

Module 2

Financial Modelling

Introduction



Outcomes

Upon completion of this module you will be able to:

- *apply* ratio analysis, Horizontal analysis, Vertical analysis and the DuPont relationship to explain trends in Company financial performance.
- *construct* a financial model that can be used for predicting corporate funding requirements.
- *describe* the limitation on growth imposed by lack of access to external capital.
- *identify* the funding implications of working capital investment and devise policies to minimise such investment.



Terminology

Financial statements:	Records that provide an indication of an individual's, organisation's financial status.
Balance sheet:	A financial statement that are used to provide insight into a company's assets and debts, including equity at a particular time.
Income statement:	A financial statement that presents information concerning the revenue earned by a company in a specified period.
Cash-flow statement:	A financial statement that provides a look at the movement of cash in and out of a company.
Statements of retained earnings:	A financial statement that shows changes in a company's or organisation's retained earnings over a specific period.
Vertical analysis:	An analysis that reports each amount on a financial statement as a percentage of another item.



- Horizontal analysis:** An analysis looks at amounts on the financial statements over the past years. The ratios that measure how productively an organisation uses its assets.
- DuPont model:** A technique that can be used to analyse the profitability of a company using traditional performance management tools.

Introduction: Financial modelling and forecasting

This module will review topics that were included in MS-4 Accounting and Finance. We will revisit financial statement analysis by using different analysis tools to assist in the preparation of cash budgets and financial statements for future dates. Understanding historical relationships between financial statement items is a key step in preparing financial forecasts that are useful to users of these tools. The financial manager's main concern with cash budgets and financial forecasts is determining when there will be excess cash and when financing will be required. Therefore these two estimates are fundamental tools in managing an organisation's financial resources.

Before going for the analysis tools and techniques here a brief description of financial statements is given.

Financial statements

Financial statements are the records that provide an indication of an individual's, organisations', or business' financial status. There are four basic types of financial statements: balance sheets, income statements, cash-flow statements, and statements of retained earnings. Typically, financial statements are used in relation to business events.

Balance sheet financial statements are used to provide insight into a company's assets and debts at a particular time. Information about the company's shareholder equity is included as well. Typically, a company lists its assets on the left side of the balance sheet and its debts and liabilities on the right. Sometimes, however, a balance sheet has assets listed at the top, debts in the middle, and shareholders' equity at the bottom. This is called report format of balance sheet.

Income financial statements present information concerning the revenue earned by a company in a specified time period. Income statements also show the company's expenses in attaining the income and shareholder earnings per share. At the bottom of the income statement, a total of the amount earned or lost is included. Often, income statements provide a record of revenue over a year's time.

Cash-flow financial statements provide a look at the movement of cash in and out of a company. These financial statements include information from operating, investing, and financing activities. The cash-flow statement can be important in determining whether or not a company has enough cash to pay its bills, handle expenses, and acquire assets. At the bottom of a cash-flow statement, the net cash increase or decrease can be found.

Statements of retained earnings show changes in a company's or organisation's retained earnings over a specific period. These statements show the beginning and final balance of retained earnings, as well as any adjustments to the balance that occur during the reporting period. This information is sometimes included as part of the balance sheet or it may be combined with an income statement. However, it is frequently provided as a completely separate statement.

The average individual does not typically have a use for financial statements. However, sole proprietors may use them in the same manner as other businesses. High-net-worth individuals may also use them for the purpose of obtaining loans, participating in investment deals, and developing financial, tax and business plans. In some cases, personal financial statements may be used when running for a government office.

What is ratio analysis?

While a detailed explanation of ratio analysis is beyond the scope of this module, we will focus on a technique, which is easy to use. It can provide you with a valuable investment analysis tool.

This technique is called cross-sectional analysis. Cross-sectional analysis compares financial ratios of several companies from the same industry. Ratio analysis can provide valuable information about a company's financial health. A financial ratio measures a company's performance in a specific area. For example, you could use a ratio of a company's debt to its equity to measure a company's leverage. By comparing the leverage ratios of two companies, you can determine which company uses greater debt in the conduct of its business. A company whose leverage ratio is higher than a competitor's has more debt per equity. You can use this information to make a judgment as to which company is a better investment risk.

However, you must be careful not to place too much importance on one ratio. You obtain a better indication of the direction a company is moving when several ratios are taken as a group.

Financial ratio tools

In Accounting and Finance, we introduced financial ratios and how they can be used to evaluate a company's performance and make inter-company comparisons. In this course, we build on the foundation we established in the



earlier course and concentrate on describing the relationship between ratios and decision making about financial matters.

Previously we had divided the assessment of a business into five areas, and came up with a series of ratio measurements for each area. The five areas were: liquidity, profitability, asset management, gearing and market value.

In accounting we used the term to focus on debt levels within the firm. When we examined credit assessment we were largely concerned with the extent to which a particular corporation could borrow money and the risk associated with such borrowings. In this course, we replace the term gearing with the word leverage. In corporate finance much energy is devoted to choosing a financing strategy (that includes leverage), which enhances return on equity (ROE) and the ultimate return to stockholders. As well as changing labels, we are also broadening the concept. We can, in fact, divide leverage into financial leverage (that is related to the extent of borrowed funds), and operating leverage that relates to the way operational costs are structured. This course concentrates on financial leverage.

In accounting we discussed the efficient management of current assets such as accounts receivable and inventory. In finance we replace the term asset management ratios with activity ratios that are focused on the various elements of asset turnover.

In finance we can divide our financial assessment of an enterprise into five key areas as defined in the table below.

Financial assessment

Element	Description
Liquidity	The firm's ability to meet its short-term commitments as they become due and payable.
Activity ratios	The firm's ability to put its assets to productive use.
Leverage (debt and other fixed costs)	The firm's reliance on fixed commitments that can help or hurt its profitability, and the degree to which the firm is financed with borrowed money.
Profitability	The firm's ability to generate satisfactory profits.
Shareholder value (market ratios)	The value investors assign to the firm. It expresses the desirability of the firm in the eyes of its owners. This last attribute can only be readily measured for publicly traded corporations. Private limited companies and unincorporated firms have a value but it is not easy to establish.

Together these five areas of assessment can produce a picture of a company's financial strengths and weaknesses. In businesses that are asset intense (e.g., food processing), a ratio analysis can be very useful. However, its utility is limited in businesses that have few assets, particularly those in their early stages of development. Ratio analysis is therefore of limited use in early stage biotech ventures, where assets are few and profitability not yet established. Clearly, ratio analysis is heavily dependent on traditional accounting data which is based largely on cost and which often ignores the true worth of such assets as patents and other intangibles. The ratio analysis has limited scope for analysis of a firm in a service industry.

In the following sections we will review the formulae for the key ratios that we will use in this course.

Liquidity ratios

The following ratios measure the ability of an organisation to meet its short-term financial obligations. In other words, does the company have sufficient short-term assets (those that can normally be converted readily into cash) to make payments on its short-term liabilities? The higher the result for both these ratios the better able a company is to meet its obligations. What is acceptable for both ratios will vary depending on the industry an organisation is operating in.

Current ratios

The current ratio is one of the best known measures of financial strength. It is figured as shown below:

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

The main question this ratio addresses is: "Does your business have enough current assets to meet the payment schedule of its current debts with a margin of safety for possible losses in current assets, such as inventory shrinkage or collectable accounts?" A generally acceptable current ratio is 2 to 1. But whether or not a specific ratio is satisfactory depends on the nature of the business and the characteristics of its current assets and liabilities. The minimum acceptable current ratio is obviously 1:1, but that relationship is usually playing it too close for comfort. If you feel your business's current ratio is too low, you may be able to raise it by:

- Paying some debts.
- Increasing your current assets from loans or other borrowings with a maturity of more than one year.
- Converting non-current assets into current assets.
- Increasing your current assets from new equity contributions.



- Putting profits back into the business.

Quick ratios

The quick ratio is sometimes called the “acid-test” ratio and is one of the best measures of liquidity. It is figured as shown below:

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

The quick ratio is a much more exacting measure than the current ratio. By excluding inventories, it concentrates on the really liquid assets, with value that is fairly certain. It helps answer the question: “If all sales revenues should disappear, could my business meet its current obligations with the readily convertible ‘quick’ funds on hand?”

An acid-test of 1:1 is considered satisfactory unless the majority of your “quick assets” are in accounts receivable, and the pattern of accounts receivable collection lags behind the schedule for paying current liabilities.

Working capital

Working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. It is calculated as shown below:

Formula:

$$\text{Working Capital} = \text{Total Current Assets} - \text{Total Current Liabilities}$$

Bankers look at net working capital over time to determine a company’s ability to weather financial crises. Loans are often tied to minimum working capital requirements.

A general observation about these three liquidity ratios is that the higher they are the better, especially if you are relying to any significant extent on creditor money to finance assets.

When preparing financial statement forecasts you will want to assess the liquidity ratios that result from your forecast. If the ratios are very different from the results a company has experienced historically, then you may want to revisit some of your forecasted items to ensure you have used appropriate assumptions.

Activity ratios

The following ratios measure how productively an organisation uses its assets. In preparing financial forecasts these ratios are used to determine balances for accounts receivables, inventory, and total assets for the forecast balance sheet.

Inventory turnover ratio

The inventory turnover ratio measures the number of times a year 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. Formula to calculate the inventory turnover rate as follows:

Formula:

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods}}{\text{Average Inventory}}$$

The higher the inventory turnover rate, the more efficiently a company is able to grow sales volume. Sales can also be used as a nominator for calculation but the purpose of taking cost is more meaningful because inventories are always shown on cost.

Days sales of inventory – DSI

It is a financial measure of a company's performance that gives investors an idea of how long it takes a company to turn its inventory (including goods that are work in progress, if applicable) into sales. Generally, the lower (shorter) the DSI the better, But it is important to note that the average DSI varies from one industry to another.

Formula: Here is how the DSI is calculated:

$$\text{Days Sales of inventory} = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} * 365$$

It is also known as days inventory outstanding (DIO). This measure is one part of the cash conversion cycle, which represents the process of turning raw materials into cash. The days sales of inventory is the first stage in that process. The other two stages are days sales outstanding and days payable outstanding. The first measures how long it takes a company to receive payment on accounts receivable, while the second measures how long it takes a company to pay off its accounts payable.

Receivables turnover ratio

An accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. The receivables turnover ratio is an activity ratio, measuring how efficiently a firm uses its assets.

Formula:

$$\text{Account Receivable Turnover} = \frac{\text{Net Credit Sales}}{\text{Average Account receivable}}$$



Some companies' reports will only show sales - this can affect the ratio depending on the size of cash sales.

By maintaining accounts receivable, firms are indirectly extending interest-free loans to their clients. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

A low ratio implies the company should re-assess its credit policies in order to ensure the timely collection of imparted credit that is not earning interest for the firm.

Average collection period

It indicates the average time taken to collect trade debts. In other words, a reducing period of time is an indicator of increasing efficiency. It enables the enterprise to compare the real collection period with the granted/theoretical credit period.

Formula:

Debtor Collection Period = (Average Debtors / Credit Sales) x 365 (= No. of days) (average debtors = debtors at the beginning of the year + debtors at the end of the year, divided by 2)

Credit sales are all sales made on credit (i.e. excluding cash sales). A long debtors collection period is an indication of slow or late payments by debtors. You can change the multiplier to 12 (for months) or 52 (for weeks) if appropriate.

Creditors turnover ratio

This ratio is similar to the debtors' turnover ratio. It compares creditors with the total credit purchases. It signifies the credit period enjoyed by the firm in paying creditors. Accounts payable include both sundry creditors and bills payable. As with debtors' turnover ratio, creditors' turnover ratio can be calculated in two forms, creditors' turnover ratio and average payment period.

Formula:

$$\text{Creditors Turnover Ratio} = \frac{\text{Net Credit Purchase}}{\text{Average Creditors}}$$

The average payment period ratio represents the number of days by the firm to pay its creditors. A high creditor's turnover ratio or a lower credit period ratio signifies that the creditors are being paid promptly. This situation

enhances the credit-worthiness of the company. However, a very favourable ratio to this effect also shows that the business is not taking the full advantage of credit facilities allowed by the creditors.

$$\text{Creditors Payment Period} = \frac{\text{Days of the year}}{\text{Creditors Turnover Ratio}}$$

Asset turnover analysis

This ratio is useful to determine the amount of sales generated from each dollar of assets. As noted above, companies with low profit margins tend to have high asset turnover, those with high profit margins have low asset turnover. For companies in the retail industry you would expect a very high turnover ratio – mainly because of cutthroat and competitive pricing.

Formula:

Indicates the relationship between assets and revenue:

$$\text{Total Asset Turnover} = \frac{\text{Total Revenue}}{\text{Total Assets}}$$

Important things to be remembered:

- Companies with low profit margins tend to have high asset turnover, those with high profit margins have low asset turnover - it indicates pricing strategy.
- This ratio is more useful for growth companies to check if in fact they are growing revenue in proportion to sales.

Fixed assets turnover

Fixed assets turnover ratio is also known as sales to fixed assets ratio. This ratio measures the efficiency and profit earning capacity of the concern. Higher the ratio, greater is the intensive utilisation of fixed assets. Lower ratio means under-utilisation of fixed assets. The ratio is calculated by using following formula:

Formula:

Fixed assets turnover ratio turnover ratio is calculated by the following formula:

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



Leverage (debt ratios)

In preparing financial forecasts, you can use these ratios as a guide for the level of financial leverage acceptable in an organisation. For example, a company may set limits on what levels these ratios can reach in the future. The ratios can also be used as an assessment of how much financial leverage will exist in the future based on the forecast financial statements prepared by an organisation.

By using a combination of assets, debt, equity, and interest payments, leverage ratios are used to understand a company's ability to meet its long term financial obligations. The three most-widely used leverage ratios are the debt ratio, debt to equity ratio and interest coverage ratio.

Debt ratio

The debt ratio gives an indication of a company's total liabilities in relation to their total assets. The higher the ratio, the more leverage the company is using and the more risk it is assuming. Both total assets and liabilities can be found on the balance sheet. There is a hint to be aware of with this formula. Mentioned above, these leverage ratios are meant to measure long-term ability to meet financial obligations. When we take a look at our total liabilities number in more detail, items such as accounts payable are included. This is a short-term liability which is essential for the proper functioning of the business and not a liability in the sense that we are discussing it here.

Formula:

$$\text{Debt Ratio} = \frac{\text{Total Debts}}{\text{Total Assets}}$$

Debt-to-equity ratio

The debt-to-equity ratio is the most popular leverage ratio and it provides detail around the amount of leverage (liabilities assumed) that a company has in relation to the monies provided by shareholders. As you can see through the formula below, the lower the number, the less leverage a company is using. Again, like the debt ratio, we must understand the drawbacks of this formula. Total liabilities include operational liabilities required to run the business. These are not long term in nature and can distort the debt-to-equity ratio. Some will exclude accounts payable from the liabilities and/or intangible assets from the shareholder equity component.

Formula:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Debts}}{\text{Total Equity}}$$

Interest coverage ratio

The interest coverage ratio tells us how easily a company is able to pay interest expenses associated to the debt they currently have. The ratio is designed to understand the amount of interest due as a function of a company's earnings before interest and taxes (EBIT). Some will actually replace EBIT with EBITDA. It is different for each sector, but an interest coverage ratio below two may pose a threat to the ability of a company to fulfill its interest obligations. The interest coverage ratio is very closely monitored because it is viewed as the last line of defence, in a sense. A company can get by even when it is in a serious financial bind if it can pay its interest obligations.

Formula:

$$\text{Interest Coverage} = \frac{\text{EBIT}}{\text{Interest Expenses}}$$

Profitability ratios

As an investor, you are interested in a corporation's earnings because earnings provide you with potential dividends and growth. Companies with greater earnings pay higher dividends and have greater growth potential. You can use profitability ratios to compare earnings for prospective investments. Profitability ratios are measures of performance showing how much the firm is earning compared to its sales, assets or equity.

You can quickly see the difference in profitability between two companies by comparing the profitability ratios of each. Let us see how ratio analysis works. The profitability ratios include: operating profit margin, net profit margin, return on assets and return on equity.

Profit margin measures how much a company earns relative to its sales. A company with a higher profit margin than its competitor is more efficient. There are three profit margin ratios: gross profit margin, operating profit margin and net profit margin.



Gross profit margin

A company's total sales revenue minus its cost of goods sold, divided by the total sales revenue, expressed as a percentage. The gross margin represents the per cent of total sales revenue that the company retains after incurring the direct costs associated with producing the goods and services sold by a company. The higher the percentage, the more the company retains on each dollar of sales to service its other costs and obligations.

Formula

$$\text{Gross Profit Margin} = \frac{\text{Revenue} - \text{Cost of goods Sold}}{\text{Sales}}$$

Operating profit margin

Operating profit margin measures the earnings before interest and taxes, after incurring all the operating expenses, and is calculated as follows:

Formula

$$\text{Operating Profit Margin} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Sales}}$$

Net profit margin

Net profit margin is calculated as follows:

Net profit margin measures earnings after taxes and is calculated as follows:

Formula:

$$\text{Net Profit Margin} = \frac{\text{Earnings After Taxes}}{\text{Sales}}$$

While it seems as if these both measure the same attribute, their results can be dramatically different due to the impact of interest and tax expenses. Similarly, the next two ratios appear similar but they tell different stories. As an investor, you are interested in getting a return on your investment. So is a corporation.

Return on assets (ROA)

Return on assets (ROA) tells how well management is performing on all the firm's resources. However, it does not tell how well they are performing for the stockholders. It is calculated as follows:

$$\text{Return on Assets} = \frac{\text{Earnings After Taxes}}{\text{Total Assets}}$$

Earnings per share

The portion of a company's profit allocated to each outstanding share of common stock. Earnings per share serve as an indicator of a company's profitability.

Calculated as:

$$\text{Earnings Per Share} = \frac{\text{Net Income-Dividend on Preferred Stock}}{\text{Average Outstanding Shares}}$$

When calculating, it is more accurate to use a weighted average number of shares outstanding over the reporting term, because the number of shares outstanding can change over time. However, data sources sometimes simplify the calculation by using the number of shares outstanding at the end of the period.

Return on equity

Return on equity (ROE) measures how well management is doing for you, the investor, because it tells how much earnings they are getting for each of your invested dollars. It is calculated as follows:

$$\text{Return on Equity} = \frac{\text{Earnings After Taxes}}{\text{Equity}}$$

These ratios are easy to calculate and the information is readily available in a company's annual report. All you need do is review the income statement and balance sheet to come up with the data to plug into the formulas.

But, do not neglect other income statement information that can save you from making a costly mistake.



Market ratios

This set of ratios is an attempt to provide information on the value of the organisation from the perspective of an investor or potential investor. The ratios are examined from the perspective of what somebody is willing to pay for a percentage ownership in the organisation compared to historical earnings and book value.

Price earnings ratio (P/E)

A valuation ratio of a company's current share price compared to its per-share earnings.

Calculated as:

$$(P/E) = \frac{\text{Market Value per Share}}{\text{Earnings Per Share}}$$

For example, if a company is trading at \$43 a share and earnings over the last 12 months were \$1.95 per share, the P/E ratio for the stock would be 22.05 (\$43/\$1.95).

EPS is usually from the last four quarters (trailing P/E), but sometimes it can be taken from the estimates of earnings expected in the next four quarters (projected or forward P/E). Also sometimes known as "price multiple" or "earnings multiple".

Book value per share

A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly.

Formula:

$$\text{Book Value per Share} = \frac{\text{Total Shareholder Equity-Preferred Stock}}{\text{Total Outstanding Share}}$$

Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors paid.

In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Market price/book ratio (P/B)

A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the book value per share. It is also known as "price-equity ratio".

Calculated as:

$$\text{P/B Ratio} = \frac{\text{Stock Price}}{\text{Total Assets-Intangible assets and liabilities}}$$

A lower P/B ratio could mean that the stock is undervalued. This ratio also gives some idea of whether you're paying too much for what would be left if the company went bankrupt immediately.

Horizontal financial statement analysis

Horizontal analysis, also called "trend analysis", is used to discover trends in the earnings, assets and liabilities of a company over the course of several years. It compares each line of the balance sheet and income statement from year to year in terms of percentage change. To do a horizontal analysis, you will need the condensed balance sheets and income statements for the company that cover the years in question. It is a comparative study of a balance sheet or income statement for two or more accounting periods, to compute both total and relative variances for each line item. This technique is also known as comparative analysis.

It is conducted by setting consecutive balance sheet, income statement or statement of cash flow side-by-side and reviewing changes in individual categories on a year-to-year or multiyear basis. The most important item revealed by comparative financial statement analysis is trend. A comparison of statements over several years reveals direction, speed and extent of a trend(s). The horizontal financial statements analysis is done by restating amount of each item or group of items as a percentage.

Such percentages are calculated by selecting a base year and assign a weight of 100 to the amount of each item in the base year statement. Thereafter, the amounts of similar items or groups of items in prior or subsequent financial statements are expressed as a percentage of the base year amount. The resulting figures are called index numbers or trend ratios. The following indexed balance sheet can be established.

Example: Common Size Balance Sheet



Mohsin and Wajaht Company Ltd.			
Balance Sheet Statement (\$'000') For year ended 30 June			
	2000	2001	2002
Assets	33.1	40.2	39.9
Stock	7.1	2.1	1.9
Account receivables			
Overdraft	8.7	6.7	5.8
Bank Balance & Cash	11.1	8.1	13.7
Total Current assets	54.5	57.2	61.4
Fixed Assets	19.4	20.4	18.9
Freehold property	21.6	18.8	16.4
Equipment and vehicles	4.5	3.6	3.3
Other fixed assets	45.5	42.8	38.6
Total Fixed Assets	100.0	100.0	100.0
Total Assets	55.1	55.4	54.9
Liabilities and Owners' equity	5.9	8.4	8.3
Accounts payables			
Taxation	3.3	3.2	3.5
Shareholders for dividend			
Current liabilities	64.3	66.9	66.7
Long term liabilities	2.9	2.3	1.2
Total Liabilities	67.2	69.2	67.9
Equity:			
Share capital	0.5	0.4	0.3
Share premium	2.5	2.1	1.9
Non distributable reserve	3.5	2.6	2.4
Retained income	26.3	25.7	27.5
Shareholders interest	32.8	30.8	32.1
Total Liabilities and Equity	100.0	100.0	100.0

As basis of analysis, the analyst may seek variables which seem to improve or deteriorate and bring a challenge to the stakeholders in their various decisions. Example from the previous table one can ask the following questions?

1. Why is there an increase in the stock of the company? Has the company changed its inventory policy?
2. Why did taxation increase so tremendously? Were there any changes in taxation? Is it reflected by the increase in sales? Profit?
3. Why is there an increase in the fixed assets and at the same time decrease in the long-term debt? How were these assets financed?
4. And many more question which can be elaborated by the management or which can be used as the basis for discussions.

Vertical/cross-sectional/common size analysis techniques

Vertical/cross-sectional/common size statements came from the problems in comparing the financial statements of firms that differ in size. In the balance sheet, for example, the assets as well as the liabilities and equity are each expressed as 100 per cent and each item in these categories is expressed as a percentage of the respective totals. In the common size income statement, turnover is expressed as 100 per cent and every item in the income statement is expressed as a percentage of turnover (sales).

Horizontal Financial Statement Analysis for two years

Mohsin and Wajaht Company Ltd.			
Balance Sheet Statement (\$'000')			
For the year ended 30 June			
	2000	2001	2002
Assets	100	149.0	165.6
Stock	100	152.1	159.2
Account receivables			
Overdraft	100	95.1	91.8
Bank Balance & Cash	100	89.4	169.6
Total Current assets	100	128.4	154.5
Fixed Assets:			
Freehold property	100	129.0	133.6
Equipment and vehicles	100	106.8	104.6



Other fixed assets	100	97.4	100.0
Total Fixed Assets	100	1153	1165
Total Assets	100	122.4	137.2
Liabilities and Owners' equity	100	122.9	136.6
Account payables			
Taxation	100	173.6	194.0
Current liabilities	100	118.8	147.1
Long term liabilities	100	127.4	142.4
Total Liabilities	100	97.5	57.9
Equity:	100	126.1	138.8
Share capital	100	100.0	100.0
Share premium	100	100.0	100.0
Non distributable reserve	100	91.8	93.2
Retained income	100	119.6	143.2
Total shareholders' interest	100	114.9	133.9
Total liabilities and Equity	100	122.4	137.2

From the vertical analysis above, an analyst can compare the percentage mark-up of asset items and how they have been financed. The strategies may include increase/decrease the holding of certain assets. The analyst may as well observe the trend of the increase in the assets and liabilities over several years.

Difference between vertical analysis and horizontal analysis:

Vertical analysis reports each amount on a financial statement as a percentage of another item. For example, the vertical analysis of the balance sheet means every amount on the balance sheet is restated to be a percentage of total assets. If inventory is \$100,000 and total assets are \$400,000 then inventory is presented as 25 (\$100,000 divided by \$400,000). If cash is \$8,000 then it will be presented as 2 (\$8,000 divided by \$400,000). The total of the assets will now add up to 100. If the accounts payable are \$88,000 they will be presented as 22 (\$88,000 divided by \$400,000). If owner's equity is \$240,000 it will be presented as 60 (\$240,000 divided by \$400,000). The restated amounts from the vertical analysis of the balance sheet will be presented as a common-size balance sheet. A common-size balance sheet allows you to compare your company's balance sheet to another company's balance sheet or to the average for its industry. Vertical analysis of an income statement results in every income statement amount being presented as a percentage of sales. If sales were \$1,000,000 they would be restated to be 100

(\$1,000,000 divided by \$1,000,000). If the cost of goods sold is \$780,000 it will be presented as 78 (\$780,000 divided by sales of \$1,000,000). If interest expense is \$50,000 it will be presented as 5 (\$50,000 divided by \$1,000,000). The restated amounts are known as a common-size income statement. A common-size income statement allows you to compare your company's income statement to another company's or to the industry average.

Horizontal analysis looks at amounts on the financial statements over the past years. For example, the amount of cash reported on the balance sheet at December 31 of 2006, 2005, 2004, 2003, and 2002 will be expressed as a percentage of the December 31, 2002 amount. Instead of dollar amounts you might see 134, 125, 110, 103, and 100. This shows that the amount of cash at the end of 2006 is 134 per cent of the amount it was at the end of 2002. The same analysis will be done for each item on the balance sheet and for each item on the income statement. This allows you to see how each item has changed in relationship to the changes in other items. Horizontal analysis is also referred to as trend analysis.

Vertical analysis, horizontal analysis and financial ratios are part of financial statement analysis.

DuPont model

The DuPont model is a technique that can be used to analyse the profitability of a company using traditional performance management tools. To enable this, the DuPont model integrates elements of the income statement with those of the balance sheet.

Origin of the DuPont model:

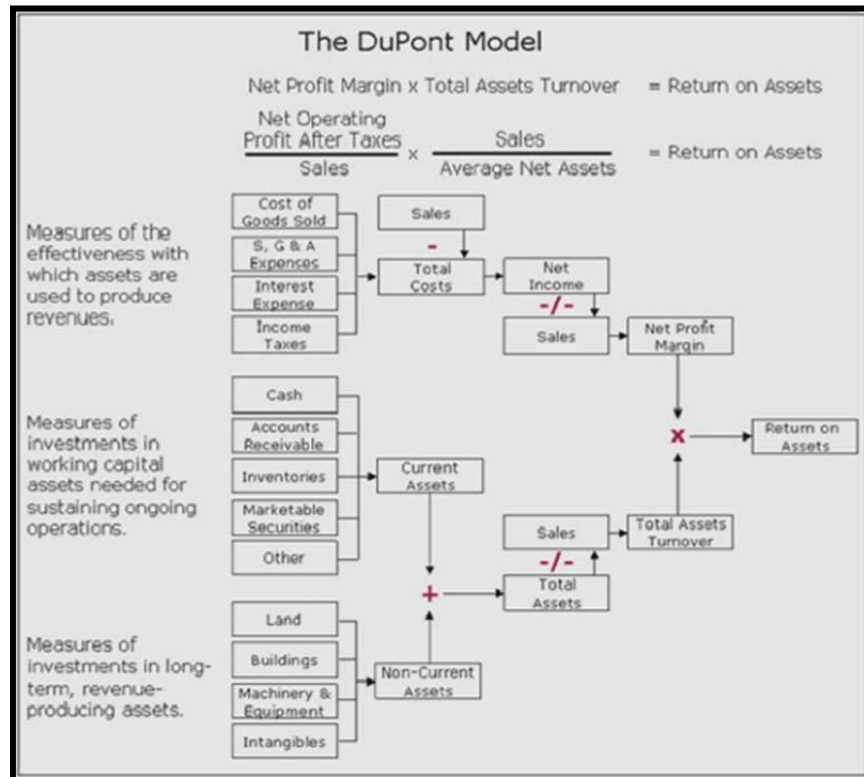
History

The DuPont model of financial analysis was made by F. Donaldson Brown, an electrical engineer who joined the giant chemical company's treasury department in 1914. A few years later, DuPont bought 23 per cent of the stock of General Motors Corp. and gave Brown the task of cleaning up the car maker's tangled finances. This was perhaps the first large-scale reengineering effort in the U.S. Much of the credit for GM's ascension afterward belongs to the planning and control systems of Brown, according to Alfred Sloan, GM's former chairman. Ensuing success launched the DuPont model towards prominence in all major U.S. corporations. It remained the dominant form of financial analysis until the 1970s.

Calculation of DuPont

Formula

$$\text{Return on Assets} = \text{Net Profit Margin} \times \text{Total Assets Turnover} = \text{Net Operating Profit after Taxes} / \text{Sales} \times \text{Sales} / \text{Average Net Assets}$$



This figure describes the functionality and impact of Dupont Model on different components of capital structure and cost components of any organisation. Figure of Dupont model is adapted from pdf-search-engine.com, Analysis of Dupont <http://www.pdf-search-engine.com/dupont-analysis-pdf.html/web> date access /27/08/2009

Applications of the DuPont framework:

- The model can be used by the purchasing department or by the sales department to examine or demonstrate why a given ROA was earned.
- Compare a firm with its colleague firm in the industry.
- Analyse changes over time.
- Teach people a basic understanding how they can have an impact on the company results.
- Show the impact of professionalising the purchasing function.

Strengths of the DuPont model:

- Simplicity. A very good tool to teach people a basic understanding how they can have an impact on results.
- Can be easily linked to compensation schemes.
- Can be used to convince management that certain steps have to be taken to professionalise the purchasing or sales function. Sometimes

it is better to look into your own organisation first. Instead of looking for company takeovers in order to compensate lack of profitability by increasing turnover and trying to achieve synergy.

Limitations of the DuPont analysis:

- Based on accounting numbers, which are basically not reliable.
- Does not include the cost of capital.

Assumptions of the DuPont method:

- Accounting numbers are reliable.

Shareholders' value and Du Pont Identity:

The DuPont Identity is a means of determining what area a company is having difficulty in if their return on equity (ROE) is less than satisfactory. Conversely, it can also identify the areas where the company is successful. In the DuPont system, ROE is broken down into three components as follows:

$$\text{ROE} = (\text{Net Margin}) \times (\text{Asset Turnover}) \times (\text{Financial Leverage Multiplier})$$

Financial leverage multiplier is equal to total assets divided by common stock equity. We can deduce from this relationship that ROE will be increased by:

- Increasing margins on sales;
- Increasing asset turnover by such actions as improving customer collections, reducing inventories and selling off surplus assets; and
- Increasing financial leverage (in general) by increasing the proportion of capital supplied by borrowed money.

Cash flow statement

Complementing the balance sheet and income statement, the cash flow statement (CFS), a mandatory part of a company's financial reports since 1987, records the amounts of cash and cash equivalents entering and leaving a company. The CFS allows investors to understand how a company's operations are running, where its money is coming from, and how it is being spent. Here you will learn how the CFS is structured and how to use it as part of your analysis of a company.

The structure of the CFS

The cash flow statement is distinct from the income statement and balance sheet because it does not include the amount of future incoming and outgoing cash that has been recorded on credit.

Therefore, cash is not the same as net income, which, on the income statement and balance sheet, includes cash sales and sales made on credit.



Cash flow is determined by looking at three components by which cash enters and leaves a company: core operations, investing and financing.

Operations

Measuring the cash inflows and outflows caused by core business operations, the operations component of cash flow reflects how much cash is generated from a company's products or services. Generally, changes made in cash, accounts receivable, depreciation, inventory and accounts payable are reflected in cash from operations.

Cash flow is calculated by making certain adjustments to net income by adding or subtracting differences in revenue, expenses and credit transactions (appearing on the balance sheet and income statement) resulting from transactions that occur from one period to the next. These adjustments are made because non-cash items are calculated into net income (income statement) and total assets and liabilities (balance sheet). So, because not all transactions involve actual cash items, many items have to be re-evaluated when calculating cash flow from operations.

For example, depreciation is not really a cash expense; it is an amount deducted from the total value of an asset that has previously been accounted for. That is why it is added back into net sales for calculating cash flow. The only time income from an asset is accounted for in CFS calculations is when the asset is sold.

Changes in accounts receivable on the balance sheet from one accounting period to the next must also be reflected in cash flow. If accounts receivable decreases, this implies that more cash has entered the company from customers paying off their credit accounts – the amount by which AR has decreased is then added to net sales. If accounts receivable increase from one accounting period to the next, the amount of the increase must be deducted from net sales because, although the amounts represented in AR are revenue, they are not cash.

An increase in inventory, on the other hand, signals that a company has spent more money to purchase more raw materials. If the inventory was paid with cash, the increase in the value of inventory is deducted from net sales. A decrease in inventory would be added to net sales. If inventory was purchased on credit, an increase in accounts payable would occur on the balance sheet and the amount of the increase from one year to the other would be added to net sales.

The same logic holds true for taxes payable, salaries payable and prepaid insurance. If something has been paid off, then the difference in the value owed from one year to the next has to be subtracted from net income. If there is an amount still owed, any differences will have to be added to net earnings.

Cash flows from operating activities are related to your principal line of business and include:

- Cash receipts from sales or for the performance of services
- Payroll and other payments to employees
- Payments to suppliers and contractors
- Rent payments
- Payments for utilities
- Tax payments.

Investing

Changes in equipment, assets or investments relate to cash from investing. Usually cash changes from investing are a “cash out” item, because cash is used to buy new equipment, buildings or short-term assets such as marketable securities. However, when a company divests of an asset, the transaction is considered “cash in” for calculating cash from investing. Investing activities include capital expenditures – disbursements that are not charged to expense but rather are capitalised as assets on the balance sheet. Investing activities also include investments (other than cash equivalents as indicated below) that are not part of your normal line of business. These cash flows could include:

- Purchases of property, plant and equipment
- Proceeds from the sale of property, plant and equipment
- Purchases of stock or other securities (other than cash equivalents)
- Proceeds from the sale or redemption of investments.

Financing

Changes in debt, loans or dividends are accounted for in cash from financing. Changes in cash from financing are “cash in” when capital is raised, and they’re “cash out” when dividends are paid. Thus, if a company issues a bond to the public, the company receives cash financing; however, when interest is paid to bondholders, the company is reducing its cash. Financing activities include cash flows relating to the business’s debt or equity financing:

- Proceeds from loans, notes, and other debt instruments
- Installment payments on loans or other repayment of debts
- Cash received from the issuance of stock or equity in the business
- Dividend payments, purchases of treasury stock, or returns of capital.



Analysing an example of a CFS

Let us take a look at this CFS sample:

Cash Flow Statement Company XYZ FY ended 31 December 2003 (all figures in USD)	
Cash Flow from Operations	
Net earnings	2,000,000
<i>Additions to Cash</i>	
Depreciation	10,000
Decrease in Accounts Receivable	15,000
Increase in Accounts Payable	15,000
Increase in Taxes Payable	2,000
<i>Subtractions from Cash</i>	
Increase in Inventory	(30,000)
<u>Net Cash from Operations</u>	<u>2,012,000</u>
Cash Flow from Investing	
Equipment	(500,000)
Cash Flow from Financing	
Notes Payable	10,000
<u>Cash Flow for FY ended 31 Dec 2003</u>	<u>1,522,000</u>

For understanding of cash flow statement Model Cash flow statement is adapted from Zeromillion.com, inancialRatioAnalysis, <http://www.zeromillion.com/business/financial/financialratio.html#ixzz0IT7zFcNu&D/web> date access /07/08/2009

From this CFS, we can see that the cash flow for Financial Year 2003 was \$1,522,000. The bulk of the positive cash flow stems from cash earned from operations, which is a good sign for investors. It means that core operations are generating business and that there is enough money to buy new inventory. The purchasing of new equipment shows that the company has cash to invest in inventory for growth. Finally, the amount of cash available to the company should ease investors' minds regarding the notes payable, as cash is plentiful to cover that future loan expense.

Of course, not all cash flow statements look this healthy, or exhibit a positive cash flow. But a negative cash flow should not automatically raise a red flag without some further analysis. Sometimes, a negative cash flow is a result of a company's decision to expand its business at a certain time, which would be a good thing for the future. This is why analysing changes in cash flow from one period to the next gives the investor a better idea of how the company is performing, and whether or not a company may be on the brink of bankruptcy or success.

Relationship between cash flow statement, balance sheet and income statement

As we have already discussed, the cash flow statement is derived from the income statement and the balance sheet. Net earnings from the income statement are the figures from which the information on the CFS is deduced. As for the balance sheet, the net cash flow in the CFS from one year to the next should equal the increase or decrease of cash between the two consecutive balance sheets that apply to the period the cash flow statement covers. (For example, if you are calculating a cash flow for the year 2000, the balance sheets from 1999 and 2000 should be used.)

Conclusion

A company can use a cash flow statement to predict cash flow, which helps with matters in budgeting. For investors, the cash flow reflects a company's financial health: basically, the more cash available for business operations, the better. However, this is not a hard and fast rule.

Sometimes a negative cash flow results from a company's growth strategy in the form of expanding its operations. By adjusting earnings, revenues, assets and liabilities, the investor can get a very clear picture of what some people consider the most important aspect of a company: how much cash it generates and, particularly, how much of that cash stems from core operations.

Cash flow budget

Cash flow management is an essential element of a financial manager's responsibility. Having sufficient cash flow to meet obligations and effectively investing excess cash flow is what creates an inflow of funds and increases shareholder value. Therefore, revisiting cash flow budgets is important for this finance course. We are not examining the cash flow statement that forms part of an organisation's financial statements in this section. We are looking at cash budgets, which are an internal tool used for planning cash needs and projecting financing requirements. This is a bit of a review of material covered in MS-4 Accounting and Finance; however, as cash budgeting is critical to good financial planning we are revisiting it in this course. A cash budget for an organisation is not very different from one we would prepare for our personal needs. The main difference is the volume of items to consider and the degree of estimates used in these budgets. A cash flow budget is quite simply a summary of all cash receipts (all cash collected by an organisation) and all cash disbursements (all cash paid out by an organisation). The main purpose of the cash flow budget is to identify where additional financing will be needed and to ensure proper steps are taken to ensure financing is available when needed. Below is a one format for a cash flow budget. You may have seen or be more familiar with other formats. The importance of a cash budget is the information it contains and not the format it is set up in.



Sample Format for a Cash Flow Budget

	Jan	Feb	Mar...	Dec
Cash Receipts	XX	XX	XX	XX
Cash Disbursements	XX	XX	XX	XX
Net Cash Flow	XX	XX	XX	XX
Beginning Cash Balance	XX	XX	XX	XX
Ending Cash Balance	XX	XX	XX	XX

Cash receipts less cash disbursements equals the net cash flow. The net cash flow plus the beginning balance gives you the ending balance. The ending balance of one period is the opening balance of the following period. In the example above, the Jan. ending balance would be the Feb. beginning balance. If the ending balance is positive then you have the potential to have excess cash to invest. If the ending cash balance is negative then you will need to arrange some type of financing.

Determining the timing of cash receipts and disbursements may be straightforward or complex depending on the type of organisation you are in and what historical information is available. The thing to remember about a cash budget is that it is on-going. You do not prepare a cash budget at the beginning of the year and then let it sit for the balance of the year and compare it to actual results at the end of the year. Due to the fact that there are many estimates and things occur that cannot be planned for, a cash budget must be continually updated. The frequency of those updates will vary depending on your 'cash' traffic. If you are a cash intense organisation you will likely be examining your cash budgets daily.

Cash receipts

The most common cash receipts are a collection of accounts receivable, cash sales, and cash earned on investments. Your organisation may also have other cash receipts such as proceeds from the sale of assets and proceeds from the issuance of bonds and shares. Because sales play a key role in the cash budget it is important that an organisation prepare a sales estimate and that this sales estimate be used in your cash budgeting. This estimate provides information on expected sales for the upcoming year by month or shorter periods depending on your cash flow budget periods. It is important that sales estimates be based on reasonable estimates. Typically, the marketing and/or the sales departments prepare these estimates. There should be some support for the estimates based on current and expect economic situation and marketing and sales efforts of the organisation for the upcoming year.

Once you have your sales plans, as a financial manager you must estimate how these sales will be converted into cash. The easiest way to do this is to look at historical results. Questions you would ask are:

1. What are your historical levels of cash sales of the total monthly sales? If history shows that cash sales are 10 per cent then you would put 10 per cent in your current month as a cash receipt.
2. What have your collection patterns been historically? If history shows that 70 per cent of your accounts receivables are collected in 30 days, you would show 70 per cent of the current month's sales in the next month's cash receipts. If the balance of accounts receivable is collected in 60 days then you would include 20 per cent (100 per cent less 10 per cent cash sales less 70 per cent collected in 30 days) of the current month's sales estimate two months in the future.
3. Will you likely collect all the sales in cash or should a portion be excluded from cash receipts, as it may be not be collected?

To illustrate this let's look at an example. Assume that Company X is preparing a cash receipts budget for October to December. It has estimated sales for October, November, and December of \$100, \$120, and \$200 respectively. Actual sales for August and September were \$90 each month. Historically cash sales have been 5 per cent each month, 80 per cent of the accounts receivables are collected in 30 days and 15 per cent are collected in 60 days and there is no estimate of any bad debts.

The cash receipts budget would look like this:

Cash receipts

	October	November	December
Sales estimate	\$100	\$120	\$200
Cash Sales¹	\$5	\$6	\$10
Collections			
1 month²	72	80	96
2 months³	14	14	15
Total Cash Receipts	91	100	121



Notes:

¹Cash sales are calculated by taking 5 per cent of the current month sales estimate.

²Collections: 1 month are calculated as 80 per cent of the previous month's sales estimates or actual sales. For October this equals September sales of \$90 x 80%.

³Collections: 2 months are calculated as 15 per cent of the sales estimate or actual sales from 2 months previous. For October this equals August sales of \$90 x 15%.

Cash disbursements

Cash disbursements will vary among organisations as well. Some of the more common disbursements are purchases, accounts payable, payroll, rental payments, tax payments, interest payments, investments such as capital assets, repurchase/retirement of bonds and shares. It is important to note that not all expenses result in a cash disbursement as there are financial statement expenses, such as amortisation, that have no cash impact. In addition to non-cash item differences there are also timing differences between your financial statements and your cash budget. The process to prepare the cash disbursements budget is very similar to that of the cash receipts budget. You will use sales estimates to determine timing of your various purchases of goods and services required. You will then determine what the timing of payment for these services and products will be. In most organisations you will not be paying for items on a cash basis as the bulk of your services/products are invoiced to the organisation and paid for in agreement with the payment terms of each supplier. You would therefore go through the same exercise for cash disbursements that you did for cash receipts. You would determine your normal payments terms, based on history and include your payments to suppliers as cash disbursements in accordance with this schedule. Therefore, if you pay 10 per cent of your accounts payable in the month the service is incurred then you would include 10 per cent of your purchases estimate in the current month. If you pay 60 per cent of purchases within 30 days and 30 per cent within 60 days then you would include 60 per cent of the current month's purchases in the month following your estimated purchase date and 30 per cent in the second month following your estimated purchase date. The level of detail you would include would depend on the organisation and the variety of payment terms in existence. The goal is for the disbursement budget to as closely match actual disbursements as is possible.

It would be nice to be able to say that you then just combine your cash receipts and cash disbursement budgets and your job is done. However, that is not the case. Despite best efforts and reasonable estimates these budget estimates are just that, estimates. Therefore, we know that actual events will not exactly match those budgeted either as to timing or amounts. Due to the fact that uncertainty exists, the financial manager needs to be prepared for

cash receipts to fall short of estimates or cash disbursements to exceed estimates and therefore needs a mechanism to be in place to handle this uncertainty. The simplest way of dealing with this uncertainty is to have different scenarios, a worse case, most likely case and best case. The financial manager would base his/her plans on the most likely but would have plans to deal with the worse and best cases as well. Computer spreadsheets are often used to perform various “what if” situations to make manipulating the cash budgets for different events more efficient.

Financial projections/pro forma statements

In creating financial projections we will refer to the financial statements created as pro forma financial statements. You may read about pro forma statements in the financial press and it is key to understand that pro forma statements are based on projections and/or forecasted results and they do not represent actual financial results.

As with the cash budget, the sales estimate is a key element in the preparation of financial forecasts. Another key element is the prior year’s financial statements. Along with these two key elements you will need a long list of assumptions to support your financial statement projections.

A very simple method of preparing an income statement projection is to base all items as a percentage of sales. This would involve using the prior year’s income statement and calculate what each item is as a percentage of total sales. You would then use these calculated percentages to estimate your future expense amounts.

As we work through the pro forma statements we will use Pandora Developments as our sample organisation. The income statement and balance sheet for Pandora Developments are:



Pandora Developments Income Statement

Pandora Developments Income Statement For the year ended December 31, 2001	
Sales	50,000
Cost of Goods Sold:	
Direct Labour	17,000
Direct Materials	7,000
Overhead	3,000
Total Cost of Goods Sold	27,000
Gross Margin	23,000
Operating Expenses	19,500
Operating Income	3,500
Interest Expense	2,080
Net Income before tax	1,420
Tax Expense	568
Net Income	852
Dividends	426
Transfer to Retained Earnings	426

Pandora Developments Balance Sheet

Pandora Developments Balance Sheet As at December 31, 2001	
Accounts Receivable	1,500
Capital Assets	7,500
Total Assets	9,000
Line of Credit	2,500
Common Stock	1,000
Retained Earnings	5,500
Total Liabilities and Equity	9,000

Pro forma income statement

If we use the simple approach of basing all projections on a percentage of sales basis, the first step in our forecast would be to convert the income statement above to the percentage of sales. The next step would be to obtain the sales forecast information in order that you can determine your sales figure for the coming year. With these two steps completed you can then prepare your pro forma statement for the next year. Converting the above income statement to a percentage of sales gives you the following percentages and forecasted amounts for 2002 based on a 12 per cent increase in sales:

Income to percentage of sales

		2002
Sales	100%	56,000
Cost of Goods Sold:		
Direct Labor	34%	19,040
Direct Materials	14%	7,840
Overhead	6%	3,360
Total Cost of Goods Sold	54%	30,240
Gross Margin	46%	25,760
Operating Expenses	39%	21,840
Operating Income	7%	3,920
Interest Expense	4.16%	2,330
Net Income before tax	2.84%	1,590
Tax Expense	1.14%	636
Net Income	1.70%	954
Dividends	85%	477
Transfer to Retained Earnings	85%	477



This is a very straightforward method and is often used in organisations with some modifications. One of the key problems with this method, though, is that it assumes that all costs vary with sales and therefore ignores any fixed component of your expenses.

Organisations will normally identify those costs that are fixed and estimate the rate of change for these costs based on indicators such as inflation or expected rate increases. For example, if your plant rent is known to increase by 2 per cent in the coming year then your estimate for rent would be the current year rent expense plus an additional 2 per cent and you would not calculate rent based on a percentage of sales.

It should also be noted that percentage of sales is not appropriate for certain specific expenses such as:

- Amortisation/depreciation: this should be calculated from the current balances for capital assets plus the projected expenditures for the forecast year. Projected expenditures should be consistent with sales forecasts, as you need this capital to handle sales production.
- Interest income and expense: these items should be calculated on forecast future borrowings/investments.
- Dividends paid: this should be based on outstanding shares and projected dividend payout rates.

Pro forma balance sheet

In preparing a pro forma balance sheet there are several items for which using a percentage of sales is not appropriate, for example:

- Cash
- Capital assets
- Borrowings both short and long term
- Common and preferred shares
- Retained earnings.

A better approach to prepare a balance sheet forecast is to use what is referred to as a judgmental approach. What this involves is assessing how to best estimate each item on the balance sheet using a combination of methods for estimating. In preparing the balance sheet there will need to be a “plug” amount. This is required to balance the balance sheet using the basic accounting equation, that is $\text{assets} = \text{liabilities} + \text{shareholders' equity}$. If more assets are required to balance your statement then the plug figure is excess cash. If more liabilities are needed then the plug figure is called external financing.

We will extend our example of Pandora to preparing a pro forma balance sheet for 2002 using the following assumptions:

1. No capital investments will be made in 2002.
2. The amortisation of capital assets for 2002 is projected to be \$500.
3. A new issue of shares will produce net proceeds of \$1,000 in 2002.
4. Sales will increase by 12 per cent in 2002 bringing a corresponding increase in accounts receivable.
5. Net income in 2002 is forecast to be \$954.
6. The dividend payout rate is estimated to be 50 per cent of net income.

The process for solving this problem is:

1. Calculate the values of the assets and liabilities where you have the data to do it.
2. Determine the value of the line of credit (LOC) based upon the balance sheet equation.

The calculations under (a) are as follows:

$$\text{Accounts Receivable} = 1.12 \times 1,500 = 1,680$$

$$\text{Capital Assets} = 2001 \text{ balance} + \text{capital expenditure in 2002} - \text{amortisation in 2002} = 7,500 + 0 - 500 = 7,000$$

$$\text{Common Stock} = \text{common stock at 2001} + \text{net proceeds of new share issues} = 1,000 + 1,000 = 2,000$$

$$\text{Dividend} = \text{net income} \times \text{dividend rate} = 954 \times 0.5 = 477$$

$$\text{Retained Earnings for 2002} = \text{retained earnings for 2001} + \text{net income for 2002} - \text{dividend} = 5,500 + 954 (\text{net income}) - 477 (\text{dividend}) = 5,977$$

At this point we complete the blanks for the 2002 column as follows:



Pro Forma Balance Sheet

	2001	2002
Accounts Receivable	1,500	1,680
Capital Assets	7,500	7,000
Total Assets	9,000	8,680
Line of Credit	2,500	?
Share Capital	1,000	2,000
Retained Earnings	5,500	5,977
Total Liabilities and Equity	9,000	?

Applying the balance sheet equation,

$$\text{LOC} = \text{Total Assets} - \text{common stock} - \text{retained earnings} = 8,680 - 2,000 - 5,977 = 703.$$

We then add liabilities to equity = $703 + 2,000 + 5,977 = 8,680$, which equals the asset total.

We can go back to our balance sheet again and complete the missing numbers to achieve the finished result below:

Pro Forma Balance Sheet, Completed

	2001	2002
Accounts Receivable	1,500	1,680
Capital Assets	7,500	7,000
Total Assets	9,000	8,680
Line of Credit	2,500	703
Share Capital	1,000	2,000
Retained Earnings	5,500	5,977
Total Liabilities and Equity	9,000	8,680

That was a fairly simple example. In more complex examples you would use some of the following estimates for your more common balance sheet accounts:

Cash: Estimated using your cash budget or a stated desired cash balance.

Accounts receivable: Estimated using historical accounts receivable turnover ratios. You would either take an average of the last few years or the most current year if that is more representative of what would occur in the future with respect to collections.

Inventory: Estimated using historical inventory turnover ratios. As with accounts receivable you would either use an average of the past few years or use the most current year.

Capital assets: Estimated based on strategic plans. You would add any new equipment required for the forecast period to the current capital asset balance and deduct an estimate of amortisation. You would also deduct any assets expected to be sold or scrapped.

Accounts payable: Estimated using purchase information and accounts payable turnover ratio.

Taxes payable: Estimated based on normal payment of installments and final tax payments schedules.

Notes and long-term debt: Estimated based on loan agreements.

Retained earnings: Calculated as beginning retained earnings plus projected net income less projected dividends.

Capital stock: Estimated based on current balances plus any proceeds from proposed new issues of stock less any stock repurchased by the organisation.

If you do not have information required for individual estimates then you can use the percentage of sales method to estimate some those items. For example, items such as prepaid expenses you may not have specific information on and they tend to be smaller amounts therefore the percentage of sales is often used for estimating these items.

It is important to note that judgment needs to be used throughout the preparation of your financial forecast. Historical data and ratios are not always an indication of what the future will hold. Therefore when preparing a financial forecast you should assess the impact of expected events on the historical results before simply applying the historical rates.

Module summary



Summary

In this module you learned:

- Financial ratios can be used to prepare forecasted income statement and balance sheet. However, you should use historical ratios with care and not assume that the ratios remain rather constant over time. This need not necessarily be true.
- Ratios can also be used to assess pro forma statements as you can compare expected future performance to historical trends.
- The five key categories for ratios are liquidity, activity ratios, leverage (debt and other fixed costs), profitability, and shareholder value (market ratios).
- The cash budget, while a very straightforward tool, is very useful to a financial manager. It is used to assess financing needs and to identify when there is cash for investment purposes.
- The cash budget allows the financial manager to make arrangements for financing that will be required during the upcoming year in advance of the cash needs. This advance planning can lead to better financing agreements, as there is time to arrange the best financing options. If financing arrangements are left to the last minute, organisations can often face higher financing costs as they do not have sufficient time to assess the best form of financing.
- Sales estimates are crucial to both the cash budget and the preparation of pro forma financial statements.
- The percentage of sales method is a simplistic approach to preparing pro forma income statements. It is often used in a modified manner where the historic percentage of sales is the default estimation if better information is not available.
- For the preparation of pro forma balance sheets a judgmental approach is used whereby each line item on the balance sheet is assessed individually rather than a blanket approach applied to all items.
- Preparing pro forma balance sheets is where ratios are used most frequently in the preparation of financial forecasts. Ratios will either be used to create your estimates or they will be used to assess your estimates based on past trends.

Assignment



Assignment

1. Following are the particulars of Mohsin & Wajahat Company, from these particulars you are required to construct a balance sheet as at June 30, 2008.

Particulars	
Current ratio	2
Working capital	\$ 500,000
Capital block to current asset	3:2
Sales cash/credit	1:2
Debentures/share capital	1:2
Stock velocity	2 months
Creditor velocity	2 months
Debtors velocity	2 months
Gross profit ratio	25 per cent (to sales)
Capital block:	
Net profit	10 per cent of turnover
Reserve	2.5 per cent of turnover

Note: All purchase for given period is credit purchase.

Example:

$$\text{Working Capital} = 500,000$$

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

$$\text{Current Ratio} = 2$$

$$\text{CA} - \text{CL} = 500,000$$

$$\text{CA} = 2 \text{ CL}$$



$$CA - 2CL = 0$$

$$CA = 2(500,000)$$

$$CA = 1,000,000$$

Assessment



Assessment

1. Using the modified DuPont formula allows the analyst to break Dana Dairy Products' return on equity into three components: the net profit margin, the total asset turnover, and a measure of leverage (the financial leverage multiplier). Which of the following mathematical expressions represents the modified DuPont formula relative to Dana Dairy Products' 2002 performance? (See Figure 2-8.)
 - a. $5.6 (\text{ROE}) = 2.5 (\text{ROA}) \times 2.24 (\text{Financial leverage multiplier})$
 - b. $5.6 (\text{ROE}) = 3.3 (\text{ROA}) \times 1.70 (\text{Financial leverage multiplier})$
 - c. $4.0 (\text{ROE}) = 2.0 (\text{ROA}) \times 2.00 (\text{Financial leverage multiplier})$
 - d. $2.5 (\text{ROE}) = 5.6 (\text{ROA}) \times 0.44 (\text{Financial leverage multiplier})$

Dana Dairy Products, Income Statement

Income Statement	
Dana Dairy Products For the Year Ended December 31, 2007	
Sales Revenue	\$100,000
Less: Cost of Goods Sold	\$87,000
Gross Profits	\$13,000
Less: Operating Expenses	\$11,000
Operating Profits	\$2,000
Less: Interest Expense	\$500
Net Profits Before Taxes	\$1,500
Less: Taxes (40%)	\$600
Net Profits After Taxes	\$900



Dana Dairy Products, Balance Sheet

Balance Sheet		
Dana Dairy Products December 31, 2002		
Assets		
Cash		\$1000
Accounts receivable		\$8900
Inventories		\$4350
Total Current Assets		\$14250
Gross Fixed assets	\$35000	
Less Accumulated Depreciation	\$13250	
Net Fixed Assets		\$21750
Total assets		\$36000
Liabilities & Stockholders' Equity		
Accounts Payable	\$9000	
Accruals	\$6675	
Total Current Liabilities	\$15675	
Long term debts	\$4125	
Total liabilities	\$19800	
		\$19800
Common Stock	\$1000	
Retained Earning	\$15200	
Total Stockholders' Equity	\$16500	
Total Liabilities and Stockholders' equity		\$16200
		\$36000

2. A firm has just ended the calendar year making a sale in the amount of \$150,000 of merchandise purchased during the year at a total cost of \$112,500. Although the firm paid in full for the merchandise during the year, it has yet to collect at year end from the customer. The net profit and cash flow for the year are:
 - a. \$0 and \$150,000 respectively.
 - b. \$37,500 and -\$150,000 respectively.
 - c. \$37,500 and -\$112,500 respectively.
 - d. \$150,000 and \$112,500 respectively.
3. The most common cash disbursements are
 - a. dividend income, cash sales, and accounts payable.
 - b. cash purchases, dividends, and interest income.
 - c. cash purchases, dividends, and accounts payable.
 - d. cash sales, rent, and accounts payable.
4. Under the judgmental approach for developing a pro forma balance sheet, the “plug” figure required to bring the statement into balance may be called the
 - a. cash balance.
 - b. external financing required.
 - c. retained earnings.
 - d. accounts receivable.
5. A weakness of the per cent-of-sales method to preparing a pro forma income statement is
 - a. the assumption that the values of certain accounts can be forced to take on desired levels.
 - b. the assumption that the firm faces linear total revenue and total operating cost functions.
 - c. the assumption that the firm’s past financial condition is an accurate predictor of its future.
 - d. ease of calculation and preparation.
6. Huddleston Manufacturing estimates its sales in 2004 will be \$3 million. Interest expense is expected to remain unchanged at \$70,000, and the firm plans to pay cash dividends of \$140,000 during 2004. Use the per cent-of-sales method to prepare a pro forma income statement for the year ended December 31, 2004, based on the 2003 income statement shown below.



Huddleston Manufacturing Company Income Statement

Income Statement Huddleston Manufacturing Company For the Year Ended December 31, 2003	
Sales	\$2,800,000
Less: Cost of goods sold	\$1,820,000
Gross profits	\$980,000
Less: Operating expenses	\$240,000
Operating Profits	\$740,000
Less: Interest expense	\$70,000
Net profits before taxes	\$670,000
Less: Taxes	\$268,000
Net profits after taxes	\$402,000
Less: Cash Dividends	\$132,000
To: Retained earnings	\$270,000

7. Use the following information to complete the balance sheet and sales information in the table that follows for Hopkins Industries using the following financial data. Then answer the questions below.

Debt ratio: 65 per cent

Quick ratio: 1.1x

Total assets turnover: 2.5x

Receivables turnover: 8.333

Gross profit margin on sales: 30 per cent

Inventory turnover ratio: 5x

Hopkins Industries

Balance Sheet			
Cash		Accounts Payable	
Accounts Receivable		Long Term debt	\$300,000
Inventories		Common stock	
Fixed Assets		Retained earnings	\$225,000
Total Assets	\$1,000,000	Total Liab. & Equity	
Sales		Cost of Goods Sold	



Answer Key to Assessment Questions

1. a
2. c
3. c
4. b
5. c

6. Huddleston Manufacturing Company

Sales \$3,000,000

Less: Cost of goods sold (65%) 1,950,000

Gross profits \$1,050,000

Less: Operating expenses (8.57%) 257,142

Operating Profits \$792,858

Less: Interest expense 70,000

Net profits before taxes \$722,858

Less: Taxes (40%) 289,143

Net profits after taxes \$433,714

Less: Cash Dividends 140,000

To: Retained earnings \$293,714

7. Hopkins Industries Balance Sheet

Cash	85,000	AP	350,000
AR	300,000	Lt Debt	300,000
Inventory	350,000	Common	125,000
Fixed Assets	265,000	RE	225,000
TA	1,000,000	TL + SE	1,000,000
Sales	2,500,000	COGS	1,750,000

References



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