



Study of Inventory Management process in Automobile Industry: A comparative study of Ashok Leyland with Tata Motors, Eicher Motors and Mahindra and Mahindra.

Vivek Arya, Management Faculty, Centre for Development of Advanced Computing, B-30, Sector-62, Noida, 201307, Uttar Pradesh, India

Sarvesh Ghai, Management Trainee, Textron India Ltd, Bangalore, India

Abstract:

Inventory management is important for proving uninterrupted production sales and customer service level a minimum cost. Besides, unnecessary investments have to be avoided. Inventories have to be held for transaction motive, precautionary motive and speculative motive inventory inefficiencies are caused due to inefficiencies in Inventory Management and the system set up. A case study of Ashok Leyland has been undertaken. A comparison drawn between Ashok Leyland and its competitors Tata Motors, Eichers Motors and Mahindra and Mahindra proves that Ashok Leyland is performing better than its competitors.

Keywords: Inventory Management, Ashok Leyland, Investments

Introduction

Definition of Inventory Management: Inventories are stock of goods kept in business and meant either for sale or for consumption in the production process. It includes raw materials work in process and finished goods.

The objective of inventory management is to provide uninterrupted production, sales and customer service levels at the minimum cost. Inventories constitute the most significant part of current assets of a large majority of companies in India. Because of the large size of inventories maintained by firms, a considerable amount of firm's capital is required to be committed them. It is therefore imperative to manage inventories efficiently and effectively in order to avoid unnecessary investments. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately.

Different kinds of Inventory: The various forms in which inventories exist in a manufacturing co are as follows:

- (a) Raw Materials: are those basic inputs that are converted into finished product through the manufacturing process. Raw materials inventories are those units which have been purchased and stored for future productions.
- (b) Work in Process: They are semi manufactured products. They represent products that need more work before they become finished products for sale.
- (c) Finished Goods: These are completely manufactured products which are ready for sale. Stocks of raw material and work-in-process facilitate production while stock of finished goods is required for smooth marketing operations. Thus inventories serve as a link between the production and consumption of goods.

Need of Inventory Management

Inventory is a necessary evil that every organization would have to maintain for various purposes. Optimum inventory



management is the goal of every inventory planners. Over inventory and under inventory both cause financial impact and spoil health of the business as well as effect business opportunities.

Need to Hold Inventory

- The question of managing inventories arises only when the co holds inventories. Maintaining inventories involves tying up of the co's funds and incurrence of storage and handling costs. It is expensive to maintain inventories but companies still maintain them. There are three general motives for holding inventories.

Transaction Motive: Which emphasizes the need to maintain inventories to facilitate smooth production and sales operations.

Precautionary Motive: Which necessitates holding of inventories to guard against the risk of unpredictable changes in demand and supply forces and other factors.

Speculative Motive: This motive influence the decision to increase or reduce inventory levels to take advantage of price fluctuations.

A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. A time lag exist between demand for materials and its supply. The procurement of materials may also get delayed because of factors such as strike, transport disruption or short supply.

Other factors which may influence purchasing and holding of raw material inventory are quantity discounts and anticipate price increase. The firm may purchase large quantities of raw materials than needed for the desired

production and sales level to obtain quantity discounts of bulk purchasing. At times, the firm would like to accumulate raw materials in anticipation of a price rise.

Work in process inventory builds up because of the production cycle. Production cycle is the time span between introduction of raw material into production and emergence of finished product. Till the production cycle completes, stock of working process has to be maintained.

Stock of finished goods has to be held because production and sales are not instantaneous. A firm cannot produce immediately when customers demand goods. Therefore to supply goods on regular basis their stock has to be maintained. Stock of finished goods has to be maintained to meet sudden demand from customers. In case, the firm's sales are seasonal in nature substantial finished goods inventories should be kept to meet the peak demand. Failure to supply products to customers when demanded would mean loss to the firm's sales to the competitors.

Types of Inventories

Independent Demand

An inventory of an item is said to be falling into the category of independent demand when the demand for such an item is not dependent upon the demand for another item. Finished goods Items, which are ordered by External Customers or manufactured for stock and sale, are called independent demand items.

Dependant Demand

If the demand for inventory of an item is dependent upon another item, such demands are categorized as dependant demand. Raw materials and component inventories are dependent upon the



demand for Finished Goods and hence can be called as Dependant demand inventories.

Inventories Cost

Inventory procurement, storage and management is associated with huge costs associated with each these functions.

Inventory costs are basically categorized into three headings:

Ordering Cost , Carrying Cost, Shortage or stock out Cost & Cost of Replenishment , Cost of Loss, pilferage, shrinkage and obsolescence etc. Cost of Logistics , Sales Discounts, Volume discounts and other related costs.

Ordering Cost

Cost of procurement and inbound logistics costs form a part of Ordering Cost. Ordering Cost is dependant and varies based on two factors - The cost of ordering excess and the Cost of ordering too less.

Carrying Cost

Inventory storage and maintenance involves various types of costs namely:

- Inventory Storage Cost
- Cost of Capital

Inventory carrying involves Inventory storage and management either using in house facilities or external warehouses owned and managed by third party vendors. In both cases, inventory management and process involves extensive use of Building, Material Handling Equipments, IT Software applications and Hardware Equipments coupled managed by Operations and Management Staff resources.

Inventory Storage Cost

Inventory storage costs typically include Cost of Building Rental and facility maintenance and related costs. Cost of Material Handling Equipments, IT

Hardware and applications, including cost of purchase, depreciation or rental or lease as the case may be. Further costs include operational costs, consumables, communication costs and utilities, besides the cost of human resources employed in operations as well as management.

Cost of Capital

Includes the costs of investments, interest on working capital, taxes on inventory paid, insurance costs and other costs associate with legal liabilities.

Inventory Control - Inventory Audits and Cycle Counts

Any inventory of Raw materials, finished goods as well as Intermediate in process inventory has an economic value and is considered an asset in the books of the company. Accordingly any asset needs to be managed to ensure it is maintained properly and is stored in secure environment to avoid pilferage, loss or thefts etc.

Factors Leading to Inventory Inefficiencies

In any company inventory management is one area that the managements always focus on when it comes to improving business efficiencies and cutting costs. An inventory reduction drive always yields results, which are visible and releases cash back into business. Does this mean that inventory management is inefficient? The answer can be a yes and a no. Inventory management function is dependent upon physical operations involving multiple locations and agencies and processes. The inter dependence upon transactions which are sequential and parallel, renders inventory susceptible to inefficiencies occurring in operations, transactions, and documentation over a period of time. Another possible factor that can hamper



the inventory efficiencies is the system setup that is used to manage the inventory. Quite often one can find that the system setup and process defined in the system is not user friendly and cumbersome. An efficient system should define and guide the physical

Data Collection

The researcher has used secondary data for the purpose of this study. Data has been obtained from Annual reports of the auto companies.

Case study of Ashok Leyland

Organization profile: Ashok Leyland is a commercial vehicle manufacturing co based in Chennai, India Founded in 1948, the co is one of India’s leading manufacturer of commercial vehicles, such as trucks and buses as well as emergency and military vehicles

operating six plants. Ashok Leyland also makes spare parts and engine for industrial and marine applications. It sells about 60,000 Vehicles and 7000 engines annually.

It is the second largest commercial vehicle co in India in the medium and heavy commercial vehicle segment with passengers transportation options ranging from 17 seaters to 80 seaters. Ashok Leyland is a market leader in the bus segment. In the truck segment Ashok Leyland primarily concentrates on the 16 ton to 25 ton range of trucks.

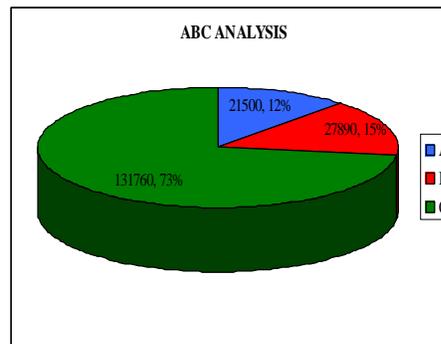
Tools for Analysis

- Inventory Turnover Ratio
- ABC Analysis
- XYZ Analysis
- FSN Analysis
- HMLAnalysis

Table: 3 Table ABC Analyses

Category	No of items	% of items
A	21500	12
B	27890	15
C	131760	73
Total	181150	100

Fig. 1 Showing ABC Analysis



Interpretation:

The table above shows that Category A constitutes 12 % and Category C constitutes 73%. “A” are in 21500 numbers, claim greater issue value and hence more importance is required. A

=this category consist a few items of high value. B = this category consist a more items of medium value. C = this category consist an all other material of small value.



Table: 4 - Table Showing XYZ Analysis

Category	No of items	% of items	% of values
X	8330	4.6	81.12
Y	23160	12.78	15.55
Z	149660	82.62	3.3
Total	181150	100	100

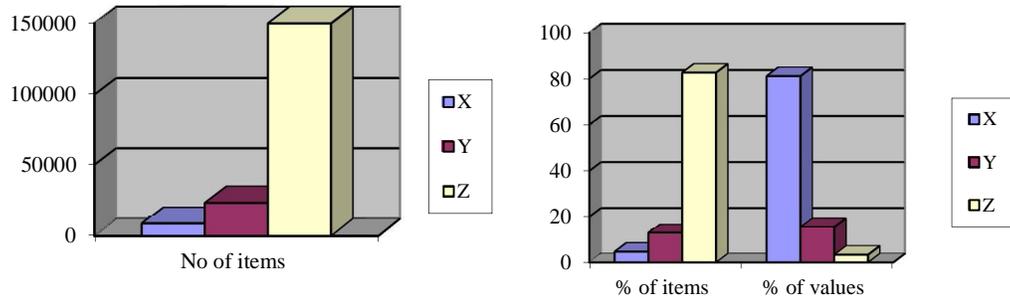


Fig. 2: Showing XYZ Analysis

Interpretation:

It explains that 4.6 % of the items constitutes 81.12% of the issue value and 82.62% of the items constitute only 3.3% of the issue value. "Z" is 149660 in numbers, claim greater issue value and hence more importance is required to "Z" category. X= constant consumption,

fluctuations are rather rare, Y =stronger fluctuations in consumption, usually for trend moderate or seasonal reasons, Z =completely irregular consumption. There are 8330 items falling under "X" category these items have greatest stock value.

Table: 5 - Showing FSN Analysis

<i>Category</i>	<i>No of items</i>	<i>% of items</i>
<i>F</i>	<i>105110</i>	<i>58.02</i>
<i>S</i>	<i>1810</i>	<i>1</i>
<i>N</i>	<i>74230</i>	<i>40.98</i>
<i>Total</i>	<i>181150</i>	<i>100</i>

Source: Secondary data

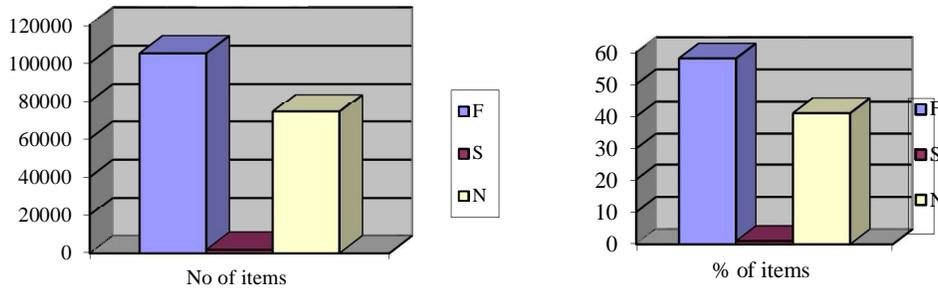


Fig. 3: Showing FSN Analysis

Interpretation

Fast moving items forming high percentage of inventory at around 58.02%. Around 40.98% of inventory is found to be non-moving which requires special attention. Around 1% of inventory

is found to be slow moving. F = Stands for Fast moving. S = Stands for Slow moving. N = Stands for Non-moving. Around 105110 items considered being fast moving and 561 items have high unit value.

Table 6: - Showing HML Analysis

Category	No of items	% of items
H	5610	3.1
M	21810	12.04
L	153730	84.86
Total	181150	100

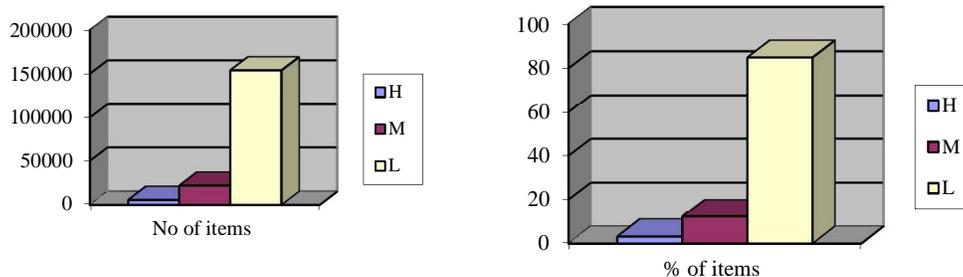


Fig. 4: Showing HML Analysis



Interpretation:

- Unit values more than RS.10000 are classified "H" there are 5610 items. The company must take care while purchasing these items so as to avoid over stocking. In the above classification there are about 153730 items where the unit values are less than RS.1000. H -Stands for High cost. M - Stands for Medium cost. L - Stands for low cost.

- Purchase of "H" items has to be eliminated, so that unnecessary purchase can be avoided since it has high unit value.
- A critical analysis must be done in an effort to reduce "A-X" analysis.
- The inventory stock in number of days to be found in 71 days which indicate good inventory management.

Comparison of Ashok Leyland with its Competitors

Findings

- Bulk of inventory items and routine controls should be adequate.
- "X" items should have high stock value. The company should take special effort to reduce these items.

Inventory Turnover ratio is calculated by taking the total cost of goods divided by average inventory. Adding together beginning inventory and ending inventory and dividing the figure by 2 in turn calculates average inventory.

Table: Inventory Turnover Ratio

Name of Company	2009	2010	2011	2012	2013
Ashok Leyland	5.36	5.11	5.86	6.63	7.01
Tata Motors	13.47	13.5	12.1	11.64	10.05
Eicher Motors	19.81	17.97	17.16	15.64	-
Mahindra & Mahindra	14.58	17.91	13.85	13.51	18.71

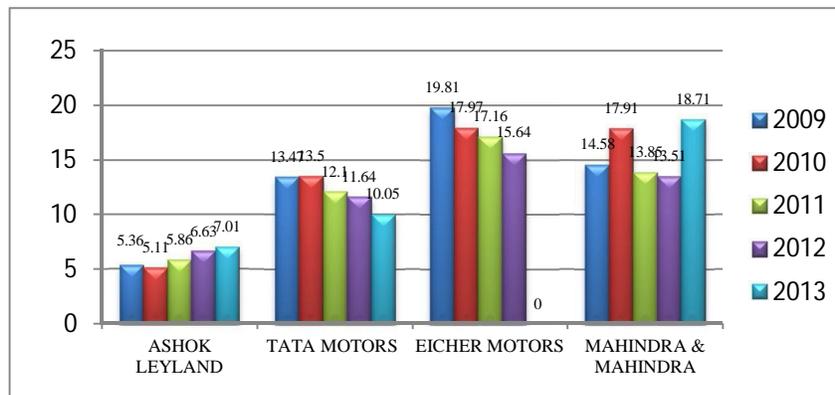


Fig.5: Inventory Turnover Ratio



Interpretation

While analyzing this data we find that the inventory turnover ratio has steadily increased from 5.36 in 2009 to 7.01 in 2013, whereas it has fallen from 13.47 in 2009 to 10.05 in case of Tata Motors. In case of Eicher motors it has declined from 19.81 to 15.64 in 2012. However in case

of Mahindra and Mahindra it first increased from 14.58 in 2009 to 17.91 in 2010 and then declined in 2011 and increased again to 18.71 in 2013. A higher inventory indicates healthy trend of increased sales and indicates the need to maintain adequate inventory.

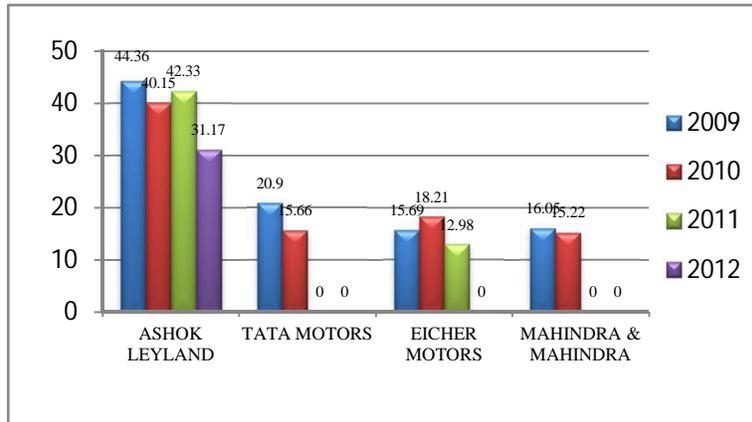


Fig.6: Average Raw Material Holding

Interpretation

Average raw material holding has steadily declined in case of Ashok

Leyland Tata Motors and Mahindra and Mahindra but it has increased in case of Eicher Motors.

Table 8: Average Finished Goods Held

Years	2009	2010	2011	2012
Ashok leyland	44.36	40.15	42.33	31.17
Tata motors	13.64	17.70	-	-
Eicher motors	2.88	9.53	9.96	14.54
Mahindra & Mahindra	16.26	13.32	-	-

Interpretation

Average finished goods have steadily declined in case of Ashok Leyland showing improved sales. It has increased

in case of Tata Motors and Eicher Motors and declined in case of Mahindra and Mahindra



Table 9: Number of Days in Working Capital (WIP)

Years	2009	2010	2011	2012	2013
Ashok leyland	42.04	35.64	11.53	14.56	10.05
Tata motors	16.24	60.19	25.06	48.91	40.55
Eicher motors	45.92	52.66	47.56	68.06	-
Mahindra & Mahindra	7.80	11.77	4.27	1.10	2.77

Interpretation

Number of days in working capital have increased in Eicher Motors Tata Motors declined in Ashok Leyland and Mahindra has shown an erratic trend and Mahindra while they have steadily

Table 10: Material Cost Composition

Name of company	2009	2010	2011	2012	2013
Ashok leyland	73.82	74.42	73.69	72.89	71.46
Tata motors	73.73	64.93	68.95	70.49	68.78
Eicher motors	71.70	74.42	75.64	75.42	-
Mahindra & Mahindra	70.39	67.30	70.77	76.15	75.85

Interpretation

There is not much change in material cost composition of Ashok Leyland. Tata Motors has shown no steady trend.

Eicher Motors has shown an increasing trend and by and large Mahindra and Mahindra has shown an increasing trend

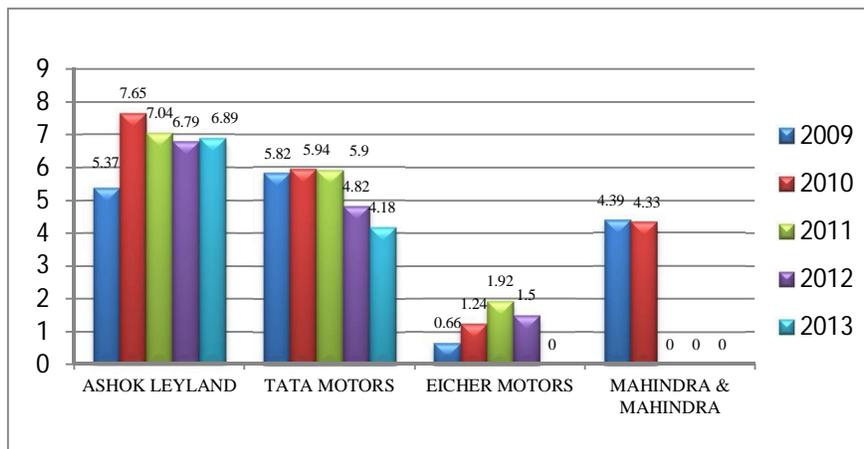


Fig. 7: Imported Composition of Raw Material Consumed

Interpretation



Imported composition of raw material increased in 2010 in Ashok Leyland but it declined thereafter. Tata Motors showed an increasing trend till 2011 and showed a declining trend thereafter. Eicher Motors showed an increasing trend till 2011 and declined in 2012. Mahindra and Mahindra showed a declining trend. Thus no industry showed a steady trend in imported composition of raw material.

Conclusion

Inventory management is important for keeping costs down, while meeting regulations. The techniques of inventory management help in determining the optimum level of inventory as well as how much should be ordered and when it should be ordered

The researcher has done a case study of Ashok Leyland Ltd with the help of ABC Analysis, XYZ Analysis, FSN Analysis and HML Analysis. Moreover the findings and suggestions given in this study would help the organization in curbing the costs and increasing the profitability.

A comparative study of Ashok Leyland It is concluded that inventory management at Ashok Leyland is excellent and followed as a policy. More careful vigilant and optimize inventory management is practiced especially with regard to imported items.

Recommendations

- A close monitoring and stringent control is required for "A" class items. Class "C" items account for the focus is required on "A-F" items. The company should take more effort to reduce an item which falls under "A-N" and "C-N" categories.
- "A-H" items require higher control measures. In respect of other items, lower control is sufficient because

unit values more than 10000 are classified as "H" and there are 5610 "H" items

- Quick disposal of "N-H" items is advisable since it has high unit value. Even though the unit value is low for "N-L" items non-moving items involved are very huge. So it has to be disposed at optimum price.

References

Maheshwari S.N "Financial Management" sultan chand and sons 14th edition,1997

Prasana Chandra "Fundamentals of Financial Management" Tata McGraw hill publication ltd, 3rd edition.

Chary S.N "Production and Operation Management" Tata McGraw hill publication ltd, 1966.

Menon K.S "Purchasing and Inventory Control" wheels publication, 1997.

Gopalakrishnan A.P "Purchase and Materials Management" Tata McGraw hill publication ltd, 1993.

- <http://www.theinternationaljournal.org/ojs/index.php?journal=rjitsm&page=article&op=view&path%5B%5D=2074&path%5B%5D=pdf>
- <http://www.moneycontrol.com/financials/eichermotors/ratios/EM>