**MGT388 Finance and Law for Engineers**

**Finance Lecture 2 Notes**

# Financial Statements Analysis 财务报表

The analysis of financial statements involves evaluating different areas of company’s performance in the perspective of different user needs.

Ratio analysis is an essential tool to make three main typologies of comparison: intracompany公司内部， intercompany公司间 and with industry averages行业平均水平.

We use the term intracompany to indicate the comparison of an item or financial relationship within a company in the current year with the same item or relationship in one or more prior years, to find the amount of the increase or decrease.

The term intercompany identifies the comparison of an item or financial relationship of one company with the same item or relationship in one or more competing companies, on the basis of the published financial statements for the same accounting period.

Finally, a company can compare an item or financial relationship with industry average published by financial ratings organisations, such as Moody’s or Standard & Poor’s. This type of comparison provides information as to a company’s relative performance within the industry.

Moreover, ratios can be easily and effectively represented in charts and graphs and they can be used as key performance indicators in strategic management accounting. For example, operating profit margin, expressed as a percentage, is an indicator of cost efficiency.

# Profitability ratios

Profitability ratios measure the income or operating success of a company for a given period of time. Income, or the lack of income, affects the company’s ability to obtain debt and equity. If a company shows a loss for one or more accounting periods, it can be difficult to be funded.

Income also affects the company’s liquidity position because it is strictly linked with cash, cash equivalents and trade receivables, that, in case of losses, will tend to decrease over time.

Moreover, a company with a poor performance in profitability will need to increase its liabilities and this will lead to an increase in “cash outflows” to pay a higher amount of trade payables towards the suppliers that will try to impose higher prices and also to pay a higher amount of interests on debts towards banks and other financial institutions. Additionally, those interests will represent higher costs in the income statement, furtherly depressing income or worsening loss.

Income also affects the company’s ability to grow because it should be the main source of selffinancing through the generation of cash flows.

As a consequence, both creditors and investors are interested in evaluating profitability or, in other terms, earning power. Analysts frequently use profitability as the ultimate test of management’s operating effectiveness.

盈利能力比率是一组财务指标，用于衡量公司的盈利能力和效益。它们提供了有关公司如何转化销售收入为利润的信息。以下是几个常见的盈利能力比率及其简单解释：

1. 净利润率 (Net Profit Margin): 净利润率表示公司在每销售1美元的产品或服务后保留的利润百分比。它的计算方式是净利润除以总销售收入。更高的净利润率通常表示更好的盈利能力。
2. 毛利润率 (Gross Profit Margin): 毛利润率衡量公司在生产或提供产品或服务时的盈利能力。它表示在销售收入中扣除直接成本后的利润百分比。高毛利润率通常表示公司能够高效地生产产品或提供服务。
3. 运营利润率 (Operating Profit Margin): 运营利润率衡量公司在扣除销售成本和一般及管理费用后的利润。它表示公司的日常经营活动盈利能力。较高的运营利润率意味着公司在日常经营中更有效益。
4. 回报率 (Return on Investment - ROI): ROI是一种综合性盈利能力比率，它衡量公司对投资的回报。ROI将净利润与公司的总资产相比较，用于评估公司如何管理其资源以产生盈利。
5. Return on Equity (ROE): ROE衡量公司为股东创造价值的能力。它将净利润与股东权益相比较，显示公司如何在股东投资方面表现。

## Return on capital employed (ROCE)

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营业利润=总收入（Total Revenue）-直接成本（**Cost of Goods Sold，COGS**）-营业费用（**Operating Expenses**）

A primary measure of business performance is the Return on capital employed, which can be calculated dividing operating profit by equity funds plus non-current liabilities.

衡量业务绩效的主要指标是已动用资本回报率，可以计算出营业利润除以权益基金加上非流动负债。

Operating profit is a flow referred to a period of time, the accounting period, and represents the profit achieved during that period after all operating expenses have been deducted from revenues from operations. Financing expenses are not included here because they are deducted after the calculation of operating profit.

营业利润是指一段时间（会计期间）的流量，代表从营业收入中扣除所有营业费用后在该期间实现的利润。融资费用不包括在计算营业利润后扣除。

Equity and non-current liabilities are both measured in a precise day at the end of the period. To be accurate, we should compare operating profit with the average long-term capital (equity and borrowings) invested in the business.

权益和非流动负债均在期末的精确日期进行计量。准确地说，我们应该将营业利润与投资于企业的平均长期资本（股权和借款）进行比较。

Equity is the owner’s claim on the business and, in the case of a limited company, it comprises the sum of the share capital and reserves.

股权是所有者对业务的债权，对于有限公司，它包括股本和储备金的总和。

Reserves derive from profits and gains which have not been distributed to the shareholders through dividends or reduced by losses.

储备金来自未通过股息分配给股东或因亏损而减少的利润和收益。

Definitely, the return on capital employed ratio expresses the operating profit as a percentage of the long-term funds invested in the business.

当然，资本运用回报率将营业利润表示为投资于业务的长期资金的百分比。

Return on Capital Employed (ROCE)是一个用来评估公司的盈利能力和资本利用率的重要财务比率。ROCE的计算涉及两个主要元素：净利润和资本雇用。

简单来说，ROCE衡量了一家公司在使用其资本（包括股本和债务资本）来实现盈利方面的效率。这个比率的计算方法如下：

ROCE = (净利润 / 资本雇用)

其中，

净利润是公司在一定期间内的利润，通常是净利润（扣除了所有费用和税款）。

资本雇用是公司使用的资本总额，通常是股本和债务的总和。

ROCE的目标是衡量公司是否有效地使用其资本来实现盈利。高ROCE通常被视为积极的信号，表明公司能够在资本投入的基础上产生良好的回报。相反，低ROCE可能表明公司没有有效地利用其资本，或者它的盈利水平相对较低。

## Gross profit margin

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即：（销售收入-销售成本）/销售收入=毛利率

毛利率比率可以计算为企业毛利除以销售收入。这两个值都来自损益表，它们是流量。

在解释毛利率时，我们首先应该考虑毛利取决于销售成本。

其次，要确保增加市场份额的政策不与销售价格的降低挂钩，否则未来利润率会下降。

第三，如果新进入者加入市场，竞争加剧可能会压低销售价格，从而降低毛利率。

这些考虑因素对于了解和防止该比率随时间推移的可能动态至关重要。

The gross profit margin ratio can be calculated dividing the gross profit of the business by the sales revenue. Both values come from the income statement and they are flows.

In interpreting gross profit margin, we should consider first of all that gross profit depends on cost of sales.

Second, we should make sure that a policy of increasing market share is not linked to a reduction in sales prices, otherwise we will see a reduced margin in the future.

Third, if new entrants join the market, the increased competition may force down sales prices and consequently reduce gross profit margin.

These considerations are essential to understand and prevent the possible dynamics of this ratio over time.

## Operating profit margin



营业利润=总收入（Total Revenue）-直接成本（**Cost of Goods Sold，COGS**）-营业费用（**Operating Expenses**）

营业利润率可以用营业利润除以收入来计算。

营业利润是从销售成本中扣除行政和分配费用计算的，它是利息和税前利润。

这个比例主要取决于公司在成本控制方面的能力。

Operating profit margin can be calculated dividing Operating profit by revenue.

Operating profit is calculated deducting the administrative and distributive expenses from the cost of sales, and it is the profit before interest and taxation.

This ratio mainly depends on the company’s ability in cost control.

## Net asset turnover

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即：总销售收入/净资产（净资产：总资产-总负债）

Looking at the efficiency in the asset utilisation, we need to calculate the net asset turnover dividing the revenue by equity plus non-current liabilities. There is also an alternative formula that divides revenue by assets. This is possible because the total amount of assets always equals the sum of equity and liabilities.

In the interpretation of this ratio, we should be able to compare this figure over time for the same company and against companies in the same industry.

Moreover, non-current assets, such as PP&E and intangible assets, must be depreciated over time, so a company with old assets will have a low figure for assets and as a consequence it will show a higher turnover.

Moreover, it is also true that for definition assets will provide benefits to the company in the future, but the investments in assets may not translate to increased revenue immediately. It takes some time depending on the activity’s nature and many other factors.

从资产利用效率来看，我们需要计算净资产周转率除以权益加上非流动负债。还有一种替代公式，将收入除以资产。这是可能的，因为资产总额总是等于权益和负债的总和。 在解释这个比率时，我们应该能够比较同一家公司和同一行业公司随时间推移的数字。 此外，非流动资产，如PP&E和无形资产，必须随着时间的推移而折旧，因此拥有旧资产的公司将拥有较低的资产数字，因此其营业额将更高。 此外，从定义上讲，资产将在未来为公司带来收益，但对资产的投资可能不会立即转化为收入的增加。这需要一些时间，具体取决于活动的性质和许多其他因素。

# Relationship among ratios

Finally, we find that there is an important relationship among ratios.

The Return on capital employed (ROCE) can be found multiplying the operating profit margin by the net asset turnover.

This formula is very effective to understand that the company’s ability to deploy capital employed depends both on profitability and on efficiency.

最后，我们发现比率之间存在重要关系。 已动用资本回报率 （ROCE） 是营业利润率乘以净资产周转率。 这个公式非常有效地理解了公司部署所用资本的能力取决于盈利能力和效率。

# Working capital management

Liquidity is essential for a business to survive and avoid bankruptcy. Cash is the priority because a business will go bankrupt it is no more able to pay its debts towards the employees for salaries and wages, towards the suppliers for purchases, towards the bank for borrowings, towards the shareholders for capital invested, etc.

The availability of cash depends on profitability, but a business may be at the same time profitable and short in liquidity because of poor management of working capital, so not able to meet its debts as they fall due.

Working capital is the difference between current assets, such as cash and cash equivalent, trade receivables and inventory, and current liabilities, such as trade payables, tax payables, and overdrafts.

First of all, a company must avoid holding too much inventory for too long. On the one hand, the inventory is needed to prevent any interruption in the provision of factors of productions upstream or merchandises and the delivery of products and services to customers downstream. On the other hand, inventory is very expensive and holds the cash in place, preventing it from circulating.

Downstream inventory contains unsold goods, so until they remain in the inventory they do not generate cash and sales revenue. Moreover, the inventory needs a physical space to buy or rent, incurring a cost. Therefore, the golden rule is to hold only the minimum needed inventory and for the shortest possible time.

Second, a company should be able to apply a good collection policy to be effective in collecting trade receivables from customers as soon as possible and so increase cash.

Third, a prompt payment of trade payables towards the suppliers is to be preferred, to receive a reduction in purchasing prices and to keep good relationships with the suppliers.

A good working capital management protects the company from bank overdrafts, which are quite expensive short-term liabilities. A bank overdraft enables a business to maintain a negative balance on its bank account and it is a very flexible form of borrowing, but on the other side the interest rates are higher than those for a term loan and the overdraft is repayable on demand so potentially risky for a company’s liquidity.

# Efficiency ratios

They are all expressed as a period, so a certain number of days.

## Inventory holding period

closing inventory/ cost of sales \*365Days

The inventory holding period can be calculated by dividing closing inventory by cost of sales and then multiplying the result by 365 days to express it in days.

Usually, in a manufacturing company, the inventory is classified into three categories: finished goods, works in process, and raw materials. Finished goods inventory includes manufactured items that are completed and ready for sale. Work in process is that portion of manufactured inventory that has been placed into the production process but is not yet complete. Raw materials are the basic goods that will be used in production but have not yet been placed into production.

Many companies have significantly lowered inventory levels and costs using just-in-time inventory methods, so they manufacture or purchase goods just in time for use.

## Trade receivable collection period

Trade receivables/ Revenue \* 365days

The second ratio is the trade receivable collection period that we obtain by dividing trade receivables by revenue and then multiplying the result by 365 days, as for the previous ratio.

A collection period should not be too long or too short and this is a professional judgement made by accountants.

If a collection period is too long, it may indicate a poor collection policy or anyway the inability of a company to collect money from its customer. Something to be improved in this process.

Also, it may indicate that some customers are refusing to pay because they have not been satisfied by the quality of products.

If the period is too short, there is a risk to lose customers because they will prefer the competitors who offer longer credit terms. Moreover, we should consider if a short collection period hides a price policy that offers discounts for prompting the payment but reduces margins.

## Trade payable payment period

trade payables /cost of sales\*365

Finally, the trade payable payment period can be obtained by dividing the trade payables by the cost of sales and then multiplying by 365 days, as usual.

In interpreting the trade payable payment period, we need to consider that it should match the trade receivable collection period and it should not be too long for two main reasons.

First, because a promptly payment allows to receive some reduction in purchasing prices, so enhancing profitability.

Second, because a short payment period will help keeping good relationships with suppliers.

# Liquidity ratios

Liquidity ratios measure the short-term ability of the company to pay its maturing obligations and to meet unexpected needs for cash. Short-term creditors, such as bankers and suppliers, are particularly interested in assessing liquidity.

The ratios we use to determine the enterprise’s short-term debt-paying ability are current ratio and acid-test ratio.

## Current ratio

Current ratio is a widely used measure and is computed by dividing current assets by current liabilities. Generally speaking, a current ratio around 2 is judged to be adequate and indicates that debts could be met when they fall due.

However, to provide an accurate interpretation of this ratio we should make reference to the industry average, as we discussed in lecture 3. For example, typically supermarkets have low current ratios because their customers pay immediately, so they have a low amount of trade receivables, and they hold fast-moving inventories. Moreover, they enjoy a high negotiation power, so they usually have a high level of trade payables because they receive long delays from suppliers. Finally, they invest cash in developing or improving their site, so the amount of cash among current assets is low as well. Summarising, for supermarkets cash, trade receivables and inventory tend to be low. Trade payables tend to be high, so current ratio tend to be low.

A low current ratio expresses a poor liquidity and ability to pay debts in the short-term, so with reference to one year. On the other hand, is a high current ratio good?

Not so much, it depends on how much it is high and the answer to this question requires a professional judgement for a specific business.

A very high current ratio can hide some inefficiencies. First of all, a company should not hold large reserves of cash, but it should rather invest cash to be more productive and generate profits.

Second, the amount of inventory and trade receivable should not be too high, otherwise probably the company is not managing them efficiently so stocks become obsolete, trade receivable are not collected from customers and both these inefficiencies can cause cash to be tied up.

## Acid-test (or quick) ratio

Acid-test (or quick) ratio is a measure of a company’s immediate short-term liquidity. We compute this ratio with a similar formula, but at the numerator we deduct the inventory from current assets. We remove the inventory because it is the less liquid assets among current assets, due to the time lag of turning inventory into cash by selling products and then collecting trade receivables.

Some authors state that the minimum level for this ratio is 1 time. However, many highly successful businesses, have an acid-test ratio below 1 without suffering liquidity problems.

Moreover, we should compare this ratio with the industry average as usual.

# Solvency ratios

Solvency ratios measure the ability of a company to survive over a long period of time. Long-term creditors and shareholders are particularly interested in assessing the potential risk of their investment. In other terms, a company’s ability to pay interests as they come due and to repay the face value of debt at maturity.

For this purpose, we need to look at the medium-term capital structure of a business.

We point out here the difference between debt and equity.

Financing activities (in other words, liabilities or debt) result in interest expense, which is the payment for the use of money. Interest is the difference between the amount borrowed (which is called the principal) and the amount repaid. The amount of interest to be paid is usually stated as a rate over a specific period of time and the rate of interest is generally stated as an annual rate.

Therefore, the amount of interest involved in any financing transaction is based on three elements:

1. Principal, which is the original amount borrowed by a company.
2. Interest rate, which is an annual percentage of principal.
3. And time, which is the number of years that the principal is borrowed.

Simple interest is the return on principal for one period and it can be calculated by multiplying the principal by the rate by the time.

For example, if you borrow £ 10,000 for 1 year at 4% interest rate, you will pay an interest expense of £ 400. In practice, the amount repaid will be the sum of principal (10,000) and interest expense (400), so 10,400 pounds.

Therefore, a company knows that it will pay interests at a certain rate on its liabilities.

Equity (also known as residual equity) is the ownership claim on total asset.

The remuneration of an investment in equity is totally different from the payment of interest on liabilities. The distribution of cash or other assets to shareholders is called a dividend.

Dividends reduce retained earnings but they are not an expense.

A company first determines its revenues and expenses and then computes net income or net loss. If it has net income, and decides it has no better use for that income, a company may decide to distribute a dividend to its owners.

The amounts of dividends paid to shareholders are not determined by a certain rate, but they are determined with a decision of the board of administrators, ratified by shareholders in the ordinary general assembly meeting.

Also the presentation in the financial statements is totally different. Interest expenses are presented as a cost in the Income Statement and so deducted from operating profit to find profit before tax.

Dividends are presented in the Statement of Financial Position as a reduction of retained earnings.

For this reason, investors face a risk of not receiving an annual return on their investment and also non having their investment repaid. They need to have a look at the solvency ratios to assess if the company they invested in is able to survive in the medium – long term.

The solvency of a business can be assessed by looking at its financial gearing (also known as financial leverage). A high level of non-current liabilities (which are long-term debt) exposes a business to a potential financial risk. A business that cannot repay its loans will fail in the mediumlong term.

## Gearing ratio

Gearing ratio is concerned with assessing the relationship between equity and debt financing and can be calculating by dividing the sum of loans and overdrafts by the sum of share capital and retained earnings.

At the numerator, debt includes non-current liabilities and preference shares.

Preference shares are a particular class of shares having a preference or priority over ordinary shares. Typically, they have a priority as to distribution of income (through dividends) and assets in the event of liquidation. However, they sometimes do not have voting rights. If they carry a fixed rate of interest, they should be regarded as debt.

If a business has a current loan or overdraft that is semi-permanent, it should also be regarded as debt.

At the denominator, equity includes share capital and retained earnings.

## Interest ratio

Interest cover ratio expresses the ability of a business to meet the payment of interest payables from the operating profit. It is calculated by dividing operating profit by interest payable.

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