IJMRSETM

e-ISSN: 2395 - 7639

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT

Volume 9, Issue 8, August 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.580

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 7.580| A Monthly Double-Blind Peer Reviewed Journal |

| Volume 9, Issue 8, August 2022 |

| DOI: 10.15680/IJMRSETM.2022.0908015 |

Ratio Analysis: A Technique of Financial Statement Analysis

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ABSTRACT: Financial statement analysis (or just financial analysis) is the process of reviewing and analyzing a company's financial statements to make better economic decisions to earn income in future. These statements include the income statement, balance sheet, statement of cash flows, notes to accounts and a statement of changes in equity (if applicable). Financial statement analysis is a method or process involving specific techniques for evaluating risks, performance, financial health, and future prospects of an organization.[1]

It is used by a variety of stakeholders, such as credit and equity investors, the government, the public, and decision-makers within the organization. These stakeholders have different interests and apply a variety of different techniques to meet their needs. For example, equity investors are interested in the long-term earnings power of the organization and perhaps the sustainability and growth of dividend payments. Creditors want to ensure the interest and principal is paid on the organizations debt securities (e.g., bonds) when due.

KEYWORDS: financial, statement, analysis, ratio, cash, balance, sheet

I. INTRODUCTION

Common methods of financial statement analysis include horizontal and vertical analysis and the use of financial ratios. Historical information combined with a series of assumptions and adjustments to the financial information may be used to project future performance. The Chartered Financial Analyst designation is available for professional financial analysts. Benjamin Graham and David Dodd first published their influential book "Security Analysis" in 1934.[2] [3] A central premise of their book is that the market's pricing mechanism for financial securities such as stocks and bonds is based upon faulty and irrational analytical processes performed by many market participants.[1,2,3] This results in the market price of a security only occasionally coinciding with the intrinsic value around which the price tends to fluctuate.[4] Investor Warren Buffett is a well-known supporter of Graham and Dodd's philosophy.

The Graham and Dodd approach is referred to as Fundamental analysis and includes: 1) Economic analysis; 2) Industry analysis; and 3) Company analysis. The latter is the primary realm of financial statement analysis. On the basis of these three analyses the intrinsic value of the security is determined.[4]

Horizontal analysis compares financial information over time, typically from past quarters or years. Horizontal analysis is performed by comparing financial data from a past statement, such as the income statement. When comparing this past information one will want to look for variations such as higher or lower earnings.[5]

Vertical analysis is a percentage analysis of financial statements. Each line item listed in the financial statement is listed as the percentage of another line item. For example, on an income statement each line item will be listed as a percentage of gross sales. This technique is also referred to as normalization[6] or common-sizing.[5]

Financial ratios are very powerful tools to perform some quick analysis of financial statements. There are four main categories of ratios: liquidity ratios, profitability ratios, activity ratios and leverage ratios. These are typically analyzed over time and across competitors in an industry.

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- Liquidity ratios are used to determine how quickly a company can turn its assets into cash if it experiences financial difficulties or bankruptcy. It essentially is a measure of a company's ability to remain in business. A few common liquidity ratios are the current ratio and the liquidity index. The current ratio is current assets/current liabilities and measures how much liquidity is available to pay for liabilities. The liquidity index shows how quickly a company can turn assets into cash and is calculated by: (Trade receivables x Days to liquidate) + (Inventory x Days to liquidate)/Trade Receivables + Inventory.[5,7,8]
- Profitability ratios are ratios that demonstrate how profitable a company is. A few popular profitability ratios are the breakeven point and gross profit ratio. The breakeven point calculates how much cash a company must generate to break even with their start up costs. The gross profit ratio is equal to gross profit/revenue. This ratio shows a quick snapshot of expected revenue.
- Activity ratios are meant to show how well management is managing the company's resources. Two common activity ratios are accounts payable turnover and accounts receivable turnover. These ratios demonstrate how long it takes for a company to pay off its accounts payable and how long it takes for a company to receive payments, respectively.
- Leverage ratios depict how much a company relies upon its debt to fund operations. A very common leverage ratio used for financial statement analysis is the debt-to-equity ratio. This ratio shows the extent to which management is willing to use debt in order to fund operations. This ratio is calculated as: (Long-term debt + Short-term debt + Leases)/ Equity.[7]

DuPont analysis uses several financial ratios that multiplied together equal return on equity, a measure of how much income the firm earns divided by the amount of funds invested (equity).

A Dividend discount model (DDM) may also be used to value a company's stock price based on the theory that its stock is worth the sum of all of its future dividend payments, discounted back to their present value.[8] In other words, it is used to value stocks based on the net present value of the future dividends.

Financial statement analyses are typically performed in spreadsheet software — or specialized accounting software — and summarized in a variety of formats.

II. DISCUSSION

An earnings recast is the act of amending and re-releasing a previously released earnings statement, with specified intent.[9]

Investors need to understand the ability of the company to generate profit. This, together with its rate of profit growth, relative to the amount of capital deployed and various other financial ratios, forms an important part of their analysis of the value of the company.[9,10,11] Analysts may modify ("recast") the financial statements by adjusting the underlying assumptions to aid in this computation. For example, operating leases (treated like a rental transaction) may be recast as capital leases (indicating ownership), adding assets and liabilities to the balance sheet. This affects the financial statement ratios.[10]

Recasting is also known as normalizing accounts.[11]

Financial analysts typically have finance and accounting education at the undergraduate or graduate level. Persons may earn the Chartered Financial Analyst (CFA) designation through a series of challenging examinations. Upon completion of the three-part exam, CFAs are considered experts in areas like fundamentals of investing, the valuation of assets, portfolio management, and wealth planning.

A financial ratio or accounting ratio is a relative magnitude of two selected numerical values taken from an enterprise's financial statements. Often used in accounting, there are many standard ratios used to try to evaluate the overall financial condition of a corporation or other organization. Financial ratios may be used by managers within a firm, by current and potential shareholders (owners) of a firm, and by a firm's creditors. Financial analysts use

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financial ratios to compare the strengths and weaknesses in various companies.[1] If shares in a company are traded in a financial market, the market price of the shares is used in certain financial ratios.

Ratios can be expressed as a decimal value, such as 0.10, or given as an equivalent percent value, such as 10%. Some ratios are usually quoted as percentages, especially ratios that are usually or always less than 1, such as earnings yield, while others are usually quoted as decimal numbers, especially ratios that are usually more than 1, such as P/E ratio; these latter are also called multiples. Given any ratio, one can take its reciprocal; if the ratio was above 1, the reciprocal will be below 1, and conversely. The reciprocal expresses the same information, but may be more understandable: for instance, the earnings yield can be compared with bond yields, while the P/E ratio cannot be: for example, a P/E ratio of 20 corresponds to an earnings yield of 5%

Values used in calculating financial ratios are taken from the balance sheet, income statement, statement of cash flows or (sometimes) the statement of changes in equity. These comprise the firm's "accounting statements" or financial statements. The statements' data is based on the accounting method and accounting standards used by the organisation.

Financial ratios quantify many aspects of a business and are an integral part of the financial statement analysis. Financial ratios are categorized according to the financial aspect of the business which the ratio measures. Liquidity ratios measure the availability of cash to pay debt.[2] Activity ratios measure how quickly a firm converts non-cash assets to cash assets.[3] Debt ratios measure the firm's ability to repay long-term debt.[4] Profitability ratios measure the firm's use of its assets and control of its expenses to generate an acceptable rate of return.[5] Market ratios measure investor response to owning a company's stock and also the cost of issuing stock.[6] These are concerned with the return on investment for shareholders, and with the relationship between return and the value of an investment in company's shares.

Financial ratios allow for comparisons

- between companies
- between industries
- between different time periods for one company
- between a single company and its industry average

Ratios generally are not useful unless they are benchmarked against something else, like past performance or another company. Thus, the ratios of firms in different industries, which face different risks, capital requirements, and competition are usually hard to compare.[12,13,15]

III. RESULTS

Financial ratios may not be directly comparable between companies that use different accounting methods or follow various standard accounting practices. Most public companies are required by law to use generally accepted accounting principles for their home countries, but private companies, partnerships and sole proprietorships may elect to not use accrual basis accounting. Large multi-national corporations may use International Financial Reporting Standards to produce their financial statements, or they may use the generally accepted accounting principles of their home country.

There is no international standard for calculating the summary data presented in all financial statements, and the terminology is not always consistent between companies, industries, countries and time periods.

Various abbreviations may be used in financial statements, especially financial statements summarized on the Internet. Sales reported by a firm are usually net sales, which deduct returns, allowances, and early payment discounts from the charge on an invoice. Net income is always the amount after taxes, depreciation, amortization, and interest, unless otherwise stated. Otherwise, the amount would be EBIT, or EBITDA (see below).

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Companies that are primarily involved in providing services with labour do not generally report "Sales" based on hours. These companies tend to report "revenue" based on the monetary value of income that the services provide.[15,17]

Note that Shareholders' Equity and Owner's Equity are not the same thing, Shareholder's Equity represents the total number of shares in the company multiplied by each share's book value; Owner's Equity represents the total number of shares that an individual shareholder owns (usually the owner with controlling interest), multiplied by each share's book value. It is important to make this distinction when calculating ratios.

Profitability ratios measure the company's use of its assets and control of its expenses to generate an acceptable rate of return

Gross margin, Gross profit margin or Gross Profit Rate[7][8]
Gross Profit/Net Sales :::OR :::Net Sales - COGS/Net Sales
Operating margin, Operating Income Margin, Operating profit margin or Return on sales (ROS)[8][9]
Operating Income/Net Sales

- Note: Operating income is the difference between operating revenues and operating expenses, but it is also sometimes used as a synonym for EBIT and operating profit.[10] This is true if the firm has no non-operating income. (Earnings before interest and taxes / Sales[11][12])

Profit margin, net margin or net profit margin[13]
Net Profit/Net Sales
Return on equity (ROE)[13]
Net Income/Average Shareholders Equity
Return on assets (ROA ratio or Du Pont Ratio)[6]
Net Income/Average Total Assets
Return on assets (ROA)[14]
Net Income/Total Assets[18,19,20]
Return on assets Du Pont (ROA Du Pont)[15]
Net Income/Net Sales · Net Sales/Total Assets
Return on Equity Du Pont (ROE Du Pont)
Net Income/Net Sales · Net Sales/Average Assets · Average Assets/Average Equity
Return on net assets (RONA)
Net Income/Fixed Assets + Working Capital
Return on capital (ROC)
EBIT(1 − (Tax Rate))/Invested Capital
Risk adjusted return on capital (RAROC)
Expected Return/Economic Capital :::OR :::Expected Return/Value at Risk
Return on capital employed (ROCE)
EBIT/Capital Employed
Note: this is somewhat similar to (ROI), which calculates Net Income per Owner's Equity
Cash flow return on investment (CFROI)
Cash Flow/Market Recapitalisation
Efficiency ratio
Non-Interest expense/Revenue
Net gearing
Net debt/Equity
Basic Earnings Power Ratio[16]
EBIT/Total Assets

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Liquidity ratios

Liquidity ratios measure the availability of cash to pay debt.

Current ratio (Working Capital Ratio)[17]
Current Assets/Current Liabilities
Acid-test ratio (Quick ratio)[17]
Current Assets − (Inventories + Prepayments)/Current Liabilities
Cash ratio[17]
Cash and Marketable Securities/Current Liabilities
Operating cash flow ratio
Operating Cash Flow/Total Debts

Activity ratios (Efficiency Ratios)

Activity ratios measure the effectiveness of the firm's use of resources.[21,22,23]

Average collection period[3]
Accounts Receivable/Annual Credit Sales × 365 Days
Degree of Operating Leverage (DOL)
Percent Change in Net Operating Income/Percent Change in Sales
DSO Ratio.[18]
Accounts Receivable/Total Annual Sales × 365 Days
Average payment period[3]
Accounts Payable/Annual Credit Purchases × 365 Days
Asset turnover[19]
Net Sales/Total Assets
Stock turnover ratio[20][21]
Cost of Goods Sold/Average Inventory
Receivables Turnover Ratio[22]
Net Credit Sales/Average Net Receivables
Inventory conversion ratio[4]
365 Days/Inventory Turnover
Inventory conversion period (essentially same thing as above)
Inventory/Cost of Goods Sold · 365 Days
Receivables conversion period
Receivables/Net Sales · 365 Days
Payables conversion period[25,27,28]
Accounts Payables/Purchases · 365 Days
Cash Conversion Cycle
(Inventory Conversion Period) + (Receivables Conversion Period) − (Payables Conversion Period)
Debt ratio[23]
Total Liabilities/Total Assets
Debt to equity ratio[24]
(Long-term Debt) + (Value of Leases)/(Average Shareholders Equity)
Long-term Debt to equity (LT Debt to Equity)[24]
(Long-term Debt)/(Average Shareholders Equity)
Times interest earned ratio (Interest Coverage Ratio)[24]
EBIT/Annual Interest Expense
OR

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Net Income/Annual Interest Expense
Debt service coverage ratio
Net Operating Income/Total Debt Service
Earnings per share (EPS)[25]
Net Earnings/Number of Shares
Payout ratio[25][26]
Dividends/Earnings[29,30,31]
OR
Dividends/EPS
Dividend cover (the inverse of Payout Ratio)
Earnings per Share/Dividend per Share
P/E ratio
Market Price per Share/Diluted EPS
Dividend yield
Dividend/Current Market Price
Cash flow ratio or Price/cash flow ratio[27]
Market Price per Share/Present Value of Cash Flow per Share
Price to book value ratio (P/B or PBV)[27]
Market Price per Share/Balance Sheet Price per Share
Price/sales ratio
Market Price per Share/Gross Sales
PEG ratio
Price per Earnings/Annual EPS Growth
EV/EBITDA
Enterprise Value/EBITDA
EV/Sales
Enterprise Value/Net Sales
Cost/Income ratio
Sector-specific ratios[32,33,35]
EV/capacity
EV/output

IV. CONCLUSION

In addition to assisting management and owners in diagnosing the financial health of their company, ratios can also help managers make decisions about investments or projects that the company is considering to take, such as acquisitions, or expansion.[37]

Many formal methods are used in capital budgeting, including the techniques such as

- Net present value
- Profitability index
- Internal rate of return
- Modified internal rate of return
- Equivalent annuity[38]

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39. Other Market Ratios

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