Chapter 2

Accounting earning based performance measures – a critical analysis
2.1 An Overview

Measurement, which is defined as the “process assigning numbers to represent qualities’ (R.J Chambers, 1965) is the most important concept in accounting. Chamber (1965) stated that measurements become obviously important for comparing or obtaining aggregates or differences between two or more things. Since accounting has role in making economic decision, the issue of measurement becomes the “heart” of accounting. The measurement of income is one of the most important functions of accounting. It helps the owners or managers in evaluating the past performance, taking many important decisions and making future plans. The increase in income indicates success for business while decrease in income is an indicator of its inefficient operation. However, the necessities or objectives of income measurement are discussed in the following lines.

(i) **Measurement of efficiency:** To measure the efficiency is the major objective of income determination. Efficiency can be measured in two ways. The overall efficiency of the business can be measured by ascertaining the income because income is a basic indicator of success. A concern earning more income regularly enjoys the facility of high level efficiency than the firm not earning satisfactory income or earning negative income. The shareholders can also assess the efficiency of their investments on the basis of income determined. A good return on investments or high income indicates better use of funds invested whereas a low return or poor income indicates the inefficiency.

(ii) **Making dividend and retention policy:** Formulation of dividend and retention policy depends on income measurement. How much to distribute and how much to retain? It is a vital problem of the present day management. Correct measurement of income makes possible the distinction between capital and income. If income is not accurately measured there lies every possibility of distributing capital by means of dividend.

(iii) **Maintenance of capital:** Capital maintenance is also indirectly dependent on income measurement. If income is not properly determined distributable income may include a portion of capital. If it is distributed it may lead to erosion of capital.
(iv) **Evaluation of managerial effectiveness**: The effectiveness of management as administrator, decision maker and caretaker of resources may be judged by the shareholders on the basis of income ascertained. Usually a low income indicates managerial ineffectiveness while a high income speaks of high quality of managerial services.

(v) **Evaluation of the performance of responsibility centers**: Department and sub department wise income determination helps proper evaluation of the performance of different responsibility centers. Such evaluation is useful for introducing responsibility accounting in the firm.

(vi) **Decision making**: A wide range of decisions taken by the management depend on income measurement. Decisions regarding capital budgeting, expansion, closing down of responsibility centre, use of scarce resources, wage fixation and incentive payment, raising of fund, etc. largely depend on correct measurement of income. If income measured is inaccurate that may lead to wrong decisions.

(vii) **Forecasting and planning**: Future related assumptions or forecasting depend a lot on past and present income or income trends. The expected future income and assumptions of various future events help making future plans and budgets. So without correct measurement of income adequate forecasting and proper planning are not possible.

(viii) **Measuring Credit worthiness**: A firm’s capacity to obtain credit facility from the market along with some other factors depends on its income earning capacity. This is because the repayment of loan is dependent on income. So availability of credit facility depends on credit worthiness which in turn depends to a great extend on income.

(ix) **Determination of tax liability**: The governments of most of the countries impose tax burden on firms’ income considering the levels of income earned. The procedure of advance-tax payment depends on the correct assessment of income. Incorrect income measurement may result in underpayment of tax and invites penalty and litigation problems for the firm.
(x) **Formulation of fiscal policy of the government**: The formulation of government’s fiscal policy is indirectly dependent on income earned by the firms. Policies of price controlling, monopoly curbing, subsidy payment, etc. framed by the government are influenced by income trends of the industries. Moreover, the decisions of taking over of sick industries by the government are also influenced by the income earning capacity of the concerned industries.

(xi) **Wage bargain by employees**: Claim of the employees for wage increase, bonus, and profit incentives, etc. are placed to the management on the basis of income earned by the firm. Employees and workers are the assets of a firm who exert their best for affecting a high yield. So they can legitimately claim a share of income earned by placing the above demands to the management. In this respect also correct income measurement is essential.

We have to note that an economic decision is the matter of choices of two or more alternatives. Therefore, the quality of corporate reports depends on the measurement systems. In this chapter we will discuss about the measurement of income.

### 2.2 Concept of Income

Generally, income is denoted by different terms such as profit, net profit or net income. Now, the prime question is what does income actually mean? Income may be defined differently from different viewpoints.

According to Harry Norris, income is generally conceived to be a residue which emerges out of matching expired cost against revenue. This definition of income is given from the view point of income statement (i.e., Profit & Loss A/c). As per this definition, income is the excess of revenue over expired cost (i.e., benefit of expense already exhausted).

According to Morton Backer, income is defined as aggregate of value received in exchange of goods and services of an Enterprise that results in augmentation of Enterprise Assets. This definition of income has given from the view point of the Balance Sheet of an enterprise. As per this definition, income is the net assets increased of the enterprise during an accounting period. Net Assets of a firm increases due to profit
earned during that period. These different concepts of income and different way of measurement of income are discussed individually in the following sections.

2.2.1 Accounting Concept of Income

In accounting the term income is synonymous to the term profit and is defined as excess of realized gross earnings over expired costs. The term gross earnings include revenue and gains whereas the term expired costs include expenses and losses. So the term income in accounting may be presented through the following equation:

\[ A = (R + G) - (E + L) \]

Where A= accounting income,
R = Recognized revenue - revenue generated as a result of central operating activities of the firm and recorded.
G= Gains - surplus resulting from transaction other than relating to revenue and capital.
E= Expenses - gross decrease in net assets as a result of revenue earning activities (or from delivering goods and services)
L= Losses - decrease in net assets as result of incidental transactions (or sacrifice of assets without obtaining the benefits)

In accounting income is fundamentally the net income or business income. It is measured not from an individual’s view point but from the view point of the firm.
The committee on accounting concepts and standards of American Accounting Association (AAA) defines accounting income on the following lines: “the realized net income of an enterprise measures its effectiveness as an operating units and is a charge in its net assets arising out of (a) excess or deficiency of revenue compared with related expired cost and (b) other gains and losses to the enterprise from sales, exchanges and other conversion of assets”

Usually the following arguments are placed in favors of accounting income:

(i) **Transaction based**: Under accounting concept income is measured as the end result of the transactions occurred during a particular accounting period. As it is transaction based it is a realistic concept.
(ii) **Verifiable**: Income based on transactions can be objectively verified. Transactions, particularly the external transactions, are based on documentary evidences.

(iii) **Safe**: In measuring accounting income the principle of conservatism is followed. So accounting concept is a too safe concept of income.

(iv) **Dependable**: Accounting income is determined on the basis of realistic information rather than anticipatory information. So such income is more dependable for decision making.

(v) **Judging managerial efficiency**: Accounting income helps measuring the past performance of the management. So the shareholders who entrust the responsibility of managing the business affairs on the managers or stewards find this accounting income more useful for judging the efficiency of the management.

**The critics of accounting concept of income speak about its following limitations:**

(i) **Unrealized income not included**: Accounting income can never be taken as complete and total income as it takes into consideration realized income only. Unrealized income arising out of holding assets over time is not included in accounting income.

(ii) **Overstatement**: Accounting income is measured by matching expired costs against revenue. Inventory consumption which is a part of expired cost is valued at historical cost i.e. at the acquisition cost or market price whichever is lower, but it is matched against revenues or sales which are expressed at current prices. So the obvious result is overstatement of income.

(iii) **Mismatch of expenses with revenue**: Matching process, the vital step in the determination of accounting income, is in the opinion of the critics a “practical impossibility.” decisions are taken by the accountants by applying their sense of judgments which may be guided only by their own interest and not by the interest of the investors and other parties. So matching may lead to mismatch of expired costs.
(iv) **Investors’ need not emphasized upon:** The conservation principle that plays a vital role in the determination of accounting income gives birth to some awkward problems. All possible future losses are provided for while no revenue is usually taken into consideration on anticipatory basis. So the investors’ needs are not emphasized upon properly in the accounting concept of income.

(v) **Biased towards income statement:** Under accounting concept of income more emphasis is placed on the income statement i.e. the Profit and Loss Account. Balance Sheet, the basic source of financial information of any business, plays the secondary role. Vernon Kam pointed out this limitation of accounting concept of income and said, “It (Balance Sheet) is merely a summary of balances that result after applying the rules of determining income.

(vi) **Problems of historical cost:** Accounting income is based on historical cost, a concept that is itself subject to severe criticism in the present world. Some of these criticisms are inadequacy at times of inflation, distribution of capital, violation of true and fair principles, non-relevance in decision making, etc.

2.2.2 Economic Concept of Income

In accounting, income is measured from the viewpoint of business or firm; but in economics, it is measured from the viewpoint of individuals, group of individuals or society i.e. both from micro and macro point of view. Economic concept of income has been developed on the basis of the proposition launched by J.R. Hicks. In his opinion, a man’s income is to be considered as the maximum value which he can consume during a week, and still expect to be as well off at the end of the week as he was at the beginning.

The Hicksian concept of economic income may be termed as capital maintenance concept of income because Hicks identified that surplus as income at the end of a certain period which remains after maintaining the opening capital intact. S. Alexander defined economic income on the line of Hicks as the maximum amount which a firm can distribute to its shareholders during a period and still be as well off at the end of the
period as at the beginning. In the opinion of Harry Norris, “Income is the residuum of revenue after setting aside funds to maintain capital value at a constant figure.

In the light of the above definitions economic income may be identified as the difference between the capital of two different dates plus drawings or dividends minus additional capital contributed. This may be represented by the following equation:

$$E_1 = C_1 - C_o + C \text{ or } (D - F)$$

Where, $E_1 =$ Economic income, $C_1 =$ Capital at the end of the period,
$C_o =$ Capital at the beginning of the period, $C =$ Consumption of the period,
$D =$ Dividend or Drawings and $F =$ Fresh Capital introduced.

While determining economic income opening and closing capitals are measured by ascertaining the present discounted value of the expected net cash flows. As the ascertainment of present discounted value of the expected net cash flows is based on uncertainty, economic income is an assumptive and not a realistic measure of income. So the determination of economic income involved four clear steps:

(a) Valuation of capital or net assets at the beginning of the period,
(b) Valuation of capital or net assets at the end of the period,
(c) Ascertainment of capital consumed during the period in the form of drawing or dividend and
(d) Making necessary adjustments among items (a), (b) and (c).

2.3 Methods of Income Measurement

Methods of Income Measurement

Balance Sheet Method | Transaction Method

Two methods are used for measuring income in accounting: (i) Balance Sheet Method and (ii) Transaction Method. While discussing accounting income early in this chapter the formula suggested for income measurement is used in reality in the Transaction Method. Balance Sheet Method is another method of measuring accounting income which has been developed on the line of economic concept of income.
Irrespective of the method used in income determination, the result obtained is same. These methods of income measurement are discussed in the following lines.

2.3.1 Balance Sheet Method

Income is a result of increase in assets. Balance Sheet Method is that method where income of a firm is measured by finding out the difference in net assets of two different dates i.e., the closing date and the opening date of an accounting period and making minor adjustment to that. For the purpose of ascertaining the value of net assets of two different dates two Balance Sheets are prepared on these dates. As in income determination preparation of Balance Sheets plays very important role this method is known as Balance Sheet Method. If the net assets on the closing date of the accounting period are more than the same on the opening date, income is said to be earned.

The method of income measurement under the Balance Sheet method largely resembles to the method of measurement of economic income. In ascertainment of economic income the opening and closing value of net assets are not ascertained by preparing Balance Sheets, rather these are measured by finding out the present (discounted) value of the expected net cash flows of the assets. Under the Balance Sheet Method each item of income of the firm is supported by earning of additional assets. If the value of the assets spent for earning additional assets is deducted from the total assets acquired by the firm, the portion left is taken as income. In this context it is to be mentioned that proper allowances are to be given in income determination for the introduction of fresh capital and capital withdrawn during the accounting period.

It is true that under the Balance Sheet Method individual transactions are not accounted for, but the overall effect of all the transactions taken place in a particular period is automatically reflected on determined income because each transaction results in a change of net assets. The continuous circulations of capital assets through a series of transactions create additional assets or income. As income is said to be the excess of the opening net assets or capital, the capital is maintained intact in this method. For this
reason this method is also known as Capital Maintenance Method or Approach of income measurement.

The accounting equation of income measurement process under the Balance Sheet Method is: 

\[ I = C_1 - C_0 + W - F \]

Where \( I \) = income, \( C_1 \) = Capital on the closing date of the accounting period, \( C_0 \) = capital on the opening date of the accounting period, \( W \) = withdrawal or drawings of capital and \( F \) = fresh capital introduced.

From the formula of income determination used in the Balance Sheet Method it is clear that this is nothing but single entry system followed in accounting. These formulas are similar to that of economic income, but in case of economic income \( C_1 \) and \( C_0 \) are not determined by preparing Balance Sheets. They are determined by ascertaining the present discounted value of expected net cash flows and summing up the same.

**Advantages of Balance Sheet Method**

Balance Sheet method of income measurement has may benefits. The important advantages of this method are as follows:

- **Capital maintenance**: As this method is dependent on the capital maintenance concept the net increase in capital assets of the firm is taken as income. This system maintains the initial capital intact.
- **Less complex**: This method takes into consideration the overall effect of all the transactions through change in the assets and does not consider each transaction separately. So this method is much more easier than the other method of income determination.
- **Useful for small concerns**: The Balance Sheet Method resembles to single entry accounting system. So it is less costly and therefore, useful for small concerns having limited financial strength.

**Limitations of Balance Sheet Method**

Balance Sheet Method of income determination is highly criticized in the present accounting world. The limitations of this method are discussed below:
- **Unscientific:** This method is not accepted as a scientific method because it does not allow the double entry accounting system. It does not also keep the detailed records of the transactions related to revenue and expired costs.

- **Non-ascertainment of gross profit:** As the records of the transactions related to purchase and sales are not kept gross profit cannot be ascertained under this method.

- **Difficult to control operating or indirect expenses:** As gross profit cannot be ascertained comparative analysis between gross profit and net profit cannot be done. Therefore operating or indirect expenses are not known to the management. It creates great problems in controlling these expenses.

- **Less informative:** Balance Sheet Method is less informative method of income measurement. Not only it fails to supply information of gross profit and indirect expenses it does not also provide information of credit purchase and credit sales, cost of goods sold, closing stock, departmental expenses, operating capital etc.

- **Not useful for judging managerial efficiency:** External transactions are not recorded in this method. So in case this method is followed the performance of the managers in running the business can only be evaluated through increase in net profit. Detailed analysis of managerial efficiency in relation to controlling of operating expenses, maintenance of consistency in stock valuation, credit policy, stock turnover, etc. cannot be made.

- **Difficulty in valuation of assets:** The accuracy of income measurement, under this method, largely depends on valuation of assets on the opening and closing dates. Valuation of assets always poses problems because of the existence of different contradictory approaches and principles of valuation. Any consequential error in valuation of assets may lead to over or under statement of income.

- **Impossibility of comparative analysis:** The present day accounting very often claims meaningful inter-firm and inter-year comparative analysis. Such analysis is usually done by computing different accounting ratios like gross profit ratio, net profit ratio, operating ratio, expense ratio, etc. If the Balance Sheet Method of income measurement is adopted such computation of ratios and comparative analysis cannot be done due to the non-availability of adequate information.
2.3.2 Transaction Method

Transaction Method is that method of measurement of income where income is considered to be a flow out of capital stock used in the business arising as a result of transactions taken place during two specific dates and is measured by matching expired cost against recognized revenue. Like Balance Sheet Method here also it is accepted that income arises out of an increase in utility or value of assets. In addition to this notion it is also assumed that the increase in assets takes place due to a series of transactions occurred in the particular accounting period. These transactions are divided into two types – (i) internal and (ii) external. Inter-departmental transactions and paper transactions related to depreciation, provision, etc. are identified as internal transactions. On the other hand transactions with outsiders are treated as external transactions.

Income is considered to be the outcome of both these types of transactions. It arises out of operating activities of the firm and is measured by keeping records of individual transactions. From the records of the transactions of a particular accounting period the following information is summed up: (a) revenue recognized and gains earned and (b) expenses spent including the allocated portion of fixed costs for depreciation and other losses sustained. After collecting these information expenses and losses are matched against revenues and gains and the balance is taken as income.

Transaction Method is also known as operative method. This method of income measurement is fundamentally the double entry system of accounting, which is identified as the only scientific method of accounting of the present world.

The income determination process in the Transaction Method may be represented by the following equation: 

\[ I = (R_r + G) - (E + L) \]

Where \( I \) = income, \( R_r \) = revenue recognized for the accounting period, \( G \) = gains from unusual transactions, \( E \) = expenses paid for earning revenue and \( L \) = losses from unusual transactions. [This equation has also been mentioned while discussing accounting income]

One of the main features of this method is that it does not only measure income of the firm by differentiating between gross profit (income) and net profit (income), it also shows how income is generated. How income is generated as an overall effect of all
internal and external transactions that is shown through the Income Statement or Profit and Loss Account. Operating expenses can be ascertained and many other useful information can be supplied. So this method of income measurement is a very widely popular method among the firms.

**Advantages of Transaction Method**

Transaction method of income measurement has may benefits. The important advantages of this method are as follows:

- **Scientific:** Transactions are recorded and classified following the double entry system which is the only scientific system of accounting of the present world. So this method of income determination has the scientific base.

- **Segregation between trading and non-trading income:** This system helps segregating trading income of the firm from its non-trading income. As separate records are maintained for trading activities like purchase, sales, expenses, etc. and non-trading activities like investment, interest earned, dividend received, etc. such segregation is possible. This enables the management to measure the return on capital invested and return on non-trading investments.

- **Separate records for internal transactions:** Internal transactions like depreciation on fixed assets, provisions for doubtful debts, taxation, etc. are separately recorded. It enables the management to judge the influence of these transactions on the income of the firm.

- **Elaborate analysis:** Income is determined under this system after making a thorough analysis of all the financial activities of the firm. Such detailed analysis provided many useful information to the management and the other users for taking many important decisions.

- **Comparative analysis:** Information available under this method is sufficient to computer different significant accounting ratios like gross profit ratio, net profit ratio, expense ratios, return on capital employed, stock turnover, debtors turnover, etc. It helps comparative analysis of the performance of the same firm over years and also the same among different firms.
- **Valuation of closing stock**: Each time a transaction takes place the inflow and outflow of assets are recorded under this method. As a result it becomes easier to value the closing stock at the end of each accounting period.

- **Authenticity**: Income which is determined under this method after taking into consideration the effect of each transaction, can be objectively verified on the basis of documentary evidences of the transaction, can be objectively verified on the basis of documentary evidences of the transactions. So income ascertained under this method can be accepted as an authentic measurement.

- **Judgment of managerial efficiency**: The information available under this method helps the owners or shareholders to judge the managerial efficiency. For example, on the basis of information regarding return on investment the shareholders can assess the efficiency of the management in managing the fund entrusted to them.

**Limitations of Transaction Method**

There is no doubt that the Transaction Method of income measurement is the most popular and advantageous method in the present days. But this method is not fully free of flaws. The limitations of this method are as follows:

- **Personal bias**: The value of the internal transactions like depreciation, provisions, etc. are very often influenced by personal judgment of the accountants or management because there is no contractual price for such transactions. Personal judgment is likely to be effected by individual’s bias or willingness. As a result income determination process gets affected by personal bias.

- **Problem in measurement and valuation**: The success of this method depends on correct measurement and recognition of revenues and expenses as well as on proper valuation of closing stock. Different approaches are there for timing of recognition of revenues, measurement of expenses and methods of valuation of inventory. It is difficult for the accountants to select the approach most suitable for the concerned firm.

- **Difficulty in matching**: Income under this method is determined by matching expired costs against revenue. Matching process is always a very difficult task.
Matching signifies not only the charging of used up value of resources in the current accounting period, also it claims an accurate measurement of such used up value. In the opinion of Paton and Littleton in matching “It should be emphasized, however, that the essential test is reasonableness, in the light of all the pertinent conditions, rather than physical measurement.

2.4 Accounting earning based performance measurement

An accepted financial axiom is that the role of managers is to maximize the wealth of shareholders by the efficient allocation of resources. In order to operationalise this objective, shareholder wealth is traditionally proxies by either standard accounting magnitudes (such as profits, earnings and cash flows from operations) or financial statement ratios (including earnings per share and the returns on assets, investment and equity). This financial statement information is then used by managers, shareholders and other interested parties to assess current firm performance, and is also used by these same stakeholders to predict future performance. Further, under the semi-strong form of the efficient market hypothesis, the publicly available information contained in these variables is readily interpreted by the market, and thereby incorporated into future stock prices. Unfortunately, the empirical literature to date suggests that there is no single accounting based measure upon which one can rely to explain changes in shareholder wealth.

Traditionally the methods of measurement of corporate performance are many. Common bases used are: - Net Profit Margin (NPM), Operating Profit Margin (OPM), Return on Investment (ROI), Return on Net Worth (RONW) etc. Profit after Tax (PAT) is an indicator of profit available to the shareholder and Profit before Interest after Tax (PBIAT) is an indicator of the surplus generated using total funds. However, the traditionally used profit indicators are ineffective parameters in explaining whether the reported profit covers the cost of capital. Old profit concept fails to indicate clear surplus. The basic proposition is that the Return on Capital Employed should be greater than the Cost of Capital (i.e. ROCE > K0). Capital Employed highlights long term capital and cost of capital represents weighted average cost of capital.
Traditionally the methods of measurement of corporate performance are many. In this chapter, we will concentrate only five different earning-based performance measurement systems. They are classified as

1. Profitability ratio based on Assets/Investments;
   - Return on capital employed (ROCE)
   - Return on assets (ROA)

2. Profitability from the point of view of Owners/Shareholders;
   - Earning Per Shares (EPS)
   - Return on equity (ROE)

3. Profitability ratio in the context of managerial performance;
   - Earnings before depreciation interest and amortization margin (EBDITA Margin).

2.4.1 Return on Capital Employed

The profitability of the firm can also be analysed from the point of view of the total fund employed in the firm. The term funds employed or capital employed refers to the total long term sources of the funds. It means that the capital employed comprises of shareholders funds plus long term debts. Alternatively, it can also be defined as fixed assets plus net working capital. The Return on Capital Employed may be calculated as follows:

\[
\text{ROCE} = \frac{\text{Net Profit After tax}}{\text{Average Capital Employed}} \times 100
\]

However, there is a conceptual mismatch in the above formula. The figure of net profit after tax is a profit figure after deducting the interest on debts whereas the figure of capital employed in the denominator includes the long-term debts. Therefore, it would be
better to adjust the amount of interest on long-term debts in the numerator in either of the following ways:

\[
\text{ROCE} = \frac{\text{Net Profit After tax} + \text{interest} (1-t)}{\text{Average Capital Employed}}
\]

It is post tax version of earning power

OR, \(\text{ROCE} = \frac{\text{Earning Before Interest and Tax (EBIT)}}{\text{Average Capital Employed}}\)

Published financial statements do not disclose interest on short-term borrowings and interest on long-term borrowings separately. An analyst has to estimate on long-term borrowings based on information available in the footnotes in financial statements. Therefore, it is difficult to calculate ROCE accurately. ROCE can be criticized on the ground that, there is no strong logic to exclude short-term borrowings in evaluating the overall profitability or productivity of the capital, because most of the companies roll over short-term borrowings. It may not be correct to assume that short term borrowings are always for temporary financing. It may be true in some situation but may not be true in many situations. An analyst using ROCE holds the view that a company borrows short term to meet short term requirement of funds, which is not correct in all situations.

### 2.4.2 Return on Assets

The Return on Assets (ROA) is one of the important measures of performance evaluation of the company. The Return on Assets compares income with total Assets (equivalently the total liability and equity capital. It can be interpreted in two ways.

1. It measures management’s efficiency in using firm’s assets to generate operating profits
2. It reports the total return accruing to all providers of capital.

The return is measured by net income prior to the cost of financing and is computed by adding back after tax interest expenses to net income.

\[
\text{Return on Assets (ROA)} = \frac{\text{Net Income} + \text{After tax interest cost}}{\text{Average total Assets}}
\]
ROA can also be computed on a pretax basis using EBIT as the return measure. This result is unaffected by difference in a firm’s Tax position as well as financial policy. In such case, ROA is measured as:

\[
\text{Return on Assets (ROA)} = \frac{\text{Earnings before Interest and Tax (EBIT)}}{\text{Average total Assets}}
\]

In practice, however, the ROA is computed using either net income or EBIT as the numerator. Such post interest ROA ratio make leveraged firms appear less profitable by charging earning for payments (interest) to some capital providers and lender. Pre interest ROI ratios, in contrast, facilitate the comparison of firms with different degree of leverage. Therefore, ROA ratios that use total assets in the denominator should always include total earnings before interest in the numerator. As interest is tax deductible, post-tax profit measures should add back net of tax interest payment.

The ROA ratio can be disaggregated as follows

\[
\text{ROA} = \text{Total Asset Turnover} \times \text{Return on Sales}
\]

\[
= \frac{\text{sales}}{\text{Assets}} \times \frac{\text{operating income}}{\text{Sales}}
\]

The firm’s overall profitability is the product of an activity ratio and profitability ratio. A low ROA can results from low turnover indicating poor asset management, or low profit margin, or a combination of both factors.

### 2.4.3 Earning Per Share

The probably one of the easiest methods among all that are being used to assess the value a company's stocks is the Earnings Per Share, or as it usually is called, the EPS method. The phrase “earnings” in finance is referred to net profit, that is, after tax profit. Earnings per Share equals simply to the total net profit (earnings) divided by the total number of shares. What EPS means is how much net profit one share of the company is producing. Obviously the higher this ratio is, the better, because the value of the share will increase. When the company publishes what proportion of its profits will be paid out as dividend to
the stockholders, then the higher the EPS is the better, since than more dividends will be received after each shares owned. There are two types of EPS in use of Financial Statement.

1. Basic EPS = \( \frac{\text{Net Profit—Pref Dividend}}{\text{Number of outstanding Equity Shares}} \)

2. Diluted EPS = \( \frac{\text{Net Profit After adjustment for diluted earnings to Equity}}{\text{Outstanding and Potential Equity Shares}} \)

It is required to calculate the diluted EPS when there are potential equity shares in the capital structure of the enterprise. Like convertible debenture, convertible preference shares, options, warrants etc.

**Advantages of Using EPS**

- As EPS ratio tells how much profit one share produces, it is an excellent method of determining the profitability of the company.
- In addition, the EPS is easy very easy to grasp and to calculate.
- EPS evaluates solely the performance of the company and do not consider stock market prices of the company. The advantage of this is that EPS is not dependent on such factors as market optimism, pessimism or consensus.

**Disadvantages of using EPS**

- Since this ratio tells the current profitability of the company (or its shares rather), It does not tell us anything about the future of the company. For example, when the company sold an asset it held, say one of its buildings, it results in a sudden jump in EPS. Likewise, when the company purchases an asset, for example a production plant, it results in a sudden drop in its EPS.
- It is often difficult to determine which type of EPS the company reported, and the financial figures of the company should be dealt with in depth, as otherwise it can be quite misleading.

**2.4.3.1 Types of EPS**

There are many types of EPSs that investors could use. The next section of our discourses about these different types of EPS. However, before moving on, to the
description of what shares outstanding are, we first have to define the phrase. Shares outstanding are simply shares issued, and traded on the secondary market, that is the stock exchanges. Shares outstanding can be classified in two ways; primary shares, or primary EPS, and diluted shares, or diluted EPS.

(a) Primary and Diluted EPS

Primary EPS is simply all the shares that are issued, and can currently be traded with on stock exchanges. Diluted EPS, on the other hand is a much more complex mathematical method. It includes all shares, options, and warrants that are converted into shares at one point of time, usually at the end each quarter. There are many types of options, which simply give additional or differentiated rights of the holders of the shares. Warrants are types of options that the holder can exercise, after a pre-set amount of time, which usually is five to ten years, use. Usually diluted EPS is preferred to primary shares by the investors, because as the price of the shares change, the number of the diluted shares can change also. During reporting, companies tend to report both the diluted-, and the primary shares, although there are instances when they do not report in such a manner. In these cases the investor and the investigator of the report has to be extremely careful to note and take this fact into consideration.

(b) Pro Forma EPS

Pro forma type of EPS, differing from the reported type of EPS, usually exclude the expenses and incomes incurred by the company due to the sell of the subsidiary or other single, non-conventional, and nonrecurring incomes and costs. The reason behind this is by doing so; the different entries that are comparable to each other can thus remain comparable over an extended period of time. Another example of a pro forma type of company EPS is a company that chooses not to include some of its expenses, because its management may feel that the expenses are nonrecurring and does not represent the company’s earnings coming from its traditional operations. These expenses, however, seem to be more and more the norm recently among the reporting companies. This trend is suspected to be so prevalent so that managers thus can’t manipulate the EPS of their company.
(c) Reported EPS

There are many strict laws, and regulations about how to report the earnings of a company in its financial statements, however there are ways to distort the results, sometimes even when it actually is only unintentional. For instance, sometimes, the sale of a subsidiary company can be, deceivingly, considered a corporate income, but a one-time machinery purchase can be excluded as direct costs in the financial statements. The importance of this is that when investors observe the company statements, it should be very careful in how to interpret them. However, due to different measuring standards, companies can easily distort the reported earnings per shares, by simply applying those measurements that fits the purposes of the company, just as Enron has done this for years.

(d) Ongoing EPS

This type of EPS is calculated using only the operational, and excluding one-time, exceptionary, incomes, or costs. The purpose of ongoing EPS is to be able to compare and contrast past accounting statements and trying to forecast the future earning of the company. This method of EPS calculation is also called "pro forma" EPS.

(e) Headline EPS

The headline type of EPS is the one that usually appears in the media and is mentioned. This can either be a pro forma EPS, excluding the nonrecurring expenses and incomes, or can be calculated from the reported earnings of the company, but it is usually not indicated which type is being used in the media.

(f) Cash EPS

The cash type of EPS is the operating cash flow, not earnings before interest, tax, depreciation, and amortization, or the EBITDA, divided by the diluted shares, which are all shares together with all options and warrants converted to shares, outstanding.

Since this valuation method is more explanatory, it is probably more useful than the previous. The reason behind this is that operating cash flow is much harder to manipulate then the income of the company, because the operating cash flow takes into account the changes in key asset categories such as inventories and receivables.
2.4.4 Return on Equity

Common or equity shareholders are entitled to the residual profits. The rate of dividend is not fixed; the earnings may be distributed to the shareholders or retained in the business. Nevertheless, the net profits after tax represent their return. A return on shareholder’s equity is calculated to see the profitability of owners’ investment. The shareholder’s equity or net worth will include paid up share capital, securities premium and reserve & surplus less accumulated losses. Net worth can also be found by subtracting total liabilities from total assets.

The return on equity is net profit after taxes divided by shareholder’s equity which is given by net worth.

$$\text{ROE} = \frac{\text{Profit after Taxes}}{\text{Net worth (Equity)}} = \frac{\text{PAT}}{\text{Net Worth}}$$

If the company has both preference shares and ordinary, ROE should be calculated after deducting preference dividend from PAT and preference share capital from net worth.

ROE indicates how well the firm has used the resources of the owners. In fact, this ratio in one of the most important relationship with the financial analysis. The earning of a satisfactory return is the most desirable objective of the business. The ratio of net profit to owner’s equity reflects the extent to which this objective has been accomplished. This ratio is, thus of great interest to the present as well as the prospective investors and a great concern of management. This ratio will reveal the relative performance and strength of the company based on accounting earnings. Higher the return reveals the better the profitability position to the equity shareholders.

DU Pont analysis (1953) enables the enterprise to break its ROE into three major components, in order to identify the area that is responsible for the profit earning capacity of the enterprise. These three components are:

(i) Profitability – measured by net profit ratio \(\frac{\text{Income}}{\text{Sales}}\)

(ii) Activity – measured by asset turnover ratio \(\frac{\text{Sales}}{\text{Assets}}\)

(iii) Solvency - measures the leverage position in the capital structure \(\frac{\text{Assets}}{\text{Equity}}\)

i.e. total assets acquired by share holders fund
Hence, ROE = \(\frac{\text{Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}\)

Although three components model is shown in the Standard Du Pont analysis, but that model can be developed further. It is worthwhile to look at the effect of interest payments or tax payments. To do so we must disaggregate the profitability ratio further as follows:

\[
\frac{\text{Income}}{\text{Sales}} = \frac{\text{Net Income (PAT)}}{\text{Earning Before Tax (EBT)}} \times \frac{\text{Earning Before Tax (EBT)}}{\text{Earning Before Interest Tax}} \times \frac{\text{EBIT}}{\text{Sales}}
\]

- \(\frac{\text{Net Income (PAT)}}{\text{Earning Before Tax (EBT)}}\) measures the effect of Tax burden
- \(\frac{\text{Earning Before Tax (EBT)}}{\text{Earning Before Interest Tax}}\) measures the effect of interest burden
- \(\frac{\text{EBIT}}{\text{Sales}}\) measures the effect of cost of goods sold in operating profit

This decomposition allows the analyst to view the income tax burden separately from the interest burden and separately from operating profit.

Selling and Stickney (1990) enables the enterprise to disaggregate ROE into three major components, in order to identify the area that is responsible for the profit earning capacity of the enterprise.

\[\text{ROE} = \text{ROA} \times \text{FLM} \times \frac{\text{Net Income to Operating Income (Earning Leverage)}}{\text{Profit after Tax (PAT)}} \times \frac{\text{Total Assets}}{\text{Equity}}\]

The terms to the right to ROA are clearly measures of financial leverage (FLM) and always greater than 1 and its effect is to increase ROE relative to ROA. The ratio of the Net Income to Operating Income is the inverse of the financial leverage and always be less than 1, tendency to drive ROE below ROA. Whether ROE is greater than or less than ROA depends on whether the positive effect of capital structure leverage (FLM) outweigh the negative effect of earning leverage.
2.4.5 EBDITA Margin

EBITDA stands for earnings before interest, taxes, depreciation and amortization. The EBITDA margin measures the number of cents of EBITDA generated per dollar of sales. It is one way to measure the cash flow of a company’s operations. EBITDA is created by considering a company's earnings before interest payments; tax, depreciation, and amortization are subtracted for any final accounting of its income and expenses. The EBITDA of a company gives an indication of the current operational profitability of the business, i.e. how much profit does it make with its present assets and its operations on the products it produces and sells.

EBDITA Margin = \frac{\text{Earning before Interest, Taxes, Depreciation, and Amortisation}}{\text{Net Sales}}

Though EBITDA is not a financial metric recognized in generally accepted accounting principles, it is widely used when assessing the performance of companies. It is intended to allow a comparison of profitability between different companies, by canceling the effects of interest payments from different forms of financing (by ignoring interest payments), political jurisdictions (by ignoring tax), collections of assets (by ignoring depreciation of assets), and different takeover histories (by ignoring amortization often stemming from goodwill).

A negative EBITDA indicates that a business has fundamental problems with profitability. A positive EBITDA, on the other hand, does not necessarily mean that the business generates cash. This is because EBITDA ignores changes in Working Capital (usually needed when growing a business), capital expenditures (needed to replace assets that have broken down), taxes, and interest. The EBITDA margin helps ensure the company is generating enough cash to stay in business.

**EBITDA margin is computed using the following steps:**

Step 1: Add the cost of goods sold, research and development, and sales, general and administrative expenses to calculate the total cash expenditures of the company for the year.
Step 2: Subtract the company’s total cash expenditures from its sales for the year to find the company’s EBITDA.

Step 3: Divide the company’s EBITDA by its sales to calculate the EBITDA margin

Step 4: Multiple the EBITDA margin by 100 to convert it to a percentage. This percentage represents how many cents out of every dollar of sales that count towards the business’s EBITDA.

2.5 Deficiencies of traditional accounting measures

1. Traditionally, the most popular methods of evaluating company performance have been through profitability measures such as earnings per share (EPS) and return on equity (ROE). These measures, however, can be misleading in that they are often poor indicators of shareholder value creation.

2. Accounting numbers can be manipulated to the detriment of the interests of shareholders since management has flexibility in how it records transactions. For example, several different ways exist to record sales and costs. The method employed can have a significant impact on the recognition of revenues and expenses, and therefore, the net income of the firm.

3. Accountants do not measure economic profits. Generally accepted accounting principles (GAAP) deduct only the interest on debt, but not the cost of equity capital in arriving at net income. Nevertheless, the right of shareholders to receive an economic return on their investment is as legitimate as a creditor's right to receive interest.

4. Risk is of central importance in calculating the economic value of assets. Assets seldom offer both high returns and safety. However, conventional accounting reports, such as income statements, fail to consider the level of business and financial risk associated with generating a given level of earnings. Therefore, accounting-based measures can be inaccurate measures of the financial performance of a company.

5. Earnings calculations also ignore the time value of money. The economic value of an investment is the discounted (or present) value of the forecast cash flows produced by
the investment. The discount rate used in computing the economic value of an investment includes a premium for bearing risk as well as a premium for expected inflation.

6. Finally, earnings-based measures fail to incorporate the ongoing investment requirements of a firm. As the business grows, there generally will be an associated growth in both working capital and fixed investment. For a business to remain competitive, these incremental working and fixed capital expenditures must be funded in a timely manner.

In contrast to accounting-related measures, economic profit incorporates risk and considers the time value of money. Furthermore, the value-based technique considers the cost of equity capital, working capital, and capital expenditure investment requirements.