Inventory Management in Sugar Industry of Kumaon Region of Uttarakhand

Dr. Shalini Tamta¹, Prof. B.P. Singhal²
¹Assistant Teacher, Ex. Research Scholar, Department of Commerce, Kumaun University, S.S.J. Campus Almora, Uttarakhand, INDIA
²Campus Head, Department of Commerce and Management Studies, Kumaun University S.S.J. Campus Almora, Uttarakhand, INDIA

ABSTRACT

Inventory constitutes a major portion of the working capital and constitutes the most significant part of current assets of a large majority of companies in India. On an average, inventories are approximately 60% of current assets in public limited companies in India. Because of the large size of inventories maintained by firms, a considerable amount of fund is required to be committed to them. It is, therefore, absolutely imperative to manage inventories efficiency and effectively in order to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately. In a manufacturing unit usually about 20 to 30% of the total assets are in the form of inventory and its efficient management should ultimately result in the maximization of the owners wealth. Factors influencing inventories are lead time, cost of holding inventory, re-order point, stock, variety reduction, material planning, service level, obsolete inventory and scrap & quality discounts. The study reveals that it seems that there is no consistent relationship between turnover and current ratio and their relationship cannot be judged. Analysis of inventory conversion period reveals that the lesser the number of days more quickly the inventory is sold. In this study it is clear that there is no satisfactory inventory control system relating to stores inventory. The sugar mills should try to increase the production so as to get economics of large scale production. In order to increase the profitability of the companies, it is suggested to control the cost of goods sold and operating expenses. The management should try to adopt cost reduction techniques in their firms to get over this critical situation. There is no accountability because no one is held responsible for a failure in achieving targets. For overcoming this kind of problem responsibility centre should be created.

Keywords— Stock Control, Inventory, ANOVA

I. INTRODUCTION

An inventory constitutes a major portion of the working capital. Thus, managing working capital is synonymous with controlling inventories. Inventories constitute the most significant part of current assets of a large majority of companies in India. On an average, inventories are approximately 60% of current assets in public limited companies in India. Because of the large size of inventories maintained by firms, a considerable amount of fund is required to be committed to them. It is, therefore, absolutely imperative to manage inventories efficiency and effectively in order to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately. In a manufacturing unit usually about 20 to 30% of the total assets are in the form of inventory and its efficient management should ultimately result in the maximization of the owners wealth. The financial manager is actually a kind of a watch dog over other functional areas. An efficient management of inventory is an essential requirement for the success of the enterprise. The inventory of manufacturing concern is classified into the following types- raw material, work in progress and finished goods. Factors influencing are lead time, cost of holding inventory, re-order point, stock, variety reduction, material planning, service level, obsolete inventory and scrap & quality discounts.

II. OBJECTIVES OF THE STUDY

The objectives of the study is to assess the significance of inventory and inventory management by few important parameters like inventory turnover ratio, inventory to current assets, inventory to working capital ratio etc. To ensure an adequate supply of materials, stores, spares etc. minimize stock outs and shortage and avoid costly interruption in operation and to bring down the inventory carrying cost which is considerable.
III. RESEARCH METHODOLOGY

The first hand information gathered by the researcher reveals that about ten units of sugar mills are running into the Kumaon region of Uttarakhand of which six units are in co-operative sector and the rest are in corporate sector. A sample of 50% units representing the whole industry was selected i.e. the Kisan Sahkari Chini Mill Ltd. Gadarpur (KSCML-G), The Bazpur Co-operative Sugar factory Ltd. (BCSFL), The Kisan Sahkari Chini Mill Ltd. Nadehi (KSCML-N), The Kisan Sahkari Chini Mill Ltd. Sitarganj (KSCML-S) and Kisan Sugar company Ltd. (KSCL). For analyzing this study ratio analysis has been done and for assessing the behavior of data statistical technique like ANOVA tests have been used in the study. For this purpose the data collected from different sources have been compiled, edited and tabulated in suitable and appropriate format to facilitate a more meaningful analysis.

The present study is mainly based on secondary data collected from annual published financial statement and other document. The period of study is from 2006 to 2010; hence the data were collected related to this period only.

Hypothesis: - Null, Alternative

IV. DISCUSSION

Before analyzing inventory management practices in sugar industry the audit reports about inventory management contained in annual reports of sugar units under study reveals the following facts which are significant under the study of inventory management.

V. INVENTORY VALUATION

The industry has not followed the mandatory accounting standard As-2 (Accounting Standard) are the statement code of practice of the regulatory accounting bodies that are to be observed in the preparation and presentation of financial statements. In layman terms, accounting standards are the written document issued by the experts institutes or other regulatory bodies covering various aspect of measurement, treatment, presentation and disclosure of accounting transactions (Source: www.joshiapte.com). On valuation of inventories issued by the institute of charted accountants of India, but has followed its past practice of valuing stock of finishing sugar, molasses without considering excise duty liability.

VI. STORES INVENTORY

The following facts are revealed from the auditor’s report. There is no inventory control system relating to stores inventory. On our examination we found an amount is blocked up in non moving stores items.

(a) Stores are not identified in the form of surplus slow moving and non-moving.
(b) A huge amount is blocked up in non-moving items having considerable value has blocked working capital.
(c) Valuation of store inventory has been made on weighted average price method.

ACCOUNTING POLICIES ABOUT INVENTORY

Inventories: The valuation of inventory has not been as per mandatory standard As-2 issued by the institute of charted Accountants of India, but following the past practice the management has taken, valued and certified the inventory as under:

(a) Sugarcane: All Cost
(b) Finished Sugar
(1) Levy Sugar: At Govt. Rates
(2) Free Sale Sugar: At Net realizable value or cost price whichever is less.
(c) Molasses: At Market price determined by stale Govt.
(d) Sugar in Process: Valued on cost of sugar vane added with manufacturing expenses thereon.
(e) Molasses in Process: At market price net realizable price.
(f) Baggage: At weighted average cost.

The evaluation of inventory is significant from the stand point of both the balance sheet and the income statement. In the former, the inventory influences the current assets, the total assets, the ratio of current assets and current liabilities and working capital. In the later the inventory evaluation may influence the sale and the profits. In view of the above, an attempt has been made to analyze inventory management practices in sugar industry by taking inventory as component of the current assets, the total assets, working capital, the ratio of current assets and the current liabilities along with its impact on profitability.

VI. INVENTORY TURNOVER

Inventory turnover ratios of all the units under study have been tabulated year wise in table No.1 this turnover ratio has been calculated under:

The inventory turnover ratio is shown as:

SALES
AVERAGE STOCK
VII. INVENTORY CONVERSION PERIOD OR STOCK VELOCITY

Sometimes, the stock velocity may be calculated in terms of period i.e. to know the time taken to clear the stock, is referred to as inventory conversion period. It is calculated as:

\[
\text{INVENTORY CONVERSION PERIOD (No. of days)} = \frac{\text{No. of days}}{\text{Inventory Turnover}}
\]

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCML-G</th>
<th>BCSFL</th>
<th>KSCML-N</th>
<th>KSCML-S</th>
<th>KSCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1.09</td>
<td>1.23</td>
<td>1.16</td>
<td>1.26</td>
<td>1.16</td>
</tr>
<tr>
<td>2007</td>
<td>1.19</td>
<td>1.23</td>
<td>1.64</td>
<td>1.24</td>
<td>1.50</td>
</tr>
<tr>
<td>2008</td>
<td>1.50</td>
<td>0.71</td>
<td>0.81</td>
<td>0.87</td>
<td>0.66</td>
</tr>
<tr>
<td>2009</td>
<td>0.10</td>
<td>1.23</td>
<td>1.25</td>
<td>1.19</td>
<td>1.17</td>
</tr>
<tr>
<td>2010</td>
<td>1.51</td>
<td>2.15</td>
<td>1.99</td>
<td>3.08</td>
<td>4.59</td>
</tr>
<tr>
<td>Total</td>
<td>5.39</td>
<td>6.55</td>
<td>6.85</td>
<td>7.64</td>
<td>9.08</td>
</tr>
<tr>
<td>Average</td>
<td>1.078</td>
<td>1.31</td>
<td>1.37</td>
<td>1.528</td>
<td>1.818</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Reports

VIII. INVENTORY TURNOVER (ONE WAY ANOVA TEST)

Ho: Null Hypothesis: There is no significant difference in turnover of firm under study.

H1: Alternative Hypothesis: There is significant difference in inventory turnover of firms under study.

Level of significance: 5 percent
Critical value: 3.01
Degree of freedom: 16

IX. INVENTORY TURNOVER RATIO (ONE WAY ANOVA TEST)

Table no 3

<table>
<thead>
<tr>
<th>Sum of variance</th>
<th>Sum of squares</th>
<th>Degree of freedom</th>
<th>Mean sum of squares</th>
<th>Calculated value of F</th>
<th>Tabulated value of F at 9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>10.277</td>
<td>4</td>
<td>2.569</td>
<td>6.783</td>
<td>3.01</td>
</tr>
<tr>
<td>Distinct</td>
<td>1.500</td>
<td>4</td>
<td>0.375</td>
<td>0.990</td>
<td>3.01</td>
</tr>
<tr>
<td>Error</td>
<td>6.060</td>
<td>16</td>
<td>0.378</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Since, the calculated value of F for year is more than the tabulated value of F, we accept the alternative hypothesis and conclude that there is significant difference between them.

**Percentage of Inventory in current assets**

Percentage of Inventory in current assets of all units under study has been tabulated year wise in table no. 4. It has been calculated as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCL-G</th>
<th>KSCL-N</th>
<th>KSCL-S</th>
<th>KSCML</th>
<th>BCSFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>92</td>
<td>88</td>
<td>80</td>
<td>88</td>
<td>81</td>
</tr>
<tr>
<td>2007</td>
<td>91</td>
<td>88</td>
<td>67</td>
<td>88</td>
<td>78</td>
</tr>
<tr>
<td>2008</td>
<td>92</td>
<td>94</td>
<td>79</td>
<td>89</td>
<td>86</td>
</tr>
<tr>
<td>2009</td>
<td>88</td>
<td>92</td>
<td>74</td>
<td>93</td>
<td>87</td>
</tr>
<tr>
<td>2010</td>
<td>85</td>
<td>65</td>
<td>64</td>
<td>78</td>
<td>54</td>
</tr>
</tbody>
</table>

Source: Computed from Annual Reports.

**Unit wise analysis**

**KSCML-G** – This table reveals that in 2006 percentage of inventory in current assets 92% after that in slightly decreased and increased in 2007 and 2008 but respectively i.e. 91% in 2007 and 92% in 2008 but in 2009 and 2010 again it decreased to 88% and 85% respectively. In 2006 and 2008 highest percentage of stock in current assets showed.

**BCSFL:** In 2006 and 2007 same percentage of stock in current assets showed by this table i.e, 88% but in 2008 it increased to 94% which was highest in this year thereafter it went on declining trend and lead to 65% which was lowest on 2010.

**KSCML-N:** Inventory in current assets 80% which was highest in the year 2006 thereafter there was increase and decrease during this study period and lead to 64 percent which was lowest in the year 2010.

**KSCML-S:** In 2006 and 2007 percentage of inventory in current assets remained constant i.e, 88% after that it went on increasing trend and lead to 93% which was highest in 2009 but in 2010 it decreased to 78% which was lowest in this year.

**KSCL:** In 2007 percentage of inventory in current assets decreased to 78% from 81% in 2006 after that it went on the year 2009 increasing track and lead to 87% which was highest but in 2010 again it decreased to 54% which was lowest in this year.

**X. PERCENTAGE OF INVENTORY IN CURRENT ASSETS (One way Anova Test)**

**Ho: Null Hypothesis:** There is no significant difference of inventory in current assets of firm under study.

**H1: Alternative Hypothesis:** There is significant difference in percentage of inventory in current assets of firms under study

- Level of Significance : 5%
- Critical value: 3.01
- Degree of freedom : 16

**Percentage Of Inventory In Current Assets (One Way Anova Test)**

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCL-G</th>
<th>KSCL-N</th>
<th>KSCL-S</th>
<th>KSCML</th>
<th>BCSFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>37</td>
<td>62</td>
<td>32</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>2007</td>
<td>29</td>
<td>62</td>
<td>35</td>
<td>27</td>
<td>49</td>
</tr>
<tr>
<td>2008</td>
<td>34</td>
<td>64</td>
<td>42</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>2009</td>
<td>33</td>
<td>55</td>
<td>34</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>2010</td>
<td>24</td>
<td>27</td>
<td>23</td>
<td>20</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Reports

**Unit wise analysis**

**KSCML-G:** This table demonstrates that percentage of inventory in total assets fluctuating during this study period. In 2006 this percentage 37 which was highest in this year and after fluctuation this percentage leads to 24 which was lowest in the year 2010.

**BCSFL:** This table reveals that percentage of inventory in current assets 70% which was highest in the year 2006 thereafter. There was increase and decrease during the
study period and lead to 27 percent which was lowest in the year 2006.

**KSCML-N:** Percentage of inventory in total assets 62% which was highest in the year 2006 after that there was increase and decrease during the study period and lead to 20% which was lowest in the year 2010.

**KSCML-S:** During the study period there was increase and decrease. In 2006 percentage of inventory in total assets showed 60% which was highest in this year and lead to 34% which was lowest in the year 2010.

**KSCL:** In 2006 it showed 60 percent which was highest in this year and there was increase and decrease during the study period and lead to 34% which was lowest in the year 2010.

**XI. PERCENTAGE OF INVENTORY IN TOTAL ASSETS (One way Anova Test)**

_Ho: Null Hypothesis:_ There is no significant difference in percentage of inventory in total assets of firm under study.

_H1: Alternative Hypothesis:_ There is significant difference in percentage of inventory in total assets of firms under study.

*Level of Significance: 5%*

*Critical value: 3.01*

*Degree of freedom: 16*

**Percentage of Inventory in total Assets (One Way Anova Test)**

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCML-G</th>
<th>BCSFL</th>
<th>KSCML-N</th>
<th>KSCML-S</th>
<th>KSCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1.09</td>
<td>-5.26</td>
<td>1.23</td>
<td>3.22</td>
<td>1.16</td>
</tr>
<tr>
<td>2007</td>
<td>1.19</td>
<td>-17.38</td>
<td>1.23</td>
<td>18.03</td>
<td>1.64</td>
</tr>
<tr>
<td>2008</td>
<td>1.50</td>
<td>-13.40</td>
<td>0.71</td>
<td>-1.10</td>
<td>0.81</td>
</tr>
<tr>
<td>2009</td>
<td>0.10</td>
<td>0.67</td>
<td>1.23</td>
<td>-2.24</td>
<td>1.25</td>
</tr>
<tr>
<td>2010</td>
<td>1.51</td>
<td>-14.19</td>
<td>2.15</td>
<td>-5.35</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Reports

**Unit wise Analysis**

**KSCML-G:** This table demonstrate that from 2006 to 2008 inventory turnover increased on the other hand loss also declined but in 2009 inventory turnover decreased and loss thereafter in profit changed again this turnover increased and profit changed into loss in the year 2010.

**BCSFL:** In 2006 and 2007 this turnover remains constant on the other hand loss increased from 3.22 to 18.33. In 2008 this turnover and loss both were decreased after that in 2009 and 2010 inventory turnover and loss both were increased.

**KSCML-N:** From 2006 to 2007 inventory turnover and loss both were increased but in 2008 both were decreased and 2009 and 2010 inventory turnover increased on the other hand loss decreased in 2009 and increased in 2010.

**KSCML-S:** From 2006 to 2008 inventory turnover went on declining trend on the contrary loss also declining after that this turnover increased in 2009 and 2010 but loss in 2009 went on decline and in 2010 increased and lead to 8.58.

**KSCL:** From 2006 to 2007 inventory turnover increased in 2006 there was loss but in 2007 and 2008 there was no profit no loss after that in 2009 and 2010 inventory turnover increased on the other hand there was loss in 2009 but profit 2010.

**XII. IMPACT OF INVENTORY TURNOVER ON PROFITABILITY**

Impact of inventory turnover on profitability has been showed as table no-8 the following has calculated as under:

**XIII. RELATIONSHIP BETWEEN INVENTORY TURNOVER & WORKING CAPITAL**

Relationship between inventory turnover & working capital has been showed as table No. 9 the following has calculated as under:
Relationship Between Inventory Turnover & Working Capital
Table No. 9

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCML-G</th>
<th>BCSFL</th>
<th>KSCML-N</th>
<th>KSCML-S</th>
<th>KSCL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inventory Turnover</td>
<td>Working Capital</td>
<td>Inventory Turnover</td>
<td>Working Capital</td>
<td>Inventory Turnover</td>
</tr>
<tr>
<td>2006</td>
<td>2.09</td>
<td>38.59</td>
<td>2.23</td>
<td>46.61</td>
<td>1.36</td>
</tr>
<tr>
<td>2007</td>
<td>1.99</td>
<td>32.18</td>
<td>2.57</td>
<td>31.57</td>
<td>1.64</td>
</tr>
<tr>
<td>2008</td>
<td>1.50</td>
<td>27.02</td>
<td>0.71</td>
<td>41.50</td>
<td>0.81</td>
</tr>
<tr>
<td>2009</td>
<td>1.00</td>
<td>38.44</td>
<td>2.13</td>
<td>34.14</td>
<td>1.25</td>
</tr>
<tr>
<td>2010</td>
<td>1.51</td>
<td>28.02</td>
<td>2.15</td>
<td>20.94</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Reports

Unit wise Analysis
KSCML-G: This table demonstrates that inventory turnover increased from 2006 to 2007 on the other side working capital decreased. In 2008 this turnover decreased but working capital increased and in 2010 inventory turnover increased and working capital decreased.

BCSFL: From 2006 to 2007 inventory turnover remain constant and working capital decreased. In 2008 this turnover decreased and working capital increased thereafter it went on increasing trend in 2009 and 2010 on the other side working capital also increased.

KSCML-N: From 2006 to 2007 this turnover increased and working capital decreased. In 2008 this turnover decreased and working capital increased after that inventory turnover went on increasing trend on the other side working capital decreased in 2009 and increased in 2010.

KSCML-S: From 2006 to 2007 inventory turnover went on a declining trend after that it increased to 1.19 and 3.08 in 2009 and 2010 respectively. On the other hand working capital decreased in 2007 and increased in 2008 and 2009 but decreased in 2010.

KSCL: Inventory turnover increased from 2006 to 2007 and decreased in 2008. On the other side working capital decreased from 2006 to 2007 and increased in 2008 after that it went on increasing on the other hand working capital fluctuate during the study period.

XIV. RELATIONSHIP BETWEEN INVENTORY TURNOVER & CURRENT RATIO

Relationship between inventory turnover & current ratio has been showed as table No. 10 the following has calculated as under:

Relationship Between Inventory Turnover & Current Ratio
Table No. 10

<table>
<thead>
<tr>
<th>Year</th>
<th>KSCML-G</th>
<th>BCSFL</th>
<th>KSCML-N</th>
<th>KSCML-S</th>
<th>KSCL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inventory Turnover</td>
<td>Current Ratio</td>
<td>Inventory Turnover</td>
<td>Current Ratio</td>
<td>Inventory Turnover</td>
</tr>
<tr>
<td>2006</td>
<td>2.09</td>
<td>3.08</td>
<td>1.36</td>
<td>2.08</td>
<td>1.26</td>
</tr>
<tr>
<td>2007</td>
<td>1.99</td>
<td>3.08</td>
<td>1.64</td>
<td>2.08</td>
<td>1.24</td>
</tr>
<tr>
<td>2008</td>
<td>1.50</td>
<td>3.08</td>
<td>0.81</td>
<td>2.08</td>
<td>0.87</td>
</tr>
<tr>
<td>2009</td>
<td>1.00</td>
<td>3.08</td>
<td>1.25</td>
<td>2.08</td>
<td>1.19</td>
</tr>
<tr>
<td>2010</td>
<td>1.51</td>
<td>3.08</td>
<td>2.15</td>
<td>2.08</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Reports

Unit wise Analysis
KSCML-G: Inventory turnover from 2006 to 2010 went on increasing trend except in the year 2009 on the contrary current ratio of this firm decline from 2006 after that it went on increasing upto 2009 and in 2010 again in decreased.

BCSFL: In 2006 and 2007 inventory turnover remained constant after that it decreased but in 2009 and 2010 it went on increasing on the other hand current ratio in 2007 decline from 2006 and in 2008 it remained constant thereafter it went on declining trend.

KSCML-N: In 2007 inventory turnover increased from 2006 and in 2008 it decreased to 0.81 after that it went on increasing and lead to 1.99 times in 2010. On the other side current ratio continuously declining from 2006 to 2010.

KSCML-S: Inventory turnover decline from 2006 to 2008 thereafter it went on increasing and lead to 3.08 times, on the contrary there was decrease and increase in current ratio during this study period.

KSCL: This table reveals that as like all firms inventory turnover went on declining from 2006 to 2008 after that it went on increasing and lead to 4.59 times in 2010. On the other side current ratio showed decrease and increase during this study period.

XV. CONCLUSION AND SUGGESTIONS

On the basis of above data analysis, one can conclude that:-

Relationship between inventory turnover and current ratio, impact of inventory turnover on profitability, analysis of relationship between inventory turnover and working capital and percentage of inventory in total assets and current assets registered a fluctuating trend during the period under study. Hence, the study reveals that it seems that there is no consistent relationship between turnover and current ratio and their relationship cannot be judged. Analysis of inventory conversion period reveals that the lesser the number of days more quickly the inventory is sold. Thus, the average number of days of KSCML-S is lesser than other firms. Hence, it is showing comparatively
better management of inventory. In this study it is clear that there is no inventory control system relating to stores inventory.

**SUGGESTIONS**

The sugar mills should try to increase the production so as to get economics of large scale production. In order to increase the profitability of the companies, it is suggested to control the cost of goods sold and operating expenses. The management should try to adopt cost reduction techniques in their firms to get over this critical situation. There is no accountability because no one is held responsible for a failure in achieving targets. For overcoming this kind of problem responsibility centre should be created.

**REFERENCES**