

Module Outline

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LEARNING OBJECTIVES

When you have successfully completed this module, you will be able to:

- analyze the financial condition and performance of a firm based on typical financial statements
- understand and apply commonly used financial terms
- identify the limitations of financial ratios analysis
- interpret the results of financial ratios analysis



Analysis of Financial Statements

Understanding Financial Statements

Financial Ratio Analysis

[All the financial ratios calculations have been grouped into one spreadsheet with the associated Balance Sheet and Income Statement. You will find the downloadable file (in Quattro Pro, Excel or Lotus) at the end of this module (**online**).]

Managers, investors and creditors rely on accounting information to make business decisions. They often want to analyze and compare companies and they do this by the use of standard measures. The ratios discussed in this module are some of the standard measures that enable those interested in a company to compare it with other companies, to monitor operations, help make business decisions and to search for good investments and loan prospects.

An important part of financial analysis is the calculation and interpretation of ratios. These ratios express the relationship of one number to another number from the financial statements.

For example, if the Balance sheet shows current assets of \$50,000 and current liabilities of \$10,000, the ratio of current assets to current liabilities is \$50,000 to \$10,000. We simplify this numeric equation to the ratio of 5 to1, which may be written as 5:1 or 5/1. Other acceptable ways of expressing this ratio would be:

- the business has five dollars in current assets for every one dollar in current liabilities, or
- the current ratio is 5.0



Financial Objectives

It is important to understand that every company has explicitly or implicitly two financial objectives:

- 1) A company wants to be financially sound
- 2) The company wants to earn adequate rate of return on capital invested in the business.

When we are analyzing a company, it is those two objectives that we want to assess.

How is the company doing with respect to these two generic financial objectives?

- is the company financially sound? and
- is it earning an adequate rate of return?



Financial Soundness

- 1) Be financially sound;
The financial soundness of a company is measured by its "liquidity" and "solvency".
 - Liquidity:- (short term) ability to meet short term financial obligations, to pay the claims against the company that are due in 12 months.
 - Solvency:- (long term)ability to meet long term financial obligations, meaning liabilities that are due beyond the next twelve months

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When addressing about the subject of financial soundness in a business, there are two dimensions. One is known as liquidity and the other as solvency.

Liquidity refers to how "liquid" a company is. How much cash does it have? How quickly can it get cash to meet its short-term financial obligations?

Solvency deals with the long-term portion of the time frame, beyond the next twelve months. How will the company meet the obligations that are coming down the road?

These two terms provide a structure of the financial future of the company and collectively look at the soundness of the firm and its ability to meet both its short term and long-term obligations.

Rate of Return

2) Earn adequate rate of return

Investors search for companies whose shares are likely to increase in value.

An adequate rate of return is determined by looking at what capital is required to earn a profit and what risk the company faces in terms of that invested capital. The higher the risk of investing, the higher the rate of return the investors is going to want to earn.

The rate of return on capital invested in the business should be consistent with the risk in the business.

We have to measure the rate of return a company is producing, or is projected to produce on the capital that is invested in the business

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In order to attract capital to your business, no matter the risk it faces, it has to have to a potential of earning a higher rate of return than the investor could earn in less risky opportunities. Otherwise people would just invest their capital in safe government securities where there is virtually no risk and a very modest rate of return can be earned.

Each business and each industry faces different levels of risk. There are various different risks such as market risk, how much competition is in the market and how loyal are the customers. There could also be risks inherent to the business such as perishability of inventory or technology risks. The higher the risk, the higher the potential rate of return the investor is looking for in order for them to commit their capital to that kind of business.

Financial Ratios

Financial ratios are calculated from financial statements to examine at the financial condition and performance of a company.

You have to be cautious when you are doing a financial analysis or when you are looking at someone else's financial analysis. Make sure that you understand how those ratios are calculated because there can be some significant differences in how rates are defined.

The list of financial ratios below is not an exhaustive list. You will see other kinds of financial ratios and you will see variations on the ratios presented below. You will also see variations on how accountants apply those ratios.

- Liquidity Ratios
- Solvency Ratios
- Profitability Ratios
- Profit Terms
- Turnover Ratios



Liquidity Ratios

These are ratios measuring the company's ability to pay current liabilities.

- **Current Ratio**

This ratio measures ability to pay current liabilities with current assets.

Current Assets / Current Liabilities

In the current ratio, we simply divide the current assets of the company by the current liabilities. Current assets are assets that will be converted to cash within the next twelve months. Current liabilities are claims against the company or what they owe that are due within the next twelve months.

A company prefers a high current ratio, which means the business has sufficient current assets to pay current liabilities, plus a cushion. An increasing current ratio from period to period generally indicates improvement in financial position.

There are various ways to evaluate ratios. These include:

- Industry standards - there are various financial data services where you can find typical ratios for different industries. We can look at our ratios and compare them to the industry standards to see if it is better or worse.
- Trends (historical analysis) – look at that same ratio for the last five years and see if it is increasing or decreasing.
- Budget targets – when we set the budget for the current fiscal year, what did we project the year-end current ratio to be? What did it turn out to be? Is it better than the budgeted one or worse?
- Compare the ratio with that of other firms in a similar business if the data are available.



Liquidity Ratios - example of Current Ratio

Liquidity Ratios	
● Current ratio	
$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	= Current ratio = $\frac{\$240,000}{\$26,000} = 9.23$

Example of a Balance sheet highlighting figures used to calculate the **current ratio**.

Balance Sheet
TME Corporation December 31, 1996

ASSETS	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000
LIABILITIES & SHAREHOLDERS EQUITY	1995	1996
<i>Current liabilities</i>		
_Accounts payable	\$70,000	\$20,000
_Wages payable	\$4,000	\$6,000
Total current liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
Total liabilities	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$20,000	\$118,000
Total Shareholders equity	\$120,000	\$238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

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When calculating the current ratio, we are essentially calculating a ratio that tells us how much coverage for the current liabilities that the current assets provide. By what factor are the current assets greater than the current liabilities?

The TME Corporation's current ratio in 1996, tells us that the current assets cover current liabilities by a factor of 9.23. Looking at this ratio, we are assured that this is a very liquid company.

Liquidity Ratio

- **Acid Test Ratio (Quick ratio)**

This ratio shows the ability to pay all current liabilities from current assets, can be realistically converted to cash for the purposes of meeting short term obligations.

It is a more stringent measure of the ability to pay current liabilities from current assets.

(Current Assets-Inventory-Prepaid Expenses) / Current Liabilities

The acid test ratio modifies the current ratio and takes out of the numerator (current assets) those assets that really aren't liquid because they are not assets that would be converted to cash to meet short term obligations.

The higher the acid test ratio, the better the position the business is in to pay its current liabilities. An acid test ratio that increases over time usually indicates improving business operations.



Liquidity Ratios● Acid test ratio:

$$\frac{\text{Current Assets}-\text{Inventory}-\text{Prepaid Expenses}}{\text{Current Liabilities}} = \frac{(\$240,000 - \$90,000)}{\$26,000} = \frac{\$150,000}{\$26,000} = 5.77$$

Note: Prepaid expenses = \$0 in this case.

Example of a Balance sheet highlighting the figures used to calculate the Acid test ratio

Balance Sheet
TME Corporation December 31, 1996

<i>ASSETS</i>	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000
<i>LIABILITIES & SHAREHOLDERS EQUITY</i>	1995	1996
<i>Current liabilities</i>		
_Accounts payable	\$70,000	\$20,000
_Wages payable	\$4,000	\$6,000
Total Current Liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
TOTAL LIABILITIES	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$ 20,000	\$118,000
Total Shareholders equity	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

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In the example with the TME Corporation, total current assets included cash, accounts receivable and inventory. We are not going to use inventory to pay bills. So we deduct inventory from current assets in order to calculate our quick ratio or acid test ratio. Now we are saying that our true liquidity or more accurate estimate is a ratio of 5.77. In other words the current assets available to pay short-term liabilities exceeds short-term liabilities by a factor of 5.77. Again this is a good liquidity ratio and we can look at industry standards and trends of that acid test ratio and decide if we like what we see or whether we don't like what we see.

Solvency Ratios

These are ratios measuring the company's ability to pay long-term debt

- **Debt/Equity Ratio**

Long Term Debt / Shareholder's Equity

We define debt equity ratio as long term debt divided by shareholder's equity.

Long term debt meaning long term obligations and shareholder's equity meaning share capital, shareholder's loan, and or retained earnings.

Solvency Ratios		
○ Debt/Equity Ratio:		
Long Term Debt	\$ 54,000	= 0.23
Shareholder's Equity	\$238,000	

Example of a Balance sheet highlighting the figures used to calculate the Debt/Equity ratio

Balance Sheet
TME Corporation December 31, 1996

<i>LIABILITIES & SHAREHOLDERS EQUITY</i>	1995	1996
<i>Current liabilities</i>		
_Accounts payable	\$70,000	\$20,000
_Wages payable	\$4,000	\$6,000
Total current liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
Total liabilities	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$ 20,000	\$118,000
Total Shareholders equity	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

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The debt:equity ratio is certainly one ratio that should be looked at with caution. If you are looking at the ratio from a banker's perspective, make sure you understand how they are defining long-term debt and how they are defining shareholder's equity. With a bank, there is a likelihood that when they calculate the debt:equity ratio, in the debt portion they are including both long term debt, but short term debt. It is important to be consistent in calculating this ratio and as long as you understand what is being included in the numerator and the denominator, then you can do some meaningful analysis.

It is important to ensure that debt to equity ratio is not too high or else, the value of your company may decline, as you would have taken on too much debt, exceeding the ability of the company to service it from available cash flow.

Solvency Ratios - Debt/Capitalization● **Debt/Capitalization Ratio**

Long Term Debt / (Long Term Debt + Shareholder's Equity)

A re-arrangement of the debt:equity ratio is one commonly known as the debt to capitalization ratio. In this ratio, we divide the long term debt by the total permanent capital. The total permanent capital is made up of long term debt and shareholder's equity.

With the Debt/Capitalization ratio, we find out what portion of permanent capital is financed by debt as opposed to equity.

Solvency Ratio		
○ Debt Capitalization ratio:		
Long Term Debt	\$54,000	= 18.49%
Long Term Debt + Shareholder's Equity	(\$54,000 + \$238,000) \$292,000	

Example of a Balance sheet highlighting the figures used to calculate the Debt Capitalization ratio

Balance Sheet
TME Corporation December 31, 1996

LIABILITIES & SHAREHOLDERS EQUITY	1995	1996
<i>Current liabilities</i>		
_Accounts payable	\$70,000	\$20,000
_Wages payable	\$4,000	\$6,000
Total current liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
Total liabilities	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$ 20,000	\$118,000
Total Shareholders equity	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

In this ratio, what we are finding out is that out of the permanent capital, how much of it is debt as opposed to equity. In the above example, long-term debt is \$54,000 and shareholder's equity is \$238,000. Total permanent capital is the sum of those two, which is \$292,000.

What we are saying here is that out of that \$292,000, \$54,000 is long-term debt. So 18.49% of our total permanent capital is debt.



Debt Ratio

Total Liabilities/Total Assets

Debt ratio is the ratio of total liabilities to total assets and it tells us the proportion of the company's assets that have been financed by debt. This ratio measures a company's ability to pay both current and long-term debts - total liabilities.

A low debt ratio is safer than a high debt ratio. This is because a company with a small amount of liabilities has low required payments and such a company is unlikely to get into financial difficulties. By contrast, a company with a high debt ratio may have trouble paying its liabilities, especially when sales are low and cash is scarce.. When a company fails to pay its debts on a timely basis, the creditors may take action that is detrimental to the continued operation of the business.



Solvency Ratios - Debt Ratio example

Solvency Ratios

- **Debt ratio:**

$$\frac{\text{Total Liabilities}}{\text{Total Assets}} = \frac{\$80,000}{\$318,000} = 0.2517$$

Example of a Balance sheet highlighting the figures used to calculate the Debt ratio

Balance Sheet
TME Corporation December 31, 1996

<i>ASSETS</i>	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000
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<i>Current liabilities</i>		
_Accounts payable	\$70,000	\$20,000
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Total Current Liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
TOTAL LIABILITIES	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$ 20,000	\$118,000
Total Shareholders equity	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

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The debt ratio in our example above shows us that the company used debt to finance about a quarter of the value of its assets, and shareholders equity financed the other three quarters of the company's assets.

Creditors view a high debt ratio with caution. If a business seeking financing already has large liabilities, then additional debt payments may be too much for the business to handle. To help protect themselves, creditors generally charge higher interest rates on new borrowing to companies with an already high debt ratio, and or may insist on more stringent callateral security requirements.

The Theory of Optimal Capital Structure

The theory of Optimal Capital Structure deals with the issue of the right mix of debt and equity in the long term capital structure of a firm. This theory states that if a company takes on debt, the value of the firm increases up to a point. Beyond that point if debt continues to increase then the value of the firm will start to decrease.

When you borrow money, you automatically lock yourself in to a fixed schedule of payments that you have no flexibility on or very little. It might be a mortgage that requires you to make monthly principle and interest payments. Making those payments is what we call debt servicing. If a company borrows more than its cash flow can service, then the company's risk of bankruptcy starts to increase, when its debt load is greater than its ability to service the debt. When the risk of bankruptcy starts to increase then the value of the company starts to decrease.

If this was a publicly traded company, whose shares trade on stock exchange and there is news published that this company failed to pay one of its loan payments, the shares of the company would most likely decline.

The value of a company increases as it takes on debt up to a certain point because debt is the cheapest source of capital. Just like anything else, if you use low cost factor inputs like low cost materials, low cost wages, then you are going to be more profitable, and if you are more profitable, then the value of your company will be greater than if you were less profitable. Capital is one of the factor inputs needed for any company and it is needed to finance your business. Debt is the cheapest source of capital.

Let us compare the cost of debt vs. cost of equity as capital:

- The cost of debt is the interest rate that is paid to the lender for that capital. The lender gets a legal contract saying that they will be paid back the principal, interest, and regular payments would be made. The lender probably gets a security on the loan e.g an asset. In case the borrower defaults on the loan, then the lender would get the asset or they get a personal guarantee from the borrower. The lender is fairly well protected in lending that money.
- Equity capital is provided by shareholders investing share capital in a company or by leaving profits in the company instead of taking them out as dividends.

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What does the shareholder get in comparison to the lender?

Lenders get a contract that obligates the borrower to pay back the loan according to an agreed schedule of payments, plus a pledge of assets to secure the loan in the event of default. Shareholders on the other hand, get hope for a return on their investment.

The shareholder hopes that the value of their shares will increase. They might also hope that you will pay them a dividend along the way, but there is no guarantee. For these reasons, when a shareholder invests in a company they are going to expect a greater rate of return, than the interest rate a bank would charge for lending money. If the bank charges 10% as interest, then the shareholders are hoping that their rate of return is much greater than 10%.

In simple terms, this is one why debt costs less than equity.

The Theory of Optimal Capital Structure (cont'd)

Another reason why the cost of debt is less than equity has to do with tax deductibility of interest expense.

When we look at the income statement, under the non-operating (other) expense category on the income statement, if any interest expense is incurred during that period, it can be deducted from revenue, lowering profit before tax and so less income tax would be paid. However, with any payments to shareholders like dividends, or payments to buy back their shares, none of those payments are tax deductible. Therefore, not only is debt cheaper to begin with, but also the interest expense is tax deductible which saves the company on income tax to be paid, and is therefore cheaper than it appears to be.

Debt is clearly the cheapest sort of capital. Once a business is in the position to service debt, then debt capital should be used because it is the cheapest sort of capital. However a firm should not borrow too much. In order to borrow “sensibly”, the company must forecast its financial position in the future and look at its ability to service the debt which would determine how much debt to take on.

What is the optimal capital structure? The answer to that is it depends.

It depends on the availability and stability of cash flow given the market risk and business risk inherent in the company. Depending on those risks, the company would determine the volatility in its cash flow since cash flow is what is going to service the debt.

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Suppose that your company has a volatile earnings profile that varies from year to year. Maybe you are in the aquaculture industry, where in one year the weather overall is good and there are no diseases or parasites affecting your inventory and you make good profit and cash flow. The next year disaster strikes and you have a terrible year. Remember when you borrow money you lock yourself into a fixed schedule of payments, so whether times are good or bad, you have to meet these payments.

On the other hand, if you were a company that has a very steady earning stream, maybe an electric power utility for example, regardless of whether business is good or bad for others, customers will still buy power from you. So the power company is an example of a company with a relatively stable earnings stream. The power company therefore would be in a position to have a higher debt to equity ratio than a company with a very volatile earning stream.

Profitability Ratios

Profitability Ratios show how successful a company is in terms of generating returns or profits on the Investment that it has made in the business.

- **Gross Margin %**

Gross Margin / Revenue

The Gross Margin percentage, also called the Gross Profit percentage is one of the most carefully watched measures of profitability. This method determines what percentage of the revenue or sales of the company, the gross margin represents.



Profitability Ratios - Gross Margin % example

Profitability Ratios	
● Gross Margin %	
$\frac{\text{Gross Margin}}{\text{Revenue}} = \frac{\$220,000}{\$520,000} = 42.31\%$	

Example of an Income Statement highlighting the figures used to calculate the Gross Margin ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
__Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
__Administration	\$40,000
__Depreciation	\$21,000
__Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
__Less: Income taxes	\$35,500
Net Income	\$98,000

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We know that both the gross margin and the revenue are found on the income statement. In this example, we note that gross margin is 42% of revenue. This means that for every dollar of revenue, we have 42 cents left over to pay other expenses and make a profit

We might do a historical analysis to see if our gross margin % is getting better or worse. We would like to see it as high as possible and getting better. If it is getting worse we could examine what the problem might be. If we look at revenues as a possible cause of gross margin deterioration, maybe we had to drop our prices per unit sold. While the cost per unit might be the same, we might have had to drop prices because competition is fierce. Maybe our price is still the same but the cost of goods sold has gone up because there are some inefficiencies in our production process, and the labour cost is getting out of line. There could be a variety of things happening to the cost of goods sold that causes our margin to deteriorate.

By analysing the gross margin % we are really focusing on the revenue and direct cost of production and all of the factors that might affect each.

Profitability Ratios - Operating Ratio● **Operating Ratio**

Operating Expenses / Operating Revenues

The operating ratio is most commonly derived from dividing operating expenses by operating revenues.

Or it might be the inverse of that (operating revenues divided by operating expenses). As long as it is being calculated consistently, you can still interpret the results.

Profitability Ratios			
○ Operating Ratio			
<u>Operating Expenses</u>	\$381,000	=	73.27
Operating Revenues	\$520,000		

Example of an Income Statement highlighting the figures used to calculate the Operating ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
__ Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
__ Administration	\$40,000
__ Depreciation	\$21,000
__ Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
__ Less: Income taxes	\$35,500
Net Income	\$98,000
Note: Cost of Goods Sold (COGS) + Total Other Expenses = Operating Expenses	
\$300,000	+ \$81,000
	= \$381,000
Revenues = Sales = \$520,000.	

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Normally this ratio is used in a company that does not show cost of goods sold on its income statement. This is quite common in service businesses. In the example above, we find that the operating ratio is 73.27, which means that for every dollar of sales, approximately 73 cents goes towards meeting the operating expenses.

By looking at this ratio, the company can determine whether its cost structure is getting better or worse. Comparisons with other companies in a similar business could be made. What are the existing industry standards? and what was the budgeted ratio? are questions that could be asked. In looking at this ratio the company might determine if there is an expense problem or a revenue problem. These two ratios take the first layer of expense, the true costs to operate a business and express them as a percentage of revenue, to determine what kind of a margin has been made to meet other non-operating expenses and to make a profit.

Profitability Ratios - Return on Sales**Return on Sales**

Net Income / Revenue

In business, the term *Return* is used broadly and loosely as an evaluation of profitability. The Return on Sales is also called the Profit Margin.

This ratio shows the percentage of each sales dollar earned as net income. Companies strive for a higher rate of return, because the higher the rate of return, the more net sales dollars are providing income to the business and fewer net sales dollars are absorbed by expenses.

Return on Sales however varies widely by industry. The supermarket, grocery business, for example usually has a low return on sales because the business is heavily dependent on volume.

Profitability Ratios● **Return on Sales**

$$\frac{\text{Net Income}}{\text{Revenue}} = \frac{\$98,000}{\$520,000} = 18.5\%$$



Profitability Ratios - Return on Sales example

Example of an Income Statement highlighting the figures used to calculate the Return on Sales ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
__ Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
__ Administration	\$40,000
__ Depreciation	\$21,000
__ Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
__ Less: Income taxes	\$35,500
Net Income	\$98,000

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In this example, the Return on Sales ratio is 18.5% which tells us that for every dollar of sales that the company has, 18.5 cents was brought to the bottom line after everything was taken care of including all expenses and income tax. 18.5% in any business is a pretty good bottom line.

In analysing this ratio we ask questions like:

- Is the return on sales getting better or worse?
- Can we make any comparisons with other companies?
- Are there any industry standards we can use to do an analysis?
- What had we budgeted that the return on sales would be, and what did we achieve?

Profitability Ratios - Return on Assets

- **Return on Assets**

Net Income / Total Assets

The Return on Assets measures a company's success in using its assets to earn a profit.

Profitability Ratios
<ul style="list-style-type: none">● Return on Assets $\frac{\text{Net Income}}{\text{Total Assets}} = \frac{\$98,000}{\$318,000} = 30.82\%$



Profitability Ratios - Return on Assets example**Example of an Income Statement highlighting the figures used to calculate the Return on Assets ratio**

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
_ Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
_ Administration	\$40,000
_ Depreciation	\$21,000
_ Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
_ Less: Income taxes	\$35,500
Net Income	\$98,000

Example of part of a Balance Sheet highlighting the figures used to calculate the Return on Assets ratio

Balance Sheet
TME Corporation December 31, 1996

ASSETS	1995	1996
<i>Current Assets</i>		
_ Cash	\$40,000	\$50,000
_ Accounts receivable	\$80,000	\$100,000
_ Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_ Buildings and equipment	\$100,000	\$110,000
_ Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000

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The return on assets ratio is 30.82% in this example. If we let assets be a proxy of how much capital is invested in the business, then the ratio is one measure of how productive the assets are in generating profit. For every dollar invested in assets, we are getting 30.82 cents of profit which is not a bad return on assets.

Profitability Ratios - Return on Equity

Return on Equity

Net Income / Shareholder's Equity

This ratio shows the relationship between net income and shareholders equity and it is a common measure of profitability. It tells us how much income is earned for every dollar invested by the shareholders.

Profitability Ratios		
● Return on Equity		
<u>Net Income</u>	<u>\$ 98,000</u>	= 41.18%
Shareholders Equity	\$238,000	



Profitability Ratios - Return on Equity example

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
_ Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
_ Administration	\$40,000
_ Depreciation	\$21,000
_ Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
_ Less: Income taxes	\$35,500
Net Income	\$98,000

Balance Sheet
TME Corporation December 31, 1996

TOTAL ASSETS	\$250,000	\$318,000
LIABILITIES & SHAREHOLDERS EQUITY	1995	1996
<i>Current liabilities</i>		
_ Accounts payable	\$70,000	\$20,000
_ Wages payable	\$4,000	\$6,000
Total Current Liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
TOTAL LIABILITIES	\$130,000	\$80,000
<i>Shareholder's equity</i>		
_ Share capital	\$100,000	\$120,000
_ Retained earnings	\$ 20,000	\$118,000
TOTAL SHAREHOLDERS EQUITY	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000

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The Return on Equity ratio measure profit in relation to the shareholder's investment.

In this example, the Return on Equity is 41% for the shareholders even though they may have not crystallized it by selling their shares or accessing dividends. We know that you can invest in short term government securities or maybe long term government securities and receive an interest rate of less than 10%. There is low risk in those securities, but in comparison to our example, this is a very low rate of return. So you might decide that with a 41% return on equity this seems to be a good place to invest money even though the risk is much greater.

If your investment can earn a rate of return like this every year, granted that it is riskier, then you might decide to keep your money in the company instead of going to buy a 9% government security. That is why profitability is so important in business because you will not attract capital if your return on equity is not attractive. Why should an investor put money at risk and not earn a good rate of return when they can invest in low risk government security bonds and earn a moderate to decent rate of return with little if any worry.

Profitability Ratios - Return on Investment (ROI)

- **Return on Investment (ROI)**
- Net Income / (Long Term Debt + Shareholder's Equity)

This is the ratio that is most widely used to measure profitability. However, you will see many variations of ROI. We use the Net Income in this example divided by Permanent Capital which we had earlier defined as Long Term Debt plus Shareholder's Equity. As long as you are consistent, you are producing results that can be analyzed.

Profitability Ratios		
○ Return on Investment		
Net Income	\$ 98,000	= 33.56%
Long term Debt + Shareholder's Equity	\$292,000	

Example of an Income Statement highlighting the figures used to calculate the Return on Investment

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
__Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
__Administration	\$40,000
__Depreciation	\$21,000
__Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
__Less: Income taxes	\$35,500
Net Income	\$98,000

Example of a section of a Balance Sheet highlighting the figures used to calculate the Return on Investment

Balance Sheet
TME Corporation December 31, 1996

TOTAL ASSETS	\$250,000	\$318,000
LIABILITIES & SHAREHOLDERS EQUITY	1995	1996
<i>Current liabilities</i>		
__Accounts payable	\$70,000	\$20,000
__Wages payable	\$4,000	\$6,000
Total Current Liabilities	\$74,000	\$26,000
Long term debt	\$56,000	\$54,000
TOTAL LIABILITIES	\$130,000	\$80,000

Profitability Ratios - Return on Investment (ROI)

<i>Shareholder's equity</i>		
_Share capital	\$100,000	\$120,000
_Retained earnings	\$ 20,000	\$118,000
TOTAL SHAREHOLDERS EQUITY	\$ 120,000	\$ 238,000
TOTAL LIABILITY & SHAREHOLDER'S EQUITY	\$250,000	\$318,000
Long term debt + Total Shareholder's Equity = Permanent Capital \$ 54,000 + \$238,000 = \$292,000		

*Click on the play button to hear the audio

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When in this example, we divide net income by total permanent capital we get 33.5%. This means that the return on investment, or our net income expressed as a percentage of total permanent capital invested was 33.5%. That is a pretty healthy rate of return on investment, if we compare it to other investments of moderate risk that provide a much lower rate of return. We may conclude that business in this fiscal year has earned an adequate rate of return.

The two ratios; Return on Equity and Return on Investment are the ones that would give the best perspective on whether a company is earning an adequate rate of return on investment. While in the first one we are looking at the shareholder's investment, in the second one we are looking at the total sources of permanent capital, not only the shareholders investment but also capital provided by lenders through long term debt.

Turnover Ratios

Measures of liquidity that gauge how quickly certain assets can be "turned over" or converted into cash. Such calculations can also measure the productivity of a company's assets.

- **Asset Turnover**

Revenues / Total Assets

This ratio shows Sales/Revenue divided by Total Assets during an accounting period. It is also known as the Earning Power of Assets. The ratio measures the productivity of assets.

As a rule, the higher your asset turnover, the better you are using your assets. But, like most ratios, the numbers vary from industry to industry. You need to compare your ratio with those of your competitors and over time to determine how well you are doing.



Turnover Ratios - Asset Turnover example

Turnover Ratios

● Asset Turnover

$$\frac{\text{Revenue/ Sales}}{\text{Total Assets}} = \frac{\$520,000}{\$318,000} = \$1.64 \text{ or } 1.64 \text{ times}$$

Example of an Income Statement highlighting the figures used to calculate the Asset Turnover ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
_Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
_Administration	\$40,000
_Depreciation	\$21,000
_Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
_Less: Income taxes	\$35,500
Net Income	\$98,000

Example of a section of the Balance Sheet highlighting the figures used to calculate the Asset Turnover ratio

Balance Sheet
TME Corporation December 31, 1996

<i>ASSETS</i>	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000

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As noted in the example, to find asset turnover, we divide sales by total assets getting an answer of \$1.64. This tells us that for every dollar of assets, we produce \$1.64 in sales. This should give us some indication of how productive our assets were.

It is advisable to use historical data in analyzing this ratio. It does give us some impression of the capital intensity of the business and how many dollars of assets we need to produce a dollar of sales? It also give us an idea of the productivity of the assets in terms of generating revenue (not profit).

Because this ratio applies to a given period, normally one year, another way to describe it is as a measure of the number of times per year that a dollar's worth of assets generated a dollar of sales. In our example it would be 1.64 times.

Turnover Ratios - Inventory Turnover

- **Inventory Turnover**

Cost of Goods Sold / Average Inventory

Number of times during an accounting period that a company sells the value of its inventory. This ratio is also known as Inventory Turns.

Inventory Turnover is calculated by dividing the cost of goods sold by the average inventory during the period. Average inventory is estimated by adding beginning inventory and ending inventory, then dividing the sum by two. A high number shows you are moving your merchandise well and do not have excessive working capital tied up in inventory. But, as with other ratios, you need to put the number in the context of the industry. You would expect an inventory of bread products to turn over more often than an inventory of bulldozers.



Turnover Ratios - Inventory Turnover example

Turnover Ratios	
● Inventory Turnover	
$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \frac{\$300,000}{\frac{(\$50,000 + \$90,000)}{2}} = \frac{\$300,000}{\$70,000} = \$4.29 \text{ or } 4.29 \text{ times}$	

Income Statement highlighting the figures used in the Inventory Turnover ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
Other Expenses	
Administration	\$40,000
Depreciation	\$21,000
Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
Less: Income taxes	\$35,500
Net Income	\$98,000

Section of a Balance Sheet highlighting the figures used in the Inventory Turnover ratio

Balance Sheet
TME Corporation December 31, 1996

ASSETS	1995	1996
<i>Current Assets</i>		
Cash	\$40,000	\$50,000
Accounts receivable	\$80,000	\$100,000
Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
Buildings and equipment	\$100,000	\$110,000
Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000

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The inventory turnover ratio is very important in retail businesses because inventory turnover is the engine that drives profit. If you own a grocery business, then the longer it takes to turnover what is on those shelves i.e. sell the inventory and replenish it, the worse off you are. The more times you turn over your inventory, with every inventory item having a profit margin on it, the more profit you make. The Inventory turnover in this example was 4.29 which means that on average the inventory turned over 4.29 times during the year.

Turnover Ratios - Days Receivable

Days Receivable

$\text{Accounts Receivable} / (\text{Revenues} / (365 \text{ or } 260))$

Days Receivable or Days sales in Receivables, also called the *Collection Period* indicates how many days it takes to collect the average level of receivables. The shorter the collection period, the more quickly the organisation has cash to use for operations. The longer the collection period, the less cash is available to pay bills and expand.



Turnover Ratios - Days Receivable example

Turnover Ratios

● Days Receivable

$$\frac{\text{Accounts Receivable}}{\text{Revenues}/365} = \frac{\$100,000}{(\$520,000/365)} = \frac{\$100,000}{\$1,425} = 70.19 \text{ days}$$

Section of a Balance Sheet highlighting the figures used in the days Receivable ratio

Balance Sheet
TME Corporation December 31, 1996

ASSETS	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000

Income Statement highlighting the figures used in the Days Receivable ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
_Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
<i>Other Expenses</i>	
_Administration	\$40,000
_Depreciation	\$21,000
_Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
_Less: Income taxes	\$35,500
Net Income	

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To calculate Days Receivable, we divide accounts receivable from the balance sheet for the year by average sales per day. Average sales per day is calculated by dividing revenue by 365 days (260 days if using a five day week). You then divide sales per day into your accounts receivables, giving the number of days sales you have not collected yet from customers

This ratio tells you what is the average age of your receivables or how many days outstanding your receivables are. The quicker we collect our accounts receivable the more cash we have on hand, the slower the collection, the less cash on hand. The older the accounts get, the more concerned we should be about all of these customers paying us back.

Turnover Ratios - Days Payable

Days Payable

Accounts Payable / (Purchases/(365 or 260))

Days payable is looking at the other side of the equation and saying how quickly are we paying our suppliers.

Turnover Ratios

- Days Payable

$$\frac{\text{Accounts Payable}}{\text{Purchases}/365} = \frac{\$20,000}{(\$340,000/365)} = \frac{\$20,000}{\$932} = 21.47 \text{ days}$$

Purchases

Cost of Goods Sold (COGS) = Beginning Inventory (BI) + Purchases (P) - Ending Inventory (EI)

$$\text{COGS} = \text{BI} + \text{P} - \text{EI}$$

Therefore: P = COGS + EI - BI

$$\begin{aligned} \text{Purchases} &= \$300,000 + \$90,000 - \$50,000 \\ &= \$340,000 \end{aligned}$$



Turnover Ratios - Days Payable example**Section of the Balance Sheet highlighting figures used in the Days Payable ratio**

Balance Sheet
TME Corporation December 31, 1996

ASSETS	1995	1996
<i>Current Assets</i>		
_Cash	\$40,000	\$50,000
_Accounts receivable	\$80,000	\$100,000
_Inventory	\$50,000	\$90,000
Total Current Assets	\$170,000	\$240,000
<i>Fixed Assets</i>		
_Buildings and equipment	\$100,000	\$110,000
_Less: accumulated depreciation	\$(20,000)	\$(32,000)
<i>Net Fixed Assets</i>	\$80,000	\$78,000
TOTAL ASSETS	\$250,000	\$318,000

Income Statement highlighting figures used in Days Payable ratio

Income Statement
TME Corporation
For the Year Ended December 31, 1996

Sales/Revenue	\$520,000
_Less: Cost of goods sold	\$300,000
Gross Margin	\$220,000
<i>Other Expenses</i>	
_Administration	\$40,000
_Depreciation	\$21,000
_Other	\$20,000
Total Other Expenses	\$81,000
Operating Income	\$139,000
Interest expense	\$7,500
Gain on disposal of equipment	\$2,000
Profit before tax	\$133,500
_Less: Income taxes	\$35,500
Net Income	\$98,000

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Days payable is normally calculated by first taking accounts payable from the balance sheet. We then need to figure out what our inventory purchases were. Recall earlier that cost of goods sold is equal to the beginning inventory plus purchases minus ending inventory. If we are trying to find purchases then we can rearrange the formula and purchases would equal cost of goods sold plus ending inventory minus beginning inventory. Now we can find our purchases and divide it by 365 days to get our average inventory purchases per day.

The denominator in this calculation is the average purchases per day. We can calculate purchases using the re-arranged formula, by looking to the income statement where we can get cost of goods sold and the balance sheet where we get ending and beginning inventory.

In this example, the company is collecting its receivables from customers on average in about 70 days and it is paying its own bills on average in about 21 days. These practises will tend to place a strain on working capital because on average, bills are being paid faster than sales are being collected.

Analysis of Financial Statements - Working Capital Management

WORKING CAPITAL MANAGEMENT

Example:

WORKING CAPITAL MANAGEMENT
Managing Receivable and Payable example

Sales/day	\$1,000
Purchases/day	\$500
Days Receivable	45
Days Payable	30

Balance Sheet
Company ABC
September 30, 1996

Current Assets		Current Liabilities	
Cash	\$0	Accounts Payable	\$15,000
Accounts Receivable	\$45,000	Bank Line of Credit	\$19,500
Inventory	\$22,000	Accrued Wages	\$2,500
Prepaid Expenses	\$4,000	Current Long Term Debt	\$6,000
Total	\$71,000	Total	\$43,000
Equipment	\$75,000	Long Term Debt	\$18,000
Less: Depreciation	\$15,000	Shareholder's Equity	
Net Fixed Assets	\$60,000	shareholder loan	\$25,000
		common shares	\$25,000
		retained earnings	\$20,000
		Total	\$88,000
Total Assets	\$131,000	Total Liabilities & Equities	\$131,000



Working Capital Management example

Let us conclude by seeing how the phenomenon of managing receivables and payables can affect the balance sheet of a business.

We have a company that has a sales per day of \$1000 and purchases per day of \$500.

At the moment the company is collecting its receivables on average in 45 days and is paying its receivables on average in 30 days. This company has no cash as we see on the balance sheet, but it has a line of credit that it is using to pay its bills.

As they collect receivables the line of credit goes down as it pays its bills the line of credit goes up. Right now the company owes \$19,500 on the line of credit. Lets assume that this company gets sloppy and it collects its receivables in 90 days. Now its bank line of credit is sitting at \$64,500 because it has not collected the cash from its customers as quickly. The quicker you collect your receivables, the more cash you have on hand and the less you owe on your line of credit. Just because it was a little less diligent in collecting its receivables, it owes a lot more money to the bank. Conversely it is paying its bills rather quickly at 30 days, lets suppose that you can negotiate with your supplier are extend the credit to 60 days. Now you only owe \$4,500 on your line of credit, simply because you haven't paid your bills as fast. Account payable becomes greater, but this sort of credit becomes cash to you.

This little example shows you the dynamics of managing your receivables and payables. Trying to collect your receivables quickly and trying to pay your payables as slowly as practical and acceptable to your supplier could collectively be a source of financing. Effective management of your working capital is one important source of finance.

If we lower our receivables to 30 days and stretch our payables to 60 days, now instead of owing on the bank line of credit we are in a credit position on the bank line of credit which means we have surplus cash of \$10,500. That is why effective management of working capital is so important. And that is also why the turnover ratios are important to help us decide if the age of receivables is appropriate and if the age of payables is appropriate. Can we tighten up the age of our receivables, can we lengthen the age of our payables?



Analysis of Financial Statements - Profit Terms

Profit Terms

PAT Profit After Tax

EBIT Earnings Before Interest and Taxes

EBIAT Earnings Before Interest and After Taxes

EBITDA Earnings Before Interest, Taxes and Depreciation Allowances



SUMMARY - ANALYSIS OF FINANCIAL STATEMENTS

Financial Ratios

Financial Ratios are used in the evaluation of the financial condition and profitability of a company. The ratios are calculated from the financial information provided in the balance sheet and income statements. Every firm has two basic financial objectives:

- to be financially sound
- to earn an adequate rate of return on invested capital

Liquidity and Solvency tell you how financially sound the company is. Liquidity is the ability to meet short term financial obligations. Solvency is the ability to meet long term obligations.

When analyzing financial statements you should keep in mind the principles/practices that accountants use in preparing statements.

Types of Financial Ratios

Liquidity Ratios:

Current Ratio

Acid Test Ratio

Solvency Ratios:

Debt/Equity Ratio

Debt/Capitalization Ratio

Profitability Ratios focus on earning an adequate rate of return:

Gross Margin %

Operating Ratio

Return on Sales

Return on Assets

Return on Equity

Return on Investment

Turnover Ratios focus on how effective the company is in the utilization of its assets and management of its working capital:

Asset Turnover

Inventory Turns

Days Receivable

Days Payable

*Pay attention to **how ratios are defined** when you are analyzing them. Different people use different ways to calculate the same ratio. For example, a bank might define the Debt/Equity Ratio as Long Term Debt + Short Term Debt / Shareholder's Equity, in this module it is defined as Long Term Debt / Shareholder's Equity.*



ANALYSIS OF FINANCIAL STATEMENTS

by

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Technology Management and Entrepreneurship

Faculty of Engineering

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