Accounting for Financial and Managerial Decision and Control [AFMDC]

Unit 3
Performance Measurement and Ratio Analysis

Structure

- Concept, objectives and importance of performance measurement
- Performance measurement techniques: Horizontal, vertical, trend and ratio analysis and interpretation

After the completion of this unit, you should be able to:

- Explain the concept and meaning of performance measurement
- Describe the objectives and importance of performance measurement
- Discuss the performance measurement techniques: horizontal, vertical, trend and ratio analysis
- Compute and interpret the various ratios

3.1 Concept and Meaning of Performance Measurement

Financial statement information is the key information to the decision-makers. On the basis of the available quality information, decision-makers can provide necessary decisions to individual or institutional benefits. The financial statement information demands different parties including (i) shareholders, investors, and security analysts: (ii) managers; (iii) employees; (iv) lenders and other suppliers; (v) customers; and government regulatory agencies.

Measuring organizational performance, mainly financial performance, is necessary to internal and external users. Management wants to evaluate the overall managerial performance regarding productivity, profitability, activity and stability of the organization. Similarly, employees have interest in the continued and profitable operations of their firm as well as future profitability and solvency.

Creditors and investors want to maximize their returns and minimise risks. The creditor faces the risk that the debtors fail to pay back the credit amount. Investors hope to increase their share value and dividend payments.

Thus, the organizational financial performance appraisal is an important to management, employees, investors, creditors and other stakeholders to make decision for their future plan of actions. To make future plan of action or necessary decision, financial statements are an important source of information about current and potential future profitability and solvency. So the analysis of financial statements from the viewpoints of the various stakeholders is performance appraisal.

3.2 Objectives of Performance Appraisal

The main objectives of the performance appraisal are as under:

- Assessment of past performance and current position
- Assessment of future potential and related risk

3.3 Need and Importance of Performance Appraisal

The following are the basic need and importance of the performance appraisal:

- To judge past performance and current position
- To judge future potential and the risk connected with that potential
- To develop and implementation plans for the future goal and objectives
- To get information how resources and efforts should be allocated to ensure effectiveness.

3.4 Tools for Performance Measurements

- Analysis and interpretation of various financial ratios
- Analysis and interpretation of ratios for measuring productivity, profitability, activity, stability and growth possibility,
- Measurement and interpretation of return on investment and residual income,
- Interpretation of cash flow analysis based on cash flow statement, and
- Interpretation of value added analysis based on value added statement.

3.5 Analysis of Comparative and Common Size Statements

The main purposes of comparative financial statements are:

(1) Comparative financial statements depict the absolute figures of various periods along with the extent of their increase or decrease:

(2) It indicates the weakness and soundness of an organization of that after analyzing the problem, corrective measures can be taken:

(3) It also helps in forecasting:

(4) It helps in comparing the performance efficiency and financial health of an organization with average performance of industry, with other organization and within the organization. The comparative analysis can be performed by using the following methods.

- Horizontal analysis
- Vertical analysis
- Trend analysis

Horizontal Analysis

Horizontal analysis uses comparative financial statements to analyze a company over time period. In other words, a comparison of financial statement items over a period of time to identify the strength and weakness of the financial health of the organization.

Vertical Analysis

A comparative of various financial statement items within a single period with the use of common-size statements is known as vertical analysis. In preparation of common-size statements, i.e., balance sheet, each item of assets and liabilities related to different years or different firms should be shown as percentage of total assets and liabilities. Figures of total assets and liabilities be taken as 100 percent and, on that basis, inferences can be drawn.

Trend Analysis

This segment explains how trend statements and financial ratios are used to gain insight into the success of a company over time. Constructing trend statements involves choosing one year as a base and then expressing the statement items of subsequent years relative to their value in the base year. The base year as a convention gets a value of 100.

3.6 Ratio Analysis

An arithmetical relationship between two figures is known as Ratio. It is computed by dividing one item of relationship with the other. Ratio simply means one number expressed in terms of another. Ratio analysis is a technique of analysis and interpretation of financial statement through mathematical expression. It may be defined as the mathematical expression of the relationship between two accounting figures. In short, ratio analysis can be defined as an analysis of financial statements with the help of ratios.

3.7 Steps in Ratio Analysis

Ratio analysis involves the following steps :

i. To create the ratios which are relevant to their objective of analysis.
ii. To calculate the ratios.
iii. To compare the calculated ratios with the ratios of the same firm relating to past or with the industry ratios.
iv. Interpretation and evaluation of ratios.

3.8 Importance of Ratio Analysis

Following are the important managerial uses of ratio analysis :

- Helpful in Assessing Operating Efficiency of the Business
- Helpful in Measuring Financial Solvency
- Helpful in Future Forecasting
- Helpful in Decision Making
- Helpful in Corrective Action
- Helpful in Comparing Inter-firm Performance
- Helpful in Communication
- Helpful in Cost Control

3.9 Limitations of Ratio Analysis

The ratio analysis contributes a lot to portray the financial position of a business. But they suffer from various limitations. Some of the limitations of the ratio analysis are given below :

- Limited Use of Single Ratio
- Difficult to Interprete
- Ignored Qualitative Factors
- Limitation of Accounting Record
- Mislead by Accounting Procedure
- Arithmetical Window Dressing
- Wrong Conclusion

- Price Level Changes
- Personal Bias

3.10 Classification of Ratios

The ratios used for financial analysis of business can be classified into four categories. They are:

A. Liquidity Ratios
B. Leverage Ratios
C. Activity Ratios
D. Profitability Ratios

A. Liquidity Ratios

The ability of a firm to meet its short term obligation is known as Liquidity. It reflects the short term financial strength of the business.

i. Current Ratio
ii. Quick Ratio

i. Current Ratio

This ratio shows the relation between current assets and current liabilities. The objective of this ratio is to measure the ability of the firm to meet its short term obligation. The following formula can be used to ascertain this ratio :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Interpretation

Higher the current ratio, better the liquidity position is. For manufacturing of business, 2:1 is considered to be an adequate ratio. If the current ratio of a firm is less than 2:1, it means the firm has difficulty in meeting its current obligation. If the current ratio is more than 2:1, the company may have an excessive investment in current assets that do not produce satisfied return.

ii. Quick Ratio or Liquid Ratio or Acid-test Ratio

A relation between quick (liquid) assets and current liability is termed as Quick Ratio. Quick assets includes all the current assets other than stock and prepaid. This ratio measures the ability of firm to pay current liabilities immediately. This ratio is calculated as below :

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Assets} = \text{Current Assets} - \text{Stock} - \text{Prepaid}$$

Interpretation

Higher the current ratio, better the liquidity position is. However, an ideal quick ratio is said to be 1:1.

B. Leverage Ratios

The leverage ratios are calculated to judge the long-term financial position of a firm. These ratios measure the enterprise's ability to pay the interest regularly and to repay the principal on maturity. The following ratios are included in leverage ratios :

i. Debt-equity Ratio
ii. Debt to Total Capital Ratio
iii. Interest Coverage Ratio

iv. Fixed Coverage Ratio

1. Debt-equity Ratio

It is a popular measure of the long term financial solvency of a firm. It is calculated as follows:

$$\text{Debt-equity Ratio} = \frac{\text{Long Term Debt}}{\text{Share-holder's Equity}}$$

or

$$\text{Debt-equity Ratio} = \frac{\text{Total Debt}}{\text{Share-holder's Equity}}$$

Interpretation

A high ratio shows the large share of financing by the creditors as compared to that of owners. It indicates the margin of safety to the owners. The creditors prefer low debt-equity ratio. A low debt-equity ratio implies larger safety margin for creditors.

A high ratio is more risky than low ratio. Higher ratio shows that more of the funds invested in the business are provided by the outsider. The lower ratio shows that more of the funds invested in the business are provided by the owners.

ii. Debt to Total Capital Ratio

This ratio shows the relationship between the long term debt and total capital. Total capital includes the shareholder's equity as well as long term debt. The ratio is calculated as :

$$\text{Debt to Total Capital Ratio} = \frac{\text{Long Term Debts}}{\text{Capital Employed}}$$

or

$$\text{Debt to Total Capital Ratio} = \frac{\text{Total Debt}}{\text{Capital Employed + Current Liabilities}}$$

Interpretation

A low ratio represents security to creditors in extending credit. On the contrary, a high ratio represents a greater risk to creditors as well as shareholders.

iii. Interest Coverage Ratio

This ratio indicates the ability of a firm to pay interest charges on its borrowed capital. It is also called "Debt Service Ratio" or "Time Interest Earned Ratio". It is calculated by dividing net profit before interest and taxes (NPBIAT) by the amount of fired interest charges.

$$\text{Interest Coverage Ratio} = \frac{\text{Net Profit Before Interest and Taxes}}{\text{Interest}}$$

Interpretation

A high ratio is a sign of low burden of borrowing of the business and lower utilisation of borrowing capacity. From the point of view of creditors, debenture holders, and loan creditors, the higher the coverage, the greater the ability of the firm to make the payment of interest.

C. Activity Ratios or Turnover Ratios or Efficiency Ratios

The relationship between sales and resources is indicated by turnover ratios. These ratios reflect how efficiently the company is managing its resources. Thus these ratios measure the degree of

effectiveness in use of resources or funds by a firm. The common ratios of turnover are as follows:
:

1. Inventory Turnover Ratio
2. Debtors Turnover Ratio
3. Average Collection Period
4. Fixed Assets Turnover Ratio
5. Total Assets Turnover Ratio
6. Capital Employed Turnover Ratio

1. Inventory Turnover Ratio

This ratio may be calculated as follows :

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost Of Goods Sold}}{\text{Average Inventory}}$$

The Cost of Goods Sold and Average Inventory are calculated as under :

i. Cost of Goods Sold= Opening Inventory + Net Purchases + Direct Expense S - Closing Inventory
   or Cost of Goods Sold = Sales – Gross Profit

ii. $\text{Average Inventory} = \frac{\text{Opening Inventory + Closing Inventory}}{2}$

Generally, the cost of goods sold may not be available in the published financial statements. In such a situation, to ascertain the inventory turnover ratio, the net sales is divided by closing inventory. Hence, to ascertain average inventory, the opening inventory is necessary. In the absence of opening inventory, to draw this ratio, the net sales is divided by closing inventory. symbolically, it may be written as :

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Average Inventory}}$$

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Closing Inventory}}$$

Interpretation

A high inventory turnover is indicative of efficient inventory management. A low inventory turnover implies excessive inventory levels than warranted by production and sales activities. With the help of this ratio, management can assess whether stock has been more efficiently used or not.

2. Debtors Turnover Ratio

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Debtors}}$$

Net Credit Sales and Average Debtors are calculated as under :

i. Net Credit Sales = Total Sales – Cash Sales – Sales Return

ii. $\text{Average Debtors} = \frac{\text{Opening Debtors + Closing Debtors}}{2}$

While calculating opening debtors and closing debtors, both the debtors and bills receivable must be included.

In the absence of credit sales and opening debtors, the following formula is used to ascertain debtors turnover ratio :

$$\text{Debtors Turnover Ratio} = \frac{\text{Sales}}{\text{Closing Debtors}}$$

Interpretation

The higher the ratio, the more efficient is the management on collecting the debtors. A higher ratio indicates that within a short period, the firm is collecting the cash from debtors. A low ratio shows that debts are not being collected rapidly.

iii. Average Collection Period

Average Collection Period or Debt Collection Period

$$= \frac{\text{Debtors} \times (12 \text{ Months or } 52 \text{ weeks or } 365 \text{ days})}{\text{Credit Sales}}$$

or,
$$= \frac{12 \text{ Months or } 52 \text{ Weeks or } 365 \text{ Days}}{\text{Debtors Turnover}}$$

or,
$$= \frac{\text{Debtors}}{\text{Sales per Day}}$$

$$\text{Sales per Day} = \frac{\text{Net Credit Sales}}{\text{No. of Working Days}}$$

Interpretation

The minimum time is preferable. The minimum days show that the firm is efficient on collecting cash from debtors and it also reduces the change of bad debt. A higher average collection period shows the excessive blockage of funds with debtors which increases the chances of bad debts.

iv. Fixed Assets Turnover Ratio

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Net Fixed Assets}}$$

Net Sales and Net Fixed Assets are Calculated as under :

Net Sales = Total Sales – Sales Return

Net Fixed Assets = Fixed Assets – Depreciation

Interpretation

The higher ratio reflects better utilisation of fixed assets. A low ratio is indicative of the poor utilisation of the existing plant capacity which will result in reduction of production and increase in cost of production.

v. Total Assets Turnover Ratio

$$\text{Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

Interpretation

A higher ratio is preferable. A higher ratio implies better utilisation of total assets and vice versa.

vi. Capital-employed Turnover Ratio

$$\text{Capital-employed Turnover Ratio} = \frac{\text{Net Sales}}{\text{Capital Employed}}$$

Interpretation

Higher the ratio, the more efficient is the management on utilisation of capital. The capital employed includes shareholder's equity and long term liabilities.

D. Profitability Ratios

The profitability ratio is related to profit. It shows the overall efficiency of the business concern. The earning capacity of a business is measured by profitability ratio. Profitability of a business concern may be measured in two ways :

i. Profitability in Relation to Sales.
ii. Profitability in Relation to Investment.

i. Profitability in Relation to Sales or Return on Sale

The following ratio can be ascertained considering the sales as basis :

(a) Gross Profit Ratio
(b) Net Profit Ratio
(c) Operating Ratio

(a) Gross Profit Ratio or Gross Profit Margin

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$$

Gross Profit is Computed as under :

Gross Profit = Sales – Cost of Goods Sold

Gross Profit = Opening Stock + Net Purchases + Direct Expenses – Closing Stock

Interpretation

A higher ratio is a sign of efficient management, which reflects lower cost of goods sold and maximising profit, on the other, a low ratio may reflect higher cost of goods sold due to the firm's inability to purchase at favourable terms.

(b) Net Profit Ratio or Net Profit Margin

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Sales}}$$

[The figure of net profit may be taken either before tax or after tax]

Interpretation

A higher ratio is an indication of the higher overall efficiency of the business and better utilisation of total resources. Poor financial planning and low efficiency is the indication of lower ratio.

(c) Operating Ratio

$$\text{Operating Ratio} = \frac{\text{Operating Expenses}}{\text{Sales}}$$

Interpretation

The lower operating ratio indicates the higher operating profit. Hence, lower percentage is preferable for the company. The higher ratio shows the increase in operating expenses and decrease in business capacity.

ii. Return on Investment or Profitability in Relation to Investment

(a) Return on Assets

(b) Return on Shareholder's Equity
(c) Return on Capital Employed
(d) Return on Common Shareholder's Equity

(a) Return on Assets

$$\text{Return on Assets} = \frac{\text{Net Profit After Tax + Interest}}{\text{Total Assets}}$$

[Total assets = Current assets + Fixed assets + Intangible assets Total tangible assets = Current assets + Fixed assets]

Interpretation

This ratio measures the profitability of all financial resources invested in the firm's assets. Hence, the higher ratio implies that the available source and tools are employed efficiently.

(b) Return on Shareholder's Equity

$$\text{Return on Shareholder's Equity} = \frac{\text{Net Profit After Tax}}{\text{Shareholder's Equity}}$$

Interpretation

This ratio indicates how well the firm has used the resources contributed by the owners. It is good for the firm to be the return of investment high. Higher the ratio, the more efficient the management and utilisation of shareholder's fund.

(c) Return On Capital Employed

$$\text{Return on Capital Employed} = \frac{\text{Npat + Interest}}{\text{Capital Employed}}$$

$$\text{or} = \frac{\text{Npat + Interest}}{\text{Capital Employed – Fictitious Assets}}$$

Interpretation

This ratio shows the efficiency of the firm on the utilisation of total capital. A higher ratio is an indication of the better utilization of capital employed. Hence, higher ratio is preferable for the company.

(d) Return on Common Shareholder's Equity

$$\text{Return on Common Shareholder's Equity} = \frac{\text{NPAT – Preference Dividend}}{\text{Common Shareholder's Equity}}$$

Interpretation

This ratio is applied for testing profitability and higher ratio is better for the company. The higher the ratio, the better is the return for common shareholders and vice versa.

iii. Other Ratios

The other ratios related to profitability are as under :

(a) Earning Per Share
(b) Dividend Per Share
(c) Dividend Payout Ratio
(d) Dividend Yield Ratio
(e) Earning Yield Ratio

(f) Price-earning Ratio
(g) Earning Power Ratio

(a) Earning Per Share

$$\text{Earning per Share} = \frac{\text{Net Profit after Tax – Preference Dividend}}{\text{No. of Common Shares}}$$

Interpretation

The more per share return, the more excellent it is and the less per share return, the worse it is.

(b) Dividend Per Share

$$\text{Dividend Per Share} = \frac{\text{Earning Paid to Equity Shareholders}}{\text{No. of Equity Shares}}$$

Interpretation

The dividend per share is considered excellent when it is higher.

(c) Dividend Pay-out Ratio

$$\text{Dividend Pay-out Ratio} = \frac{\text{Dividend Per Share}}{\text{Earning Per Share}}$$

(d) Dividend Yield Ratio

$$\text{Dividend Yield Ratio} = \frac{\text{Dividend Per Share}}{\text{Market Value Per Share}}$$

(e) Earning Yield Ratio

$$\text{Earning Yield Ratio} = \frac{\text{Earning Per Share}}{\text{Market Value Per Share}}$$

(f) Price Earning Ratio

$$\text{Price Earning Ratio} = \frac{\text{Market Value Per Share}}{\text{Earning Per Share}}$$

(g) Earning Power Ratio

Earning power ratio has two elements. They are :

i. Net Profit Margin
ii. Investment Turnover

Earning power ratio is also known as Return on Investment Ratio. It is calculated by multiplying net profit margin and investment turnover. Thus :

$$\text{Earning Power Ratio} = \text{Net Profit Margin} \times \text{Investment Turnover}$$

$$= \frac{\text{Net Profit After Tax}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}}$$

$$= \frac{\text{Net Profit After Tax}}{\text{Investment}}$$

Investment may refer to total assets, capital employed and shareholder's equity. Hence the earning power ratio may be calculated in the following way also :

$$\text{Earning Power Ratio} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

References

Anthony, R.N., Hawkins, D.F. & Merchant, K.A. (2012). *Accounting: Text and cases*. The McGraw-Hill Companies

Atkinson, A. A., Kaplan, R. S., Matsumura, E. M., Young, S. M., & Kumar, G. A. (2014). *Management accounting: Information for decision-making and strategy execution*. Pearson Education

Bamber, L.S., Braun, K.W., & Harrison, Jr. W.T. (2008). *Managerial accounting*. Pearson Education

Dangol, R. M. & Dangol, J. (2019). *Accountancy for financial and managerial decision and control*. Taleju Prakashan

Hilton. R. W. & Platt, D. E. (2014). *Managerial accounting: Creating value in a global business environment*. McGraw-Hill Education