials - finished

products.” In light of this, departmental stores need to use the “just-in-time” concept of inventory management in order to get tangible results just like large companies as such methods are not reserved or constrained to large businesses.

The need to recognize the costs measures linked with effective inventory management in order to maximize profit remains intense for the retail industry in Pakistan. For this study, departmental stores in Karachi were selected because there have been insufficient studies and knowledge that seek to examine the impact of inventory management on firm's performance.

1.3 Gap Analysis

In the last several years, inventory management has become a fundamental component of every organization. Moreover, increasing attention is devoted to effective inventory management and its impact on company's performance by a number of researchers. As stated by Bonney (1994), inventory planning, management and control attempts to level the benefits against the drawbacks of holding stock. Sahin, & Robinson, (2002) asserts in his study that in an attempt to discover impact of inventory management on firm's performance, a number of decisions are being taken in order to provide a strategy and direction for productivity and competitiveness. For example, Nsiah Asare, & Prempeh, (2016) stated that there is a substantial relationship between firm's profitability and inventory management. Similarly, studies conducted by (Mwangi, 2016; Etale, & Bringilar, 2016; Koumanakos, 2008) also support the direct association between inventory management and firm's performance and profitability.

In contrast, the studies conducted by (Bratland, & Hornbrinck, 2013; Sitienei, & Memba, 2015; Mawutor, 2014) showed vice versa. However, almost all the mentioned studies fail to recognize the fact that management of inventory also have an impact on operating cash flows of an organization. In this context, Gunasekaran, Patel, & Tirtiroglu, (2001) states that due to inventory's economic value, capital productivity is improved if level of inventory

is efficiently managed as inventories are vacant resources of an organization.

The need to recognize the cost measures linked with inventory management in order to maximize profit and return is indistinct particularly in the retail industry in Pakistan (Raheman, Afza, Qayyum, & Bodla, 2010). Past studies in their quest to study the impact of inventory management on firms' performance and profitability utilized models like six-sigma (Hines, Holweg, & Rich, 2004). However, the question of whether inventory management has been beneficial to firms' performance has not been reviewed for the developing countries. For the firm's in Pakistan, studies involving inventory management are exiguous and there is a lack of research concerning small and medium enterprises e.g. departmental stores.

Retail industry of Pakistan is chosen for this study because there have been few studies and little knowledge that seek to explore the impact of inventory management on firm performance. Most studies on inventory management and firms' performance have mostly been carried out in other countries and very few are available in Pakistan. Moreover, those few studies tend to focus only on one or few companies (Malik, & Kotabe, 2009). Therefore, the rationale of this study is on the impact of inventory management on firms' performance of different departmental stores in Karachi.

This study have exclusively focused on the impact of efficient inventory management on the performance of a company particularly of retails stores in Karachi. The study presents an argument that efficient and effective inventory management will result in profitability and significant operating cash flow. This is due to the fact that inventory management is regarded as all the practices and procedures that go into keeping the required level of inventory at the right time, place and quantity and includes coordinating, controlling, purchasing, assembling, and utilization of inventory for productivity. Therefore, the current study fills an apparent gap in bridging efficient management of inventory of the contemporary and modern firms in Karachi and how it contributes to firm performance

and the Pakistan economy in GDP (gross domestic product).

1.4 Research Objectives and Significance

The main objective of this research is to examine and understand the impact of Effective inventory management on Firms performance and efficiency. The results of this study demonstrate that increased level of inventory management practice can result in enhanced organizational performance and improved competitive advantage. The study also provides evidence that efficient inventory management practice has a direct and positive impact on firms' performance. Therefore, it is recommended for managers and owners of the small medium enterprise to promote effective inventory management practice by utilizing different scientific tools which will result in increased competitiveness and firm performance.

Based on the gap identified and discussions made on theoretical and empirical evidences, the following general objectives were also formulated:

1. To determine the role of IT (Lean Inventory) in managing inventory efficiently;
2. To find out the relationship between effective inventory management and improved firm performance;
3. To identify the effects of capacity utilization on effective inventory management;
4. To determine how Stock Availability can lead to effective inventory management.

2: Literature Review

The study of Nyaoga, Wang, & Magutu, (2015) intended to find out the relation between capacity utilization and supply chain performance of tea processing firms in Kenya. The study used data from both primary and secondary sources. This study adopted a cross-sectional research design and respondents from 85 tea processing firms in Kenya participated in this study. The study also contributed the research domain by providing empirical insights from the tea processing on capacity utilization and supply chain performance. The result of this study demonstrates a correlation and strong relationship between capacity utilization and value chain performance ($r = 0.639$, $p < 0.01$). According to

Hausman, (2004) firms have increasingly recognized the role of capacity utilization and management in the formation and maintenance of competitive advantage. Author of this study also states that one of the key reasons leading to a shift or a breakdown in the fulfillment of production orders is that many enterprises lack the tools to quickly assess the level of capacity utilization. This is especially true for enterprises that fulfill large orders within the framework of inter-plant cooperation networks or holding structures.

According to Hedrick, Barnes, Davis, Whybark, & Krieger (2008) inventories are all materials and goods which are maintained by firms in order to meet future demands. In addition to this definition, Vilorio & Robayo (2016) categorize them as products in process, finished goods, raw materials and final products that are available physically to the organization and is utilized by the company in the prospect of finishing or starting the process of production or to market the finished products. Inventory management is one of the most discussed phenomenon of management-related studies. Wild (2017) suggests that firms ought to conform market seasonal to the cost and procedures of production and should arrange products for sale. Another key point in Inventory management is to consider how the inventory is moved and stored. If this does not take place in an appropriate manner then it will result in damages to the inventory material and, consequently, inflict additional cost to the firm.

In accordance with the study of Hugos (2018) effective and efficient inventory management can be a great competitive advantage to reduce costs, optimize operations and ensure business profitability. In light of this statement, inventory management if efficiently followed in the departmental stores can result as a set of activities with the purpose of ensuring the supply of materials necessary for the operation of the firm, in the correct time, in the quantity required, in the desired quality and at the best price. Before the right time, it causes high stocks, above the company's need. After the correct time, it causes lack of material to meet the needs. In addition to the required quantity, it represents immobilizations in idle inventory.

Without quality attributes, it entails higher costs and unrealized profit opportunities. If the required quantity is short, it can lead to insufficient inventory (Prajogo, Oke, & Olhager, 2016).

The study of Oballah, Waiganjo, & Wachiuri, (2015) investigates the effect of inventory management practices on firms' performance in public health sector in Kenya. This study revealed that inventory accuracy has a positive impact on organizational performance, while shrinkage of inventory has a negative effect on a firms' performance. This fact is supported by the study of Miller (2010), where the author asserts that inventory management involves all activities put in place to ensure that customer have the needed product or service. In addition, this study also confirms that inventory accuracy brings in its meaning the idea of precision. The accuracy of inventory can be defined by the measurement (in percentage) of the amount of material physically found by the quantity recorded in the information system (Miller, 2010). The results of the study deduced that accuracy of inventory has a positive effect on inventory management with the majority of the respondents strongly approving that up to date inventory and proper records have a positive effect on firms' performance.

The work done by Rinehart (1960) can be considered the initial literature on accuracy of stock. At present, pioneers in the study of accuracy can be considered Pitts (2006) that, in a survey conducted at the US Navy depot in Rhode Island, impact of inactivity on the level of inventory generated by information insecurity (Pitts, 2006). The lack of accuracy is currently the subject of numerous researches.

According to the study conducted by Nel, & Badenhorst-Weiss, (2011) organization using lean inventory system should manage their supply chain cycle in order to successfully achieve firms' efficiency. The study used non-probability sampling to collect data from 13 organizations and the selection was done from Sunday Times top brand surveys (2008 & 2009). The findings of the study shows that it is necessary for the firms to manage their supply chain drivers according to their selected

supply chain strategy. Moreover, according to the authors of the study, lean inventory management techniques and principles can be applied successfully in the retail sector as it improves operational flows. In addition, implementation of lean inventory management encourages manufacturers to produce standard products in accordance with the place (created) orders from retailers in conformance to the consumer demands.

Another study by Rahman, Sharif, & Esa, (2013) investigates the implementation of Kanban in Malaysian business environment. The study was carried on selected manufacturing companies in Malaysia that have implemented lean manufacturing system using the Kanban practices. The respondents of this study were the management staff and employees from the store, production and logistic departments. In addition, collection of data was carried out via structured interview and observation. As per the findings of the study it is found that vendor and supplier participation, quality control, inventory management, quality improvement and commitment of employees were the factors that lead to effective implementation of the Kanban system in the company.

The study of Ogbo, & Ukpere, (2014) puts light on the relationship between stock or inventory availability and organization performance in the seven-up bottling company, Nile Mile Enugu. According to this study, one of the most important tasks of an efficient inventory management system is to ensure that the right product is available at the right time, in the right place and in the right quantity. A total of 83 respondents constitute the sample for the study with research questions and hypothesis generated using descriptive statistics and non-parametric test. The result of this study showed that availability of stock is an important approach to achieving organizational performance. According to the findings of this study, organizations benefits from inventory control management by way of improved sales effectiveness, easy retrieval and storage of material, and reduced operational cost. The study also found that there is a significant relationship between utility of inventory control management and operational feasibility in the

customer related concerns of an organization and cost effectiveness technique are put into practice in order to improve the return on investment in the firm.

The study conducted by Bawa, Asamoah, & Kissi, (2018) aims to investigate the impact of inventory management and stock availability on firm performance of listed manufacturing firms in Ghana. This is an observational research study in which sample data included observations from 14 manufacturing firms in Ghana over a 10-year period, from 2007 to 2016. The study has used a cross sectional secondary data in order to test any relationship between inventory management, stock availability and firm's performance of listed manufacturing firms in Ghana. Another study is of John, Etim, & Ime, (2015) which assess the impact of inventory management and stock availability on performance improvement of an organization. This research study focuses on relationship between stock availability and operational and environmental and financial performance of a firm. This research study is conducted in flour milling firms in Lagos, Nigeria with the integration of producers of mills and conducted a survey process for data collection. It is identified in the results that availability of stock and inventory is one of the important strategic options related to firms' operational performance.

Conceptual Framework

3.1 Efficient Inventory Management

An efficient inventory control system does not deal in the same way with all products, but it applies methods of control and analysis in correspondence with the economic importance related to each product. Inventory management derives from the importance of stock for the company and, therefore, the need to manage and control them is essential to maintain a level of inventory that allows, at a minimum cost, maximum service to customers. The basic reasons for inventory management are: protect against uncertainties, allow production and purchase under economically advantageous conditions, cover anticipated changes in demand and supply and maintain transit between production and storage points.

According to Hedrick, Barnes, Davis, Whybark, & Krieger (2008) inventories are all materials and goods which are maintained by firms in order to meet future demands. In addition to this definition, Vilorio & Robayo (2016) categorize them as products in process, finished goods, raw materials and final products that are available physically to the organization and is utilized by the company in the prospect of finishing or starting the process of production or to market the finished products. Inventory management is one of the most discussed phenomenon of management-related studies. Wild (2017) suggests that firms ought to conform market seasonal to the cost and procedures of production and should arrange products for sale. Another key point in Inventory management is to consider how the inventory is moved and stored. If this does not take place in an appropriate manner then it will result in damages to the inventory material and, consequently, inflict additional cost to the firm.

Effective and efficient inventory management can be a great competitive advantage to reduce costs, optimize operations and ensure business profitability (Hugos, 2018). Inventory management in the departmental stores is a set of activities with the purpose of ensuring the supply of materials necessary for the operation of the firm, in the correct time, in the quantity required, in the desired quality and at the best price. Before the right time, it causes high stocks, above the company's need. After the correct time, it causes lack of material to meet the needs. In addition to the required quantity, it represents immobilizations in idle inventory. Without quality attributes, it entails higher costs and unrealized profit opportunities. If the required quantity is short, it can lead to insufficient inventory (Prajogo, Oke, & Olhager, 2016).

Inventory management is vital and often absorbs a substantial part of an organizations operating budget, which means that it must be strictly monitored. Another point of attention is the legislative issue (Ballou, 2007). The firm that demonstrates inconsistency between the physical inventory and the accounting can be assessed by the Treasury. Inventory management is a vital issue and often absorbs a substantial part of an organization's

operating budget. Since they do not add value to products, the lower the level of inventory that a productive system can manage to work with, the more efficient it will be (Wild, 2017).

The efficiency of its administration can create the difference with competitors, improving quality, reducing time, reducing costs among other factors, thus offering a competitive advantage for the firm itself. It is essential that companies minimize the quantity of stocks in the supply chain in order to rationalize storage costs and maintain them.

To move in the right direction, it is important to understand that like all other processes in an organization, inventory management needs to be constantly reworked to flow according to the dynamics of the firm and always bring good results. The improvement of the productive quality, the reduction of operational times, the careful reduction of costs, among other aspects, are some of the benefits obtained through effective inventory management.

3.2 Lean Inventory

Lean inventory management techniques and principles can be applied successfully in the retail sector as it improves operational flows. According to Feld (2000), implementation of lean inventory management encourages manufacturers to produce standard products in accordance with the place (created) orders from retailers in conformance to the consumer demands. According to this perspective, the characteristics of a departmental store are shorter product life cycle, strong competition, longer time of product development and high demand sensitivity. Implementation of lean inventory management in departmental stores can be an ideal example of best practices of thriving operational strategies which must be accepted by the stores' management in order to maximize the operating efficiency of the retail process. Lastly, there is the cost of the deposit. Having a lean and efficient inventory, an organization can rent a smaller space and have fewer employees. The process of packaging and shipping the products is also much more efficient when there is a smaller quantity of items stocked.

Lean methodology can be adopted to improve firms' performance as it helps in integrating suppliers and customers, specifying value and aligning methods that prioritize the best choice for the sequence of actions in the supply chain. For this purpose, value maps, Kaizen (slow but steady improvement), cell production and production leveling are used to achieve the ultimate goal. Lean methodology is a way of integrating suppliers and customers, specifying value and aligning methods that prioritize the best choice for the sequence of actions in the supply chain. Value maps, Kaizen (slow but steady improvement), cell production and production leveling are used to achieve the ultimate goal.

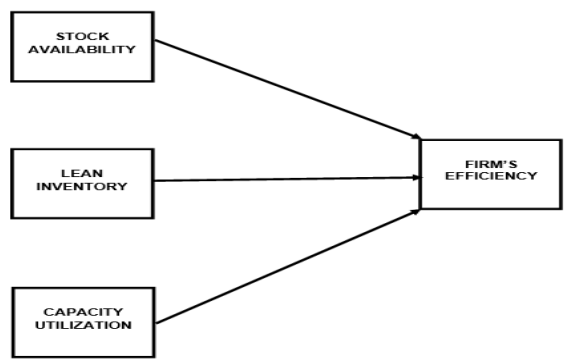
3.3 Stock Availability

One of the most important tasks of an efficient inventory management system is to ensure that the right product is available at the right time, in the right place and in the right quantity. Lean inventory management focuses on improving organizational responsiveness and speed by managing capacity constraints (bottlenecks) and reducing work-in-process (inventory). The capacity and ability to meet customer needs in the shortest time possible should be a top goal of every world-class organization. The customer will be dissatisfied when the response time does not meet the expectation that he has. It must therefore be ensured that the responsiveness is within the expectations of customers and that this response is continuously improved. In the course of the supply chain, stock management is essential for the efficient management of organizations, whether public or private. The lack of materials, high turnover, or even low are important for the functioning of the organization, it may result in significant damage to the organizations. Tseng, Wu, & Nguyen, (2011) argue that the lack of

synchronism between the pace of supply and demand compromises the outcome of the business. Therefore, it is essential to establish a stock policy that addresses the market in a competitive and adequately satisfies the requirements of the customers. For Mason-Jones, & Towill, (1997) supply chain is the flow of materials and information through the company, from the purchasing activity, through production, to the clients. Stock availability and supply chain is a complex grouping of institutions which it calls the distribution channel or channel of marketing. It is the means by which a free-market system arranges ownership of products and services. It is the battlefield where success or failure of the company is determined.

3.4 Capacity Utilization

According to Hausman, (2004) firms have increasingly recognized the role of capacity utilization and management in the formation and maintenance of competitive advantage. Author of this study also states that one of the key reasons leading to a shift or a breakdown in the fulfillment of production orders is that many enterprises lack the tools to quickly assess the level of capacity utilization. This is especially true for enterprises that fulfill large orders within the framework of inter-plant cooperation networks or holding structures. Qrunfleh, & Tarafdar, (2014) in their study states that by eradicating excess inventory and enhancing the quality of parts, the supply chain is able to lessen the set-up duration, adjust capacity, enhance product quality and respond quickly to the customer. As a result supply chain performance is enhanced simultaneously resulting in improved firms' performance.



Hypothesis

H1: Capacity Utilization has significant impact on Firms' Efficiency

H2: Inventory Accuracy has significant impact on Firms' Efficiency

H3: Lean Inventory has significant impact on Firms' Efficiency

H4: Stock Availability has significant impact on Firms' Efficiency

4. Methodology

In order to examine the impact of efficient inventory management on firm's efficiency particularly of departmental stores operating in Karachi, the study used a descriptive research design. The reason of selecting a descriptive research design is because of its efficacy as it serves as a valuable tool for the presentation of cause & effect numerical techniques such as correlation and regression analysis and involved a significant amount of numeric data. According to Kothari (2004) this helps in more precise description of objects, processes and activities. Moreover, another motive to make use of descriptive research was because this research intended to explore, examine, compare and define how variables such as stock availability, capacity utilization, inventory accuracy and lean inventory system affects a firm's efficiency (Demeter, & Matyusz, 2011).

Quantitative research is carried out to study the inventory management and its impact on departmental stores operating in Karachi. This method helped the researcher to first and foremost describe the hypothesized supply chain determinants and performance criteria used by departmental stores and, thereafter made an attempt to explain the cause-effect relationship between independent variables and firm's efficiency and performance.

For this study, survey questionnaire was designed and distributed in order to collect information from selected sample respondents (employees at departmental stores). A set of questions on each aspect of the inventory management practice was derived from widespread literature review including but not limited to the following studies

(Koumanakos, 2008; Kaynak, 2003; Rai, Patnayakuni, & Seth, 2006; Kannan, & Tan, 2005).

In this study, we employed a 5-point Likert scale to specify the extent of conformity to all items (1-Strongly Disagree to 5-Strongly Agree). Questionnaire was distributed to 250 individuals from different departmental stores in Karachi to determine the impact of inventory management on store's efficiency. The performance and competitiveness of the firms were also addressed via questionnaire. The research refined the population sample to only those stores that have a considerable relationship between inventory and income. This approach helped the researcher to get more accurate results about how efficient management of inventory can improve the performance of any firm or organization. Furthermore, the measurement scales were tested separately for their validity and reliability. The research framework was tested for hypothesis and structural fit through the method of SEM (structural equation modeling) which is a multivariate statistical analysis technique, and it also incorporates factor analysis (Schreiber, Nora, Stage, Barlow, & King, 2006).

The analysis of the results of the applied questionnaire were performed using the statistical method of structural equations (PLS - Partial Least Square). This technique is composed of diagrams causal factors involving three main components: indicators (observed measured variables), variable latent (construct, concept, factor); ways (correlation, a trajectory, or two senses / trajectories), this is appropriate when variables used to represent a phenomenon that cannot be measured directly (Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014). McDonald & Ho (2002) describes the steps for the analysis and use of the technique of structural equations: 1) Create a theoretical model, grounded in robust bibliographic review; 2) Build a track diagram (path) of causal relations (or influencers); 3) Transform the diagram into a set of structural models using software; 4) Choose the data entry matrix appropriate to estimate the model proposed.

Demographic Analysis

For obtaining information of the respondents participating in the research process, questionnaire included some questions that asked respondents about their gender, education, age and experience.

This information results in obtaining diverse information of the respondents. Among 250 respondents, according to the results it is identified that there 178 male respondents and 72 female respondents.

Gender	Count
FEMALE	72
MALE	178
Grand Total	250

Likewise, there were respondents from different age groups. According to the results it is identified that 28 respondents were from the age group of 18 to 25, 113 respondents were from the age group of 26 to

30, 55 respondents were from the age group of 31-35, 54 respondents were from the age group of above 36 years.

Age	Count
20-25	28
26-30	113
31-35	55
36 or above	54
Grand Total	250

In addition to this, researcher also collected information about education background of the respondents. According to the results, it is identified that four respondents were under graduate, 203

respondents were graduate, and 35 of the respondents were post graduate and eight respondents hold different qualification degrees.

EDUCATION	Count
GRADUATE	203
OTHER QUALIFICATION DEGREES	8
POST GRADUATE	35
UNDERGRADUATE	4
Grand Total	250

It is identified that 65 respondents have 1-3 years' experience, 69 respondents have 4-7 years' experience, and 113 of the respondents have 8-10

years' experience and 3 respondents have less than a year experience.

EXPERIENCE	Count
1-3 YEARS	65
4-7 YEARS	69
8-10 YEARS	113
Less than a year	3
Grand Total	250

Below table depict descriptive analysis of likert scale questions asked about respondent's perception about the factors.

Questions	Frequency						Percent					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Lean inventory system enhances firm's efficiency by identifying and eliminating waste	12	29	56	100	39	250	5.1	12.3	23.7	42.4	16.5	100
Using Lean Inventory system can result in	46	82	57	31	20	250	19.5	34.7	24.2	13.1	8.5	100

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waste minimization.												
Lean Inventory System can improve Flow Management (by reducing the management or coordination costs).	9	27	52	109	39	250	3.8	11.4	22	46.2	16.5	100
Lean practice is useful in reducing the lead time in work in process inventories and flow of production.	61	78	44	41	12	250	25.8	33.1	18.6	17.4	5.1	100
Is accuracy of stock level and values necessary for an organization's accounting practices.	14	26	38	108	50	250	5.9	11	16.1	45.8	21.2	100
To enhance firm's efficiency, the stock availability should be systematically checked through a regular audit (stocktaking).	10	20	59	95	52	250	4.2	8.5	25	40.3	22	100
Availability of stock is crucial for the growth and survival of an organization.	14	17	68	87	50	250	5.9	7.2	28.8	36.9	21.2	100
Stock control allows an organization to have the right amount of stock at the right time to ensure that capital is not tied up unnecessarily, and protects production if problems arise with the supply chain.	17	13	48	91	67	250	7.2	5.5	20.3	38.6	28.4	100
Capacity utilization and management plays a significant role in the creation and maintenance of competitive advantage increasing firm's efficiency.	36	79	68	41	12	250	15.3	33.5	28.8	17.4	5.1	100
Organizations should enhance the capacity utilization of limited resources in order to improve firm's performance and create competitive advantage.	12	51	65	82	26	250	5.1	21.6	27.5	34.7	11	100
Capacity utilization has a strong positive effect on firm's value chain performance.	7	30	56	106	37	250	3	12.7	23.7	44.9	15.7	100
Reduced inventory as eliminating bottlenecks means there will be less work-in-process.	6	26	59	105	40	250	2.5	11	25	44.5	16.9	100
Improved capacity as optimizing the constraint enables more product to be manufactured.	5	27	44	100	60	250	2.1	11.4	18.6	42.4	25.4	100
Inventory accuracy is necessary for easy storage and retrieval of material, improved sales effectiveness and reduced operational cost.	6	24	45	114	47	250	2.5	10.2	19.1	48.3	19.9	100
Accurate inventory management possess the capability of positively influencing firm's performance.	7	24	55	119	31	250	3	10.2	23.3	50.4	13.1	100
Poor stock management, particularly related to warehousing and distribution, significantly increases the rate of inefficiency and poor productivity.	7	22	54	101	52	250	3	9.3	22.9	42.8	22	100

Model Measurement

To test the study hypothesis we have used the structural equation model (SEM) whereas the testing has been gone through Smart PLS software. Structural equation modeling used to evaluate the structural relationship between exogenous and endogenous variables. The structural equation modeling includes factor analysis and multivariate analysis of the model. Firstly we evaluate the model fitness and measure whether the paths showing the relationship between measured and latent variables are significant or not. Moreover, to evaluate the indirect and direct effects of all the constructs the testing was done. The use of (SEM) structural

equation model has been observed to be a foremost procedure that has been used below different regression models and methods (Barron & Kenny, 1986). Moreover, the equation of regression in study targets at explaining each construct to assess the cause and effect relationship while all of the factors in the causal model could demonstrate their cause and effect at exact time. Likewise, the idea of using this model ensures to apply technique of bootstrapping which has been viewed as reasonable for both small and large sample size and does not require any kind of indirect effect (Hayes, 2013).

The PLS model includes two different models, which include a structural model and a measurement

model. This section includes an analysis of the measurement model. The measurement model implies the representation of the external connections existing between the various structures included in the study, with their indicator variable. On the other hand, the structural model implies the representation of internal associations that exist between the various constructs included in the study.

Measurement of Outer Model

The goal of measure of fit in the measurement model is to study about the reliability and validity of the instrument and to check its reliability and validity we perform test of convergent validity and discriminant validity in software naming Smart PLS.

Composite Reliability

Variables	Composite Reliability
CAPAITY UTILIZATION	0.898
FIRMS' EFFICIENCY	0.861
INVENTORY ACCURACY	0.910
LEAN INVENTORY SYESTEM	0.877
STOCK AVAILABILITY	0.931

Factor loadings significant

Below is the mentioned table of (CFA) confirmatory factor analysis with the loadings. Construct with the

Reliability measurements include reflective structure, Cronbach alpha, composite reliability and average variance extraction (AVE). Cronbach's alpha is used to assess the reliability of consistency and requires a minimum of 0.7 to be considered acceptable. However, Cronbach's alpha has limitations because it often underrates internal consistency reliability. Another method of measuring internal consistency reliability is composite reliability. A composite reliability value between 0.7 and 0.9 can be accepted. This is the accepted reliability value range. Estimation of reliability can be done by degree of constancy that lies amongst various variables (Hair, 2010). Below is the table of composite reliability.

loading of .5 are consider as strong loading variables whereas the constructs with the loading of below .5 are considered as less are better to be removed from the table.

Variable	Constructs	Item loading
Capaity Utilization	CU1	0.869
	CU2	0.878
	CU3	0.733
	CU4	0.830
Firms' Efficiency	FE1	0.873
	FE2	0.865
Inventory Accuracy	IA1	0.833
	IA3	0.920
Lean Inventory Syestem	IA4	0.879
	LI1	0.934
	LI3	0.831
Stock Availability	SA1	0.866
	SA2	0.876
	SA3	0.875
	SA4	0.897

Convergent Validity

On the other hand, convergent validity emphasizes on including outer loadings and assess whether indicators are positively correlated with other indicators of the same structure. AVE is used to measure the effectiveness of convergence to a particular level. The value of AVE greater than 0.5 indicates that the composition is interpreted as 50%

or more according to the variation of the indicator. Indicators and outer loadings must be higher than 0.708, but if the removal does not have any effect on the composite reliability, then the indicator should be considered between 0.4 and 0.7 and maintained. These overall values indicate that constructs used in the research model are fit to the reliability ad validity requirement by above mentioned statistical tests.

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	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CAPAITY UTILIZATION	0.847	0.849	0.898	0.688
FIRMS' EFFICIENCY	0.676	0.676	0.861	0.755
INVENTORY ACCURACY	0.851	0.863	0.910	0.771
LEAN INVENTORY SYSTEM	0.732	0.833	0.877	0.782
STOCK AVAILABILITY	0.901	0.903	0.931	0.771

Discriminant Validity

.Discriminant validity can be determined in PLS by the three different tests which includes Heterotrait-Monotrait (HTMT) ratio of correlation and Fornell & Larcker criterion and cross loading of indicators. Along with these two specific tests, this research

study also tests discriminant validity through Heterotrait-monotrait (HTMT) ratio. Following tables identify the results of collected data with respect to discriminant validity.

Fornell & Larcker Criterion

	CAPAITY UTILIZATION	FIRMS' EFFICIENCY	INVENTORY ACCURACY	LEAN INVENTORY SYSTEM	STOCK AVAILABILITY
CAPAITY UTILIZATION	0.829				
FIRMS EFFICIENCY	0.538	0.869			
INVENTORY ACCURACY	0.821	0.594	0.878		
LEAN INVENTORY SYSTEM	0.676	0.350	0.653	0.884	
STOCK AVAILABILITY	0.760	0.453	0.752	0.788	0.878

From the above table, it is identified that as related to discriminant validity, it is require to have proper Average Variance Extracted analysis. This test aims to identify that each square root of each AVE for each individual construct exceeds any other correlation exist between pair of latent construct. As according to the rule of thumb, it is identified that square root of each of the construct integrated in the

model should exceed the value obtained after correlation of that construct with another construct. Moreover, it is also important that value of that construct should at least 0.50. According to the results, all values are greater than 0.5 and also addressing the rule of thumb for discriminant validity.

Cross Loadings

	CAPAITY UTILIZATION	FIRMS' EFFICIENCY	INVENTORY ACCURACY	LEAN INVENTORY SYSTEM	STOCK AVAILABILITY
CU1	0.869				
CU2	0.878				
CU3	0.733				
CU4	0.830				
FE1		0.873			
FE2		0.865			
IA1			0.833		
IA3			0.920		
IA4			0.879		
LI1				0.934	
LI3				0.831	
SA1					0.866
SA2					0.876
SA3					0.875
SA4					0.897

Cross loading method is also executed for discriminant validity of the construct included in the model. As according to the rule of thumb, it is identified that cross loading value of each construct should exceed 0.70. Results indicate that except

some of the constructs, values of all other constructs in the model are greater than 0.70. This test also confirms the requirement for cross loading for each construct included in the model.

Heterotrait-Monotrait (Htmt) Ratio

	CAPAITY UTILIZATION	FIRMS' EFFICIENCY	INVENTORY ACCURACY	LEAN INVENTORY SYESTEM	STOCK AVAILABILIT Y
CAPAITY UTILIZATION					
FIRMS' EFFICIENCY	0.710				
INVENTORY ACCURACY	0.969	0.779			
LEAN INVENTORY SYESTEM	0.855	0.479	0.826		
STOCK AVAILABILITY	0.867	0.580	0.856	0.976	

Heterotrait-Monotrait (HTMT) correlation ratio is also used for measuring discriminant validity. According to the rule of thumb for this specific test, it is suggested that HTMT values should be less than 1.

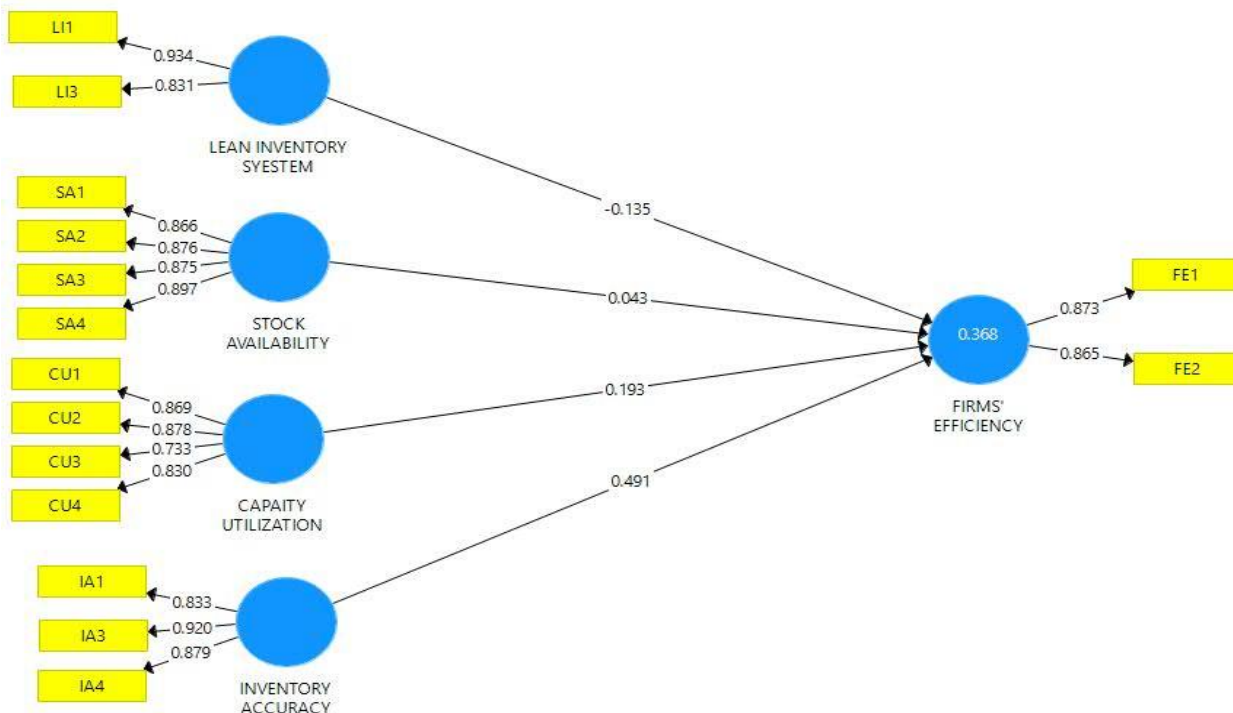
Structural Model

In Partial Least Squares (PLS) method, structural model is used for testing the hypothesis through identifying different path coefficients. A structural model can be used by researcher for identifying the linear regression analysis of the dependent variable included in the model. This specific model in SMART PLS enables researchers to identify the pattern of the association that exist among the constructs included in the research. Therefore, structural model is one of the evolving areas and is emphasized by the researcher to execute direct testing of the hypothesis in the research. For this research, entire model was assessed through using three different criteria including path coefficients, p value and t-statistics value. The validity of the structural model was executed through using SMART PLS as identified prior. Moreover, entire

structural model was designed through using specific guidelines of SmartPLS. Moreover, thumb of rule was emphasized that indicate that a t statistics values should exceed 2 and R square value should be greater than 50%. For testing the hypothesis, P value is emphasized through considering rule that P value less than 0.05 will be considered as attainment of adequate evidence to accept the hypothesis.

According to the results, it is identified that there exist statistically significant association between inventory accuracy and firms' efficiency (t-statistics=5.054, P value=0.000, between lean inventory and firms' efficiency (t-statistics =2.430, P value=0.015) and between stock availability and firms' efficiency (t-statistics=2.856, P value=0.004) as the p-values of the inventory accuracy, lean inventory and stock availability are less than the level of significance which means that they support the alternate hypothesis. Where there is insignificant difference between capacity utilization and firms' efficiency as the p-value=0.520 is greater than level of significance=0.05 which means that the alternate hypothesis is rejected.

Model



Path Analysis

	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (O/STDEV)	P VALUES
CAPACITY UTILIZATION -> FIRMS' EFFICIENCY	0.047	0.045	0.072	0.644	0.520
INVENTORY ACCURACY -> FIRMS' EFFICIENCY	0.450	0.451	0.089	5.054	0.000
LEAN INVENTORY -> FIRMS' EFFICIENCY	0.165	0.167	0.066	2.430	0.015
STOCK AVAILABILITY-> FIRMS' EFFICIENCY	0.210	0.209	0.073	2.856	0.004

Discussion

With executing comprehensive statistical tests through using Smart PLS, this chapter reach towards the final testing of hypothesis. Results attained lead towards the support and reject of the hypothesis stated in the research. The evaluation criteria that was used for testing each hypothesis was use of p

values for each path coefficient. Moreover, significant t values also indicate the support of hypothesis. The rule of thumb used for testing hypothesis was a t value greater than 2 and an alpha value of 0.05 for p value.

Following table summarizes the testing of hypothesis:

Hypothesis	Accepted or Rejected
H₁: Capacity Utilization have significant impact on Firms' Efficiency	Rejected
H₂: Inventory Accuracy have significant impact on Firms' Efficiency	Accepted
H₃: Lean Inventory have significant impact on Firms' Efficiency	Accepted
H₄: Stock Availability have significant impact on Firms' Efficiency	Accepted

H1 suggests that capacity utilization affects the firms' efficiency. This hypothesis according to the results is rejected with (T Statistics=0.644, P value=0.520). This result of the study indicates that capacity utilization is one of the important elements

for firms' efficiency. Firm needs to improved capacity as optimizing the constraint enables more product to be manufactured. It is crucial for OCS to emphasize on the delivery of services with accurate reliable and appropriate manner according to the

expectation of the customers. Organizations should enhance the capacity utilization of limited resources in order to improve firm's performance and create competitive advantage. Capacity utilization has a strong positive effect on firm's value chain performance.

H2 suggests that inventory accuracy affects the firm's efficiency. According to the results this hypothesis is accepted with T Statistics=5.054, P value=0.000. This result of the study indicates that accurate inventory management possess the capability of positively influencing firm's performance. More over inventory accuracy is necessary for easy storage and retrieval of material, improved sales effectiveness and reduced operational cost.

H3 suggests that lean inventory also influence the firm's efficiency. According to the results this hypothesis is accepted with T Statistics=2.430, P value=0.015. This means that lean inventory system enhances firm's efficiency by identifying and eliminating waste. It can improve the flow management by reducing the management or coordination costs. Moreover lean practice is useful in reducing the lead time in work in progress inventories and flow of production. Waste can be minimized if firms uses lean management system.

H4 suggests that stock availability effects the firm's efficiency. According to the results this hypothesis is accepted with T Statistics=2.856, P value=0.004. This means that stock availability is the important factor for evaluating firms' efficiency. The stock availability should be systematically checked through a regular interval time in order to enhance efficiency of firm. The inventory management techniques has a positive influence on the performance of a company. These techniques of managing inventories help in proper planning of the materials needed by identifying the gap between the desired and the actual level of materials, allocation of resources, purchasing, sales and employment of staff and everything concerned to human resources management all of which reduces on the costs incurred by the organization in the production departments for improved performance of the company.

5. Conclusion

This research studied the impact of inventory management on firms' performance of departmental stores operating in Karachi. Inventory control management have a strong impact on the firm's performance and profitability as they allow quantitative and qualitative measure of the movement of inventory, which allows strategic decisions to be made that increase efficiency in the process of the supply chain and lower costs. The main indicator of inventory control comes out to be inventory accuracy which allows having an effective control of the outputs of the different goods. The accuracy indicator is intended to be controlling how reliable is the inventory and the indicator of duration of the inventory allows to know how long a certain commodity remains in the organization. Based on the results of this study, inventory control indicators allow the firm to organize, manage and utilize the best inventory control model in order to improve the flow of inventory. With the results of the investigation it can be concluded that the most used inventory control indicators, is the Lean Inventory system, which handles the most important variables: the cost quantity and rotation. Furthermore, Inventory control indicators can also allow the firm to measure and qualify how the inventory process works, and shows the strengths and weaknesses of the inventory control system currently used in an organization.

Managing inventories in a departmental store is key to reducing costs. High and precariously managed stocks are factors that affect the final price of the products, as well as an improper application of the firms' working capital. The competitiveness of firms' in the globalized world requires a correct maintenance of this asset, and it is essential to keep only the quantity that comes parallel with demand. Correct and efficient inventory management in the supply chain cannot be done in isolation, some production control measures should also be implemented by the firm. However, it is essential that the supply chain is at the same level of evolution and the customer-supplier relationship is totally synchronized. The results of this study stipulate that adequate and efficient inventory

management enhances firm performances as it settles the bottlenecks in demand supply equation of departmental stores in Karachi.

This is because proper utilization of inventory management techniques will help the departmental stores to maintain proper running of the stock control department, controls quality of the product function, reduction on labor, control time management, lower any associated costs for improved performance of the firms' operations, helping employees to perform well, increasing company profits, help in the process of determining the sales volume of the firm for understanding the progress of the firm's performance and derive towards better performance and profitability.

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