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“When the music stops in terms of liquidity, things will get complicated. But as long as the music is playing, you’ve got to get up and dance. We’re still dancing. “
- Chuck Prince, Citigroup

1. Introduction

Cash is the important current asset for the operations of the business. Cash is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realised by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm’s manufacturing operation while excessive cash will supply remain idle, without contributing anything towards the firm’s profitability. Thus a major function of the financial manager is to maintain sound cash position.

According to S.E. Balton “Cash has been described as the oil to lubricate the ever turning wheels of business; without the process grinds to a stop.”

Cash is the money which a firm can disburse immediately without any restriction. The term cash includes coins, currency and cheques held by the firm, and balances in its bank accounts. Sometimes near-cash items, such as marketable securities or bank time deposits, are also included in cash. The basic characteristic of near cash assets is that they can readily be converted into cash. Generally, when a firm has excess cash, it invests it in marketable securities. This kind of investment contributes some profit to the firm.

Cash management concerned with the managing of: i) cash flows into and out of the firm, ii) cash flows within the firm, and iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash.
2. Cash and liquidity

Cash and liquidity are two different terms and sometimes mistaken interchangeably. For an individual, it doesn’t make any difference, but for a businessman, it needs to be separated. Cash is a part of liquidity management along with other variables like inventory, accounts receivable, accrued income, outstanding expenses, etc. Cash is a vital ingredient to study the recipe of liquidity management. Cash is also an essential element as all other variables for measuring liquidity at last get converted into cash. Although cash is an important element of liquidity management, but one cannot study only cash, otherwise, it will not provide a clear picture about liquidity. Business cannot be done only through cash; it also requires money to be invested in the form of inventory, receivables, etc. So, together with all these variables, one has to study the concept of liquidity.

3. Meaning of Liquidity

Liquidity of a firm means the ability of the firm to meet its short-term current obligations or liabilities as and when they become due for payment. In fact, liquidity is a prerequisite for the very survival of a firm. The short-term creditors of the firm are interested in short-term liquidity of a firm. But liquidity also implies...
keeping in view profitability, and liquidity is required for efficient financial management.

4. Significance of liquidity management

1 Sense of security and confidence
Adequate liquidity management creates sense of security, confidence and loyalty throughout the business and also among customers, creditors and business associates. The proprietor officials or management of a concern are carefree. If they have proper liquidity arrangements because they need not to worry for the payment of business expenditure or creditors.

2 Solvency and continuous production
In order to maintain the solvency of the business, it is essential that sufficient amount of funds are available to make all the payments in time as and when they are due. In the absence of liquidity management, production will suffer, particularly in the present era of cut throat competition. A business can never flourish in the absence of adequate liquidity.

3 Sound goodwill and debt capacity
Promptness of payment in the business creates goodwill and increase the debt capacity of the business. If investors and borrowers are confident that they will get their due interest and payment of principal in time, a firm can raise funds from the market, purchase the goods on credit and borrow short term funds from banks etc.

4 Distribution of dividends
Short of liquidity, a company can not distribute dividend to its shareholders in spite of sufficient profits. To make up for the deficiency of liquidity profits are to be retained in the business. On the other hand, ample dividends can be declared and distributed. It increases market value of share.
5 **Exploitation of good opportunity**

Good opportunities can be exploited in case of adequacy of capital in a concern, for e.g. a company may take off seasonal purchases resulting in substantial savings or it can fetch big supply orders resulting in good profits.

6 **Increase in efficiency of fixed assets**

Due to proper maintenance of adequate liquidity increases the efficiency of the fixed assets of the business. Without proper liquidity, fixed assets are like a gun which can not be shoot as there is no cartidges. It has been rightly said “*the fate of large scale investment in fixed capital is often determined by a relatively small amount of current assets.*”

7 **Increased in production efficiency**

A continuous supply of raw materials, research programmes, innovations and technical developments and expansion programmes, employees training can successfully be carried out if adequate capital is maintained in the business. It increases the production capacity which increases the efficiency and morale of the employees as well.

---

5. **Factors affecting liquidity management**

1 **Nature of business**

The working capital requirement of a firm is closely related to the nature of its business. A service firm, like an electricity undertaking or transport corporation, which has a short operating cycle and which sells predominantly on cash basis, has a modest working capital requirement and deficiency of liquidity. On the other hand, a manufacturing concern like a machine tools unit, which has a long operating cycle and which sells largely on credit, has a very substantial working capital requirement, following table shows relative proportions of investment in current assets and fixed assets for certain industries.
### Proportions of current assets and fixed assets

<table>
<thead>
<tr>
<th>Current assets (%)</th>
<th>Fixed assets (%)</th>
<th>Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20</td>
<td>80-90</td>
<td>Hotel and restaurants</td>
</tr>
<tr>
<td>20-30</td>
<td>70-80</td>
<td>Electricity generation and distribution</td>
</tr>
<tr>
<td>30-40</td>
<td>60-70</td>
<td>Aluminium, shipping</td>
</tr>
<tr>
<td>40-50</td>
<td>50-60</td>
<td>Iron and steel, basic industrial</td>
</tr>
<tr>
<td>50-60</td>
<td>40-50</td>
<td>Chemical</td>
</tr>
<tr>
<td>60-70</td>
<td>30-40</td>
<td>Tea plantation</td>
</tr>
<tr>
<td>70-80</td>
<td>20-30</td>
<td>Cotton textile, sugar</td>
</tr>
<tr>
<td>80-90</td>
<td>10-20</td>
<td>Edible oils, tobacco</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trading, construction</td>
</tr>
</tbody>
</table>

(Source: Prasanna Chandra ‘Fundamentals of Financial Management’)

2 **Seasonality of operations**

Firms which have marked seasonality in their operations usually have highly fluctuating working capital requirements. For e.g., a firm manufacturing A.Cs. the sale of A.Cs. reach a peak during the summer months and drops sharply during the winter period. The need of liquidity of such a firm is likely to increase considerably in summer months and decrease significantly during the winter period. On the other hand, a firm manufacturing a product like lamps, which have fairly even sales around the year, tends to have stable liquidity in the business.

3 **Production policy**

A firm marked by pronounced seasonal fluctuations in its sales may pursue a production policy which may reduce the sharp variations in liquidity management. For e.g., a manufacturer of A.Cs may maintain a steady production throughout the year rather than intensify the production activity during peak business season. Such a production
policy may reduce the requirement of liquidity in business up to a great extent.

4 Market conditions
The degree of competition prevailing in the market place has an important bearing on liquidity needs. When competition is keen, a larger inventory of finished goods is required to promptly serve customers who may not be inclined to wait because other manufacturers are ready to meet their needs. Further, generous credit terms may have to be offered to attract customers in a highly competitive market. Thus, working capital needs tend to be high because of greater investment in finished goods inventory and accounts receivable. On the other hand, market is strong and competition is weak, a firm can manage with smaller inventory of finished goods because customers can be served with delay. Further, in such situation the firm can insist on cash payment and avoid lock up of funds in accounts receivable and even can ask for advance payment, partial or total.

5 Conditions of supply
The inventory of raw materials, spares and stores depends on the conditions of supply. If the supply is prompt and adequate, the firm can manage with small inventory. However, if the supply is unpredictable and scant then the firm, to ensure continuity of production, would have to acquire stocks as and when they are available and carry larger inventory on an average. A similar policy may have to be followed when the raw material is available only seasonally and production operations are carried out round the year.

Financing liquidity requirements

1 Accruals
The major accrual items are wages and taxes. These are simply what the firm owes to its employees and to the government. Wages are usually paid on a weekly, fortnightly or monthly basis – between payments, the amount owed but not yet paid is shown as accrued wages on the
balance sheet. Income taxes are payable quarterly and other taxes may be payable half yearly or annually. Accruals vary with the level of activity of the firm. When the activity level expands, accruals increase and vice versa. Since no interest is paid by the firm on accruals, they are often regarded as a ‘free’ source of financing. While accruals are free source of financing, they are typically not amenable to control by management. The payment period of employees is determined by the practice in industry and provisions of law.

2 Trade credit
Trade credit represents the credit extended by the suppliers of goods and services. It is a spontaneous source of finance in the sense that it arises in the normal transactions of the firm without specific negotiations, provided the firm is considered creditworthy by its suppliers. It is an important source of finance.

3 Working capital advance by commercial banks
Working capital advance by commercial banks play important role in liquidity management. They may be provided in the forms of cash credits, overdrafts, short term loans, rediscounting of bills. In addition to these forms of direct finance, commercial banks help their customers in obtaining credit from other sources through the letter of credit arrangement.

4 Public deposits
Many firms, large and small, have resorted to unsecured deposits from the public in recent years, mainly to finance their short term requirements. It is easy to take as no security is offered against it, hence the mortgageable assets of the firm are conserved, but there are some legal procedures to be followed like credit rating of company, restrictions on fund raising and it could not be more than 25% of company shares and reserves.
5 **Inter – corporate deposits**

A deposit made by one company with another, normally for a period up to six months is referred as an inter corporate deposit. Such deposits are usually of three types: call deposit, three months deposit, six months deposit. Traditionally some prosperous companies in the fold of big business houses such as Birlas and Goenkas carried substantial liquid funds meant primarily to exploit investment opportunities in the form of corporate acquisitions and takeovers. Until such opportunity arose, the liquid funds were deposited with other companies with an understanding that they would be withdrawn at short notice.

6 **Short term loans from financial institutions**

The Life Insurance Corporation of India, the General Insurance Corporation, and the Unit Trust of India provide short term loans to manufacturing companies with an excellent trade record. But there are some eligibility criteria in the form of company’s debt equity ratio, dividend payment history as interest coverage ratios etc.

7 **Rights debentures for working capital**

Public limited companies can issue “Right” debentures to their shareholders with an object of augmenting the long term resources of the company for working capital requirements.

8 **Commercial paper**

Commercial paper represents short term unsecured promissory notes issued by firms which enjoy a fairly high credit rating. Generally, large firms with considerable financial strength are able to issue commercial paper.

9 **Factoring**

A factor is a financial arrangement which offers services relating to management and financing of debts arising from credit sales, while factoring is well established in Western countries, only two factors, the SBI Factoring and Commercial Services Limited and Canbank.
Factoring Ltd., which have been mandated by the Reserve Bank of India to operate in the western region and the southern regions respectively, have been set up recently in India. The factor selects the accounts of the client that would be handled by it and establishes, along with client, the credit limit applicable to the selected accounts.

6. Monitoring and control of liquidity

The liquidity management in a business require continuous monitoring and review. The manager can adopt different tools and techniques in monitoring, evaluating, reviewing and controlling the liquidity. Some of them are as follows:

1. Monitoring the Operating cycle

The total liquidity need depend upon the length of the operating cycle, lengthier the operating cycle, the greater would be the working capital needs and vice versa. The operating cycles of the firm consist of different cycles for different elements of the working capital. In order to have an effective control over liquidity, the finance manager must monitor duration of all these individual operating cycles of different elements.
The actual operating cycle period should be ascertained for each element i.e., raw materials, the work in progress, finished goods etc., over a period of time and it should be compared with standard operating cycle period set for the same firm or for the industry as a whole. There should always an effort to reduce the length of operating cycle not only for each element but also for whole. This would help the firm have comfortable liquidity.

2 Liquidity ratios

Another analytical tool that is adopted in order to monitor the liquidity is accounting ratios. The various liquidity measurement ratios are:

- Current ratios
- Liquidity ratios
- Stock turnover ratios
- Debtors turnover ratios etc,
These ratios are used to find out the number of years to attain the emerging liquidity position of the firm. Among the above ratios, the current ratio is the most important one.

3 Monitoring the liquidity
Even though in the long run, profitability and selection of good investment are crucial to the prosperity of the firm. It is however liquidity which is critical for the survival of the firm in short run. Sufficient liquidity can be obtained through an efficient management of different elements of working capital.

Current ratio
This is a fundamental measure of firms’ financial position in the short run, its ability to meet normal operating obligations during one financial year. A higher ratio indicates a large proportion of current assets are available to meet current liabilities. Usually the higher the ratio, the better is a company’s financial position and normally the better it can meet current obligations, but at the same time, a higher current ratio would also mean that the company may have an excessive investment in current assets that does not produce sufficient return. On the other hand, a low current ratio would indicate that the sufficient cash is not available to pay current liabilities. A frequently used standard current ratio is 2:1 or 2. However there seems to be very little justification for such a standard. For some business, these may be an adequate current ratio, for others it may be a too high or too low. It highly depends upon the nature of business.
This ratio indicates whether an enterprise possesses sufficient current assets to pay off its current liabilities. This ratio is an indicator of short-term solvency or liquidity position of an enterprise. Conventional standard or ideal ratio is 2:1, i.e. the enterprise should have twice the current assets than the current liabilities, to exhibit ideal short-term solvency position. The ratio is used to assess the firm’s ability to meet its short term liabilities on times. The standard ratio 2:1 means that current assets of a business should, at least be twice of its
current liabilities. The higher the ratio, the better it is, because the firm will be able to pay its current liabilities more easily. The reason for assuming 2:1 as the ideal ratio is that the current assets include such assets as stock, debtors etc., from which full amount cannot be realised in case of need. Hence, even if half the amount is realised from the current assets on time, the firm can still meet its current liabilities in full.

If the current ratio is less than 2:1, it indicates lack of liquidity and shortage of working capital. But a much higher ratio, even though it is beneficial to the short term creditors, is not necessarily good for the company. A much higher ratio than 2:1 may indicate the poor investment policies of the management. A much higher ratio may also be considered to be adverse under following reasons:

a) A much higher ratio indicates that stock might be pilling up because of poor sales.

b) Large amount is locked up in debtors due to inefficient collection policy.

c) The cash or bank balances might be lying idle because of no proper investment opportunity are available.

It is therefore, dangerous to use ratio alone as an index of measuring the short term financial position of a concern.

**Current ratio = Current Assets / Current liabilities**

As CAs – CLs = WC. This ratio is also called working capital ratio and it indicates the quantum of the working capital of an enterprise.

Current assets = stock + debtors + cash at bank + cash in hand + prepaid expenses + accrued incomes etc.

Current liabilities = creditors + bills payable + outstanding expense + pre received income + bank overdraft etc.

Following point should be carefully considered while calculating the current ratio:

a) Only those assets, which are expected to be realised within a year, should be included in current assets.

b) Only those liabilities, which are expected to be paid within a year, should be included in current liabilities. Those long term loans and
debentures, which will be due for payment within one year, are also included in current liabilities.

c) The term ‘investment’ is used for fixed assets. Trade investments are treated as fixed assets. But ‘short term investment’ and ‘marketable security’ should be included in current assets.

d) Loose tools, patents, goodwill and trade marks are not included in current assets.

e) Fictitious assets such as preliminary expenses, share issue expenses etc., appearing on the assets side of the balance sheet should not be included in current assets.

f) ‘Bank overdraft’ should be included in current liabilities.

g) ‘Loan’, ‘Loan on Mortgage’, and ‘Bank loan’, are treated as long term liabilities, therefore should not be included in current liabilities.
TABLE 5.1 CURRENT RATIO OF THE SELECTED REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-08 TO 2012-13)

Source: Compiled and computed from ‘Capitalline Corporate Database’ of Capital market Publishers (I) Ltd., Mumbai

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2011-12</th>
<th>2010-11</th>
<th>2009-10</th>
<th>2008-09</th>
<th>2007-08</th>
<th>AVERAGE</th>
<th>STD DEV</th>
<th>COVAR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPCL</td>
<td>0.78</td>
<td>0.76</td>
<td>0.65</td>
<td>0.72</td>
<td>0.5</td>
<td>0.74</td>
<td>0.69</td>
<td>0.10</td>
<td>15.04</td>
</tr>
<tr>
<td>HPCL</td>
<td>0.68</td>
<td>0.66</td>
<td>0.77</td>
<td>0.74</td>
<td>0.93</td>
<td>1.03</td>
<td>0.80</td>
<td>0.15</td>
<td>18.36</td>
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<tr>
<td>IOCL</td>
<td>0.83</td>
<td>1</td>
<td>0.94</td>
<td>1.01</td>
<td>1.36</td>
<td>1.15</td>
<td>1.06</td>
<td>0.17</td>
<td>15.63</td>
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<tr>
<td>MRPL</td>
<td>0.92</td>
<td>1</td>
<td>1.16</td>
<td>1.04</td>
<td>1.06</td>
<td>0.98</td>
<td>1.19</td>
<td>0.20</td>
<td>17.06</td>
</tr>
<tr>
<td>ONGC</td>
<td>2.37</td>
<td>1.13</td>
<td>1.17</td>
<td>1.39</td>
<td>1.45</td>
<td>1.56</td>
<td>1.51</td>
<td>0.45</td>
<td>29.88</td>
</tr>
<tr>
<td>RIL</td>
<td>1.43</td>
<td>1.44</td>
<td>1.16</td>
<td>1.04</td>
<td>1.06</td>
<td>0.98</td>
<td>1.19</td>
<td>0.20</td>
<td>17.06</td>
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<tr>
<td>AVG</td>
<td>1.17</td>
<td>0.97</td>
<td>0.92</td>
<td>0.94</td>
<td>0.99</td>
<td>1.05</td>
<td>1.01</td>
<td>0.36</td>
<td>35.52</td>
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</tbody>
</table>

CURRENT RATIO OF REFINERY INDUSTRIES

![Graph showing current ratio of refinery industries over years](image-url)
The above table no. 5.1 shows current ratio of refinery industries taken under sample. During research period, current ratio of BPCL was ranged between 0.78 in 2012-13 to 0.5 in 2008-09. The ratio shows fluctuating trend. The average ratio during the period was 0.69 which was the lowest one compare to other industry average. Company couldn’t maintain the ideal current ratio during the study period, hence not able to pay its current liabilities in time.

During period of study current ratio of HPCL was between 1.03 in 2007-08 to 0.68 in 2012-13, with an average of 0.80 which was near to ideal current ratio, but below to industry average of 1.01. During most of the years company was not able pay its current liabilities as ratio was less than 1.

The above table shows the current ratio of IOCL, which was the highest 0.84 in 2007-08 and the lowest in 2008-09 i.e. 0.61, trend shows very little fluctuations with an industry average of 0.78. liquidity position was good, but exact standard ratio couldn’t be maintained.

While, MRPL shows ideal current ratio during most of the period, the ratio was ranged between 1.36 in 2008-09 to 0.92 in 2012-13. The company has also maintained average current ratio of 1.06 which was more than the industry average. The standard deviation of MRPL was 0.17 which was also less compared to industry average of 0.36. therefore the company is showing less fluctuations in its current ratio as compared to industry as a whole.

ONGC was leading the race, maintaining standard current ratio throughout the research period, maximum 2.37 in 2012-13, to minimum 1.13 in 2011-12, with the highest average of 1.51. the company has shown mix trend and fluctuating current ratio with standard deviation of 0.45 which was moderate compare to industry average. overall the company has shown good liquidity position during period of study.

RIL has also maintained the standard current ratio. The company has kept average current ratio at 1.19. the data shows very less fluctuations in current ratio. The company has shown almost consistent trend and maintained average current ratio more than 0.90 throughout the period of research. Current ratio was ranged between 1.44 in 2011-12 to 0.98 in 2007-08.
ANOVA TEST ON CURRENT RATIO

Null Hypothesis: - There is no significant difference in current ratio of selected refinery Industries during study period
Alternative Hypothesis: - There is significant difference in current ratio of selected refinery Industries during the study period.
Level of significance: 5% Level

Table 5.2 ANOVA TEST ON CURRENT RATIO

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>F crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS between companies</td>
<td>2.9</td>
<td>5</td>
<td>0.58</td>
<td>11.07</td>
<td>2.6</td>
</tr>
<tr>
<td>SS between years</td>
<td>0.25</td>
<td>5</td>
<td>0.05</td>
<td>0.97</td>
<td>2.6</td>
</tr>
<tr>
<td>Error</td>
<td>1.31</td>
<td>25</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4.46</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CURRENT RATIO :-

Calculated F value: 11.07
Table F value: 2.6
Result: Significant

The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 11.07, while the table value of F was 2.6, AT 5% level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differed much.

Stock turnover ratio or stock velocity ratio

The liquidity of inventories is measured by the number of times per year that inventory is converted into cost of goods sold. Hence it is a device to measure the
efficiency of the inventory management, however, in its zeal to show a high ratio, inventories are not allowed to drop down below the danger level.

Inventory turnover rates vary tremendously by the nature of the business. It is usually desirable to compare a firm’s inventory turnover with the turnover experience by comparable companies. It is not unusual for retailers of perishable goods to experience a higher inventory turnover than those retailers who deal in durable goods. At the other hand, retailers of jewellery frequently reflect a low inventory turnover. This ratio indicates the movement of stock during a particular period, in other words, it indicates how fast goods are sold out from the stock of those goods, higher ratio indicates a faster movement of stock.

\[
\text{Stock turnover ratio/stock velocity ratio} = \frac{\text{cost of goods sold}}{\text{average stock}}
\]

Cost of goods sold = sales – gross profit
Average stock = opening stock + closing stock /2

Where the cost of goods sold cannot be ascertained, it may be replaced by sales i.e. in the absence of adequate information regarding cost of goods sold, the ratio may be taken as sales / average stock.

A low stock turnover ratio indicates that stock does not sell quickly and remains lying in the godown for quite a long time. This results in increased storage costs, blocking of funds and losses on account of goods becoming obsolete or unsalable. This ratio can be used for comparing the efficiency of sales policies of two firms doing same type of business. The stock policy of the management of that firm, whose stock turnover ratio is higher, will be treated as more efficient. Similarly, by comparing the stock turnover ratio of current year with the previous year, the management can assess whether stock has been more efficiently used or not.
TABLE 5.3 STOCK TURNOVER RATIO OF THE SELECTED REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-08 TO 2012-13)

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2011-12</th>
<th>2010-11</th>
<th>2009-10</th>
<th>2008-09</th>
<th>2007-08</th>
<th>AVERAGE</th>
<th>SD</th>
<th>COV(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOCL</td>
<td>7.85</td>
<td>8.15</td>
<td>7.56</td>
<td>8.37</td>
<td>13.98</td>
<td>9.09</td>
<td>9.17</td>
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<td>26.34</td>
</tr>
<tr>
<td>MRPL</td>
<td>9.78</td>
<td>7.32</td>
<td>11.01</td>
<td>12.03</td>
<td>23.6</td>
<td>10.53</td>
<td>12.38</td>
<td>5.72</td>
<td>46.22</td>
</tr>
<tr>
<td>ONGC</td>
<td>14.55</td>
<td>14.81</td>
<td>16.59</td>
<td>87.82</td>
<td>111.98</td>
<td>122.77</td>
<td>61.42</td>
<td>51.76</td>
<td>84.27</td>
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<tr>
<td>RIL</td>
<td>8.69</td>
<td>10.42</td>
<td>9.59</td>
<td>8.29</td>
<td>12.92</td>
<td>10.57</td>
<td>10.08</td>
<td>1.66</td>
<td>16.48</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>11.40</td>
<td>10.61</td>
<td>10.55</td>
<td>22.81</td>
<td>33.28</td>
<td>29.01</td>
<td>19.61</td>
<td>27.46</td>
<td>140.03</td>
</tr>
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</table>

*Source: Compiled and computed from ‘Capitalline Corporate Database’ of Capital market Publishers (I) Ltd., Mumbai*
The above table no. 5.2 shows inventory turnover ratio of refinery industries taken under sample. The above table shows inventory turnover ratio of BPCL, the data shows fluctuating trend in ratio. It was 11.64 times in 2007-08, then the highest 21.91 times in 2008-09, and further declined to 11.09 times and lowest 9.86 times in the 2009-10 and 2010-11 respectively. The company has maintained average turnover at 13.70 times which was below to industry average of 19.61 times. Overall the company has maintained satisfactory turnover ratio.

The inventory turnover ratio of HPCL has also shown mix trend. The turnover was ranged between 15.31 times in 2008-09 to 8.68 times in 2010-11. During study period, company has maintained average turnover at 10.93 times less than the industry average of 19.61 times. Overall the company has kept moderate inventory turnover ratio.

Where as IOCL was having the lowest average of 9.17 times of inventory turnover. IOCL was struggling to move inventory faster as compare to other companies of sample study. The company has figured out the lowest turnover ratio of 7.56 times in 2010-11, and highest was 13.98 times in 2008-09. Overall it was dissatisfactory result for company.

Inventory turnover ratio of MRPL shows fluctuating trend ranged between 23.6 times in 2008-09 to 7.32 times in 2011-12. The company has shown the lowest inventory turnover ratio to other companies under study. Overall it was dissatisfactory result of company. The standard deviation of MRPL was 5.72 which was less than the industry average of 27.46, showing less fluctuation during research period in inventory turnover ratio of company.

ONGC has shown tremendous inventory turnover ratio and also the highest among others. The company has shown the average of 61.42 times, almost 3.20 times more than the industry average of 19.61 times. The company has shown standard deviation of 51.76, which was highest among industry players and also the highest compared to industry average of 27.46. This clearly indicates the high level of volatility as well as fluctuations and unpredictable behavior of inventory turnover ratio of company. somehow the company was very efficient in converting inventory to sales.

During study period RIL has shown mix trend ranged between 12.92 times in 2008-09 to 8.29 times in 2009-10. The company could maintain 10.57 times inventory turnover during period of research which was less than industry average of 19.61
times. Standard deviation of RIL was the lowest one suggesting low fluctuations in ratio, it was the lowest in industry i.e. 1.66.

**ANOVA TEST ON INVENTORY TURNOVER RATIO**

Null Hypothesis: - There is no significant difference in inventory turnover ratio of selected refinery Industries during study period

Alternative Hypothesis: - There is significant difference in inventory turnover ratio of selected refinery Industries during the study period.

Level of significance: 5% Level

<table>
<thead>
<tr>
<th>Table 5.4 ANOVA TEST ON INVENTORY TURNOVER RATIO:-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source of Variation</strong></td>
</tr>
<tr>
<td>SS between companies</td>
</tr>
<tr>
<td>SS between years</td>
</tr>
<tr>
<td>Error</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Calculated F value: 5.95

Table F value: 2.6

Result: Significant

The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 5.95, while the table value of F was 2.6, AT 5% level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differs much.
DEBTORS TURNOVER RATIO

By the analysis of debtors turnover ratio we know the information about liquidity of a company. The ratio shows the efficiency of credit and collection policy implemented by the company. The liquidity position depends upon the quantity of debtors of a company to a great extent. It measures the rapidity or slowness of their collectability. The higher the ratio the shorter will be time lag between credit sales and cash collection. A low ratio on the other hand means that the debts are not being collected rapidly.

Debtors Turnover ratio = Net credit sales / average debtors + average bills receivables
Where average debtors include bills receivables
Average debtors = opening debtors B/R + closing debtors + B/R / 2

This ratio indicates the speed with which the amount is collected from debtors. The higher the ratio, the better it is. Since it indicates that amount from debtors is being collected more quickly. The more quickly the debtors pay, the less the risk from bad debts, and so the lower the expenses of collection and increase in the liquidity of the firm, on other hand lower debtors turnover ratio will indicate the inefficient credit sales policy of the management. The more quickly debtors pay, the less risk from bad debts. It is difficult to set up for this ratio. It depends upon the policy of management and the nature of the industry. Moreover it is also difficult to maintain one type of policy for every customer, it should be tailor made according to customers’ personal profile.
TABLE 5.5 DEBTORS TURNOVER RATIO OF THE SELECTED REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-08 TO 2012-13)

<table>
<thead>
<tr>
<th>Year</th>
<th>BPCL</th>
<th>HPCL</th>
<th>IOCL</th>
<th>MRPL</th>
<th>ONGC</th>
<th>RIL</th>
<th>AVG</th>
<th>SD</th>
<th>COV(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-13</td>
<td>46.16</td>
<td>48.7</td>
<td>37.2</td>
<td>17.68</td>
<td>12.71</td>
<td>23.78</td>
<td>31.04</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td>2011-12</td>
<td>47.58</td>
<td>57.48</td>
<td>36.01</td>
<td>17.97</td>
<td>15.02</td>
<td>18.4</td>
<td>32.08</td>
<td>5.97</td>
<td>13.44</td>
</tr>
<tr>
<td>2010-11</td>
<td>58.38</td>
<td>52.33</td>
<td>45.15</td>
<td>18.63</td>
<td>19.38</td>
<td>17.05</td>
<td>35.15</td>
<td>5.15</td>
<td>17.94</td>
</tr>
<tr>
<td>2009-10</td>
<td>58.81</td>
<td>45.87</td>
<td>45.91</td>
<td>21.65</td>
<td>16.87</td>
<td>23.67</td>
<td>35.46</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td>2008-09</td>
<td>88.37</td>
<td>63.23</td>
<td>48.15</td>
<td>21.93</td>
<td>15.16</td>
<td>26.29</td>
<td>43.86</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td></td>
<td>70.48</td>
<td>63.44</td>
<td>36.5</td>
<td>19.16</td>
<td>16.87</td>
<td>26.87</td>
<td>38.89</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td></td>
<td>61.63</td>
<td>55.18</td>
<td>41.49</td>
<td>19.50</td>
<td>16.00</td>
<td>22.68</td>
<td>36.08</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td></td>
<td>15.80</td>
<td>7.42</td>
<td>5.49</td>
<td>1.85</td>
<td>2.26</td>
<td>4.07</td>
<td>19.44</td>
<td>5.49</td>
<td>13.23</td>
</tr>
<tr>
<td></td>
<td>25.64</td>
<td>13.44</td>
<td>13.23</td>
<td>9.47</td>
<td>14.09</td>
<td>17.94</td>
<td>53.88</td>
<td>13.23</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled and computed from ‘Capitalline Corporate Database’ of Capital market Publishers (I) Ltd., Mumbai

DEBTORS TURNOVER RATIO OF REFINERY INDUSTRY

![Graph showing debtors turnover ratio for different years and companies]
The above table no. 5.3 shows Debtors Turnover ratio of refinery industries taken under sample. Above table shows debtors turnover ratio of BPCL. Average ratio was of 61.63 times more than the industry average of 36.08 times. Company’s average debtor’s turnover ratio was higher among all companies under study. The turnover was ranged between 88.37 times in 2008-09 to 46.16 times in 2012-13. Standard deviation was 15.80 and co variance was 25.64% shows greater fluctuations in debtors turnover ratio during study period. BPCL was quick to convert credit sales into cash and has implemented good collection policy.

HPCL was next to BPCL in context to average debtors turnover ratio during study period. It was 55.18 times, more than the industry average of 36.08. the ratio was ranged between 63.44 times in 2007-08 to 48.7 in 2012-13. Standard deviation of 7.42 and co variance of 13.44% show fewer fluctuations in debtors turnover ratio. Overall the company has maintained good credit collection policy.

The average debtors turnover ratio of IOCL was 41.49 times. It was also more than the industry average of 36.08 times. The turnover ratio was less fluctuating as standard deviation was 5.49 and co variance was 13.23%. Debtors turnover ratio was ranged between 48.15 times in 2008-09 to 36.01 times in 2011-12. Overall the company has maintained satisfactory collection policy.

MRPL has maintained average debtors turnover ratio at 19.50 times, which was less than the industry average of 36.08 times. The ratio was maximum of 21.93 times in 2008-09 and minimum of 17.68 times in 2012-13. Standard deviations of 1.85 and co variance of 9.47% were the least among all companies under study. It means that there was a very little fluctuations in debtors turnover ratio during study period. Overall it shows moderate collection policy.

ONGC has exceptionally shows the least turnover ratio among all companies under study. It shows average of 16 times. The debtors turnover ratio was ranged between 19.38 in 2010-11 to 12.71 times in 2012-13. Standard deviation was 2.26 and covariance was 14.09% shows major fluctuations in debtors turnover ratio. Overall it was very dissatisfactory result for a company as lower turnover ratio adversely affects the liquidity position of a company. It also leads to major blockage of working capital in the form of receivables.

Above table shows average debtors turnover ratio of 22.68 times of RIL. The ratio was more than the industry average of 36.08 times. It was ranged between 26.87 in 2007-08 to 18.4 times in 2011-12. Standard deviation was 4.07 whereas covariance
of 17.94% shows fewer fluctuations in debtors turnover ratio during period of study. Overall it shows good collection policy.

**ANOVA TEST ON DEBTOR TURNOVER RATIO**

Null Hypothesis: - There is no significant difference in debtors turnover ratio of selected refinery Industries during study period

Alternative Hypothesis: - There is significant difference in debtors turnover ratio of selected refinery Industries during the study period.

Level of significance: 5% Level

**Table 5.6 ANOVA TEST ON DEBTOR TURNOVER RATIO**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>F crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS between companies</td>
<td>11425.37</td>
<td>5</td>
<td>2285.07</td>
<td>50.4</td>
<td>2.6</td>
</tr>
<tr>
<td>SS between years</td>
<td>666.07</td>
<td>5</td>
<td>133.22</td>
<td>2.94</td>
<td>2.6</td>
</tr>
<tr>
<td>Error</td>
<td>1133.52</td>
<td>25</td>
<td>45.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13224.96</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculated F value: 50.4
Table F value: 2.6
Result: Significant

The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 50.4, while the table value of F was 2.6, AT 5% level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differ much.

**Liquid/quick/acid test ratio**

Quick ratio indicates whether the firm is in a position to pay its current liabilities within a month or immediately. As such, the quick ratio is calculated by
dividing liquid assets by liquid liabilities. It provides even more critical look at the ability of the company to meet its day to day obligations. It signifies a very short term liquidity of a business concern and is, therefore called ‘liquid ratio’. If it is desired to apply a still stiffer and rigorous test for evaluating a firm’s financial position in short period, the application of acid test ratio is recommended.

\[
\text{Liquid / quick / acid test ratio} = \frac{\text{liquid / quick assets}}{\text{Liquid / quick liabilities}}
\]

Liquid assets = current assets – stock
Liquid liabilities = current liabilities – bank overdraft

This ratio indicates whether an enterprise possesses sufficient liquid/quick assets to pay off its liquid/quick liabilities. This ratio is an indicator of the liquidity position of an enterprise.

Liquid or quick assets mean the asset which is receivable within a financial year during which it comes into existence and more easily convertible into cash, liquid assets = current assets – stock.

Liquid or quick liability means the liability which is payable within financial year and more quickly payable in cash, liquid liabilities = current liabilities – bank overdraft.

Ideal ratio is at least 1:1, i.e., an enterprise should have at least an equal amount of liquid to pay off its liquid/quick liabilities. It is considered to be better. The idea is that for every rupee of liquid liabilities, there should at least be one rupee of liquid assets. The ratio is better test of short-term financial position of the company than the current ratio, as it considers only those assets which can be easily and readily converted into cash. Stocks and similar items are excluded from current assets which are already in liquid form, or may be easily converted into cash by discounting or factoring. The acid test ratio assumes that stock may not be realized immediately and therefore, it was excluded. Some experts advocate that the bank overdraft should also be excluded, because bank overdraft is a permanent way of financing no hurry to pay it back. Quick ratio removes the shortcomings of current ratio by excluding stock and bank overdraft to show better liquidity position.
TABLE 5.7 QUICK RATIO OF THE SELECTED REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-08 TO 2012-13)

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2011-12</th>
<th>2010-11</th>
<th>2009-10</th>
<th>2008-09</th>
<th>2007-08</th>
<th>AVG</th>
<th>SD</th>
<th>COV(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPCL</td>
<td>0.71</td>
<td>0.71</td>
<td>0.45</td>
<td>0.68</td>
<td>0.67</td>
<td>0.61</td>
<td>0.64</td>
<td>0.10</td>
<td>15.55</td>
</tr>
<tr>
<td>HPCL</td>
<td>0.71</td>
<td>0.52</td>
<td>0.44</td>
<td>0.43</td>
<td>0.53</td>
<td>0.51</td>
<td>0.52</td>
<td>0.10</td>
<td>19.25</td>
</tr>
<tr>
<td>IOCL</td>
<td>0.5</td>
<td>0.74</td>
<td>0.51</td>
<td>0.45</td>
<td>0.47</td>
<td>0.54</td>
<td>0.54</td>
<td>0.11</td>
<td>19.67</td>
</tr>
<tr>
<td>MRPL</td>
<td>0.5</td>
<td>0.54</td>
<td>0.54</td>
<td>0.71</td>
<td>0.98</td>
<td>0.57</td>
<td>0.64</td>
<td>0.18</td>
<td>28.38</td>
</tr>
<tr>
<td>ONGC</td>
<td>2.26</td>
<td>1.22</td>
<td>1.08</td>
<td>1.22</td>
<td>1.27</td>
<td>1.39</td>
<td>1.41</td>
<td>0.43</td>
<td>30.55</td>
</tr>
<tr>
<td>RIL</td>
<td>1.12</td>
<td>1.17</td>
<td>0.94</td>
<td>0.69</td>
<td>0.87</td>
<td>0.89</td>
<td>0.95</td>
<td>0.18</td>
<td>18.59</td>
</tr>
<tr>
<td>AVG</td>
<td>0.97</td>
<td>0.82</td>
<td>0.66</td>
<td>0.70</td>
<td>0.80</td>
<td>0.75</td>
<td>0.78</td>
<td>0.37</td>
<td>47.94</td>
</tr>
</tbody>
</table>

Source: Compiled and computed from ‘Capitalline Corporate Database’ of Capital market Publishers (I) Ltd., Mumbai

![Quick Ratio of Refinery Industry Graph](image-url)
The above table no. 5.4 shows Quick ratio of refinery industries taken under sample. BPCL has shown average quick ratio of 0.64 during research period, which was less than the industry average of 0.93. The ratio was mostly consistent during research period except the lowest one 0.45 in 2010-11. During last two years it was consistent as well as maximum i.e. 0.71. The company has also shown the lowest variation of 15.55% from average.

HPCL had lowest average of quick ratio i.e. 0.52 among other companies. Moreover the company has shown the fluctuating trend in quick ratio, ranged between 0.52 in 2011-12 to 0.71 in 2012-13. The standard deviation was 0.10 which was also less than industry average of 0.37, means less inconsistency in ratio.

IOCL has maintained mix trend of quick ratio during period of study showing average of 0.54 at a covariance of 19.67%, the company couldn’t maintain ideal quick ratio. The ratio was ranged between 0.74 in 2011-12 to 0.45 in 2009-10.

MRPL had quick ratio ranged between 0.98 in 2008-09 to 0.5 in 2012-13. The company has maintained average of 0.64 which was less than industry average of 0.78. Standard deviation of 0.18 compared to industry average of 0.78 shows less fluctuations in quick ratio during study period.

ONGC has maintained quick ratio well, showing average quick ratio of 1.41 highest among all sample companies. Quick ratio was ranged between 2.26 in 2012-13 to 1.08 in 2010-11. ONGC was also having the highest covariance of 30.55% means there were greater fluctuations in trend of quick ratio throughout the research period. Overall it was a good management of working capital.

During research period RIL has shown average quick ratio of 0.95, ranged between 1.17 in 2011-12 to 0.69 in 2009-10. Standard deviation was 0.18 less than industry average of 0.37. The company was the second highest in maintenance of quick ratio among all sample companies during period of study.

ANOVA TEST ON QUICK RATIO

Null Hypothesis: - There is no significant difference in quick ratio of selected refinery Industries during study period Alternative Hypothesis: - There is significant difference in quick ratio of selected refinery Industries during the study period.

Level of significance: 5% Level
Table 5.8 ANOVA TEST ON QUICK RATIO:-

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>F crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS between companies</td>
<td>3.52</td>
<td>5</td>
<td>0.7</td>
<td>16.79</td>
<td>2.6</td>
</tr>
<tr>
<td>SS between years</td>
<td>0.35</td>
<td>5</td>
<td>0.07</td>
<td>1.68</td>
<td>2.6</td>
</tr>
<tr>
<td>Error</td>
<td>1.05</td>
<td>25</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4.92</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculated F value: 16.79
Table F value: 2.6
Result: Significant

The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 16.79, while the table value of F was 2.6, AT 5% level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differ much.

**Debt – equity ratio**

It develops the relationship between owned funds and the borrowed funds. This reflects the extent to which borrowed capital is used in place of equity capital. Business firms acquire assets both with owners and creditors’ funds. The larger the portion of funds provided by owners, the less risk is assumed by creditors. The debt – equity ratio is worked out as:

\[
\text{Debt – equity ratio} = \frac{\text{Total debts}}{\text{total owner’s equity}}
\]

The ratio represents the proportion of external equity to internal equity in the capital structure of the firm. The external equity represents the amount of debts/liabilities to outsiders. It includes both short term and long term liabilities. On
the other hand owners’ equity includes all such liabilities that belong to the shareholders, e.g., share capital (both preferential as well as equity), reserves and surpluses, however accumulated losses and deferred expenses are to be deducted from the owners’ equity to calculate debt equity ratio.

Either too high or too low a ratio may be disadvantageous. Too high suggests that management is not taking advantages of opportunities to maximise profits through borrowing. Too low suggests undue exposure to risk of bankruptcy and to a fixed burden of interest expense in the event of a period of relatively low profit (when the rate of return on total capital is less than the interest rate on borrowed capital). As a rule of thumb, debt – equity ratio of less than 2:1 is taken as acceptable, but this is not based on any scientific analysis, however many financial analysts prefer to consider 1:1 as safe. As the ratio increases, the amount of risk assumed by creditors increases, because the ratio indicates decreasing solvency. In fact, the acceptable level of ratio will vary from firm to firm. For e.g., banking institutions will have much higher debt – equity ratio as compared to manufacturing or trading concerns.
TABLE 5.9 DEBT EQUITY RATIO OF THE SELECTED REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-08 TO 2012-13)

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2011-12</th>
<th>2010-11</th>
<th>2009-10</th>
<th>2008-09</th>
<th>2007-08</th>
<th>AVERAGE</th>
<th>STD DEV</th>
<th>COV(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPCL</td>
<td>1.42</td>
<td>1.42</td>
<td>1.17</td>
<td>1.7</td>
<td>1.75</td>
<td>1.29</td>
<td>1.46</td>
<td>0.23</td>
<td>15.57</td>
</tr>
<tr>
<td>HPCL</td>
<td>2.36</td>
<td>2.09</td>
<td>1.99</td>
<td>1.84</td>
<td>2.12</td>
<td>1.59</td>
<td>2.00</td>
<td>0.26</td>
<td>13.16</td>
</tr>
<tr>
<td>IOCL</td>
<td>1.02</td>
<td>1.22</td>
<td>0.95</td>
<td>0.88</td>
<td>1.02</td>
<td>0.86</td>
<td>0.99</td>
<td>0.13</td>
<td>13.17</td>
</tr>
<tr>
<td>MRPL</td>
<td>1.08</td>
<td>0.8</td>
<td>0.24</td>
<td>0.31</td>
<td>0.42</td>
<td>0.55</td>
<td>0.57</td>
<td>0.32</td>
<td>56.49</td>
</tr>
<tr>
<td>ONGC</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
<td>0.19</td>
<td>0.2</td>
<td>0.18</td>
<td>0.12</td>
<td>0.08</td>
<td>69.14</td>
</tr>
<tr>
<td>RIL</td>
<td>0.3</td>
<td>0.36</td>
<td>0.46</td>
<td>0.49</td>
<td>0.65</td>
<td>0.46</td>
<td>0.45</td>
<td>0.12</td>
<td>26.53</td>
</tr>
<tr>
<td>AVG</td>
<td>1.04</td>
<td>0.99</td>
<td>0.81</td>
<td>0.9</td>
<td>1.03</td>
<td>0.82</td>
<td>0.93</td>
<td>0.68</td>
<td>72.58</td>
</tr>
</tbody>
</table>

Source: Compiled and computed from ‘Capitalline Corporate Database’ of Capital market Publishers (I) Ltd., Mumbai
The above table no. 5.5 shows Debt Equity ratio of refinery industries taken under sample. BPCL has maintained average debt equity ratio at 1.46 during period of study, which was slightly less than industry average of 0.93. Debt equity ratio was ranged between 1.75 in 2008-09 to 1.17 in 2010-11. Standard deviation of 0.23 shows less variation in ratio as industry average was of 0.68. The ratio shows greater portion of debt to equity in company, which means company is having more debt fund compared to owners’ equity, on the other hand company at a greater side to take advantage of trading on equity.

HPCL was having the highest proportion of debt equity ratio during period of study i.e. 2, as compared to industry average of 0.93. It means that company was having twice proportion of debt compare to its equity. Debt equity ratio was ranged between 2.36 in 2012-13 to 1.59 in 2007-08. Standard deviation of 0.26 was less than industry average of 0.68, it means that there was less inconsistency in debt equity ratio during study period. Greater portion of debt will adversely affect profitability during slag period, however proper utilization of debt funds may improve return to share holders.

IOCL has shown average debt equity ratio of 0.99 which was near to industry average of 0.93. Debt equity ratio was ranged between 1.22 in 2011-12 and 0.86 in 2007-08. During study period the company has maintained almost ideal debt equity ratio. Standard deviation of 0.13 and co variance of 13.17% shows less fluctuation in debt equity ratio during research period. Overall it shows good balance of debt and equity.

MRPL was having debt equity ratio at an average of 0.57, which was less than industry average of 0.93. Ratio was ranged between 1.08 in 2012-13 to 0.24 in 2010-11. During last three years there was continuous increase in the ratio. This shows that company was moving towards larger share of debt to finance new projects.

Above table shows average debt equity ratio of 0.12 of ONGC as compared to industry average of 0.93. The ratios show very meagre proportion of debt in capital structure. The ratio was ranged between 0.2 in 2008-09 to 0.04 in 2012-13. During last three years it was almost negligible that means there was a greater control of
owners. Capital structure was not balanced one but lean towards equity share holders. It also means very little chance of trading on equity.

RIL has maintained average debt equity ratio at 0.45, industry average was of 0.93, which means company has been maintaining lower level of debt compare to other companies under study. The ratio was ranged between 0.65 in 2008-09 to 0.30 in 2012-13. Standard deviation of 0.12 and co variance of 26.53% suggests less fluctuation in debt equity ratio.

ANOVA TEST ON DEBT EQUITY RATIO
Null Hypothesis: - There is no significant difference in debt equity ratio of selected refinery Industries during study period

Alternative Hypothesis: - There is significant difference in debt equity ratio of selected refinery Industries during the study period.
Level of significance: 5% Level

Table 5.10 ANOVA TEST ON DEBT EQUITY:-

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>F crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS between companies</td>
<td>14.67</td>
<td>5</td>
<td>2.93</td>
<td>73.36</td>
<td>2.60</td>
</tr>
<tr>
<td>SS between years</td>
<td>0.31</td>
<td>5</td>
<td>0.06</td>
<td>1.53</td>
<td>2.60</td>
</tr>
<tr>
<td>Error</td>
<td>1</td>
<td>25</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15.98</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculated F value: 73.36
Table F value: 2.6
Result: Significant
The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 73.36, while the table value of F was 2.6, AT 5%
level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differ much.

**Fixed assets turnover**

The ratio measures the efficiency in the utilization of fixed assets. The ratio of sales to fixed assets measures the turnover of the plant and machinery, it compares the sales revenue of a company with its net fixed assets. According to J.R. Monga, “Assets are the economic resources owned by the business which can be conveniently expressed in monetary terms.” This ratio describes how efficiently company is using its fixed assets to generate revenue. If company has high fixed assets turnover it shows that company is efficient at managing its fixed assets as fixed assets are important because they usually represent the largest component of fixed assets and is expressed as under;

Fixed assets turnover = sales / net fixed assets
TABLE 5.11 FIXED ASSETS TURNOVER RATIO OF THE SELECTED
REFINERY INDUSTRY UNDER THE STUDY FOR THE PERIOD OF (2007-
08 TO 2012-13)

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2011-12</th>
<th>2010-11</th>
<th>2009-10</th>
<th>2008-09</th>
<th>2007-08</th>
<th>AVG</th>
<th>SD</th>
<th>COV(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPCL</td>
<td>7.17</td>
<td>6.72</td>
<td>5.19</td>
<td>4.75</td>
<td>5.98</td>
<td>5.15</td>
<td>5.83</td>
<td>0.96</td>
<td>16.55</td>
</tr>
<tr>
<td>HPCL</td>
<td>5.63</td>
<td>5.38</td>
<td>4.53</td>
<td>4.32</td>
<td>6.22</td>
<td>5.35</td>
<td>5.24</td>
<td>0.71</td>
<td>13.48</td>
</tr>
<tr>
<td>IOCL</td>
<td>4.2</td>
<td>4.49</td>
<td>3.61</td>
<td>3.78</td>
<td>4.98</td>
<td>4.38</td>
<td>4.24</td>
<td>0.50</td>
<td>11.74</td>
</tr>
<tr>
<td>MRPL</td>
<td>5.8</td>
<td>5.97</td>
<td>5.11</td>
<td>4.29</td>
<td>5.17</td>
<td>4.42</td>
<td>5.13</td>
<td>0.69</td>
<td>13.42</td>
</tr>
<tr>
<td>ONGC</td>
<td>0.86</td>
<td>0.85</td>
<td>0.85</td>
<td>0.85</td>
<td>1.05</td>
<td>1.05</td>
<td>0.92</td>
<td>0.10</td>
<td>11.11</td>
</tr>
<tr>
<td>RIL</td>
<td>2.24</td>
<td>2.05</td>
<td>1.58</td>
<td>1.24</td>
<td>1.01</td>
<td>1.29</td>
<td>1.57</td>
<td>0.49</td>
<td>30.98</td>
</tr>
<tr>
<td>AVG</td>
<td>4.32</td>
<td>4.24</td>
<td>3.48</td>
<td>3.21</td>
<td>4.07</td>
<td>3.61</td>
<td>3.82</td>
<td>2.00</td>
<td>52.44</td>
</tr>
</tbody>
</table>

Source: Compiled and computed from ‘Capitaline Corporate Database’ of Capital
market Publishers (I) Ltd., Mumbai

FIXED ASSETS T/O RATIO OF REFINERY IND.
The above table no. 5.6 shows Fixed Assets Turnover ratio of refinery industries taken under sample. The table shows fixed assets turnover ratio of BPCL. The company has shown increasing trend after year 2007-08. The fixed assets turnover ratio of BPCL was ranged between 7.17 times in 2012-13 to 5.15 times in 2007-08. Standard deviation of 0.96 shows less fluctuations compared to industry average of 2. The average fixed assets turnover ratio of BPCL was 5.83 times which was also the highest among all sample companies under study. It means higher efficiency. Company is more efficient in using fixed assets to generating sales.

The fixed assets turnover ratio of HPCL has shown fluctuating trend during research period. Highest 6.22 times in 2008-09, whereas the lowest 4.32 times in 2009-10. The standard deviation was 0.71 times which was less than the industry average. The mean ratio of company was 5.24 times, higher than industry average of 3.82 times. Thus it shows that the company has managed its fixed assets efficiently.

With an average of 4.34 times, IOCL has maintained mix trend of fixed assets turnover ratio during research period. The ratio ranged between 4.98 times in 2008-09 to 3.61 times in 2010-11. Standard deviation was 0.50, less than the industry average. Average 4.35 times fixed turnover ratio was higher than industry average of 3.82 times. Overall it shows good management and utilization of fixed assets to produce sales.

The fixed assets turnover ratio of MRPL has shown mix trend during fist three years then after it has shown upward trend, the ratio was ranged between 5.97 times in 2011-12 to 4.29 times in 2009-10. Standard deviation was 0.69, less than the industry average of 2. Average fixed assets turnover ratio of company was 5.13 times, higher than the industry average of 3.82 times, which shows the satisfactory management of fixed assets.

ONGC has shown the lowest average of fixed assets turnover ratio, i.e. 0.92 times compared to industry average of 3.82 times. It was consistent during fist two years i.e. 1.05 times and was also the highest and then after it has shown almost downtrend, except in the year 2012-13 where there was a very little improvement. The result shows that the investment in fixed assets is more than what is needed to generate sales.

RIL has maintained average fixed assets turnover ratio of 1.57 times which is less than the industry average, the company has shown improvements in fixed assets turnover ratio after 2007-08. It was maximum in 2012-13 i.e. 2.24 times which
ANOVA TEST ON FIXED ASSETS TURNOVER RATIO

Null Hypothesis: - There is no significant difference in fixed assets turnover ratio of selected refinery Industries during study period
Alternative Hypothesis: - There is significant difference in fixed assets turnover ratio of selected refinery Industries during the study period.
Level of significance: 5% Level

Table 5.12 ANOVA TEST ON FIXED ASSETS TURNOVER RATIO:

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>F crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS between companies</td>
<td>128.470</td>
<td>5</td>
<td>25.69</td>
<td>110.50</td>
<td>2.60</td>
</tr>
<tr>
<td>SS between years</td>
<td>6.170</td>
<td>5</td>
<td>1.23</td>
<td>5.31</td>
<td>2.60</td>
</tr>
<tr>
<td>Error</td>
<td>5.810</td>
<td>25</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>140.450</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIXED ASSETS TURNOVER RATIO :-

Calculated F value: 110.50
Table F value: 2.6
Result: Significant

The analysis showed the significant result. It can be seen from the table, that the calculated value of F was found as 110.50, while the table value of F was 2.6, AT 5% level of significance. The calculated value of F, being more than the table value of F, the alternate Hypothesis stood accepted and the null hypothesis got rejected at 5% level of significance. So it proves that the differences among the average of this group were much significant and the average liquidity of the groups of the refinery Industries differs much.
BIBLIOGRAPHY