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Analysis of Inventory Management of Selected Plastic Industries in Manipur

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Abstract:
Inventory occupies a vital position in the structure of working capital as it constitutes the major part of current assets. Maintaining inventories is necessary to every business enterprises since without inventories the operating cycle of the firm is not completed. The importance of inventory management is reflected in the profitability and liquidity of the firm. Most of the financial managers spent their valuable time in managing current assets and current liabilities of the firm. The effective control of inventories helps in achieving better operational results and reduces investment in working capital. Maintenance of adequate inventory is necessary in order to protect the business from adverse effects in times of emergencies. This paper focuses attention on the importance of inventory management and evaluates the performance in the sphere of size of inventory, growth of inventory and adequacy of inventory in the selected plastic industries in Manipur.

Keywords: *Current assets, inventory, profitability, structure, working capital*

1. Introduction

Inventory occupies a very important place in the structure of working capital as it constitutes the most significant part of current assets. Maintaining inventories is necessary to every business because without inventories the operating cycle of the firm cannot continue (Talekar, 2005).As a matter of fact, inventories are very important to the management of an enterprise as they have direct impact on the firm's profit (Periasamy, 2005).It is, therefore, absolutely imperative to manage inventories efficiently and effectively, in order to avoid unnecessary investment (Pandey ,2010).

The term inventory is used for several meanings. The dictionary or literary meaning of the term 'inventory' is 'stock of goods'. It is composed of goods that will be sold in future in the normal course of business operations (Basava, 1997).

The classified definition of inventory is that it is idle resource of any kind having an economic value (Gopikrishnan, 1991). From this we can identify inventory as those materials which are procured, stored and used for day to day functioning of the business enterprise. Inventory is also defined as the goods held for the eventual resale by the firm (Hampton, 1980). To the financial executives, it connotes the value of raw materials, consumables, spares, work-in-progress and finished goods in which company's working capital funds have been invested (Gopikrishnan, 1991).

When the term inventory is used in a manufacturing concern it exists in various forms such as: Raw materialsare those basic inputs that are converted into finished product through the manufacturing process. Raw material inventories are those units which have been purchased and stored for future productions; Work-in-progressinventories are semi finished goods which represent products that need to be processed before they become finished goods for sale; finished goods inventories are those completely manufactured products which are ready for sale; Stores and Spares include office and plant maintenance materials. In the present study, the definition of inventory is held related to a manufacturing concern.

2. Literature Review

Agrawal (1977) made a study at the University of Delhi on the "Management of Working Capital" in respect of certain large manufacturing and trading public limited companies. He observed that although most of the companies were making use of modern control techniques in the areas of inventory, receivables and cash management, there appeared a sufficient scope for reduction in investment in almost all the segments of working capital. His study also revealed that the majority of the industries have failed to plan their working capital requirements properly and there exists ample scope for the improvement in the management of working capital.

Lal (1981) in his study on Modi Steels Ltd. as a case study, with an objective of analyzing inventory management.Having found that the company did not take into account the price variable in inventory management whereas Mr. Lal developed a model which included the price variable. The study strongly recommended concrete policies, which should take care of both internal and external factors into account, for efficient management of working capital.

Swami (1987) in his study on "Materials Management in public Sector Undertakings" took five central public sector enterprises in the state of Rajasthan.

The study revealed that the inventory alone constituted 61% of total current assets during the study period (1977-82). The growth of inventories during the period found to be very high indicating no control. The study concluded that the materials management in selected companies was not satisfactory and recommended for improvement through continuous monitoring and necessary action.

Jain (1993) studied seven paper companies in India to analyze the basic components of working capital. The study revealed that the current ratio in public sector undertakings during the study period was found to be highly erratic while the same in private undertakings registered continuous decrease. As far as the inventory was concerned the study revealed that it was highly unplanned in public sector undertakings units when compared to private sector units. The study contributed much in terms of realizing the importance of effective management of working capital management.

Tanwar and Shah (2012) conducted a study on Analysis of inventory management of selected companies in India. The study revealed that the size of inventory, inventory to current assets and inventory to working capital turnover ratio showed a fluctuating trend in the sampled companies during the study period.

3. Objectives

The objectives of the paper are:

1. To examine the overall quantum of inventory maintained by the industries under study.
2. To carry out analysis on the inventory turnover ratios of the industries.
3. To examine the inventory management practices of the industries.

4. Hypotheses

- Ho1= Inventory turnover ratio does not differ significantly among the selected plastic industries over the years.
- Ho2= Inventory turnover ratio of selected plastic industries does not differ significantly among the years.

5. Research Methodology

The study is based on the analysis of data from the annual balance sheet, profit and loss accounts and past financial records of the selected plastic industries located in the state of Manipur. In the present study, the observed secondary data is used for financial analysis purpose. In the course of analysis, use of various accounting and statistical techniques have been made. Accounting techniques include ratio analysis and trend analysis. The statistical techniques such as arithmetical mean, standard deviation, coefficient of variation, maximum, minimum, simple and average growth rates have been applied. The uses of all this techniques at different places have been made in the light of nature and suitability of data available and also requirements of analysis.

6. Sampling Design

Keeping in mind the need for an in-depth analysis of the working capital management of plastic industries, a group of nine (9) plastic industries manufacturing plastic products and registered as Micro, Small and Medium Enterprises (MSMEs) in Manipur have been selected on the basis of judgment sampling method.

There are 15 plastics industries operating in the state of Manipur. These industries are registered in the District Industries Centers and Directorate of Commerce and Industries, Government of Manipur. In order to select the industries for the purpose of study first of all, the list of those industries having financial records for six years or more has been prepared which shows nine (9) such industries. Thus, nine (9) plastic industries have been selected out of 15 plastic industries for the purpose of the study and seem to have represented the plastic industries as a whole in the State of Manipur.

7. Size and Trends in Inventory

Inventory occupies a major share in working capital of plastic industries under study. On an average 25% to 90% of the amount of working capital of plastic industries is blocked in inventories. Major part of inventory is formed by stock of finished goods. Thus, inventory management is crucial part of financial management of plastic industries.

Table No.1 shows the size, trend and growth of inventories in plastic industries under study. Growth is shown for every year for the period of six years from 2008-09 to 2013-14 for each year. For constructing growth, trend indices are used. The base year taken to construct the trend indices is 2008-09.

Sl. No.	Name of the Industry	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
1	AMRO Plastic Industry	176.16	201.30	226.18	397.90	300.77	560.54
2	BISRA Polymers	458.58	600.84	844.07	1090.87	1303.74	2214.98
3	DEBCHAN Plastic Industry	154.78	175.47	367.27	402.78	406.47	852.14
4	KAMAL Poly Industry	299.75	267.47	327.22	402.27	592.35	260.83
5	KSHIS Plastic Industry	347.18	1224.67	739.94	1533.64	1214.16	1724.99
6	LISMART Industries	402.95	402.51	348.93	602.05	499.53	717.35
7	MANIPUR Plastic Industry	469.10	592.00	683.39	1735.30	2786.43	2788.23
8	RANJOY Plastic Industry	145.70	163.62	230.36	180.36	834.93	651.07
9	S.J. Plastic Enterprises	220.17	425.58	631.35	825.64	821.55	1076.61
10	Industry Average	298.15	450.38	488.75	752.06	756.38	1205.19

Table 1: Total Investment in Inventory (` in lakhs)

Source: Annual Audited Financial Statements and Records of Sampled Industries.

The above table shows the industry-wise investment in inventory and year-wise investment of the industries with the industry average at the end. It is observed that the average investment in inventory for the year 2008-09 was `. 298.15 lakhs and reached to `.1205.19 lakhs in the year 2013-14, which shows the average growth rate at 50.70% per annum.
The highest investment in inventory is shown by Manipur plastic industry in 2013-14 and the lowest is shown by Ranjoy plastic industry in 2008-09. All the plastic industries under study have shown an increasing trend in the inventory over the period of study. The increasing trend is due to the purchase of virgin raw materials, holding extra raw materials and holding finished products in stock in order to avoid disruption in the production process and maximize the profit through continuous sales.

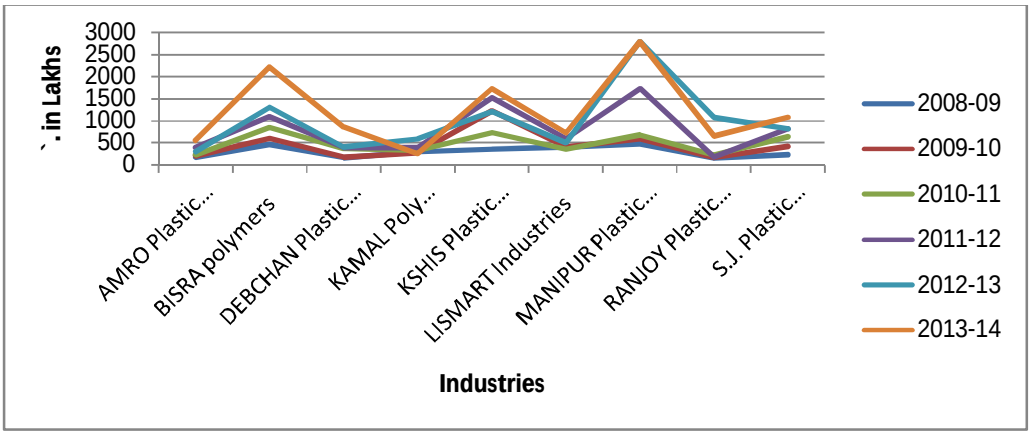

Figure 1:Total Investment in Inventory of Sampled Industries
Source: Computed from Table No.1

Table No. 2 shows the growth indices in inventories of the sampled industries during the period of study. All the industries showed a fluctuation in the investment in inventory due to changes in the price level and demand for their products.

Sl.No	Name of the Industry	Mar-09	Mar-10	Mar-11	Mar-12	Mar-13	Mar-14
1	AMRO Plastic Industry	100.00	114.27	112.36	175.92	75.59	186.37
2	BISRA Polymers	100.00	131.02	140.48	129.24	119.51	169.89
3	DEBCHAN plastic Industry	100.00	113.37	209.31	109.67	100.92	209.96
4	KAMAL Poly Industry	100.00	89.23	122.34	122.93	147.25	44.03
5	KSHIS Plastic Industry	100.00	352.75	60.42	207.26	79.17	142.07
6	LISMART Industries	100.00	99.89	86.69	172.54	82.97	143.60
7	MANIPUR Plastic Industry	100.00	126.20	115.43	253.92	160.57	100.06
8	RANJOY plastic Industry	100.00	112.30	140.79	78.29	462.92	77.97
9	S.J. Plastic Enterprises	100.00	193.30	148.35	130.77	99.50	131.05
10	Industry Average	100.00	148.04	126.24	153.39	147.22	133.89

Table 2:Trend Analysis of Total Inventory in Sampled Industries (%)
Source: Annual Audited Financial Statements and Records of the Sampled Industries.

The highest fluctuation trend was observed in Kshis plastic industry. Growth indices are comparatively high in Ranjoy plastic industry, Kshis plastic industry and Manipur plastic industry than other industries. Ranjoy plastic industry showed the highest growth of inventory at 462.92% in 2012-13 and Kamal poly industry showed the lowest growth of inventory at 44.03% in 2013-14. The lower growth of inventory in the sampled industries is due to low production in some of the particular years of the study.

8. Adequacy of Inventory

Table No. 3 shows inventory turnover ratio of the plastic industries under study. Ratios are computed for every year from 2008-09 to 2013-14. The ratio is computed by using the formula net sales divided by average inventory. The average inventory is calculated as opening stock of inventory plus closing stock of inventory divided by two. This ratio shows the operation of working capital.
It can be observed from study that the average inventory turnover ratio of Amro plastic industry was 10.28:1, which is higher than the industry average. Highest inventory turnover ratio recorded was 11.50 in 2010-11. It shows the adequate inventory utilization of the industry. The lowest ratio registered in 2012-13 was 8.90, which is also higher than the industry average.

Sl. No.	Name of the Industry	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Average
1	AMRO Plastic Industry	10.05	11.10	11.50	10.50	8.90	9.60	10.28
2	BISRA Polymers	4.45	4.30	3.20	5.20	7.80	5.10	5.01
3	DEBCHAN Plastic Industry	2.60	2.60	3.30	5.60	3.40	3.70	3.53
4	KAMAL Poly Industry	7.80	6.90	8.60	10.50	10.20	9.80	8.97
5	KSHIS Plastic Industry	12.42	18.93	12.27	9.50	11.00	7.60	11.95
6	LISMART Industries	5.50	6.40	6.20	7.60	6.50	6.50	6.45
7	MANIPUR Plastic Industry	16.80	15.10	16.10	13.40	12.70	14.30	14.73
8	RANJOY Plastic Industry	3.50	4.60	4.90	5.30	6.30	7.30	5.32
9	S.J. Plastic Enterprises	12.10	10.80	10.00	12.60	10.30	10.30	11.02
10.	Industry Average	8.36	8.97	8.45	8.91	8.57	8.24	8.57

Table 3: Inventory Turnover Ratios of the Sampled Industries
Source: Annual Audited Financial Statements of the Sampled Industries.

9. Hypothesis Testing-1

- Ho_1: Inventory turnover ratio does not differ significantly among the selected plastic industries over the years.

Source of Variation	SS	DF	MS	F	Sig.	Fcrit.
Between Groups	669.687	8	83.711	27.453	0.000	2.800
Within Groups	137.214	45	3.049			
Total	806.901	53				

Table 4: Result of One-Way ANOVA
Source: Computed from Table No.3

9.1. F-Test between the Industries

The above table of one-way ANOVA shows that the calculated value of F ratio (27.453) is higher than the table value of F (2.800) at 1% significance level. This leads to the rejection of null hypothesis and acceptance of alternate hypothesis. Therefore, it can be concluded that the inventory turnover ratio differs significantly among the selected plastic industries over the years.

10. Hypothesis Testing-2

- Ho_2: Inventory turnover ratio of selected plastic industries does not differ significantly among the years.

Source of Variation	SS	DF	MS	F	Sig.	F crit.
Between Groups	3.961	5	0.792	0.047	0.999	2.450
Within Groups	802.940	48	16.728			
Total	806.901	53				

Table 5: Result of One-Way ANOVA
Source: Computed from Table No.3

10.1. F-Test within the Years

The one-Way ANOVA table shows that the calculated value of F ratio (0.047) is lower than the table value of F (2.45) at 1% significance level. This leads to the acceptance of the null hypothesis and rejection of the alternate hypothesis. Hence, it can be concluded that inventory turnover ratio of selected plastic industries does not differ significantly among the years.

11. Results and Discussions

Results from this study indicate that inventory occupies a major portion in the structure of working capital. It is generally accepted that holding of inventories results into cost and benefits of the business enterprises. Therefore, management of inventories affects the profitability of the business firms. All the industries showed a fluctuation in the investment in inventory due to changes in the price level and demand for their products. The lower growth of inventory in the sampled industries is due to low production in some of the particular years of the study.

Inventory turnover ratio is also is also known as stock turnover ratio in the traditional language. It assists the financial manager in evaluating inventory policy to avoid any danger of over-stocking. It expresses the relationship between cost of goods sold or sales and average inventory for the period. Lower inventory turnover ratio indicates inefficient use if inventories in the industries.

The inventory turnover ratio analysis reveals that there were adequate inventory in all plastic industries under study during the period of six years. The highest average inventory ratio observed was 14.73 times in Manipur plastic industry, which indicates too much holding of inventories in stock. It results into high inventory holding costs which is the sign of inefficient management of

inventory. The lowest average inventory turnover ratio of 3.53 times is shown by Debchan plastic industry, which reveals efficient management of inventory during the period of study. The overall industry average inventory turnover ratio shows low speed of sales and consumption of raw materials which results excess inventories in the plastic industries under study during the period of six years.

Inventory turnover ratio shows efficient management of inventory in the plastic industries. It indicates shortage of inventory in stock and becomes frequent stoppage of operation in the manufacturing cycle. Higher ratio indicates efficient use of inventory in the industries. The inventory turnover ratio analysis revealed that there was inadequate inventory in all the plastic industries studied.

All important aspects like purchase of raw material, production of plastic products and sale of finished products are controlled by the proprietors in most of the plastic industries under study. So, they need to take advice from the concerned executives of the respective industries.

12. Conclusions

The present study observed that all the plastic industries under study are not making adequate profits due to various factors. Financial position of some of the plastic industries is very weak. The experience of plastic industries in Manipur has proved that the manufacturing units in the industry sector, if managed well, can provide a good scope for the economic development of the state. Inspite of this success, the plastics industries in Manipur are facing various problems and have become a centre of criticism due to several reasons. It has been a common observation that plastic industries in the state of Manipur are lagging behind in managerial efficiency.

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