CHAPTER : 6  ANALYSIS OF RATIO AND STATISTICAL TOOLS

6.1 The Role of Ratios and Statistical Tools.
6.2 Ratios and Statistical Tools to be Analysed.
6.3 Interpretation.
6.4 Analysis of Ratios and Statistical Tools.
CHAPTER: 6 ANALYSIS OF RATIO AND STATISTICAL TOOLS

6.1 The Role of Ratios & Statistical Tools:

Ratio analysis is one of the most commonly used technique in the analysis of financial statements and evaluation of managerial performance.15 The analysis of ratios and statistical tools points out problems and provides a basis to solve the same problems by recommending corrective actions in time. In order words, financial ratios are calculated and tested to examine different aspects of business operation.16

A ratio can be defined as the indicated quotient of two mathematical expressions or the relationship between two or more things. The analysis of ratios is the powerful tool of financial analysis. In order to know the financial position of a firm and also the performance of the same, a ratio or more is used as an index or yardstick. But, “the ratio analysis does not add anything new but it makes statement more meaningful and helps in drawing conclusion”.17 The main importance of ratios and its analysis are as follows:

15 Pradhan, Surendra Basis of Financial Management Educational Enterprise (P) Ltd., Nepal, 1992
16 IBID, P-38.
17 Varshney, G.K., Top Management Accounting, Top Publications, Delhi, 1999.
1. The use of ratio is very helpful in testing the solvency position of the firm. For example, the ratio of current assets to current liabilities shows upward trend, which means sufficient working capital. Thus, by studying this ratio, the claim of creditors can be paid easily.

2. It is also very useful in decision-making process.

3. It is helpful in financial forecasting and planning.

4. The ratios are most useful when comparison is made between companies for profitability. Two types of comparisons of present ratio with past ratio and the second comparison of several previous years are computed with the objective of knowing improvements or downfalls in the financial health.

5. By ratio analysis, a sound liquidity position of a firm can be known and can control it.

6. It is also helpful in knowing operating efficiency and controlling cost, and

7. It is helpful in analysing the overall financial health of the company.

On the other hand, statistical tools are also very important in judging the significance of data and make maximum use of the
information gathered. The theories are also empirically tested by using statistical tool. Summarisation of the results is one of the requirement of any study. This can be done by statistical techniques in meaningful way. Statistical tools are helpful in drawing general and broad conclusions and also for the prediction for future.

Therefore, the role of ratios and statistical tools are very important and should adopt these in order to draw a meaningful and accurate result of study.

6.2 Ratios and Statistical Tools to be Analysed.

The following ratios and Statistical tool(s) are to be analysed in order to draw a clear and accurate conclusion of the study.

Ratios :

1. **Current Ratio** :

   The current ratio is given by dividing current assets by current liabilities.

   \[
   \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
   \]

   \[
   \therefore \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
   \]
Here,

Current assets include cash, assets which can be converted into cash within one year. Marketable securities, debtors and inventories are the examples of current assets. Prepaid expenses are also can be considered as current assets as they represent the payments that will not be made by the firm in future.

All obligations, which mature within a year are included in current liabilities. Creditors, bills payable, accrued expenses, short-term loan from the bank, long term debt maturing in current year etc. are included in current liabilities.

*Importance:*

There is importance of this ratio as it indicates the availability of current assets in rupees for every one rupee of current liability. This ratio represents a “margin of safety” for creditors.

2. **Quick Ratio/Acid Test Ratio/Liquid Ratio:**

Quick ratio is found out by dividing quick assets by current liabilities

\[
\text{Quick Ratio} = \frac{\text{Quick assets}}{\text{Current Liabilities}}
\]
\[
\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventories}^*}{\text{Current Liabilities}}
\]

[Since, \text{Quick assets} = \text{Current assets} - \text{Inventories}]

* Inventories are stock of the product of a company, which is manufacturing for sale and components that make up the product. The various forms in which inventories exist in a manufacturing company are raw materials, work in process and finished goods. But in such financial institutions like MRB & MSCB Ltd., these two banks considered fixed assets and loan & advances disbursed as inventories.

**Importance:**

The importance of Quick Ratio/Acid Test Ratio/Liquid Ratio is to know whether a firm can meet its obligations because of its quick assets or not. Simply, the quick ratio remains an important index of the firm's liquidity.

3. **Cash Ratio:**

It is the ratio of cash and current liabilities. Trade investment or marketable securities are also equivalent of cash. Therefore, they are also included in the calculation of cash ratio. The cash ratio is measured by the following formula:
Cash Ratio = \frac{\text{Cash + Marketable Securities/Investments}}{\text{Current Liabilities}}

Importance:

It's importance is also same as in the above ratios namely, current ratio, quick ratio and cash ratio and is mainly for measuring the ability of a firm to meet its current obligations.

4. **Net Working Capital Ratio:**

It is also known as Net Current Assets Ratio and measured by the following formula:

\[
\text{Net Working Capital Ratio} = \frac{\text{Net Working Capital}}{\text{Net Assets}} = \frac{\text{Current Assets} - \text{(Current Liabilities + Short term borrowing)}}{\text{Fixed Assets + Net Current Assets}}
\]

\[
= \frac{\text{Current Assets} - \text{(Current Liabilities + Short term borrowing)}}{\text{Fixed Assets + (Current Assets - Current Liabilities)}}
\]
Importance:

This ratio is used to measure the liquidity position of a firm and the Net Working Capital itself is also used to measure the firm's potential reservoir of funds.

5. Total Debt Ratio:

It can be measured by dividing total Debt by Capital Employed or Net Assets.

\[
\text{Total Debt Ratio} = \frac{\text{Total Debt}}{\text{Capital Employed}} = \frac{\text{Total Debt}}{\text{Net Assets}}
\]

Total Debt includes short and long term borrowings, debentures and bonds, deferred payment arrangements for buying capital equipment, bank borrowing, public deposits and any other interest bearing loan. The Net Asset includes net Fixed Assets and Net Current Assets.

Importance:

It may be used to analyse the long term solvency of a firm.
6. **Size of Deposit:**

The ratio named as Size of Deposit can be measured by dividing the Amount of Deposit by the Total Number of Accounts.

Therefore,

\[
\text{Size of Deposit} = \frac{\text{Amount of Deposit}}{\text{Total No. of Accounts}}
\]

**Importance:**

It helps to study the customers' attitude towards the financing institutes. It measures the amount of deposit per account.

**Statistical Tool(s):**

The statistical tool namely "the correlation" is very important for the study. It is defined as a technique that gives the relationship between two or more variables. In other words, "the correlation thus expresses the relationship or interdependence of two sets of variables upon each other in such a way that the changes in the value of one variable are in sympathy with the changes in the other".\(^{18}\)

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**Importance:**

Regarding the present study, correlation is useful in studying the relationship between variables like deposit and loan-and-advances. The extent of relationship is also given by using co-efficient of correlation, which is denoted by “r”.

**6.3 Interpretation:**

Interpretation of ratios and statistical tools is not an easy task as it seems. The interpretation needs skill and intelligence. Foresightedness the inherent limitations of analysis of ratios and statistical tools should be kept in mind while interpreting the results.

In cash of current ratio, as a conventional rule, a current ratio of 2 to 1 or more is considered satisfactory.

Generally, a quick ratio of 1 to 1 is considered current financial satisfactory condition. When we use quick ratio, it should be used cautiously. The ratio of 1 to 1 or more does not always necessarily imply sound liquidity position. It is because of that all book debts may not be liquid, and cash may be immediately needed to pay operating expenses. Similarly, inventories are not absolutely non-liquid. A company may have
to a measurable extent of inventories to meet the current obligations. Thus, the company with high value of quick ratio may suffer from the shortage of funds as it has the above points. In cash of Cash Ratio, if the value is less than 1, it is considered to carry small amount of cash. Although, the firm carry the small amount of cash, there is nothing to be worried about the lack of cash if the company has reserve borrowing power.

In Cash of Net Working Capital Ratio, if the value is less than 1, it cannot be considered as satisfactory. When we subtract the value of Net Working Capital Ratio from 100(hundred), the difference is to be treated as the amount financed by the lenders rather than the owners. Total debt ratio can be interpreted in such a way that the value of the ratio is multiplied by 100 so that the product is financed by the lenders in present and the owners have provided the remaining amount.

Interpretation of ratios in cash of size of deposit is mainly based on the particular bank. The bank may decide the amount considered to be satisfactory per account. The interpretation of statistical tool namely the correlation can be done in five different methods. But “Karl Pearson’s Method” is the most widely used method of to measure the intensity of linear relationship between two variables. This is a mathematical method.
The Pearsonian correlation coefficient between two variables $X$ and $Y$ is denoted by "r". Thus, "r" can be calculated as

$$r = \frac{\sum (X - \overline{X})(Y - \overline{Y})}{\sqrt{\sum (X - \overline{X})^2 \sum (Y - \overline{Y})^2}}$$

where,

$r =$ the correlation co-efficient.

$X$ and $Y =$ the two variables.

$$\overline{X} = \frac{\sum X}{\text{No. of observations}} = \frac{\sum X}{n}$$

and $$\overline{Y} = \frac{\sum Y}{\text{No. of observations}} = \frac{\sum Y}{n}$$

The co-efficient of correlation (r) is also known as Pearson's Product moment correlation co-efficient. The numerical value of "r" lies between + 1 and −1. If "r" has positive value it indicates positive or direct correlation in between the two variables $X$ and $Y$. In other words, as the values of $X$ increases the corresponding values of $Y$ will also increase or as the values of $X$ decreases, the corresponding values of $Y$ will decrease. In short, the movement of $X$ and $Y$ is on the same direction. Negative values of "r" indicate inverse or negative correlation, thereby meaning an increase in the value of one variable results in the decrease in the value of the other variable. A zero correlation co-efficient means no
association between the two variables X and Y. In such case, X does not account for any of the variation in Y.

**TABLE - XXXI**

CALCULATED RATIOS OF MRB AND MSCB LTD. (31.3.90 TO 31.3.99)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Ratio</th>
<th>For</th>
<th>For the Year ending</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>31.3.99</td>
<td>31.3.98</td>
</tr>
<tr>
<td>1.</td>
<td>Current Ratio</td>
<td>MRB</td>
<td>0.68:1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSBC Ltd.</td>
<td>0.46:1</td>
</tr>
<tr>
<td>2.</td>
<td>Quick Ratio</td>
<td>MRB</td>
<td>0.63:1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSBC Ltd.</td>
<td>0.45:1</td>
</tr>
<tr>
<td>3.</td>
<td>Cash Ratio</td>
<td>MRB</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSCB Ltd.</td>
<td>0.01</td>
</tr>
<tr>
<td>4.</td>
<td>Net Working Capital Ratio</td>
<td>MRB</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSCB Ltd.</td>
<td>0.04</td>
</tr>
<tr>
<td>5.</td>
<td>Total Debt Ratio</td>
<td>MRB</td>
<td>2.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSCB Ltd.</td>
<td>0.30</td>
</tr>
<tr>
<td>6.</td>
<td>Size of Deposit (Rs. in thousands)</td>
<td>MRB</td>
<td>2.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSCB</td>
<td>1.03</td>
</tr>
</tbody>
</table>

Source: The Balance Sheet and Profit and Loss Account of MRB and MSCB Ltd. (31.3.90 to 31.3.99)
In this present study, the statistical tool namely the correlation can be used in order to find out the relationship between deposit and the credit disbursement of MRB and MSCB Ltd. The following table is used to calculate the co-efficient of correlation ($r$).

**TABLE – XXXII**

**COMPARATIVE AMOUNT OF DEPOSITS TO MRB & MSCB LTD.**

<table>
<thead>
<tr>
<th>Yrs.</th>
<th>89-90</th>
<th>90-91</th>
<th>91-92</th>
<th>92-93</th>
<th>93-94</th>
<th>94-95</th>
<th>95-96</th>
<th>96-97</th>
<th>97-98</th>
<th>98-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>For MRB Amt.</td>
<td>169.41</td>
<td>214.08</td>
<td>270.18</td>
<td>344.55</td>
<td>387.59</td>
<td>494.57</td>
<td>791.31</td>
<td>1028.91</td>
<td>1259.15</td>
<td>1391.91</td>
</tr>
<tr>
<td>For MSCB Amt.</td>
<td>670.98</td>
<td>715.71</td>
<td>856.53</td>
<td>935.99</td>
<td>678.29</td>
<td>786.89</td>
<td>951.36</td>
<td>805.49</td>
<td>914.66</td>
<td>1002.65</td>
</tr>
</tbody>
</table>


**TABLE – XXXIII**

**COMPARATIVE AMOUNT OF CREDIT DISBURSEMENT OF MRB & MSCB LTD.**

<table>
<thead>
<tr>
<th>Yrs.</th>
<th>89-90</th>
<th>90-91</th>
<th>91-92</th>
<th>92-93</th>
<th>93-94</th>
<th>94-95</th>
<th>95-96</th>
<th>96-97</th>
<th>97-98</th>
<th>98-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>For MRB Amt.</td>
<td>72.21</td>
<td>53.74</td>
<td>35.05</td>
<td>37.89</td>
<td>16.45</td>
<td>12.67</td>
<td>63.27</td>
<td>106.70</td>
<td>157.75</td>
<td>100.81</td>
</tr>
<tr>
<td>For MSCB Amt.</td>
<td>583.13</td>
<td>478.49</td>
<td>247.10</td>
<td>470.15</td>
<td>115.51</td>
<td>118.99</td>
<td>68.94</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Correlation between deposit (x) and credit disbursement (y) of MRB.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>x - ( \bar{x} )</th>
<th>y - ( \bar{y} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>169.41</td>
<td>72.21</td>
<td>-366.166</td>
<td>6.556</td>
</tr>
<tr>
<td>214.08</td>
<td>53.74</td>
<td>-321.086</td>
<td>-11.914</td>
</tr>
<tr>
<td>270.18</td>
<td>35.05</td>
<td>-264.986</td>
<td>-30.604</td>
</tr>
<tr>
<td>344.55</td>
<td>37.89</td>
<td>-190.616</td>
<td>-27.764</td>
</tr>
<tr>
<td>387.59</td>
<td>16.45</td>
<td>-147.576</td>
<td>-49.204</td>
</tr>
<tr>
<td>494.57</td>
<td>12.67</td>
<td>-40.596</td>
<td>-52.984</td>
</tr>
<tr>
<td>791.31</td>
<td>63.27</td>
<td>256.144</td>
<td>-2.384</td>
</tr>
<tr>
<td>1028.91</td>
<td>106.70</td>
<td>493.744</td>
<td>41.046</td>
</tr>
<tr>
<td>1259.15</td>
<td>157.75</td>
<td>723.984</td>
<td>92.096</td>
</tr>
<tr>
<td>1391.91</td>
<td>100.81</td>
<td>856.744</td>
<td>35.156</td>
</tr>
</tbody>
</table>

\( \Sigma x = 6351.66 \quad \Sigma y = 656.54 \quad \Sigma (x - \bar{x}) \Sigma (y - \bar{y}) = 999.59 \quad \Sigma y - \bar{y} = 0 \)

We have,

\[
r = \frac{\Sigma (x - \bar{x})(y - \bar{y})}{\sqrt{\Sigma (x - \bar{x})^2 \Sigma (y - \bar{y})^2}}
\]

where,

\( r = \) the correlation co-efficient

\( x \) and \( y \) = the two variable.

\[
\bar{x} = \frac{\Sigma x}{\text{No. of observations}} = \frac{\Sigma x}{n}
\]

and \( \bar{y} = \frac{\Sigma y}{\text{No. of observations}} = \frac{\Sigma y}{n} \)

\[
\Rightarrow r = \frac{999.59 \times 0}{\sqrt{(999.59)^2 \times 0^2}}
\]

\[
= 0 \quad \text{[since, } X \times 0 = 0 \text{ and } \frac{0}{X} = 0]\]
Correlation between deposit (x) and credit disbursement (y) of MSCB Ltd.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>x - ( \bar{x} )</th>
<th>y - ( \bar{y} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>670.98</td>
<td>583.13</td>
<td>-128.41</td>
<td>285.66</td>
</tr>
<tr>
<td>715.71</td>
<td>478.49</td>
<td>-83.68</td>
<td>181.02</td>
</tr>
<tr>
<td>856.53</td>
<td>247.10</td>
<td>57.14</td>
<td>-50.37</td>
</tr>
<tr>
<td>935.99</td>
<td>470.15</td>
<td>136.60</td>
<td>172.68</td>
</tr>
<tr>
<td>678.29</td>
<td>115.51</td>
<td>-121.10</td>
<td>-181.96</td>
</tr>
<tr>
<td>786.89</td>
<td>118.99</td>
<td>-12.5</td>
<td>-178.48</td>
</tr>
<tr>
<td>951.36</td>
<td>68.94</td>
<td>151.97</td>
<td>-228.53</td>
</tr>
</tbody>
</table>

\[ \Sigma x = 5595.74 \quad \Sigma y = 2082.31 \quad \Sigma x - x = 0.02 \quad \Sigma y - y = 0.02 \]

Again we have,

\[
r = \frac{\Sigma (x - \bar{x})(y - \bar{y})}{\sqrt{\Sigma (x - \bar{x})^2} \sqrt{\Sigma (y - \bar{y})^2}}
= \frac{0.02 \times 0.02}{\sqrt{(0.02)^2 \times (0.02)^2}}
= \frac{0.004}{\sqrt{0.00000016}}
= \frac{0.004}{0.004} = +1
\]
6.4 Analysis of Ratios and Statistical Tools:

As discussed in the previous Chapter-V, the Apex Bank, which is NABARD is not refinancing the MRB and MSCB Ltd. for each and every year. There was no refinance assistance of NABARD to MRB in the year, 1996-97 and 1998-99. The same thing was happened to MSCB Ltd. in most of the years of the study period. It was because of the two banks in the state are in varying stages if decay and bankruptcy. During the years which both the banks were refinanced by NABARD, the two banks cannot recover the targeted amount. Over the years, while the lending rates of MRB and MSCB Ltd. declined, the rates payable on deposits increased. This also leads to another factor of making losses. Even as NABARD, MRB and MSCB Ltd. are functioning simultaneously, they are not able to cover the agricultural sector and the farmers in a coordinate manner so that these banks cannot be considered satisfactory to deliver credit for agricultural development in Manipur.

As a conventional rule, a current ratio of 2 to 1 is considered satisfactory. The MRB has a current ratio of 0.68:1, 0.79:1, 0.78:1, 0.68:1, 0.51:1, 0.55:1, 0.61:1, 0.65:1, 0.66:1 and 0.69:1 respectively. On the other hand, the MSCB Ltd. has a current ratio of 0.46:1, 0.57:1, 0.60:1, 0.66:1, 0.93:1, 0.84:1, 0.88:1, 0.29:1, 1.16:1 and 1.13:1
respectively for the respective years as on 31/3/92 to 31/3/99. Therefore, it may be interpreted to the insufficiency liquid in all these ten years of present study. The ratio greater than one, means that the firm has more current assets than the current claims against them. But, MRB has the ratio less than one for the above 10 years. Similarly, the MSCB Ltd. has the ratio less than one except for the year ending 31/3/90 and 31/3/91. Both the banks have less current assets than current claims against them and also has less margin of safety.

For the quick ratio, if the ratio is of 1 to 1, it is considered to represent a satisfactory current financial condition. But MRB has reached ratios about ¼ to 1 for each year beginning from 1990 to 1999. In 1997 and 1998 the ratios are being increased a little. On the other hand, the MSCB Ltd. also carries a very small quick ratio. There is only one year (1995) which can reach up to 0.87 to 1. The bank also carries negative quick ratios in the year 1990 to 1993. Therefore, it can be concluded that, both the banks have no sound liquidity positions. If the inventories of these two banks do not sell to pay all its current liabilities, the banks may find difficult to meet its obligations.

In case of Cash Ratio, if the value is less than 1, it is considered to carry small amount of cash. The MRB and MSCB Ltd. carries a very small amount of cash. There is nothing to be worried about the lack of
cash if the bank has reserve borrowing powers. MRB and MSCB Ltd. borrows from NABARD, UBI and SIDBI.

The Net Working Capital Ratios of MRB and MSCB Ltd. are very small. Since the values are less than 1, the two banks are unsatisfactory regarding the Net Working Capital.

The average total debt ratio of MRB for 10(ten) years of study is 2.41. It means that lenders have financed 241 percent or about two and half of MRB’s net assets (capital employed).

Similarly, the average total debt ratio of MSCB Ltd. is 0.45, which means that lenders have financed 45 percent or about half of MRB’s net assets (capital employed). It is obviously implied that owners have provided the remaining finances. They have financed: \(1 - 0.45 = 0.65\) percent of MRB’s net assets during these 10(ten) years of study.

The size of deposit of MRB is continuously increasing year by year. It is the highest in 1999. Similarly, the size of deposit of MSCB Ltd. also can be treated as “increasing”. There is a little decline in deposits in the year 1997 and 1998. This shows that the customers’ attitude towards the two banks is positive.
The statistical tool used in order to find out the relationship between deposit and credit disbursement of MRB and MSCB Ltd. is correlation. As calculated above, the correlation co-efficient \((r)\) of MRB is zero \((0)\) and that of MSCB Ltd. is +1 (one).

Since, the MRB has zero \((0)\) as the correlation co-efficient considering the two variables namely deposits \((x)\) and credit disbursement \((y)\), it can be interpreted that there is no relationship between these two variables. In other words, the deposit \((x)\) of MRB does not account for any of the variation in credit disbursement \((y)\) and vice versa.

Further, the correlation co-efficient of MSCB Ltd. considering deposit \((x)\) and credit disbursement \((y)\) as the two variables is +1. Therefore, this shows that, the two variables are directly related. It can be expressed as the value of deposit increases, the corresponding value of credit disbursement also increase or as the value of deposit decreases, the corresponding value of credit disbursement decrease. In short, the movement of the two variables \(x\) and \(y\) is in the same direction.