Introduction to Ratio Analysis using the DuPont System

The DuPont Ratios.

DataWise Report Writer uses the DuPont system of ratio analysis as its standard for analysis in the 3 page summary report.

The DuPont system was developed many years ago as an effective way for shareholders and financial managers to determine the profitability and therefore success of their organisations. The measures need to be viewed in the context of the industry in which they operate. For example a high asset based petroleum company cannot be compared with a employment consultancy. Industry standards can be obtained from numerous sources, and from the financials published by listed companies. The best measure is that of the company over time. All of the measures can be used as yardsticks on which to improve efficiencies.

In DataWise Forecast the financial ratios are calculated on both a monthly and an annualised basis. This gives the decision maker the opportunity to see where in the year, what events are causing a deviation of the data.

Terms & abbreviations.

EBITDA - Earnings before interest, company tax, depreciation and amortisation
EBIT - Earnings (profit) before interest and company tax
EAIT - Earnings after Interest, Company Tax (and Depreciation & amortisation)

I. Liquidity Ratios

Liquidity ratios also called solvency ratios and include the current ratio, quick ratio, net working capital. They measure the firm's ability to satisfy obligations as they become due.

Current Ratio

current ratio = current assets / current liabilities

Measurers the firms ability to meet it's short term obligations. A current ratio of 2.0 is generally acceptable, but depends on the industry. 1.0 may be ok for a utility company, but not a manufacturer. The more predictable a firm's cash flows, the lower the acceptable current ratio.

With a current ratio of 2.0 a firm can still cover it's current liabilities if its assets shrink by 50%.

With a current ratio of 1.0, it's net working capital is zero.

Current assets include cash, marketable securities, inventory, and prepaid expenses. Current liabilities includes accounts payable (1 year or less) , current portions of long-term debt, and salaries payable. The current ratio measures the ability of the firm to pay is current bills while still allowing for a safety margin above their required amount needed to pay current obligations.

Quick Ratio

The quick ratio is similar to the current ratio but eliminates the inventory figure in the current assets section of the balance sheet. The inventory figure is thought to be the least liquid figure and should thus, be eliminated. Calculate the quick ratio as follows:

Quick ratio = (Current Assets - Inventory) / Current Liabilities

Generally, the quick ratio should be lower than the current ratio because it eliminates the inventory figure from the calculation. A quick ratio of 1.0 or greater is occasionally recommended. It gives a better measure of overall liquidity **only** when a firm's inventory cannot be easily converted to cash.

Net Working Capital

The Net Working Capital figure simply deducts the current assets from the current liabilities on the balance sheet. Calculate the Net Working capital as follows:

NWC = Current Assets - Current Liabilities

Net working capital is only suitable for time-series analysis. The current ratio should be used for any cross-sectional analysis. Often under contracts a contractor can require the firm to maintain a certain level of net working capital so that it has enough operating liquidity to protect the creditor.

II. Activity Ratios

Activity ratios measure the operating characteristics of the firm. They measure the speed with which various accounts are converted into cash or sales. Activity ratios include the inventory turnover rate, average collection period, average payment period, fixed asset turnover ratio, and total asset turnover ratio.

Average Collection Period or Days Sales Outstanding

Calculate the average collection period by the following formula:

ACP = Accounts Receivable / (Annual Sales / 360 days)
or Accounts Receivable / (Months Sales / 30 days)

Total accounts receivable includes all outstanding credit obligations from customers. The accounts collection period varies from industry to industry. The smaller the accounts receivable period, the more effectively a company is in managing and collecting money from customers.

Average Payment Period

The average payment period is calculated by the following formula:

APP = Accounts Payable / (Purchases / 360)
or Accounts Payable / Cost of Sales + Change in stock holding

Where a company does not account for purchases as a separate item DataWise Forecast uses the Cost of Sales plus change in inventory to determine the month's purchases. In some cases the calculation can be achieved by using the total purchases, and include a percentage of sales based on historical figures. This is largely a high risk estimate and is not possible in DataWise Forecast . This amount could vary from industry to industry.

The accounts payable turnover ratio includes all outstanding obligations that a company owes its creditors. Calculate the average payment period by adding all current accounts payable financial obligations.

Fixed Assets Turnover

The fixed assets turnover is a measure of how efficiently a company uses its fixed assets to generate sales. The higher the fixed asset ratio the better. Calculate the fixed assets turnover by adding all fixed assets of the company and dividing the amount by annualised sales. The basic formula is as follows:

FAT = (Fixed Assets / Total Assets) or
Annual Sales / Net Fixed Assets

The fixed asset turnover can vary substantially from industry to industry.

Note that the age of fixed assets is not measured and comparing firms with significantly newer or older assets can be misleading. The differences in profitability could be a result of more costly assets to run.

Total Asset Turnover

The total asset turnover is a measure of how efficiently and effectively a company uses its assets to generate sales. The figure is similar to the fixed assets turnover but includes all assets. The higher the total asset turnover ratio, the more efficiently a firms assets have been used. Calculate the total asset turnover ratio as follows:

Total Asset Turnover = Sales / Total Assets

Inventory Turnover

The inventory turnover ratio measures the number of times during a year that a company replaces its inventory. The turnover is only meaningful when comparing other firms in the industry or a company's prior inventory turnover. Differences in turnover rates result from differing operating characteristics within an industry. Calculate the inventory turnover rate as follows:

Inventory Turnover = Cost of Goods / Total Inventory

The higher the inventory turnover rate means the more efficiently a company is able to grow sales volume. Compile inventory turnover by using the cost of goods figure in the numerator since inventories are usually carried at cost. Many other compilers of financial data use sales in the numerator. However, this is usually an inaccurate barometer of financial performance to determine the inventory turnover rate.

III. Debt Ratios

Debt ratios measure the total amount and proportion of debt within the liabilities section of a firm's balance sheet. These figures are normally appropriate for comparing a company performance from one period to another. The debt position of a firm indicates the amount of other people's money being used in attempting to generate profits. The ability to repay long term debt is of most concern.

The more debt a firm uses in relation to it's total assets, the greater is it's financial leverage.

Ie: Fixed-cost debt up = financial leverage up = shareholder risk up.

Borrowing money to finance your firm's debt will give you a higher return on investment, but also more risk as there are interest and capital repayment obligations to be met first.

Debt Ratio

Measure the proportion of total assets provided by a company's creditors. The debt ratio is calculated by dividing the total liabilities by total assets. The higher this ratio, the greater the degree of outside financing by creditors. It indicates that the firm is more highly leveraged (debt) and highly risky for creditors. The basic formula is as follows:

Debt Ratio = Total Liabilities / Total Assets

Higher ratios indicate high financial leverage to the firm. Some people ignore short term obligations (e.g. current liabilities) in calculating debt ratios.

Debt to Equity Ratio

This ratio indicates the ratio of debt on a firm's balance sheet to the amount of funds provided by owners. Measure performance by using only long term debt divided by total equity. The basic formula is calculated as follows:

Debt to Equity = Long Term Debt / Total Equity

The more capital intensive the firm, the higher the debt to equity ratio. It measures the percentage of debt tied up in the owners equity. Less capital intensive firms with volatile cash flows have lower debt equity ratios.

Times Interest Earned

Times interest earned measures the ability of the firm to service all debts. The figure will indicate how many times a company can cover its fixed contractual obligations to its creditors. The higher the times interest earned, the more likely the firm can meet its obligations. Measure this basic formula as follows:

Times Interest Earned = EBIT / Interest

The figure is determined from the income statement by finding the operating profit margin. The operating profit margin (discussed below) is the profits of the firm before interest and taxes are subtracted. The interest figure is the interest obligations for the prior four quarters of financial performance from the use of long term debt funds.

Fixed Payment Coverage Ratio

The fixed payment coverage ratio indicates the ability of the firm to pay its fixed obligations for a specified period of time. This figure includes the principal plus interest amount owed to creditors. The figure is determined by the following formula:

Fixed Payment = BIT / Interest + (Principal + Preferred div). x Taxes

The higher the ratio the safer creditors are for receiving amounts owed to themselves.

Operating Leases are essentially long term obligations and should be included in Fixed obligations.

The formula for calculating the tax is [1/(1-t)] where t is the tax rate as a percentage 33% = .33

IV. Profitability Ratios

The profitability figures measure the ability of the business firm to earn a profit from its operations through assets, sales, and equity.

Sometimes common-size income can be better for analysing profitability. Here each item is expressed as a percentage of sales. Eg: if salaries move from being 10% of sales to 15% of sales, this would be a concern, but if salaries expense is up, but is only 9%, then this would be positive. A change in product margin would also be relevant, depending on whether the firm's product mix has changed.

Gross Profit Margin

The gross profit margin indicates the percentage of each sales dollar remaining after a firm has pad for its goods. The basic formula is calculated as follows:

GPM = (Sales - Cost of Goods Sold) / Sales

The higher the GPM the better pricing flexibility and cost management controls a firm has in its operations.

Operating Profit Margin

The operating profit margin indicates the profits of the company before interest and taxes are deducted from a firms operation. The higher the operating profit margin, the greater pricing flexibility a firm has in its operations. However, it could also indicate the degree of cost control management a firm possesses. The figure is calculated as follows:

Operating Profits = Operating Profits / Sales

Net Profit Margin

Similar to the operating profit margin, the net profit margin measures the amount of profits available to shareholders after interest and taxes have been deducted on the income statement. The higher the profit margin, the more pricing flexibility a firm may have in its operations or the greater cost control initiated by management. The figure is determined as follows:

NPM = Net Profits after tax /Sales or EAIT / Sales

Return on Investment

The ROI is determined by multiplying the Total Asset turnover by the Net Profit Margin. The figure is meaningful because it shows how well a company uses its assets to generate profits,. The basic formula is as follows:

ROI = Total Asset Turnover x Net Profit Margin

Alternatively use EAIT / Total Assets

The DuPont method allows the firm to break down its return on investment into a profit on sales component and an asset efficiency component. Typically, a firm with a low net profit margin would have a total asset turnover. The relationship between the net profit margin and Total Asset turnover is largely dependent on the industry the firm operates.

Return on Equity

The return on equity measures the return earned on the owners equity in the firm. The higher the rate the better the firm has increased wealth to shareholders. The basic formula is as follows:

ROE = Net Profits / Stockholders Equity or EAIT / Stockholders Equity

Earnings Per Share

The earnings per share measures the per share dollar return to owners of a company. The figure is calculated as follows:

EPS = Total Earnings / No. of shares outstanding

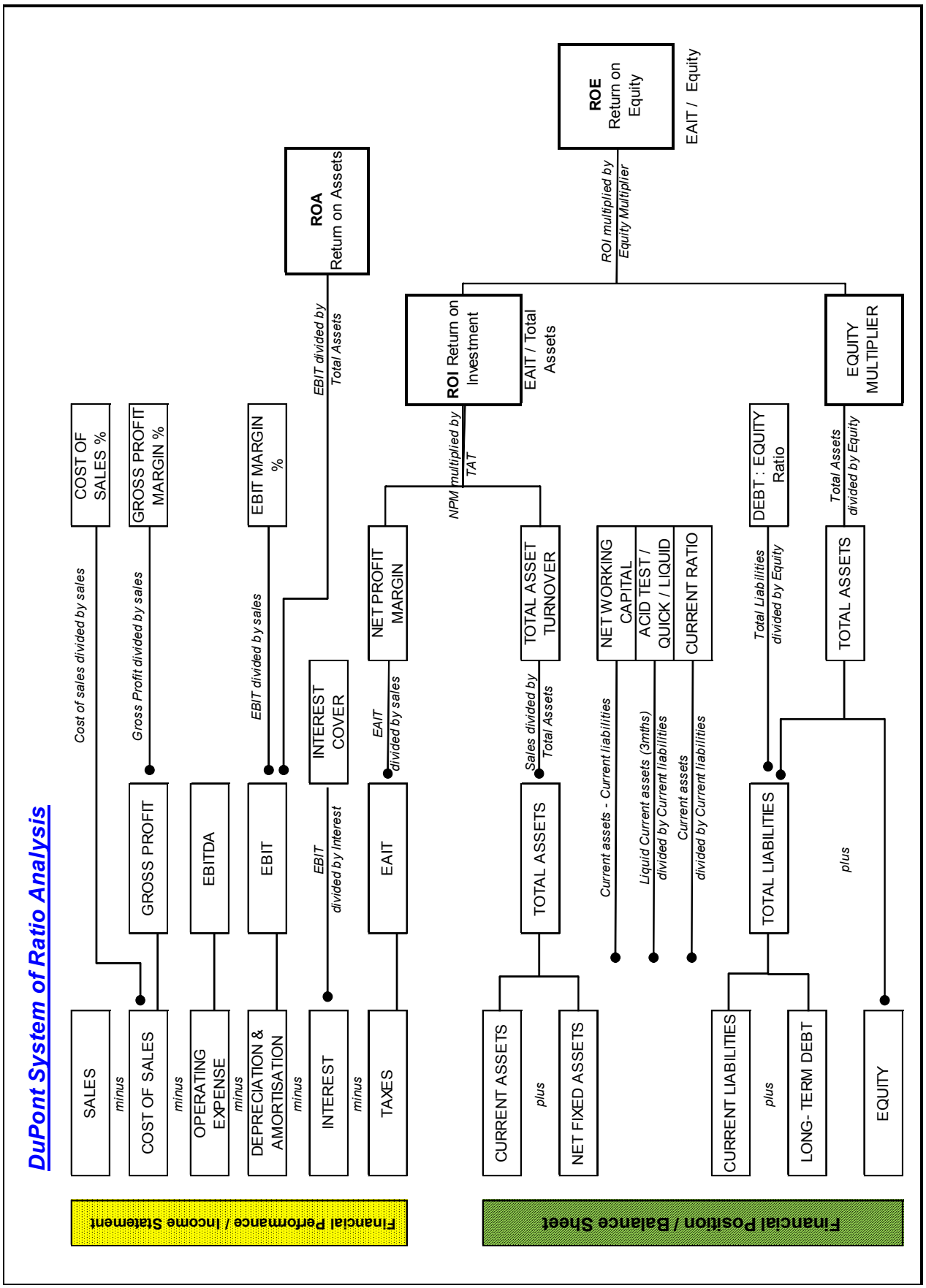
Total earnings are the earnings available to common stock holders.

Sum the prior year earnings and divide the amount by the weighted average of shares outstanding. This assumes the most accurate information if a company distributes new shares outstanding during the period which could substantially impact (or dilute) shares to current shareholders with lower per share earnings.

Price / Earnings Ratio

PE = Price / Earnings Ratio

For more information go to www.datawise.co.nz


DuPont System of Ratio Analysis
Financial Performance / Income Statement
Financial Position / Balance Sheet
SALES
minus
COST OF SALES
GROSS PROFIT
minus
OPERATING EXPENSE
EBITDA
minus
DEPRECIATION & AMORTISATION
EBIT
minus
INTEREST
EBIT divided by Interest
minus
TAXES
EAIT
COST OF SALES %
Cost of sales divided by sales
GROSS PROFIT MARGIN %
Gross Profit divided by sales
EBIT MARGIN %
EBIT divided by sales
INTEREST COVER
EAIT divided by sales
NET PROFIT MARGIN
NPM multiplied by TAT
ROA Return on Assets
EBIT divided by Total Assets
ROI Return on Investment
EAIT / Total Assets
CURRENT ASSETS
plus
NET FIXED ASSETS
TOTAL ASSETS
Sales divided by Total Assets
TOTAL ASSET TURNOVER
NET WORKING CAPITAL
Current assets - Current liabilities
ACID TEST / QUICK / LIQUID
Liquid Current assets (3mths) divided by Current liabilities
CURRENT RATIO
Current assets divided by Current liabilities
CURRENT LIABILITIES
plus
LONG- TERM DEBT
TOTAL LIABILITIES
Total Liabilities divided by Equity
DEBT : EQUITY Ratio
EQUITY
plus
TOTAL ASSETS
Total Assets divided by Equity
EQUITY MULTIPLIER
ROI multiplied by Equity Multiplier
ROE Return on Equity
EAIT / Equity