

**SYLLABUS Introduction to finance**  
**Module: Corporate Finance**



Year 2024-2025

*This syllabus has been compiled from the syllabus of the course Business & Law. Due to this "transformation," some references may not be accurate.*

## Table of contents

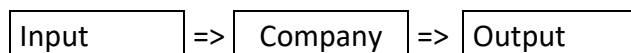
1. Introduction to Finance and Accounting .....	3
2. The Balance Sheet, the Profit and Loss Statement, and the Cash Flow Statement.....	7
2.1 Introduction .....	7
2.2 The Balance Sheet .....	8
2.3 The Profit and Loss Statement.....	10
2.5 Changes: Alterations in the Balance Sheet and the Profit and Loss Statement .....	13
2.7 Cash Flow Statement of the Orange Merchant Case Study.....	23
3 Finance theory and financial structure .....	25
3.1 introduction .....	25
3.2 Forms of Capital: Detailed Overview of Equity and Debt Capital .....	25
3.2.3 Debt Capital .....	30
4. Risk: general, operational and financial .....	33
4.1 Introduction:.....	33
4.2 Cost Theory:.....	33
4.3 Break-even Analysis.....	36
4.4 Operational Risk: .....	38
5 Financial risks.....	40
5.1 Introduction .....	40
5.2 Ratios .....	40
6 Agency Theory and Information Asymmetry in the World of Finance .....	44
6.1 Introduction .....	44
6.2 Enterprise Theories.....	44
6.3 The Microeconomic Finance Theory .....	48
6.4 The Information Problem in Finance Theory .....	51

## 1. Introduction to Finance and Accounting

In the following paragraphs, a brief overview of finance and accounting is provided. The focus of this syllabus is on accounting – the finance components offer basic introductions to or supplements for the book by Brealey et al. (2019).

### 1.1 Finance: Flow Variables

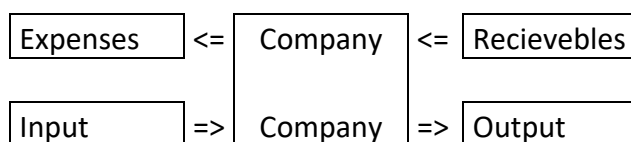
The function of a company in the societal production process is to propel resources through the business column; here, input is transformed into output. Physical flows run through the company. This flow starts with the input obtained by the company in the procurement markets. This input – the flow of resources - is then transformed into an output – goods and services - which are sold in the sales market. Figure 1: Physical flows summarizes this schematically.



*Figure 1. Physical flows*

When utilizing the input, resources are sacrificed. As a result, their value is lost – for example, the raw materials that are consumed or the wearing out of machinery. At the end of the production process, the value of the output is realized in the sales market. The sacrificed values are the costs, and the obtained values are the revenues. The difference between revenues and costs is the profit. During the transformation of input into output, the sacrificed input must be allocated to the created output: this can be done by calculating a cost price.

The purchase of input generates a financial flow alongside the physical flow. When the input is purchased, it initiates an expenditure. Eventually, there is a receipt when the equivalent value of the output is received. Figure 2: Relationship between physical and financial flows illustrates this correlation.



*Figure 2. Relationship physical and financial flows*

There is a time difference between expenditures and receipts: "cost precedes revenue." The company must first acquire and pay for the resources; only after completion of production, sales, and payment by the customer will there be receipts. The length of this period depends on the duration of the production process. This time difference can be bridged in three different ways. Firstly, by holding cash.

Another possibility is to use bank credit, obtain new loans, or obtain money from shareholders. Thirdly, it is possible to defer the payment for the resources (supplier credit; the supplier lends money because the purchase price needs to be paid later). To bridge the time difference, a company will need to rely on capital providers (shareholders, banks, or suppliers). Companies need access to capital markets; opportunities to obtain capital. These financing alternatives vary by type of company. A publicly listed company has various ways to meet its capital needs: issuing shares, entering into a private loan, issuing bonds, borrowing from the international capital market, and borrowing from banks. Small

businesses are often reliant on bank credit or private deposits. Owner's funds – invested in the company by the entrepreneur – are referred to as equity, money from third parties (or outsiders) as debt (also known as loans or liabilities).

Capital providers make capital available to finance the purchase of resources. At the end of the process, the capital can be repaid with the receipts obtained from the sales and a compensation (interest, dividend) can be paid. This process is illustrated in Figure 3 Company and Capital Market.

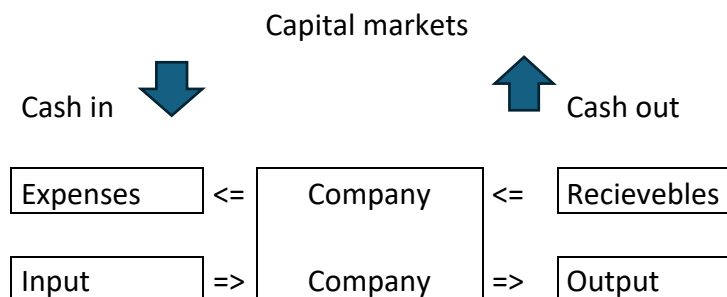


Figure 3. Company and capital market

In financial theory, incoming and outgoing cash flows are central. This issue breaks down into determining the capital requirement (investment) and the manner in which this capital requirement should be met (financing).

## 1.2 Accounting: Flow and Stock Variables

In Figure 3: Company and Capital Market, both the physical and financial flows are indicated. A flow (a financial fact or a mutation) - for example, a transaction or a transformation - causes a change; but a change in what? To represent the change in position, we introduce the concept of stocks. This concept has a broader meaning than in everyday language: it reflects the position of the resources on one hand and the equity and debt on the other. Stock can relate to resources: raw material stock, cash, machinery and receivables from customers (debtors), liabilities: debts to suppliers (creditors) and to the tax authorities (sales tax), loans, and the balance between them - equity; if the capital does not come from outsiders, it is by definition equity. This leads to the following figure 4:

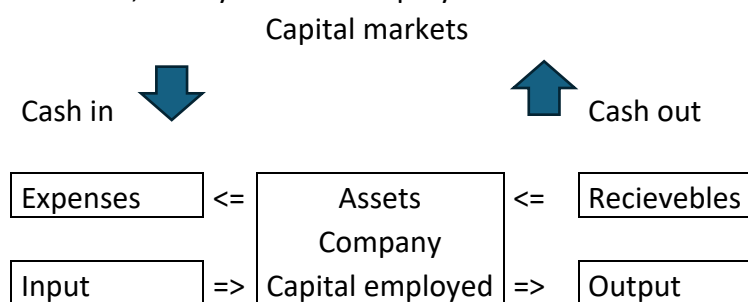


Figure 4. Company assets and capital employed

Inventories can arise because the conversion from input to output is not yet complete; a machine with an economic life (the period during which the machine will be used) of five years has only consumed one-fifth of its value after one year of use. This remaining value can be seen as a stock of performance that the machine can still deliver. Inventories can also arise because contracts have not (yet) been financially settled. If a company has made

purchases on credit and has not yet paid by the end of the period, this results in a debt to the supplier (creditor).

A flow consists of a number of units per period (period variable). A stock is the number of units present at a specific point in time (point-in-time variable). There is a certain relationship between the flows running through the company and the inventories held by the company. Each flow will cause a change in the inventory to which that flow relates. For instance, the ending inventory of raw materials of a company can be determined by adding purchases to the beginning inventory and subtracting the consumed inventory from it. This relationship is present for all resources, liabilities, and (the balance between them – equity). A liability – for example, outstanding bills to suppliers – at the beginning of the period increases due to purchases on credit and decreases by paying bills. This liability to suppliers is referred to as accounts payable.

The purchase of input entails expenditures but may not necessarily result in costs in the same period. An expenditure means a payment, an outflow of cash. A cost item is related to the consumption, sacrifice, or sale of an asset. The expenses associated with obtaining the input must be attributed to the periods in which this input is used. The expense for a machine that can produce for five years must be spread over this period (through depreciation costs on the machine). At the end of the first year, 1/5 of the machine is consumed or transformed into a final product; 4/5, the machine inventory at the end of the first year, is not yet consumed. There is a similar distinction on the receivables and revenue side: not every receipt can be considered revenue from the same period.

The value conversion model includes the following elements:

- Financial flows
- Physical flows
- Financial stocks
- Physical stocks

These aspects are reflected in three financial statements included in a company's annual report:

- the cash flow statement (receipts and expenditures)
- the profit and loss statement (revenues and expenses)
- the balance sheet (inventory of assets, equity, and liabilities)

These statements provide insight into the financial performance and financial position of a company. Together, they form a basis on which the viability of a company can be assessed.

These statements answer the following three questions:

- What is the change in the company's cash position (financial flows)?
- What is the change in the company's equity due to profit? (physical flows)
- What is the equity or book value of the company? (Stocks)

On the balance sheet, inventories are listed, while flows are reported on the profit and loss statement and the cash flow statement. The following example illustrates the types of data included in these financial statements.

Suppose someone wants to trade in toy cars. One day, he starts by depositing €100 into the company's cash account. After establishing the company, he buys a batch of toy cars for €100. He sells half of these cars for €70. How do the financial statements look at the end of the first day?

At the beginning of the day, the balance sheet looks like this after the €100 deposit:

Balance Sheet beginning:

Cash €100

Value (assets) €100

For the calculation of the (book) value of the company, the value of all assets is added together. This value equals the claim of the owner/entrepreneur on his company; the assets are fully financed with equity. When the entrepreneur establishes his company - or the shareholder participates in a newly established NV - the book value of equity is equal to the economic value. Afterwards, book value and market value often diverge.

The cash flow statement for the first day reads as follows:

Purchase (expenditure) -€100

Sale (receipt) €70

Cash Variation -€30

The profit and loss statement for the first day reads as follows:

Sales (revenue) €70

Costs ( $0.5 * 100$ ) -€50

Profit €20

The balance sheet at the end of the first day looks as follows:

Cash €70

Inventory €50

Value (assets) €120

The cash flow statement includes cash transactions, which are receipts and expenditures.

The balance of the cash flow statement, formed by the cash transactions, explains the decrease in cash from €100 (starting balance) to €70 (ending balance). On the profit and loss statement, the revenues (€70) - the value obtained - and the costs (€50) - the value sacrificed - appear; the difference between them is the profit (€20). This profit leads to an increase in the book value of assets during the period:  $€120 - €100 = €20$ .

Many flows have implications for profit and cash.

Profit is not equal to the cash flow. The reason for this is that the cash flow statement includes the entire expenditure of the purchase (because it was paid), whereas the profit and loss statement only includes the sold (sacrificed) portion of the purchase. There is a difference between expenditures and costs. This phenomenon also occurs on the other side of the transformation cycle from input to output: receipts may not equal revenues. For example, when an entrepreneur sells toy cars on credit, there is revenue but not yet a receipt. Therefore, at the end of the period, there are still open accounts receivable from customers. These receivables are referred to as debtors.

The above statements are very rudimentary. A first addition could be, for example, that a company not only has assets but also liabilities. These liabilities reduce the claim of the entrepreneur – referred to as equity (assets minus liabilities). In a real balance sheet, profit and loss statement, and cash flow statement, there will be many more items. These items are classified.

The three financial statements are interconnected. This is due to the relationship between flows and stocks. An important feature is that every exchange, transformation, or transaction leads to at least two effects on the balance sheet. A purchase of goods leads to an increase in the inventory of goods but - with cash payment - to a decrease in the cash inventory. In other forms of exchange, this effect is not immediately visible, for example, in

the payment of wages to employees. This leads to a decrease in cash. Nevertheless, there is also a side effect to this; namely, the decrease in the equity of the company.

The balance sheet shows the assets, liabilities, and equity at a specific moment. A cash flow statement and a profit and loss statement show changes over a period. All items on the balance sheet are the result of financial events from the past.

The financial-economic crisis of 2008-2012 is referred to as a balance crisis. The balances of the government, banks, and individuals showed excessive debts. This led to high risks of providing capital. The coverage value of the assets plays a role in this, as well as the future earning capacity.

## 2. The Balance Sheet, the Profit and Loss Statement, and the Cash Flow Statement

### 2.1 Introduction

The financial position and performance of a company are periodically assessed by preparing the balance sheet, the profit and loss statement, and the cash flow statement. These statements are based on the registration of financial events that correspond to the processes depicted in Figure 3: Company and Capital Market. The balance sheet relates to a specific moment and provides insight into the company's inventories. The profit and loss statement and the cash flow statement offer insights into the performance of the company over a certain period in terms of profit (change in equity) and cash flow (change in cash resources), respectively.

The balance sheet lists the assets and liabilities on a specific date, as well as the balance between them: equity. The profit and loss statement shows the costs and revenues for a specific period, along with the balance: the profit. The profit and loss statement partially explains the change in equity. For this reason, the profit and loss statement is referred to as the supporting account of equity; it specifies the change in equity through operational activities. The cash flow statement provides an overview of the cash flows between the company and its environment (receipts and expenditures). The cash flow statement explains the change in cash (and/or bank balance) and can be considered the supporting account of cash.

This chapter addresses the balance sheet, the profit and loss statement, the cash flow statement, and their interrelationships. It begins by discussing some basic principles and the structure of the balance sheet, the profit and loss statement, and the cash flow statement. Subsequently, a simple case is used in Section 2.6 to discuss the recording process. Initially, only changes on the balance sheet and the profit and loss statement are presented, while the cash flow statement is excluded. The effects of each change are initially presented, followed by the comprehensive inclusion of all changes in one overview, known as the balance mutation statement. From this statement, the profit and loss statement and the cash flow statement can be derived. This statement also reveals the relationship among the balance sheet, profit and loss statement, and cash flow statement. The balance mutation statement is a practical tool without formal significance.

## 2.2 The Balance Sheet

An entrepreneur periodically compiles a summary of his assets and liabilities. This provides insight into the financial position of his company at that moment. Suppose an entrepreneur wants to determine his wealth at the end of a specific year. The only asset is a commercial building valued at €100,000. In contrast, there is a liability, in which €40,000 is owed to suppliers and €60,000 to the bank in the form of a loan.

For example, a hypothecary loan of €80,000. The entrepreneur's contribution is then:

Commercial building	€100,000
Hypothecary loan	-€80,000
Entrepreneur's contribution	€20,000

This contribution, the balance between the assets and the liabilities, is the equity. Equity (EQ) is the balance between assets (A) and liabilities (L):  $A - L = EQ$ . The balance sheet reflects this equation. To avoid working with negative numbers, the equation is transformed to:  $A = EQ + L$ . A balance sheet is a statement that includes the assets, liabilities, and equity. The balance sheet has two sides: the left side (debit) and the right side (credit). These details result in the following balance sheet:

Assets		Liabilities	
Building	100.000	Equity	20.000
		Mortgage	80.000
<b>Total assets</b>	<b>100.000</b>	<b>Total liabilities</b>	<b>100.000</b>

On the left or debit side are the assets (assets: resources), on the right or credit side are the equity and liabilities (liabilities: capital). The total sum (€100,000) is the balance total or statement total.

In addition to the aforementioned definition of the balance sheet - an overview of the assets, liabilities, and equity - there is another definition of the balance sheet. From the equation  $A = EQ + L$ , it follows that each asset is financed; each asset "holds capital." This was also addressed in the previous chapter in the financial business plan: the total of the investment plan equals that of the financing plan.

For example: Suppose the entrepreneur wants to buy a commercial building for €100,000. However, he only has €20,000 in equity. To proceed with the purchase, he must borrow the remaining €80,000. The balance sheet shows that the total asset is financed with equity (€20,000) and with funds from third parties (€80,000). On the debit side of the balance sheet, it is shown how the capital is used, in which assets the capital is invested: a commercial building worth €100,000. On the credit side, it shows from whom the capital is obtained; the origin or sources of the capital: €20,000 equity, €80,000 borrowed capital. For every asset, there must be capital that finances the asset. The equation  $A = EQ + L$  is always in balance: in equilibrium.

Equity is a business-economic abstraction. Equity indicates the portion of the assets that is not financed with external funds. Equity is not physically present; it is not something you can

pay with. Equity indicates how much capital the owners have contributed to the business. Equity is also called "the debt" of the business to the owner. Since the capital providers must be repaid in the long term, the balance sheet can also be seen as an overview of the assets and the claims or liens that rest on them. The appearance of equity depends on the legal form of the business.

If all assets and liabilities were listed separately on a balance sheet, it would become unreadable. The solution to this is to combine items with similar characteristics. On the debit side, assets are classified into fixed and current assets. The distinguishing criterion is how long an asset serves the business. If it spans more than one production process, it is classified as a fixed asset; assets that accompany only one production process are considered current assets. Fixed assets include buildings, machinery, and equipment. Current assets include raw material inventories and finished product inventories. Sometimes, the one-year term is used as a distinguishing criterion; fixed assets serve the production process for more than a year, while current assets serve for less than a year. This classification also applies to more financially oriented assets. The criterion in this case is the duration for which the capital is invested in the asset. This depends on the purpose for which the (financial) asset is held. Debtors and cash are often categorized under current assets, unless the debt from the debtor has a long-term nature.

On the credit side, there are two classifications. The first classification is between capital contributed by the owners of the business and capital provided by third parties. This is the distinction between equity and debt, such as liabilities. Equity is risk-bearing capital, while debt is risk-averse capital. With risk-bearing capital, the earnings are not contractually predetermined. With risk-averse capital, it is predetermined, such as the interest rate on a loan. The other classification is based on the duration for which the capital is provided. Capital provided for a period longer than one year is long-term capital (e.g., a private, mortgage, or bond loan), while capital that must be repaid within a year is short-term capital (e.g., accounts payable and overdraft facilities). Equity is considered long-term capital as there is no repayment obligation on this capital. When these classifications are combined, the following main classification of the balance sheet is derived:

<b>Assets</b>		<b>Liabilities</b>	
Fixed assets	100.000	Equity	30.000
Current assets	10.000	Debt long term	80.000
		Debt short term	0
<b>Total assets</b>	<b>110.000</b>	<b>Total liabilities</b>	<b>110.000</b>

The order of balance sheet items is chosen to provide easy insight into the solvency and liquidity of the company (see Chapter 5). The items on the debit side are arranged in increasing liquidity. The further down, the quicker and with little cost assets are converted into cash; hence, cash and cash equivalents are typically listed at the bottom of the debit side. On the credit side, capital is presented according to maturity. The further down, the shorter the term, and hence, the more immediate the liability. The current account payable is usually the last credit item included.

The balance sheet reflects the financial position at a specific moment. When there are changes in several items, a new balance sheet can be prepared. These changes the changes on the balance sheet arise from financial events and transactions; for instance, the purchase of raw materials results in a change in the raw material inventory, which alters its value on the new balance sheet. Understanding the impact of financial events and transactions is crucial for gaining insight into the balance sheet. This is discussed in Section 2.7 Case Study: the Orange Vendor. In some situations, the equity of the business changes; in these cases, the profit and loss statement may play a role. In other, sometimes the same, situations, the cash or bank balance changes, in which case the cash flow statement is involved.

### 2.3 The Profit and Loss Statement

The profit and loss statement includes the costs and revenues of a specific period. It provides an overview of obtained and sacrificed values: revenues and costs. The profit and loss statement has two sides: the debit and credit side. On the debit side, costs are recorded, and on the credit side, revenues are listed. The profit and loss statement includes a balance item: the difference between revenues and costs is the profit or loss.

<b>Assets</b>		<b>Income statement</b>	<b>Liabilities</b>
Costs of goods sold COGS	0	Revenu	0
Profit	<hr/>		<hr/>
	<b>0</b>		<b>0</b>

The balance is recorded on the side with the lowest balance. If the costs are less than the revenues, the balance is recorded on the debit side. Since the revenues exceed the costs, the balance represents profit. A loss is recorded on the credit side. The profit and loss statement can also be presented in a stair-step format: where revenues and costs are listed below each other. Similar to the balance sheet, the problem with the profit and loss statement is determining precisely what has been sacrificed and how much value is attributed to it. The cash flow statement does not face these issues because it only reflects actual receipts and payments within a period. The cash flow statement is more objective than the profit and loss statement.

The aforementioned profit and loss statement in a horizontal stair-step format is called a horizontal statement. Another simpler format is the vertical form, where revenues and costs are listed below each other with potential subtotals:

Revenues  
- Costs  
 Profit

The profit and loss statement establishes the connection between the equity on the opening balance sheet and the closing balance sheet. It details the operational change in equity. If the profit is not distributed, it is added to the equity. The profit and loss statement is also known as the supporting account of equity. It should be noted that other factors can cause changes in equity, such as capital movements (deposits and withdrawals). Both types of changes, those related to business operations and those resulting from capital movements, occur in the case of "The Orange Vendor."

The diagram illustrates the Capital Markets Cycle. At the top, 'Capital markets' is centered. Below it, 'Cash in' is on the left with a downward arrow pointing to the 'Expenses' box, and 'Cash out' is on the right with an upward arrow pointing from the 'Receivables' box. In the center is a box for the 'Company' containing 'Assets' and 'Capital employed'. To the left of the company box is the 'Expenses' box, and to the right is the 'Receivables' box. Below the company box is the 'Input' box, and to the right is the 'Output' box. Arrows indicate the flow: from 'Expenses' to 'Assets' (labeled '<=') and from 'Receivables' to 'Assets' (labeled '<='). Below the company box, an arrow points from 'Input' to 'Capital employed' (labeled '=>'), and another arrow points from 'Capital employed' to 'Output' (labeled '=>').

```

graph TD
    CM[Capital markets]
    CI[Cash in] --> Exp[Expenses]
    Exp --<= Assets[Assets] --- Co[Company]
    Co --<= Rec[Receivables] --> CO[Cash out]
    Co --> In[Input]
    In -->|=>| CE[Capital employed]
    CE -->|=>| Out[Output]
    Out --> CO
  
```

Expenditures in the real realm can be categorized into (short-term) operational receipts and payments, such as receiving payment from a debtor, paying a creditor, or payroll transactions; these cash/bank transactions are included in the operating cash flow. Other real realm expenditures/receipts occur on a long-term basis. These involve long-term (dis)investments, like selling a building or purchasing machinery – these are included in the investing cash flow. Cash movements resulting from raising and repaying capital (capital infusion by the entrepreneur or loan repayment) are shown in the financing cash flow.

- Receipts from customers xxx
- Payments to suppliers -xxx
- Payments to employees -xxx
- Payments to capital providers (interest, dividends) -xxx
- Payments to government (taxes) -xxx

- Investing Cash Flow:	
Investments	-€xxx
Disinvestments	€xxx

The cash flow statement provides a summary of receipts and payments. When a financial event causes a change in cash (and/or the bank balance), it is always incorporated into the cash flow statement. The cash flow statement explains the change in cash and/or bank balance.

The cash flow statement features various models. The model shown above is called the direct method. Another form, the indirect method, involves reconciling the cash movement to the profit. Suppose a company has prepared the following opening balance sheet:

<b>Assets</b>		<b>Liabilities</b>	
Machine	1.000	Equity	1.000
<b>Total assets</b>		<b>Total liabilities</b>	
	<b>1.000</b>		<b>1.000</b>

I will create the balance sheet based on the provided information about the machine's economic life and rental income. Let's proceed with preparing the balance sheet for the end of the year.

<b>Assets</b>		<b>Liabilities</b>	
Machine	800	Equity	1.300
Cash	500		
<b>Total assets</b>		<b>Total liabilities</b>	
	<b>1.300</b>		<b>1.300</b>

The depreciation of the machine – the accounting decrease in value – is  $\text{€}1,000/5 = \text{€}200$  per year. The book value at the end of the year is  $\text{€}1,000 - \text{€}200 = \text{€}800$ . The cash and equity evolution throughout the year is as follows:

Cash 1/1		Equity 1/1	1.000
Payment	0	Costs -/-	200
Receivables	500	Revenue	500
		Equity	
Cash 31/12	500	31/12	1.300

The cash flow of €500 consists of two components: on one hand, the profit of €300, and on the other hand, a portion of the capital invested in machines has been released. €200 of the machine's value has been converted into cash, representing the depreciation, the recorded loss in the machine's value that has been passed on to customers. Depreciation is an accounting adjustment to profit: it reduces profit, but the money is not actually spent. This leads to the following conclusion:

Cash Flow = Profit + Depreciation.

In the operational sphere, there are other adjustments to profit possible; for instance, in the case of sales on credit. This generates revenue, although no cash is received at that point. This cash flow is not the same as the actual cash movement but serves as an initial indication of it.

The cash flow is instrumental in recouping the investment in the machine. This cash flow is pivotal in investment analysis: it involves comparing the investment (expenditure) with the anticipated future cash flows. This complex aspect is discussed in depth in Chapter 3 of Brealey et al. Further emphasis on this topic is provided in the second lecture. Assessing (future) cash flows is crucial for evaluating an investment, a subject covered in Chapter 8 of Brealey et al.

## 2.5 Changes: Alterations in the Balance Sheet and the Profit and Loss Statement

The equation  $B = EQ + L$  underpins the balance sheet. The assets (B) are the resources owned by the company. They are offset by the equity and liabilities (EQ + L). Capital providers have a claim or entitlement to the assets. The total of these claims equals the total of the assets. New events impact the balance sheet; however, equilibrium cannot be inherently disrupted. Examples include:

- A. Purchasing raw materials on credit: Raw Material Inventory +9 and Accounts Payable +
- B. Selling products on credit: Accounts Receivable + and Product Inventory -
- C. Paying the supplier for raw materials in cash: Cash - and Accounts Payable -
- D. Receiving cash payment from a product buyer: Cash + and Accounts Receivable -

The balance in the balance sheet is achieved by recognizing the dual nature of transactions. The simplest example is a transaction involving third parties. If a company purchases goods on credit (for €1,000), it means:

- an increase in inventory of goods (+€1,000)
- an increase in accounts payable (+€1,000)

These events alter the financial position of the company. Examples include entering into or settling a contract, transformation, exchange, purchase and sale, payment or receipt. The key questions are:

- which events are relevant
- when are they recognized
- how are they expressed

This relates to issues such as:

- what items should be included in the balance sheet
- how should they be valued
- what principles should be followed

The preceding transaction has no impact on equity. However, if the goods are sold for cash for €1,500, it has the following effect:

- an increase in cash (+€1,500)
- a decrease in inventory of goods (-€1,000)
- an increase in equity (+€500)

The profit (€500) leads to an increase in equity. It is the difference between the revenue of €1,500 and the cost of €1,000. This €500 can be separately recorded on the balance sheet (credit) or directly added to equity. When the balance sheet is prepared at the end of the period, there is no longer visibility into the causes of the profit. Only a total amount is reflected on the balance sheet. To understand the composition of revenues and costs, these changes in equity are separately recorded in the profit and loss statement. The result now emerges from comparing the Sales Revenue account and Cost of Goods Sold: €1,500 - €1,000 = €500.

In the case of the orange vendor, the equity of a sole proprietorship is depicted; the breakdown of equity as in a corporation is not included. The orange vendor establishes a sole proprietorship by allocating €3,000 from his personal funds as business assets. The vendor purchases oranges from the supplier and attempts to sell them at a higher price to customers. Subsequent changes are discussed, each leading to a modification in at least two items. After each change, a new balance sheet is prepared and labeled as the post-mutation balance "X." Each balance is accompanied by a brief explanation. If there are implications for the profit and loss statement, they will be indicated as well. At this stage, the cash flow statement is still being excluded.

After the entrepreneur has deposited €3,000 into the company's cash, the following initial or formation balance sheet can be compiled:

<b>Assets</b>	<b>Opening balance sheet</b>		<b>Liabilities</b>
Cash	3.000	Equity	3.000
<b>Total assets</b>	<b>3.000</b>	<b>Total liabilities</b>	<b>3.000</b>

The only asset the company possesses is cash amounting to €3,000. There are no liabilities; hence, the equity ( $EQ = A - L$ ) amounts to €3,000. This is precisely the amount contributed by the owner/entrepreneur to the business. Legally, in a sole proprietorship, there is no separate business asset. However, in accounting, it is assumed that a distinct entity exists, for which a balance sheet can be prepared.

#### Transaction A: Purchase for Cash

The orange vendor buys a batch of oranges for €2,500 in cash. After the purchase, the assets and liabilities of the orange vendor can be inventoried again. The company now has two assets: the inventory of oranges and the cash. There are no liabilities. The balance sheet is as follows:

<b>Assets</b>		<b>Balance after mut. A</b>		<b>Liabilities</b>
Oranges	+2.500	2.500	Equity	3.000
Cash	-2500	500		
<b>Total assets</b>		<b>3.000</b>	<b>Total liabilities</b>	<b>3.000</b>

The balance sheet after transaction A has been prepared by taking stock of the assets and liabilities. Another approach is to derive this balance sheet from the opening balance. The cash balance on the opening balance was €3,000, but the payment reduced cash to €500. The oranges item had an initial balance of €0. However, it increased by the purchase of €2,500, resulting in the inventory of oranges being recorded at €2,500 on the new balance sheet. Changes on the balance sheet are indicated in parentheses.

After the purchase of oranges, the assets of the company include an inventory of oranges valued at €2,500 and cash of €500. There are no liabilities, and the equity remains stable.

The equity remains at €3,000. There are no implications for the profit and loss statement as the equity has stayed the same. The balance between assets and liabilities, €3,000, remains unchanged. This is because the value of the incoming stream equals the value of the outgoing stream. Therefore, the composition of assets has changed - cash has been replaced by oranges - but the total assets have not been altered. Acquiring assets marks the beginning of the production or exchange cycle. Profits or losses are only realized upon completion of this cycle.

#### Transaction B: Sale for Cash Receipt

The entire inventory of oranges is sold for €3,500 in cash receipt. The balance sheet and profit and loss statement after transaction B appear as follows:

<b>Assets</b>		<b>Balance after mut. B</b>	<b>Liabilities</b>	
Oranges	-2.500	0	Equity	4.000
<b>Cash</b>	<b>+3500</b>	<b>4.000</b>		
<b>Total assets</b>		<b>4.000</b>	<b>Total liabilities</b>	<b>4.000</b>

<b>Assets</b>		<b>Income statement after B</b>	<b>Liabilities</b>	
Costs	+2.500	2.500	Revenu	3.500
Profit	+3500-2500	1.000		
<b>Total assets</b>		<b>3.500</b>	<b>Total liabilities</b>	<b>3.500</b>

This transaction differs from transaction A because the two flows are the result of a completed exchange transaction. This signifies the end of the operational cycle and allows for the determination of the outcome. The inventory of oranges decreases by €2,500 to €0. These oranges sold represent the costs. However, the cash increases from €500 to €4,000 due to the receipts associated with the transaction. In the profit and loss statement, the sale is recorded as revenue. Costs and revenues are recognized simultaneously in the profit and loss statement. At the time of the sales agreement, two commitments arise. The orange vendor must deliver in exchange for the receipt. The value of the delivered oranges is then lost.

The outcome can be calculated in two ways:

a. Determination of Result

b. Equity Comparison

Determination of Result

The first method involves comparing revenue with costs. Equity has increased by €1,000, which is the result of the difference between revenue (€3,500) and costs (€2,500) reflected in the profit and loss statement.

Equity Comparison

The second method involves utilizing the concept that profit has a positive impact on equity. Conversely, the change in equity can indicate profit or loss. This is the technique of equity comparison. In this method, the equity after the transaction is compared to the equity before the transaction, where the increase in equity represents profit:

- Equity according to the final balance sheet (after transaction B) €4,000
- Equity according to the initial balance sheet (after transaction A) €3,000
- Increase in equity (= profit) €1,000

This method does not provide a breakdown of the causes of profit. The breakdown of these causes is detailed in the profit and loss statement. The total profit in the profit and loss statement corresponds to the change in equity on the balance sheet.

After transactions A and B, the exchange cycle (purchase-sale) is completed. The entrepreneur still sees opportunities for profit but aims to expand the scale of the business. Additional capital is required for purchasing a larger batch of oranges. The entrepreneur can either inject this capital personally or seek external sources. Both forms of transactions are addressed in the following two transactions (C and D).

#### Transaction C: Capital Infusion

The entrepreneur deposits €1,500 into the company's cash. This action transfers capital from the personal sphere to the business sphere.

<b>Assets</b>			<b>Balance after mut. C</b>		<b>Liabilities</b>
Cash	+1.500	5.500	Equity	+1.500	5.500
<b>Total assets</b>			<b>5.500</b>	<b>Total liabilities</b>	<b>5.500</b>

<b>Assets</b>			<b>Income statement after B</b>		<b>Liabilities</b>
Costs	+2.500	2.500	Revenu		3.500
Profit		1.000			
<b>Total assets</b>			<b>3.500</b>	<b>Total liabilities</b>	<b>3.500</b>

The profit and loss statement remains unchanged. While the equity increases by €1,500 due to the deposit, this increase is not the result of operational activities. The rise in equity solely stems from capital movement between the business and the owner. Therefore, this increase in equity is not reflected in the profit and loss statement.

The conclusion is that equity also increases through a capital infusion (the injection of new capital). This infusion is directly added to equity outside of the profit and loss statement.

#### Transaction D: Purchase on Credit

The entrepreneur buys a batch of oranges for €6,000. However, he lacks sufficient cash to finance this purchase. The supplier agrees to immediate payment of €5,000 in cash; the remaining amount must be settled by the entrepreneur in the future.

Transaction D involves a combination of a credit purchase and a cash purchase. The supplier provides capital for a short period. Suppliers offering credit are known as creditors.

Assets			Balance after mut. D		Liabilities
Oranges	+6000	6.000	Equity	+1.500	5.500
Cash		500	Accounts payable		1.000
<b>Total assets</b>			<b>6.500</b>	<b>Total liabilities</b>	<b>6.500</b>

Assets			Income statement		Liabilities
Costs	+2.500	2.500	Revenu		3.500
Profit		1.000			
<b>Total assets</b>			<b>3.500</b>	<b>Total liabilities</b>	<b>3.500</b>

The cash decreases by €5,000 due to the payment to the supplier, leading to a remaining amount of €500. Simultaneously, the inventory of oranges increases by €6,000. The total assets rise by €1,000. However, this increase in assets is offset by a corresponding rise in the liability to the supplier (creditors). As a result, the balance between assets and liabilities remains unchanged, and the equity remains the same. This scenario mirrors transaction A and signifies the start of the exchange cycle.

Since the creditor accepts a future payment, they are effectively lending capital to the orange vendor. The creditors entry represents a short-term debt that must be settled promptly, constituting short-term liabilities.

#### Transaction E: Sale on Credit

The entrepreneur sells half of the batch of oranges on credit for €3,500. By offering credit to customers, the entrepreneur is now providing vendor credit. The cost price of the oranges is €3,000.

Assets			Balance after mut. E		Liabilities
Oranges	-3000	3.000	Equity	+3.500- 3000	6.000
Accounts receivable	+3.500	3.500	Accounts payable		1.000
Cash		500			
<b>Total assets</b>			<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

Assets			Income statement		Liabilities
Costs	+3.000	5.500	Revenu		7.000
	+3500-				
Profit	3000	1.500			
<b>Total assets</b>			<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

This mutation resembles mutation B. In both cases, the revenue (cash receipt in mutation B and the acquired receivable from the debtor in mutation E) exceeds the costs (purchase price of the sold oranges). The composition and size of the assets change. The orange

inventory decreases by €3,000, offset by an outstanding receivable from the customer amounting to €3,500, listed under accounts receivable. The total assets increase by €500, and the equity also rises by €500. This represents the profit from the transaction (€3,500 - €3,000).

Mutation E is analogous to mutation B in the profit and loss statement. In both cases, the equity increases by the difference between revenue and costs. The timing of revenue receipt, whether immediate or delayed, does not impact profit determination.

The profit and loss statement provides insight into the revenues and costs incurred during the period. Up to mutation E, the total revenues amount to €7,000, comprising the sum of mutation B (€3,500) and mutation E (€3,500). The total costs, focusing only on the cost price or purchase value of the two sold batches of oranges so far, amount to €5,500, the sum of mutation B (€2,500) and mutation E (€3,000). The profit and loss statement calculates the revenues and costs cumulatively over the entire period.

#### Transaction F: Rent Payment

The orange vendor incurs additional costs for delivering the oranges. To transport the oranges to the customer, he rents a bicycle for €20, payable immediately.

<b>Assets</b>		<b>Balance after mut. F</b>		<b>Liabilities</b>
Oranges		3.000	Equity -20	5.980
Accounts receivable		3.500	Accounts payable	1.000
Cash	-20	480		
<b>Total assets</b>		<b>6.980</b>	<b>Total liabilities</b>	<b>6.980</b>

<b>Assets</b>		<b>Income statement</b>		<b>Liabilities</b>
Costs	+20	5.520	Revenue	7.000
Profit	-20	1.480		
<b>Total assets</b>		<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

The entrepreneur sacrifices €20 in cash without receiving any asset in return. There is no substitution of assets. As a result, both the total assets and the equity decrease by €20.

In the balance sheet, the cash position changes due to the payment of €20, and the equity decreases because of the expenses incurred and the subsequent lower profit.

The paid rent is recorded on the debit side of the income statement. This occurs only when the rent payment pertains to the current period, meaning there are no prepaid or deferred rental payments. Consequently, the entrepreneur's activities up to this point result in a decrease of €20.

#### MUTATION G: Loss on Receivables

In mutation E, the entrepreneur sold oranges on credit, deferring the receipt of the sale to the future. The entrepreneur presumed that the debtor would pay in the future as he

assigned a value of €3,500 to the receivable. However, it turns out that the debtor is facing payment difficulties. The entrepreneur estimates a partial non-recovery of the outstanding receivable amounting to €300.

<b>Assets</b>		<b>Balance after mut. G</b>		<b>Liabilities</b>
Oranges		3.000	Equity -300	5.680
Accounts receivable	-300	3.200	Accounts payable	1.000
Cash	-20	480		
<b>Total assets</b>		<b>6.680</b>	<b>Total liabilities</b>	<b>6.680</b>

<b>Assets</b>		<b>Income statement</b>	<b>Liabilities</b>
Costs	+20	5.820	Revenu 7.000
Profit	-20	1.180	
<b>Total assets</b>		<b>7.000</b>	<b>Total liabilities 7.000</b>

The orange seller can take two courses of action. He can wait to see how much of his receivable is recovered and then, retrospectively, categorize the loss. Alternatively, he can proactively estimate the loss. The latter approach is common practice; when compiling a balance sheet, one must consider foreseeable risks in the future.

If the orange seller wants to account for the loss upfront, he would reduce the value of the receivable by €300 to €3,200 to reflect the estimated real value. Subsequently, it will become evident whether the current estimate of the loss is accurate, or if a greater or lesser loss adjustment is needed. The write-off of the receivable leads to a decrease in assets, consequently lowering the equity. Liabilities remain unchanged. Additionally, an extra expense item needs to be included in the income statement, reducing the profit by €300. The orange seller retains a nominal receivable of €3,500 but now values it lower at €3,200.

<b>Assets</b>		<b>Balance after mut. H</b>		<b>Liabilities</b>
Oranges		3.000	Equity -300	5.680
Accounts receivable	-3000	200	Accounts payable	1.000
Cash	+3000	3.480		
<b>Total assets</b>		<b>6.680</b>	<b>Total liabilities</b>	<b>6.680</b>

<b>Assets</b>		<b>Income statement</b>	<b>Liabilities</b>
Costs		5.820	Revenu 7.000
Profit		1.180	
<b>Total assets</b>		<b>7.000</b>	<b>Total liabilities 7.000</b>

The payment of the receivable results in an increase in cash by €3,000 and a decrease in the outstanding doubtful receivable by €3,000. There is still €500 recoverable, of which €300 has been written off as uncollectible, valuing the receivable at €200. Through mutation H, the total assets remain unchanged. Only the composition of assets changes; the receivable is converted into cash. This represents the financial settlement of the previous sales

transaction. Equity remains the same, with no associated costs or revenues. Thus, mutation H has no impact on the income statement.

Mutation I occurs when the previously doubtful debtor goes bankrupt. The remaining outstanding receivable of €500, estimated by the orange seller at €200 (as in mutation G), is now considered a loss.

<b>Assets</b>		<b>Balance after mut. I</b>	<b>Liabilities</b>	
Oranges		3.000	Equity	-200
Accounts receivable	-200	0	Accounts payable	1.000
Cash	+3000	3.480		
<b>Total assets</b>		<b>6.480</b>	<b>Total liabilities</b>	<b>6.480</b>

<b>Assets</b>		<b>Income statement</b>	<b>Liabilities</b>	
Costs	+200	6.020	Revenu	7.000
Profit	-200	980		
<b>Total assets</b>		<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

The entrepreneur estimated the loss at €300 in mutation G. It turns out that the decision to write off the receivable earlier was justified. Unfortunately, the actual loss exceeds the initial estimate. While the entrepreneur had anticipated a loss of €300, the realized loss is €500. The receivable is now deemed worthless. Consequently, for the portion that wasn't accounted for previously, a loss of €200 needs to be recognized. The devaluation of the asset by €200 results in a decrease in equity and must therefore be reflected in the income statement.

<b>Assets</b>		<b>Balance after mut. J</b>	<b>Liabilities</b>	
Oranges		3.000	Equity	-200
Accounts receivable		0	Accounts payable	-1000
Cash	-1000	2.480		
<b>Total assets</b>		<b>5.480</b>	<b>Total liabilities</b>	<b>5.480</b>

<b>Assets</b>		<b>Income statement</b>	<b>Liabilities</b>	
Costs		6.020	Revenu	7.000
Profit		980		
<b>Total assets</b>		<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

The payment results in a decrease in cash by €1,000. Although the asset decreases, equity remains unchanged as the liability to creditors also decreases by €1,000. Repayment of a debt does not diminish equity. Both assets and liabilities decrease by the same amount, maintaining equity unchanged. Repayment of a debt is a financial transaction separate from operational activities, so there are no costs or revenues, leaving the income statement unaffected. Repayments thus do not appear on the income statement.

Mutation K involves a withdrawal of €530 from the cash by the orange merchant to fulfill personal needs. This action represents a transfer of assets (both in cash and in kind) from the business context to the personal sphere. This mutation, a withdrawal, mirrors the deposit (introduction of new funds), as seen in mutation C.

<b>Assets</b>	<b>Balance after mut. K</b>		<b>Liabilities</b>
Oranges	3.000	Equity	-530
Accounts receivable	0		4.950
Cash	-530	1.950	
<b>Total assets</b>	<b>4.950</b>	<b>Total liabilities</b>	<b>4.950</b>

<b>Assets</b>	<b>Income statement</b>		<b>Liabilities</b>
Costs	6.020	Revenu	7.000
Profit	980		
<b>Total assets</b>	<b>7.000</b>	<b>Total liabilities</b>	<b>7.000</b>

De withdrawal results in a decrease of €530 in cash. Since the total assets decrease by €530 with no change in liabilities, equity also decreases by €530. Withdrawals lead to a reduction in equity, reflecting the flow of capital between the business and the owner. Mutation K has no impact on the income statement as it is not related to operational activities.

To determine if a mutation affects the income statement, it's crucial to examine whether the equity changes due to that mutation. A transaction should be reported on the income statement only if equity alters due to business operations, excluding capital flows. The income statement only includes costs and revenues from operational activities.

The income statement elaborates on the operational changes impacting equity. It serves as a supplementary account to equity. The profit or loss balance on the income statement is already encompassed in the equity at the end of the fiscal year, providing a detailed explanation of the equity variation.

A financial report includes the balance sheet, income statement, and disclosures, presenting both the initial and final balance sheets. In the example of the orange merchant, where the initial balance is post business establishment and the final one is after mutation K, a report can cover the period involving mutations A to K. The report typically concludes with the balance sheets at the beginning and end of the period, the income statement, and the equity mutation overview of the orange merchant.

<b>Assets</b>	<b>Balance sheet</b>		<b>Liabilities</b>	
	<b>Opening</b>	<b>Closing</b>		
Oranges	0	3.000	Equity	4.950
Cash	3.000	1.950		
<b>Total assets</b>		<b>4.950</b>	<b>Total liabilities</b>	<b>4.950</b>

De value of the orange inventory increased from €0 to €2,950, while the cash decreased from €3,000 to €2,000. The changes in the balance sheet items are evident, but the causes behind these mutations are not explicit. Each item on the balance sheet undergoes a transition from the beginning to the end of the year. For instance, the orange inventory transition can be summarized as: Initial Inventory (€0) + Purchases (+€2,500 + €6,000) – Sales (-€2,500 - €3,000) = Final Inventory (€3,000).

The equity rose from €3,000 to €4,950. While the mutation can be traced, the underlying reasons are not directly depicted on the balance sheet. The purpose of the balance sheet is to reflect the financial position at a specific moment. However, it is possible to identify the causes of the equity change. As seen in mutation B, profit calculation can be done in two ways: through profit determination (comparing revenues and costs) and through equity analysis.

In applying the equity analysis, the principle is that the result leads to an increase in equity (for profits) or a decrease (for losses). The first step is analyzing the equity change during the period, termed the equity mutation. After determining the equity mutation over the period, it is essential to evaluate if factors other than profits influenced the equity. Implementing the equity analysis in the orange merchant's example leads to the following breakdown:

Equity 31/12	4.950	
Equity 1/1 -/-	3.000	
<b>Change in equity</b>	<b>1.950</b>	<b>1.950</b>
Capital		
Payment (c) -/-	1.500	
Withdrawal +	530	
<b>Capital paid in</b>	<b>970</b>	<b>970</b>
<b>Net profit</b>		<b>980</b>

Het eigen vermogen changes due to profits (positive) or losses (negative). Additionally, equity is impacted by capital movements between the entrepreneur and the business: deposits increase equity (mutation C), while withdrawals decrease it (mutation K). When calculating profit through equity analysis, the influence of capital movements must be accounted for, eliminating their effect on equity.

The rise in equity amounts to €1,950. However, this isn't entirely profit as part of this increase stems from capital movements. This influence needs to be removed from the equity shift. Ultimately, €970 of the €1,950 increase is attributed to new capital injected into the business. The remaining €980 (a balance entry) results from the profit generated in the preceding period.

The profit derived from equity analysis is a balance entry. It's essential to assess the accuracy of this profit. Profit can also be determined by comparing the revenues and costs of the previous period:

Sales revenue	
Oranges (B)	3.500
Oranges (E)	3.500

<b>Total revenue</b>	<b>7.000</b>	<b>7.000</b>
Cost of goods sold		
Oranges (B)	2.500	
Oranges (E)	3.000	
<b>Total COGS</b>	<b>5.500</b>	<b>5.500</b>
<b>Gross profit</b>		<b>1.500</b>
Operational costs		
Costs of receivebles (G I)	500	
Cost rent	20	
<b>Total costs</b>	<b>520</b>	<b>520</b>
<b>Net profit</b>		<b>980</b>

The profit and loss account/ income statement is usually presented in a vertical format like above. This format shows the sub totals clearly. The calculated profit or loss should account for the change in equity. In the financial report, in addition to the balance sheet, you would find the following equity mutation overview:

- Beginning equity:	€3,000
- Result (profit):	+€980
- Total:	€3,980
- Capital movements:	
- Deposits (mutation C): +	€1,500
- Withdrawals (mutation K): -	€530
- Net capital deposited:	+€970
- Ending equity:	€4,950

This presentation contains the same items as the equity comparison, but the order is different. The above display provides an overview of the factors that led to the increase in equity from the initial balance (€ 3,000) to € 4,950 at the end of the period. This is the mutation overview or progression of equity.

In the scenario where the income statement runs in parallel with the balance sheet, each mutation simultaneously indicates its (potential) effect on the income statement. Some mutations do not affect the result; in such cases, there are neither costs nor revenues.

## 2.7 Cash Flow Statement of the Orange Merchant Case Study

The cash flow statement has not been discussed in the scenario yet. Similar to the income statement, the cash flow statement can also "run" alongside the balance sheet mutations. In this case, the mutations in cash and/or bank (receipts and payments) would be tracked. The cash flow statement can be deduced from the mutation statement in the scenario. This requires extracting the Cash column from the balance mutation statement. All mutations need to be categorized. When all cash changes are included and categorized in the cash flow statement, it results in the following cash flow statement:

Received from clients

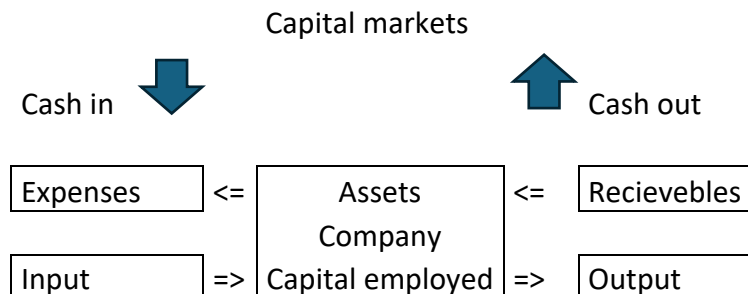
Mutation B	+3500	3.500	
Mutation H	+3000	<u>3.000</u>	
			6.500
Paid to suppliers A	-3500	-2.500	
Mutation D	-5000	-5.000	
Mutation J	-1000	<u>-1.000</u>	
			-8.500
Rent F	-20	<u>-20</u>	
			-20
Paid in capital C	+1500	<u>1.500</u>	
			1.500
Cash withdrawl K	-530	<u>-530</u>	
			-530
<b>Cash flow</b>			<b>-1.050</b>

The cash flow statement explains the difference between the cash on the opening balance sheet (€3,000) and the closing balance sheet (€1,950). The cash flow statement starts from the opening balance sheet, excluding the receipts and payments related to the opening balance sheet. Most mutations occur in the operational sphere: receipts from customers, payments to suppliers, and paid cart rental. Deposits and withdrawals are not part of the operational cash flow. If the deposits and withdrawals are translated into capital transactions between the economic owner/company and its BV, the deposit is the share issue included in the financing cash flow, and the withdrawal is the distributed dividend. Investments and divestments did not occur in the case; therefore, there is no cash flow from investment activities. The first lecture will delve into a more extensive case study, detailing the processing of common mutations and deriving the three financial statements from them.

### 3 Finance theory and financial structure

#### 3.1 introduction

The chapter discusses the model of physical and financial flows and stocks as presented in Chapter 1.



The flows of assets that pass through a business have financial implications. The purchase of raw materials leads to an expenditure, which may result in payments in the future. The sale of finished products leads to receipts, potentially in the future. The settlement of contracts results in company receipts and expenditures. Imbalances can occur between expenditures and receipts. Problems arise when a company spends more in a certain period than it receives, which in some cases can even lead to the company's bankruptcy.

The figure illustrates two types of activities that impact cash flow. On one hand, there are activities in the real sphere, including operational and investment activities. On the other hand, there are financial transactions that adjust the financial consequences of real transactions. These are transactions with the capital market, as shown in the upper part of the figure. Companies must ensure a balance between receipts and expenditures. Therefore, companies need periodic insight into their capital requirements. Capital requirements are determined by the total needed assets in the upcoming period. The next step is to evaluate how these assets will be financed.

Companies can finance their investments internally or externally. The determining factor is whether the company generates its own capital (internal financing through a positive operational cash flow) or relies on capital providers (external financing). The following section will discuss the different types of capital that can be found in a public limited company (NV).

#### 3.2 Forms of Capital: Detailed Overview of Equity and Debt Capital

##### 3.2.1 Introduction

Once the capital requirements have been assessed, the method of meeting these needs needs to be determined. The question arises regarding the types of capital available and their characteristics. This section provides a detailed analysis of equity and debt capital as applicable to a Public Limited Company (NV).

##### 3.2.2 Equity Capital

Equity capital represents the contribution of "the owners of the company" invested in the business. The specific nature of this capital depends on the type of business entity. This discussion focuses on a Public Limited Company, a legal entity with a share capital divided into transferable shares. The shareholders are the (economic) owners of the NV. Equity capital serves several crucial functions, similar to other forms of capital, in financing the company's activities. One unique aspect of equity capital is its non-repayment obligation, making it permanent capital. Another function is its risk-bearing or entrepreneurial role, where the compensation to the capital providers is not fixed, allowing the company to transfer uncertainties it encounters on different markets. Additionally, equity capital serves as a guarantee or buffer, absorbing any losses incurred by the company without impacting other parties, such as suppliers, as it is not repayable to shareholders.

The equity of an NV is divided into shares. A share represents ownership in the company's equity. Shareholders pay a specified price for a share at issuance, known as the capital they contribute - the equity investment. Shares are tradable equity securities, with the level of tradability dependent on the company's legal structure, statutes, and potential listing on a stock exchange. Reserves constitute the second component of equity capital, representing all the existing equity above the share capital, often excluding undistributed profits.

The following three aspects of equity capital will be discussed in detail:

1. Share Capital
2. Undistributed Profits
3. Reserves

#### 1. Share Capital

The establishment of an NV is done through a notarial deed, outlining provisions like the statutes of the NV. In the statutes, certain requirements must be specified, including the authorized capital (the share capital limit) and the number, type, and amount of shares. Each share holds a specific value known as the nominal value.

The law distinguishes between various capital concepts, including:

1. Authorized Capital: This represents the maximum nominal value for which the company can issue shares, as defined in the company's statutes.
2. Issued Capital: This is the portion of the authorized capital that has been sold (issued) to shareholders through share issuance.
3. Paid-up Capital: This is the capital that shareholders have paid on the shares they have purchased. This can differ from the issued capital only if the company issues registered shares, which must still be fully paid up.

A share encompasses financial, reward, and governance aspects. Financially, a share is a tradable equity security with a market value. In a liquid market, a shareholder can sell their share at this value. The reward aspect includes dividends declared by the management, potentially dependent on the company's performance. Stock appreciation is another reward aspect, determined by the market rather than the company. Governance-wise, shareholders have voting rights in the general assembly.

The authorized (and issued) capital can be divided into different types of shares beyond the regular share, including:

- Preference shares
- Preferred shares (cumulative or non-cumulative, with or without profit sharing)
- Share certificates
- Convertible preferred shares.

All these shares have a nominal value, and the total number of issued shares of each type with their corresponding nominal value constitutes the (issued) share capital listed in the balance sheet. These shares play a role in ownership structures and can serve as protective measures.

For instance, if a toy car entrepreneur sets up a Public Limited Company (NV) instead of a sole proprietorship, and the articles specify that the authorized capital is 200 shares with a nominal value of €1,000 each. The total authorized share capital would then be  $200 * €1,000 = €200,000$ . If the entrepreneur aims to purchase a property for €250,000, and has invested €75,000 through the issuance of 75 shares, this amount constitutes the issued and paid-up capital since an NV issues bearer shares that must be fully paid. The NV can potentially issue 125 more shares since the total authorized shares are 200, with 75 already issued.

This can be presented in the following overview:

	#	€	
Share capital	200	1000	200.000
Shares in portfolio	-/- 125	1000	125.000
Issued capital	75	1000	75.000
To be paid		0	0
Paid in equity			75.000

An entrepreneur issues shares for € 75.000 by issuing shares and obtains a loan of € 175.000. This is the opening balance sheet.

Assets	Balance sheet		Liabilities
Cash (75.000 + 175.000)	250.000	Equity	
		Paid in equity	75.000
		Mortgage loan	175.000
<b>Total assets</b>	<b>250.000</b>	<b>Total liabilities</b>	<b>250.000</b>

Cash is used to buy a factory building.

Assets	Balance sheet		Liabilities
Building	+250.000	250.000	Equity
Cash	-250.000		Paid in equity
			Mortgage loan
<b>Total assets</b>	<b>250.000</b>	<b>Total liabilities</b>	<b>250.000</b>

### Undistributed Profit; Conversion to Dividend and Retained Earnings

Regarding profits, two phases can be identified: profit determination and profit allocation. In the first phase, profit is determined by preparing an income statement. In the second phase, a decision is made on what to do with the profit: distribute it (as dividends) or structurally add it to equity.

For dividend payouts, it is essential for companies to realize profits or have reserves from which distributions can be made. These withdrawals lead to a decrease in equity (see mutation F of the orange seller). The law requires that a certain amount of equity be maintained by limiting the amount of dividend payment. The actual payments go through the cash account, while equity is the contra account where these distributions are deducted from.

Suppose the following events occur during the year:

- Depreciation of the retail property €5,000
- Total purchases €150,000 (cash)
- Total sales €160,000 (cash)
- Ending inventory €15,000
- The principal repayment and interest on the mortgage loan are excluded.

The cost of goods sold (the decrease in inventory) can be derived using the inventory equation: beginning inventory + purchases – sales = ending inventory. The beginning inventory is zero, purchases are €150,000, and ending inventory is €15,000. This results in the cost of goods sold being €135,000. At the end of the year, €15,000 is capitalized (under inventory) from this expenditure; this is an expense but not a cost item. The income statement would then appear as follows:

<b>Assets</b>	<b>Income statement</b>		<b>Liabilities</b>
Costs of goods sold COGS	135.000	Revenu	160.000
Depreciation	5.000		
Profit	20.000		
<b>Total assets</b>	<b>160.000</b>	<b>Total liabilities</b>	<b>160.000</b>

And the balance sheet:

<b>Assets</b>			<b>Balance sheet</b>		<b>Liabilities</b>
Building	-5000	245.000	Equity		
Inventory	+150K-135K	15.000	Paid in equity		75.000
Cash	+150K+160K	10.000	Undistributed Profit		20.000
			Mortgage loan		175.000
<b>Total assets</b>		<b>270.000</b>	<b>Total liabilities</b>		<b>270.000</b>

The profit is accounted for as a separate item on the balance sheet and corresponds to the profit in the income statement. The equity now consists of two items: the share capital and the undistributed profit. As long as the profit has not been distributed, it temporarily belongs to the equity. Such a balance sheet is a pre-dividend distribution balance sheet with an item "Undistributed Profit" on the credit side.

The next phase is profit allocation. Usually, provisions in the articles of association cover this aspect. If nothing is specified, the profit accrues to the shareholders. Typically, the board proposes a profit distribution (included in the other information in the financial report) which is approved in the general meeting. Suppose the board proposes to pay out €100 per ordinary share. The profit distribution proposal would look like this:

Undistributed Profit	20.000
Dividend     75 * € 100	<u>7.500</u>
Retained earnings	12.500

The board proposes to allocate €7,500 to the shareholders, which is the dividend, and to retain €12,500 "in the company." This amount can be used by the company to finance new investments - provided that the profit has actually flowed into the cash reserves.

When incorporating the profit distribution in the above balance sheet, the post-dividend distribution balance sheet would appear as follows:

<b>Assets</b>		<b>Balance sheet</b>		<b>Liabilities</b>
Building	245.000	Equity		
Inventory	15.000	Paid in equity		75.000
Cash	10.000	Retained earnings	+12500	12.500
		Undistributed profit	-20000	
		Mortgage loan		175.000
		Dividend	+7500	<u>7.500</u>
<b>Total assets</b>	<b>270.000</b>	<b>Total liabilities</b>		<b>270.000</b>

The income statement remains unchanged by this process as it has already been finalized. The allocation of profits only impacts the credit side of the balance sheet. The profit has been divided into two parts: a portion has been permanently added to the equity, and a portion has been converted into a liability to shareholders - undistributed profit is a temporary component of equity. The payable dividend represents a short-term liability. The company distributes 37.5% (€7,500/€20,000) of the profit, which represents the pay-out ratio. The profit increases the equity, but only for the portion retained, not distributed. The company also withholds dividend tax on the distributed dividend.

Upon the dividend distribution, the ensuing balance sheet will appear as follows:

<b>Assets</b>		<b>Balance sheet</b>		<b>Liabilities</b>
Building	245.000	Equity		
Inventory	15.000	Paid in equity		75.000
Cash	-7500	Retained earnings		12.500
		Undistributed profit		
		Mortgage loan		175.000
		Dividend	-7500	
<b>Total assets</b>	<b>262.500</b>	<b>Total liabilities</b>		<b>262.500</b>

### 3.2.3 Debt Capital

The distinction between equity and debt capital lies in the provider of the capital. Equity is contributed by the owners, while debt capital is provided by third parties. Debt capital not only includes liabilities but also comprises debt that the company "self-created": provisions. A provision reflects the anticipation by a company of certain specific risks, even in the absence of a legal obligation for payment. Therefore, the classification of debt capital should be amended in the following arrangement: a. provisions b. long-term loans c. short-term loans

#### a. Provisions

A provision is defined as a deduction of resources from profits to cover future risks arising in the current period. A provision is a result of applying the prudence principle. Establishing (and allocating to) a provision incurs costs; utilizing a provision is cost-neutral. A provision lies between equity and liabilities. Legally, a provision can be considered a contingent obligation regarding an uncertain future event. It is uncertain if and when the event will occur and what the scope of the obligation. The most common provisions include:

#### b/c Long- and short-term loans

With these forms of debt capital, there is a legally enforceable debt obligation; often based on a loan agreement. However, this is not always the case, as there are also liabilities resulting from operational activities. When purchasing on credit, a debt to the creditor arises. The creditor provides funds during the payment term, even though this is not the actual purpose of the agreement. This capital is related to the business activities. If the company makes significant purchases (due to increasing sales), the accounts payable on the balance sheet increase.

Additionally, the balance sheet includes capital intentionally attracted by the company through the conclusion of a loan agreement, such as a bank loan. Specific contractual terms are agreed upon for this purpose.

Debt capital is provided under certain conditions. The key conditions are:

- the interest rate
- the term
- the collaterals

The interest rate depends on the supply and demand in the capital market. Short-term interest rates are significantly influenced by the Dutch Central Bank, which determines the discount rate. Long-term interest rates are determined in the capital market influenced by international capital flows. Inflation expectations play a significant role. Generally, interest rates increase with a longer term.

In addition to the term, the borrower's risk also influences the interest rate. This risk can be represented by a "credit rating" - an indication of the company's creditworthiness issued by a Rating Agency. The capital provider demands compensation for this risk in the form of a higher interest rate, or they can limit the risk by imposing additional conditions, such as a mortgage guarantee.

Some examples of long-term debts are:

- bond loan
- private loan

Some examples of short-term debts include:

- overdraft facility
- accounts payable
- taxes
- dividends

A bond loan is a fragmented loan that consists of a face value (the principal), a maturity date, an interest rate, and potentially additional securities. Various forms of bonds exist, such as subordinated bonds and convertible bonds. The latter type of bond can be converted into shares at a predetermined rate over a specific period.

Bonds may be listed on the stock exchange. The value of bonds is influenced by the interest rate on the capital market and the risk associated with the company, often reflected in its credit rating.

#### Private Loan

These loans are agreed upon between the company and a financial institution, allowing for customized financing contracts. This form of financing is advantageous for the company as it avoids issuance costs. However, these loans are less liquid than public loans, resulting in slightly higher interest rates. Sometimes, these loans are later divided into tradable portions through securitization.

Private loans can be subordinated, and occasionally government intervention occurs in this market. Small and medium-sized enterprises particularly struggle to attract capital, and the government can guarantee such loans.

#### Accounts Payable/Taxes/Dividend

These are forms of capital dependent on the activities and profitability of businesses. Accounts payable arise when suppliers extend credit. Tax liabilities may include corporate tax and sales tax. Dividends can be recorded as liabilities on the balance sheet if the company incorporates the profit distribution proposal into the balance sheet post-distribution.

## Accrued Items

Furthermore, accruals can appear on the balance sheet, such as outstanding rent payments. These items are not debts in a legal sense; they are liabilities used to properly allocate expenses to the correct period.

## Revolving Credit Facility

This functions as a bank's "payment account," allowing a company to overdraw up to a certain limit, influenced by financial position, market outlook, and management quality. Primarily considered short-term capital, continuous usage can categorize it as long-term capital. This form of capital is highly flexible.

## 4. Risk: general, operational and financial

### 4.1 Introduction:

In chapters 11.1-11.3 of Brealey et al., the concept of risk is discussed from an investor's perspective. This chapter compares the investment results of three types of investments (financial instruments): treasury bills, treasury bonds, and common stock—short-term receivables (treasury bills), long-term receivables (bonds issued by the government), and stocks. Stocks yield much higher returns in the long term compared to the other two financial instruments. This disparity is due to shareholders bearing more risk than debt providers and receiving a premium for it. Risk in economics is often depicted by the degree of spread of possible outcomes, which can be represented by variance or standard deviation. In Brealey et al., risk is mainly viewed from the stock market perspective in chapters 11 and 12; an important aspect is that investors can reduce risks by diversifying—building a portfolio of different stocks. Chapter 11 compares the investment returns and risks of three different investment instruments: stocks, bonds, and treasury bills.

Risks also exist at the company level. This syllabus addresses two risks encountered in Brealey et al.: operational and financial risks. Operational risk is linked to the operational or cost structure—more or less associated with the debit side of the balance sheet. Financial risk is connected with the credit side of the balance sheet, concerning the extent to which a company is financed with equity or debt. This risk is discussed in chapter 5 of this syllabus.

### 4.2 Cost Theory:

#### 4.2.1 Introduction:

Costs refer to the monetary value of production resources sacrificed for the production of goods and/or services. Examples of costs include raw material costs, labor costs, and costs of machinery—depreciation and maintenance.

The costs of a production process may not coincide with the expenses for that process. Often, the expenditures in a particular period also constitute the costs of that period. For instance, the wages paid at the end of January may serve as both an expense and a cost for that month. However, an investment in a new machine typically cannot be accounted for as costs in the period of payment because the machine's lifespan exceeds the purchasing period.

The following section delves into different cost classifications. The concluding section addresses the break-even analysis and its connection to the operational (or business) risk of a company. These analyses are intertwined with the categorization of costs into fixed and variable costs.

#### 4.2.2 Cost Classifications

To enable cost analysis, costs must first be classified. This section covers the main cost classifications: classification by cost types, classification into direct and indirect costs, and

classification into fixed and variable costs. The latter classification is elaborated upon with the break-even analysis and the representation of operational risk.

#### Cost Types:

Costs can be categorized by cost types, also referred to as categorical cost classification. Cost types categorize costs based on the type of production resource they are associated with.

The following cost types can be distinguished:

- The costs of land
- The costs of raw materials and supplies
- Labor costs
- Costs of durable production resources
- Costs of services from third parties
- Taxes
- Interest

Some costs are further elucidated below:

- If land serves as a site, no depreciation is necessary because there is no devaluation of the land. However, if devaluation occurs, as in the case of a mining company, depreciation is required.

- A durable production resource (such as a car or a machine) can be represented as a quantity ("stock") of work units or performance units, the capacity. The acquisition of a durable production resource entails obtaining a capacity for which costs should not solely burden the period of purchase. Through usage, the production resource will wear out, leading to a decrease in remaining capacity. The devaluation of the production resource in a period is recorded as costs—depreciation.

- Taxes encompass cost-increasing taxes, such as property tax, vehicle tax, and environmental levies. Profit taxes come in various forms. For sole proprietorships, profits are taxed under income tax. This is a personal matter; the entrepreneur is the taxpayer. If income tax is paid from a business's funds, it is considered a withdrawal. For a BV (private limited company) or NV (public limited company), profit is taxed through corporate tax, reducing net profit and recorded as costs on the income statement.

- Value-added tax (VAT) is a sales price-increasing tax and is not classified as costs. The company collects taxes on behalf of the government and then remits them. Assets and liabilities, costs, and revenues are reported in the balance sheet and income statement without VAT.

- Interest costs (costs of invested capital) are not always considered a distinct cost type because interest costs may be included in each aforementioned cost type. When a machine is purchased, it entails an expense. This expenditure is gradually recouped through the sale of products manufactured with the machine. However, it may take years before the invested amount is fully been reimbursed. Meanwhile, during this interim period, the company incurs interest costs. Economically, it does not matter whether a machine is financed with borrowed funds or equity capital. While only borrowed funds incur interest expenses, the use of equity capital comes with the opportunity cost of foregone alternatives. Capital providers do not offer their capital for free. This foregone interest is also considered an economic cost, although only the interest expenses on borrowed funds are recorded on the income statement.

The classification by cost types is based on the category or type of production resource to which the costs are related. Another classification involves categorizing costs based on the location within the company where the costs arise. This is known as the organic or functional cost classification. According to this classification, costs can be categorized as production costs, management costs, sales costs, procurement costs, administrative costs, etc.

#### Direct and Indirect Costs:

Direct costs are expenses specifically incurred for a particular type of product, such as raw material costs. Indirect costs, on the other hand, are costs that are not specifically tied to a single product but rather to the company as a whole. Examples of indirect costs include administrative expenses and management costs. Indirect costs are also referred to as 'overhead.'

Allocation of indirect costs is typically time-consuming and subjective. For example, how can a grocery store allocate the rent of the retail building, mortgage interest costs, and cashier's salary to individual products?

#### Fixed and Variable Costs:

The total costs of a company increase as more is produced and sold. However, not all costs are dependent on the level of production and sales. Consequently, fixed and variable costs can be distinguished.

Fixed costs, also known as constant costs, are expenses that do not change within certain production or sales boundaries. For instance, the depreciation costs of a building do not fluctuate with changes in production levels. Other examples of fixed costs include administrative costs, heating expenses, interest costs, and salaries of management personnel.

A common misconception is that the magnitude of fixed costs remains constant. Fixed costs can change over time. Price adjustments may occur (e.g., an increase in fixed salaries), and the production capacity may be expanded or reduced. Initially, an expansion in production can be managed using existing machinery, but eventually, additional machinery may be needed. The total fixed costs are linked to the capacity of the company's production resources and the timeframe to which they refer. Fixed costs are sometimes referred to as capacity costs or period costs. As production volume increases, the costs per unit of product (average fixed costs) will decrease.

#### Example and Explanation:

In a company, the fixed costs for the production of 1,000 to 3,000 units amount to € 60,000.

#### Question:

Calculate the fixed costs per product (average fixed costs) for production levels of 1,000, 2,000, and 3,000 units.

#### Solution:

- For 1,000 units:  $\text{€ } 60,000 / 1,000 = \text{€ } 60$  per unit

- For 2,000 units:  $\text{€ } 60,000 / 2,000 = \text{€ } 30$  per unit
- For 3,000 units:  $\text{€ } 60,000 / 3,000 = \text{€ } 20$  per unit.

The higher the production volume, the lower the fixed costs per product. From this perspective, production capacity should be optimally utilized to achieve occupancy results or economies of scale.

#### Variable Costs:

Variable costs are expenses that immediately change in total amount when production or sales volume shifts. For instance, producing 500 magazines typically necessitates 20 times more paper than producing 25 magazines. Other examples of variable costs include raw materials and supplies, as well as electricity costs for production machinery. Variable costs, due to their correlation with production volume, are also known as production costs. If variable costs amount to  $\text{€ } 40$  per unit, the total variable costs for 1,000 units would be:  $1,000 \times \text{€ } 40 = \text{€ } 40,000$ . For 3,000 units:  $3,000 \times \text{€ } 40 = \text{€ } 120,000$ . The proportional variable costs per unit remain consistent.

### 4.3 Break-even Analysis

A company may wonder how much revenue is needed to break even, where revenue equals total costs, resulting in zero net profit. Actual revenue must exceed this point to avoid operating at a loss. In this context, the concept of contribution margin (or contribution margin ratio or gross margin) is essential. The contribution margin is the difference between the selling price and the variable costs.

#### Example:

The total fixed costs of a company amount to  $\text{€ } 150,000$ . The variable costs per product are  $\text{€ } 2.50$  each. The product is sold at a fixed price of  $\text{€ } 10$  per unit.

#### Question:

- Calculate the contribution margin per product.
- Determine the break-even point.

#### Solution:

a. Contribution margin = selling price minus variable costs, which is  $\text{€ } 10 - \text{€ } 2.50 = \text{€ } 7.50$  per product. This amount per product is available to cover the fixed costs since the variable costs are already covered.

b. The break-even point can be calculated by dividing the fixed costs by the contribution margin:  $\text{€ } 150,000 / \text{€ } 7.50 = 20,000$  units. If a company produces nothing, the loss is  $\text{€ } 150,000$ . When this company sells one product, the loss decreases to  $\text{€ } 150,000$  minus the contribution margin of  $\text{€ } 7.50$ ; each product sold reduces this loss by  $\text{€ } 7.50$ . Selling 20,000 units also earns back the fixed costs. At 20,000 products, the fixed costs are covered, and each additional product results in an additional profit of  $\text{€ } 7.50$ .

The break-even sales volume is 20,000 units, and the break-even revenue is  $20,000 \times \text{€ } 10 = \text{€ } 200,000$ .

Verification:

- Revenue (20,000 x € 10)	€ 200,000
- Fixed Costs	€ 150,000
- Variable Costs (20,000 x € 5)	€ 50,000
- Total Costs -	€ 200,000
-	0

Determining the break-even point is often done with a formula where the selling price 'P', total fixed costs 'C', and variable costs per unit 'V' are represented. In the break-even point, it must hold true that the fixed costs are fully covered by the contribution margin. Therefore:  
Break-even point =  $C/(P-V)$

The break-even analysis can also be graphically represented. The X-axis (horizontal axis) represents quantities, while the Y-axis (vertical axis) represents amounts - revenues and costs.

The break-even point is where the total cost line intersects the total revenue line. To the left of this intersection (the break-even point) lies a loss zone, and to the right lies a profit zone.

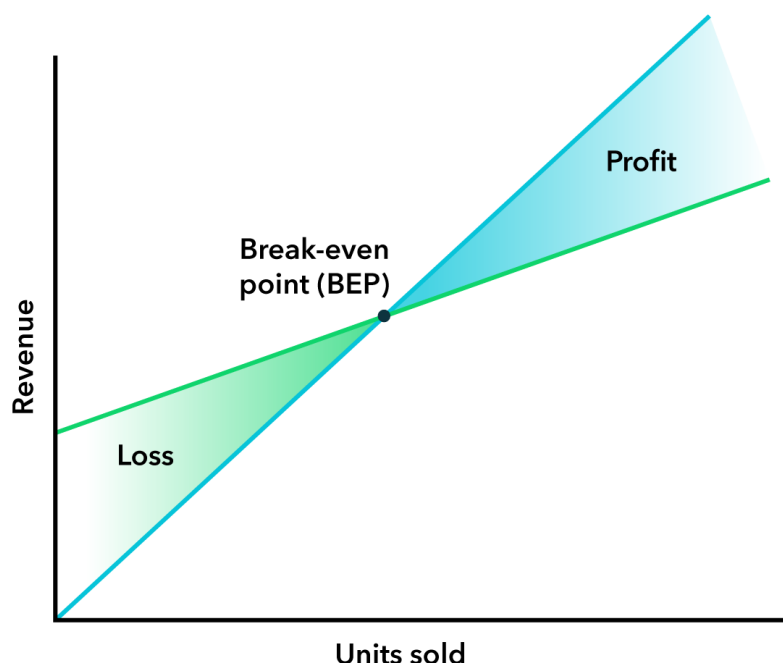
Three scenarios can be distinguished:

1. Revenue < Costs; the operating result is negative (loss).
2. Revenue = Costs; the operating result is 0 (break-even point).
3. Revenue > Costs; the operating result is positive (profit).

Based on the example data, constructing the graph follows:

"At a sales volume of 0 units, the revenue is € 0, and at a sales volume of 30,000 units (30,000 x € 10) = € 300,000. With this data, the revenue line can be plotted."

## Break-even analysis graph



### 4.4 Operational Risk:

The break-even analysis also provides insight into the sensitivity of results due to changes in sales volume. This serves as an indication of the business risk a company faces. Business risk is contingent on the operational (cost) structure of a business. If a significant portion of a company's costs consist of fixed costs, the results are relatively sensitive to changes in sales volume. This is because in the event of, for instance, lower sales volumes, the cost level cannot be (directly) reduced. Conversely, in a favorable sales scenario, total costs will increase less dramatically. Operational or business risk is heavily influenced by the various assets on the balance sheet (capital structure). An increase in the operational leverage factor (a relatively higher amount of fixed costs) renders the business results more sensitive to sales fluctuations.

Example:

Consider a scenario where a company's variable costs account for 50% of the revenue, and the fixed costs amount to € 100,000. What is the operating result at revenues of € 200,000, € 300,000, and € 400,000?

Economies of scale

Revenue	200.000	300.000	400.000
Variable costs 50% -/-	100.000	150.000	200.000
Contribution margin	100.000	150.000	200.000
Fixed costs -/-	100.000	100.000	100.000
Earnings	0	50.000	100.000

Imagine part of the production is automated. The variable costs will drop to 40% and the fixed costs will increase with 30.000. Let's look at the development of earnings

Operational leverage increased (fixed costs)

Revenue	200.000	300.000	400.000
Variable costs 40% -/-	80.000	120.000	160.000
Contribution margin	120.000	180.000	240.000
Fixed costs -/-	130.000	130.000	130.000
Earnings	-10.000	50.000	110.000

The operating result in the last table (4.2) is more sensitive to changes in revenue. This sensitivity can have both positive and negative effects; this is the impact of the operational leverage factor. The dispersion of the operating result has increased. If the likelihood of the three predicted revenues is the same, the expected revenue is the same in both scenarios. However, the risk (the dispersion in the operating result) is higher in the second scenario. Companies can analyze various scenarios where different factors change (revenue, variable costs, fixed costs). Through this sensitivity or scenario analysis, a company gains insight into the sensitivity of the operating result to changes in revenue. It also helps identify the areas where the most benefits can be obtained by acquiring more information about those aspects. This analysis is part of the enterprise's risk management.

Businesses can make their cost structure more variable or flexible through outsourcing. Consider the situation where a company has its own transportation department compared to a scenario where a company has outsourced its transportation activities. In the former case, fixed costs are high, while in the latter case, they are low, but the variable costs are high - the company must then pay a rate per km. Another method to reduce the operational leverage structure is by using a payroll company. Such companies hire employees on a (permanent) basis and then second them to other businesses. The client (former employer) then pays not only a variable rate per labor hour but also a premium for the assumed risk and the profit of the payroll company. The capital structure, with its resulting fixed interest and repayment obligations, affects the financial risk of the company. The higher the amount of borrowed capital, the higher the fixed interest and repayment obligations (similar to fixed costs in the operational structure, see chapter 5). These two risks can be estimated by following the step-by-step construction of the income statement:

Revenue

- Operating costs of revenue

Operating Result

- Interest

Result before taxes

- Taxes

Result after taxes

The operating result only includes the consequences of operational activities, while the result before taxes also includes the method of financing, with higher levels of borrowed capital leading to higher fixed interest costs. Companies sensitive to economic cycles with high business risk can compensate for this with low financial risk (by financing with relatively little borrowed capital).

## 5 Financial risks

### 5.1 Introduction

Using the annual report, an assessment can be made regarding the position and performance of a company. Additionally, the annual report serves as a tool for determining risk, which is a crucial element in evaluating returns. Risk and return are interconnected, with ratios playing a role in determining risk and return. The financial risk is addressed in profitability ratios.

### 5.2 Ratios

#### 5.2.1 Introduction

A ratio or financial indicator is a quantitative relation that characterizes a particular phenomenon. Ratios are valuable as they allow for a quick judgment on the financial position and performance. By comparing ratios over time or with those of other companies, one can swiftly identify trends. Ratios serve both internal and external purposes (e.g., for banks).

Ratios for evaluating companies can be categorized into three groups:

- Solvency ratios
- Liquidity ratios
- Profitability ratios.

The first two ratios provide insight into the risk of a company defaulting. The third ratio indicates performance – the achieved return – of a company. Typically, there is a relationship between return and risk. If investors or, more broadly, capital providers are risk-averse, an increase in risk must be offset by higher returns. There is a certain relationship between the ratios known as the financial leverage as a complement to the operational leverage.

#### 5.2.2 Solvency Ratios

Solvency refers to a company's ability to meet its long-term debt obligations. Lenders of a company will monitor its solvency since the likelihood of repayment depends on it. One of the metrics used is a solvency ratio that expresses equity as a percentage of total assets. The concept behind this ratio is straightforward: the more equity (permanent capital), the fewer fixed repayment obligations, thus increasing the likelihood that creditors can recover their debt. Solvency (ratio) can be calculated as follows:

<b>Assets</b>	<b>Balance sheet</b>		<b>Liabilities</b>
Building	1.345.000	Equity	1.850.000
Machines	2.100.000	Mortgage loan	920.000
Inventory	960.000	Bond loan	1.200.000
Accounts receivables	570.000	Bank	260.000
		Rent payable	120.000
Cash	25.000	Accounts payable	650.000
<b>Total assets</b>	<b>5.000.000</b>	<b>Total liabilities</b>	<b>5.000.000</b>

Calculate the solvency ratio as follows:

Solvency ratio = (€1,850,000 / €5,000,000) x 100% = 37%.

It is challenging to establish a universal norm for solvency. For companies with higher (operational) risk, a higher solvency ratio is more favorable. A company appears solvent when the value of assets is equal to or greater than the liabilities. This implies that the company can repay debts from the proceeds of its assets. However, solvency is often inadequate in practice because the liquidation or bankruptcy proceeds from assets are often significantly lower than their book value - the liquidation value is typically much lower than the going concern value. Additionally, bankruptcy incurs substantial costs that are not yet accounted for on the balance sheet (refer to chapter 9).

The ratio of equity to total assets for large Dutch companies typically ranges from 25% to 40%. Solvency hinges on what can be included on the balance sheet and how these assets are valued.

Strong solvency empowers a company to weather financial setbacks, preventing immediate bankruptcy. This resilience is also referred to as the company's contingency reserve. Debt reduces the contingency reserve, as the company has fixed interest and repayment obligations even in challenging times. Equity enhances the contingency reserve, providing greater financial stability.

Equity does not need to be repaid, and if the company performs poorly, dividends are also not paid out. Another reason why equity enhances the contingency reserve pertains to the priority granted to providers of borrowed capital during the repayment of debts in case of liquidation. A higher equity means that more losses can be absorbed (from the equity) before the repayment and interest payments to providers of borrowed capital are jeopardized. Additionally, the coverage value of the debts increases (more assets are available per euro of debt). Providers of borrowed capital benefit doubly from higher equity. Various solvency metrics are discussed in Chapter 4 of Brealey et al.

### 5.2.3 Liquidity Ratios

Liquidity pertains to the extent to which a company can pay its short-term obligations promptly. The assessment of liquidity is best conducted through a cash flow budget: an overview of anticipated income and expenditures, ideally on a periodical basis, such as monthly. Establishing a cash flow budget necessitates data that typically resides within the company. External stakeholders like shareholders, suppliers, customers, unions, and financiers need to assess a company's liquidity through other means, such as a published balance sheet and income statement.

In liquidity evaluation, the focus is on comparing short-term assets with short-term liabilities. To assess liquidity accurately, understanding the amount of liquid assets available and the ease of converting other assets into cash quickly is crucial. This total amount is what is available to settle short-term debts. Liquid assets include current assets like inventory and accounts receivable.

Liquidity can be expressed using either the current ratio or the quick ratio. The current ratio compares current assets to current liabilities, while the quick ratio evaluates quick assets exclusive of inventory.

The quick ratio is a financial metric used to assess a company's short-term liquidity. In this context, inventories are excluded since it is often uncertain if inventories can be sold in the short term. There is also the question of whether inventories can indeed be sold at the balance sheet value. Frequently, goods can only be sold at lower prices in the short term, such as through clearance or renovation sales.

#### Example

Refer to the balance sheet of the company from the previous example.

Question: Calculate the current ratio and quick ratio as of December 31.

Solution:

- The current ratio is calculated as:  $(€960,000 + €570,000 + €25,000) / (€260,000 + €120,000 + €650,000) = €1,555,000 / €1,030,000 = 1.51$ .

- The quick ratio is calculated as:  $(€570,000 + €25,000) / (€260,000 + €120,000 + €650,000) = €595,000 / €1,030,000 = 0.58$ .

What conclusions can be drawn from these liquidity ratios? Comparing these ratios with those from previous years indicates whether liquidity has improved or deteriorated. By comparing the ratios with those of other companies, it can be determined if the company is more or less liquid than its counterparts.

Absolute norms are often utilized to evaluate financial structure, with the common recommendation being a minimum current ratio of 2 and a minimum quick ratio of 1. However, it is risky to solely rely on absolute norms for assessing liquidity. For instance, a current ratio of 1.5 may be deemed sufficient in one company, while a ratio of 3 may not be sufficient in another. Another liquidity indicator is the net working capital, calculated as the difference between current assets and current liabilities. Net working capital is presented as a separate item on a vertical balance sheet. The balance sheet in the example from section 7.2.2 appears in a vertical format as follows (in €1,000):

Fixed assets	(1.345+2.100)		3.445
Current assets	(960+570+25)	1.555	
Current liabilities -/-	(260+120_650)	1.030	
Net working capital			<u>525</u>
<b>Capital employed</b>			<b>3.970</b>
Funding			
Equity			1.850
Debt long term	(920+1200)		<u>2.120</u>
<b>Funds employed</b>			<b>3.970</b>

#### 5.2.4 Financial Risk

The company in this example achieved a return of 11% on the total invested capital (equity + borrowed capital). Only 9% interest needs to be paid on the borrowed capital. The difference between the return earned and the interest costs results in a return on equity of 14%. This discrepancy arises because for every euro of borrowed capital, 9% is paid, while 11% is earned; this is known as the interest margin.

In the example, there is a positive interest margin of (11% - 9% =) 2%. This benefit accrues to the providers of equity. As a result, the return on equity increases. This effect intensifies as the proportion of borrowed capital rises. However, is making money (realizing returns) really that simple? If the interest margin becomes negative, the advantage of borrowed capital is reversed. Financing with more borrowed capital elevates the risk for the providers of borrowed capital (increasing risk, decreasing solvency!). They will demand a higher return for this, leading to an increase in the average interest on borrowed capital and a decrease in the interest margin.

Consider a scenario where a company achieves an annual operating result (profit plus interest, EBIT = Earnings Before Interest and Taxes) of €20,000. The total capital amounts to €200,000. If there are two possible financing options:

1. Financing with 100% equity
2. Financing with 80% equity and 20% borrowed capital at 8% interest

The return on total assets (RTA) is calculated as  $\text{€}20,000 / \text{€}200,000 * 100\% = 10\%$ . In the first option, the return on equity (ROE) equals the RTA. In the second option, the ROE is calculated as:  $(\text{€}20,000 - (8\% * \text{€}40,000)) / \text{€}160,000 = 10.5\%$ .

In this scenario, a specific situation is assumed where an operating result of €20,000 is attained. However, due to risks (such as the operational structure), the actual operating result is uncertain. If the operating result fluctuates (following a probability distribution) between €0, €10,000, €20,000, €30,000, and €40,000, the ROE when the company is fully funded with equity (€200,000) would be:

EBIT	0	10.000	20.000	30.000	40.000
Interest	0	0	0	0	0
Net profit	0	10.000	20.000	30.000	40.000
Equity	200.000	200.000	200.000	200.000	200.000
Ret. On Equity (ROE)	0%	5%	10%	15%	20%

#### **100% equity, 0% debt funded.**

##### **Financial leverage**

EBIT	0	10.000	20.000	30.000	40.000
Interest	3.200	3.200	3.200	3.200	3.200
Net profit	-3.200	6.800	16.800	26.800	36.800
Equity	160.000	160.000	160.000	160.000	160.000
Ret. On Equity (ROE)	-2,0%	4,3%	10,5%	16,8%	23,0%

#### **80% equity, 20 debt funded.**

## 6 Agency Theory and Information Asymmetry in the World of Finance

### 6.1 Introduction

Business economics focuses on explaining the "phenomenon of the enterprise" and contributes to solving problems that arise in such organizations. The enterprise can be characterized as an economically independent production organization. An enterprise is an entity oriented towards "value creation, sustaining, and capturing." Value creation is a central element in business sciences (in various forms: customer value, shareholder value, or profit). The chain of activities within the enterprise and between different companies is referred to as the value chain. This value chain extends both within and outside the enterprise (for example, through strategic alliances). Various perspectives from finance, accounting, organization, marketing, and strategy provide insights into this. In addition to this somewhat economic perspective, there exists a legal-oriented typology concerning the form of enterprise.

Prior to the classification of enterprises, important questions arise: What is the rationale for the existence of enterprises? What functions do enterprises serve in our economic system? This chapter provides a brief overview of enterprise theories, including transaction cost theory, agency theory, and information asymmetry. The latter two play a significant role in financial theory discussed thereafter.

### 6.2 Enterprise Theories

#### Transaction Cost Theory

The price mechanism serves a coordinating function in the economic system. Economic entities coordinate their behaviors through exchange in the market, where trade is assumed to occur relatively smoothly and without friction. The market regulates the allocation of scarce resources among alternative applications. Price is an expression of scarcity relations. An increase in demand leads to a price increase, reflecting the increasing scarcity of a production factor. However, there are forms of allocation that are not (or at least not directly) determined by the price mechanism. Coase provides an example: 'If a workman moves from department Y to department X, he does not go because of a change in relative prices but because he is ordered so.' Why does a 'managerial authority' take on the coordinating role of the market in such a situation? Coase argues that the primary reason for the existence of enterprises lies in the costs associated with using the market price mechanism. Coase mentions costs such as finding relevant prices, price comparison, assessing product quality, negotiation costs, drafting and concluding contracts, as well as monitoring compliance.

- Efficient Coordination: The optimal method of coordination is chosen by comparing different costs: transaction costs (market coordination) versus organization costs (enterprise coordination). Ultimately, market forces lead to the adoption of the most efficient methodology.
- Labor Contracts: Labor agreements involve unique characteristics where employees agree to perform tasks assigned by the enterprise within specified boundaries in return for defined compensation. Details of work assignments are typically outlined vaguely in contracts due to uncertainties about future tasks, which are specified as the need arises. Optimal

coordination through hierarchical employment relationships makes economic sense if the entrepreneur can coordinate at lower costs than the open market.

- Organization Efficiency: The choice between market and enterprise coordination hinges on transaction costs (in the market) versus coordination costs (in the enterprise). The market or enterprise format with minimal costs (efficiency) is selected based on rational economic considerations.

### Vertical Integration and Hierarchical Organizations

In situations where one party has few alternatives to utilize a specific resource, such as in the example of a printer and a publisher, contracts should anticipate this possibility by including incentives that motivate parties to adhere to agreements. If it's costly to establish such a contract, the supplier and the buyer may choose to place themselves under the governance of a single authority by integrating into one entity: the enterprise, bypassing the need for market transactions. This vertical integration of transformations and transactions within a single enterprise nullifies to some extent the signaling function of the price mechanism. Administrative processes within the enterprise take over the coordinating role of the market. The enterprise acts as a substitute or alternative to the market by integrating operations within its structure.

- Creation of an Enterprise: For example, in the relationship between a printer and a publishing house, a long-term contract could lead to the printer being dependent on the publisher for specialized equipment, potentially allowing the publisher to exert pressure on the printer for cost reduction. Vertical integration through forming an enterprise can help mitigate such opportunistic behavior.

- Organizational Efficiency: By choosing between market-driven transactions and internal coordination within the enterprise, the preferred approach depends on minimizing transaction costs (through market mechanisms) or coordination costs (within the organization). The optimal organization form is selected based on efficiency considerations.

### Hierarchical Enterprises and Team Production

- Optimal Performance: The theory of hierarchical organizations revolves around the benefits of team production where the team's output surpasses the sum of individual outputs. However, the challenge lies in accurately assessing each individual's contribution as there could be a tendency for workers to exert suboptimal effort (shirking). Monitoring employees is a solution to ensure performance; this monitoring could involve appointing a manager. An issue arises with the manager's motivation ('who monitors the manager?'). Allocating a share of the team's final outcome to the monitor gives them a vested interest in maximal effort deployment, turning them into the 'residual claimant.' This alignment of interests encourages optimal contribution from the supervisor. This method addresses uncertainty arising from information frictions, aligning incentives for improved team performance.

In the Transaction Cost Theory, the enterprise is an alternative to the market. Budgeting, control, performance measurement (and broadly, the entire information processing within the enterprise, or even broader information, knowledge, and risk management) serve an economic function. In this approach, the functions of the enterprise involve monitoring,

directing, and controlling the contractually bound parties. As such, the enterprise is a specialized (knowledge and information) institution that bridges the "(transaction costs) gap in the market." The existence of the enterprise lies in "market failures."

#### Agency Theory and Information Asymmetry Theory

Approaches that build on the problem of forming and organizing team production are agency theory and information asymmetry theory. In these approaches, agents (executors) and principals (assigners) are distinguished. These insights are applicable to various situations, such as:

- the relationship between an employer and an employee
- the relationship between a shareholder and a manager
- the relationship between an insurance company and an insured individual.

These insights have been developed in the insurance world. Consider someone who has taken out a travel insurance policy. While on the beach with his iPad, the insured individual may have less concern about constantly keeping an eye on his device since the insurer covers any damages. He enjoys the benefits of reduced effort (takes more dips in the sea), while the downsides are borne by the insurer. This behavioral change (compared to the situation where he bears the consequences himself) is termed "moral hazard." If the insurance company is rational, it factors in these consequences into the premium. Failure to do so could lead to losses. Ultimately, collectively, the insured individuals bear the consequences of moral hazard. Additionally, insurance companies can encourage insured individuals to exhibit good behavior. The insurance company could hire someone to monitor the insured individual all day (to monitor). However, the costs of this surveillance are excessively high. Nevertheless, insurance companies have more subtle methods, such as introducing a deductible (insured parties then bear the consequences of reduced effort), imposing various requirements when submitting a claim (which involves additional effort in filing a claim and completing various tedious forms), fine print (excluding certain risks), or delaying payouts to insured individuals (resulting in additional annoyances, phone calls, etc.).

In the aforementioned example, the problem arises from the insured individual's behavior after the insurance is purchased. Another problem may arise, for instance, after a life insurance policy is taken out. In this case, moral hazard can also occur. After obtaining the insurance, the insured individual may decide to lead a much less healthy lifestyle. However, a more significant issue is not the change in behavior after the contract is signed but the physical condition of the insured individual before the insurance is purchased. The insured individual is aware of his "physical history," whereas the insurer is not familiar with that history. The insurer incorporates an average premium, assuming that it attracts a population of average health - it cannot distinguish between healthy and unhealthy insured individuals well. If the insurer incurs losses and increases the premium, this could lead to healthy insured individuals finding the premium too high and canceling or leaving the insurance. A higher premium may then attract the wrong population. This situation is termed "adverse selection." Consequently, it could result in a scenario where nobody can insure themselves; only the least healthy individuals. This is an exceptional form of market failure; specifically, the market's inability to exist. A solution is for the insured individual to undergo a physical examination (requiring the completion of various forms), enabling the insurer to assess the risk. This is referred to as screening. Conversely, the insured individual may try to convince the insurer that he is healthy by appearing healthy (losing weight). This is known as signaling.

It is important to note that unhealthy individuals can mimic this approach and appear healthy. Signaling only works if unhealthy individuals have to incur significantly higher costs (or give up on certain things) to achieve the same effect.

In both cases, the agent - the insured individual - has an informational advantage over the principal - the insurance company. In the agency theory, this discrepancy arises after the contract is signed (ex post) due to the agent's changed behavior. In the context of information asymmetry, the agent has an information advantage before entering into the insurance contract (ex ante). This information can be abused through opportunistic behavior: expending less effort after the contract is signed or presenting oneself as healthier than one is before the contract is concluded.

Similarly, in the employee-employer relationship, both information problems can occur. In the assumption, the employer must screen the employee. The employee can demonstrate his quality (skills) by presenting obtained diplomas. Addressing the management of the employee's effort level follows this. In the agency and information asymmetry theory, the agent always has an information advantage over the principal.

### Agency Theory

The foundational model of agency theory involves a situation where a principal (employer) enters into an agreement with an agent (employee), for instance, to perform certain tasks. Through division of labor, the employee may be better able to perform the tasks. In return, the employee agent receives a reward linked to outcomes (achieved goals) or dependent on his efforts. The form of compensation depends on the level of uncertainty (which impacts the output), the costliness of information (preventing a clear assessment of the effort level), and the agent's opportunistic behavior (not optimizing effort). The problem arises from the employee attributing good performance to his efforts while ascribing unfavorable outcomes to external circumstances. Central to the agency theory is the minimization of these motivation and coordination costs.

The issue is that the employee has an information advantage over the employer; the employer cannot cost-effectively determine the employee's effort level unless constantly overseeing him (which makes it almost as if the employer is doing the work himself). The employer must weigh these 'monitoring costs' against the expected loss in the employee's effort level. Another method is to incentivize the employee by tying his compensation to outcomes. However, this conflicts with the specialization-driven separation between risk-bearing (assuming the employer is better able to bear it than the employee) and the execution of activities. The employee is likely to demand a higher premium for the risk than what the employer anticipates. The agency problem thus incurs additional costs (or lower returns) compared to the perfect scenario.

The agency problem also plays a significant role in financial theory. The classic example is the relationship between a shareholder (principal) and a manager (agent). The manager is considered the proxy for the shareholder. However, the manager does not always act in the shareholder's best interest. For instance, lavish expenses on luxurious workspaces, a low effort level, or risk avoidance come at the shareholder's expense (ultimately affecting the company's value). Nevertheless, there are ways to reduce these costs. One option is to monitor managers, such as by establishing a Supervisory Board (which, however, leads to 'monitoring costs'). The second approach is for the management to be accountable to the shareholders by providing information (yet this incurs 'bonding costs'). Enhancing the transparency of the company to the outside world can reduce agency costs. Another way to

mitigate the conflict of interests between shareholders and managers is to align management's compensation with that of the shareholders; for example, through options compensation. This motivates managers to act more "in the spirit of share holders."

### 6.3 The Microeconomic Finance Theory

The financing problem of the enterprise consists of utilizing and attracting capital, specifically the investment and financing decisions. These two decisions are often studied separately. This is theoretically supported by the separation principles. The investment decision is not influenced by the (various) preferences of the capital providers. Likewise, the manner of financing is independent of the capital providers' preferences; the capital structure is irrelevant to the firm's value. This outcome is known as the Modigliani and Miller proposition.

Various evidence supports this proposition. In the microeconomic finance theory, typically, two capital providers are distinguished: shareholders and bondholders (or other providers of long-term loans). Other short-term creditors are not considered since they are temporary - not structural - in nature. Consequently, the finance theory is a much simpler representation than the depiction in the accounting (on the balance sheet). Shareholders demand a higher return than bondholders; this is due to the previously discussed difference between risk-bearing and risk-averse capital. Let's assume the required return on equity is 10% and on debt is 5%. If the firm is financed with 50% equity and 50% debt, on every invested euro, the firm needs to achieve an average return of 7.5%. This is the average cost of capital. With this, the present value - the market value - of the firm can be determined. This is the present value of the cash flows generated by the production factors (and any potential future factors that arise from exercising future investment options).

Can the firm increase its market value by changing its capital structure? Intuitively, financing with more debt seems appealing as it is cheaper. If the firm finances with 20% equity and 80% debt, the weighted average becomes  $0.2 * 10\% + 0.8 * 5\% = 6\%$ ! A lower return requirement implies a higher value. Following this reasoning, the firm should solely finance with debt, resulting in an average return requirement of 5%. However, rational debt providers will now realize that they have taken on the shareholders' risk. They will only lend - if willing to accept the risks - at 7.5%. By increasing debt financing, the risk for debt providers rises, along with the required return. Essentially, the total (variable) available income stream remains fixed. The variability of that income stream - the operational risk - remains unchanged, independent of the financing method. Suppose in the initial scenario (with a 50% equity and 50% debt ratio) the debt is risk-free. Risk-free indicates that the income stream expected from the assets is always sufficient to cover interest and principal payments. Now, in the new financing structure (20% equity and 80% debt), the probability of default is 20%. In this case, the interest on debt will increase to 6.25%. Thus,  $0.2 * 0 + 0.8 * 6.25 = 6.25\%$ . In this scenario, it is assumed that debt providers are risk-neutral. On average, debt providers would then achieve a 5% return; in this case, they assign the same value to a certain return of 5% as they would to an average return of 5%. People are risk-averse, meaning they value (uncertain) average returns lower than a certain return. Hence, the interest rate is slightly higher than 6.25%.

Conversely, the firm could solely finance with equity. Rational shareholders would realize that their (financial) risk is significantly reduced in this case; the company's return requirement decreases to 7.5%. The weighted average of the two return requirements remains the same. If the firm shifts towards more debt financing, the financial risk for shareholders increases, see section 7.2.4 and compare tables 7.1 and 7.2. This leads to a higher return requirement, keeping the weighted average exactly the same. The market value of the firm is the sum of the values of all capital securities that the enterprise has issued. The value of the firm is determined in the composition of the assets generating the expected cash flows. The allocation of cash flows does not add value. This complements the analysis from section 4.7 focused not on the capital costs but on the market value.

A key question with these insights is: under what conditions do they arise? An essential feature is a well-functioning (perfect or efficient) capital market. The capital market trades capital securities by assigning value to these securities. Capital entitles to future income, deriving their value from the expected future cash flows: the value of these securities can be derived from the anticipated future cash flows. A bond provides an annual right to interest and the repayment of the principal at the end of the term. These cash flows are discounted at a return requirement - consisting of the risk-free rate and a premium for risk - (see section 4.7). A share represents a permanent entitlement to the expected and discounted future dividends, incorporating risk. On a capital market, capital can be transferred to the future or future receipts "brought to the present" (via a discounted value calculation). The societal function of the capital market is to expand investors' choices.

The market value is determined by investments. The investment optimum is the point where the marginal investment return (the return on the last invested euro) equals the (average) return requirement. The optimal (unanimous) decision rule is to maximize the market value (the net present value of the investments). This is the difference between the discounted value of the cash flows from an investment and the investment outlay.

The ideal typical forces impose the enterprise goal on the firm. In this approach, the enterprise is a black box; the enterprise is perceived as an investment curve (similar to the revenue curve in the real model) in a model to determine the magnitude of investments ranked by marginal return.

This approach to the enterprise thus does not concern the enterprise itself but rather markets where enterprises operate. Markets compellingly impose the objective on the enterprise. In finance theory, alongside the 'survival' argument supporting profit maximization in the real approach, another argument is introduced: the arbitrage argument. Investors can compel a firm's management to maximize the firm's value. If investors realize that value can be enhanced through a different strategy, they may acquire shares, remove the management, and alter the firm's strategy. In this manner, investors can realize an arbitrage profit. The arbitrage argument is related to the 'survival' argument. The application of this tool depends on transaction and information costs of this mechanism; 'free-rider' behavior can hinder this mechanism.

Result of this is that the form of financing (equity or debt) does not matter. This is a (practical) strange outcome because research (surveys and financial statements) shows that

managers do consider the method of financing important. The real-world in imperfect practice apparently differs from the idealized world in theory. Scholars have sought imperfections that can explain this phenomenon, addressing taxes, bankruptcy costs, agency theory, and information asymmetry. These factors particularly play a role in insolvent companies.

### Taxes and Bankruptcy Costs

One primary imperfection is the effect of taxes. The circle of "recipients of the firm - shareholders and bondholders" is no longer a closed system of only capital providers. A third party (the government) claims a portion of the cash flow. As a result, value (the levied taxes) leaks away. Nonetheless, the total distributable cash flow of the firm remains unchanged. However, the portion of the cash flow remaining for the capital providers can be influenced by the method of financing. Payments (interest) to bondholders are tax-deductible from profits, while dividend payouts to shareholders are not. The tax liability can be reduced by financing with more debt. This can increase the income allocated to the collective capital providers. The value of a firm can theoretically be maximized by financing with 100% debt. However, this conclusion is not empirically sustainable. Researchers have looked for counterforces, such as bankruptcy costs.

Bankruptcy costs diminish the firm's value if they reduce the cash flow available to capital providers. Similar to tax costs, the impact of value leakage can be evaluated based on the method of financing. However, a crucial question arises: how high are the bankruptcy costs? This depends on two factors: the bankruptcy risk and the bankruptcy costs. Bankruptcy can be described as a situation that occurs when a firm can no longer meet its financial obligations. Bankruptcy is a legal mechanism where the firm and its assets are transferred to the creditors by the shareholders. The fact that a firm can go bankrupt under certain circumstances does not mean that future cash flows are affected. A decrease in solvency (more debt) increases the risk for bondholders because the likelihood of the firm not meeting obligations grows. Consequently, bondholders will demand a higher interest rate. However, the future cash flows available for distribution remain constant, but in certain scenarios, they may not be sufficient to meet interest payments.

The future cash flow available for distribution among capital providers is influenced when bankruptcy incurs costs. This causes a portion of the cash flows to dissipate to third parties, not being capital providers. The method of financing indirectly influences these costs, as the capital structure affects the likelihood of a firm going bankrupt. Bankruptcy costs can be categorized into direct and indirect costs. Direct costs are related to the administrative and legal settlement of a bankruptcy. Indirect costs arise from reactions of suppliers, employees, customers, capital providers, and management. These reactions can lead to a change in the cost and revenue functions of the firm, for example, if customers start postponing their purchases when a firm is facing payment problems because it may affect their warranties.

Indirect costs are caused by 'lost opportunities'. These costs - in contrast to direct costs - can occur even without bankruptcy. The increased likelihood of bankruptcy can already result in negative reactions. This nature of indirect costs poses challenges in measuring them. The market value of a firm also includes the cash flows from future investment options; if a firm becomes insolvent, there is a chance that these valuable options might not be executed.

This brings us back to the question of whether the financing decision significantly affects the market value of the firm. Since capital markets are much more competitive than real markets, it is more challenging to earn above-average returns there. Value is primarily created through investments, not through the method of financing (Brealey and Myers, 2009, Chapter 14).

## 6.4 The Information Problem in Finance Theory

As mentioned earlier, these models distinguish between two parties: an agent and a principal. The agent has an informational advantage over the principal. These models can be categorized into two types: 'moral hazard' and 'adverse selection'. In these models, the agent and principal enter into a contract where the principal cannot observe the agent's actions or the type of agent. In a 'moral hazard' model (ex post), the principal cannot observe the agent's activities because the agent's output is influenced by circumstances ('nature'). Hence, the contract should include incentives to motivate the agent to perform at the optimal level. In information asymmetry models, the principal cannot detect the type of agent, and a contract serves to "separate the wheat from the chaff." The ex ante information problem can be resolved through ex post information.

The remainder of this section will address (financial theoretical) applications of the agency and information asymmetry theory.

### Agency Theory

The agency theory seeks to explain certain institutions, behaviors, organizational forms, security design (what is the purpose of a share?), and the capital structure (what are the determinants of the capital structure?).

### In the Positive Agency Theory: Alternative Organizational Forms

The rise of the large open corporation in the 1930s led to new theories about the firm. The question of why firms exist was first posed by Coase, who sought an explanation in transaction costs. In the same period, the book 'The modern corporation and private property' by Berle and Means was published. They observed that due to the dispersion of share ownership, the management of the large corporation had become very powerful. According to Alchian and Demsetz (1972), it is not transaction costs but the benefits of team production that are the reason for the existence of the firm. The hierarchical form of the firm arises from the appointment of a manager who monitors employees to prevent shirking. The firm is described in this approach as a contractual system binding many participants. "(...) the behavior of an organization is the equilibrium behavior of a complex contractual system made up of maximizing agents with diverse and conflicting objectives. In this sense, the behavior of the organization is like the equilibrium behavior of a market." (Jensen and Smith, 1985, 95). According to Fama and Jensen (1983a, 1983b), there is competition among different organizational forms. The "organizational form that delivers a product at the lowest cost" is viable. The cost of a product is determined in part by the organizational contract structure.

Fama and Jensen suggest that differences between organizations can be attributed to the characteristics of residual claimants and decision-making processes. The public corporation has the fewest restrictions regarding residual claimants, known as 'unrestricted claims'. The existence of shares can be explained using transaction costs. Shares embody a permanent right to profits. Why are these capital securities more prevalent compared to temporary profit rights (profit certificates)? Imagine you recently purchased a profit certificate from a company. This entitles you to a profit distribution for this year. Suddenly, the management of this company decides to create a reorganization provision and significantly increase expenditures on research and development. This would diminish the profit for the upcoming year, possibly benefiting the years to come, but you would not gain from it. If you are rational, you would discount this opportunistic behavior - assuming the management made these policy changes to deceive you - in the value of the profit certificate. By granting shareholders a permanent right, this issue is avoided.

Regarding the financing problem, three groups are relevant: the management, shareholders, and bondholders. The agency issue is studied using two conflicts: the conflict between management and shareholders, and that between shareholders and bondholders.

The large publicly listed corporation with a separation of ownership and management has a disadvantage in agency costs. Jensen and Smith (1985, 102-103) specify the conflict between managers and shareholders in three points.

1. The level of effort exerted by management.

Shareholders have an interest in the management putting forth optimal effort. However, the management may not value these efforts positively and often perform less than necessary to maximize the firm's value. Furthermore, the management may appropriate resources from the shareholders.

2. Differences in Risk Attitudes:

Shareholders can limit the risk they face by diversifying. The management does not have this option as they possess 'firm-specific human capital.' Therefore, the management will typically pursue a lower risk level than what is optimal from the shareholders' perspective.

3. Differences in Time Horizon:

The manager's interest in the enterprise is limited to the end of their tenure, while for a shareholder, cash flows beyond this term are also significant.

The large publicly traded corporation has a significant agency cost disadvantage: the costs of the conflict between the manager and shareholders. Nevertheless, this organizational form has flourished for the following reasons (Fama and Jensen (1983a, 1983b)):

1. Benefits of Common Stock:

A significant portion of risks is allocated to a specific group, who can mitigate these risks through diversification. This results in other groups facing little to no risk, thereby reducing transaction costs as negotiations do not need to occur constantly with varying outcomes. Furthermore, individual management skills do not need to align with a strong financial position, allowing for better specialization.

2. Mechanisms to Restrain Agency Costs:

The open corporation has a hierarchical decision-making structure. The division into 'decision management' and 'decision control,' where the decision-making process is segmented into stages of monitoring and ratification, can reduce agency costs. Ways to restrain these costs include reputation building, granting of call options, a high salary, or making compensation dependent on past performance.

"The modern corporate form of organization is a highly social invention." (Jensen and Smith, 1985, 95). However, the separation between management and ownership also leads to conflicts between management and shareholders. Various options exist to mitigate the costs of this conflict. One way to reduce these costs is through the method of financing. The influence of the capital structure on agency costs will be addressed further.

The first significant application of agency issues to financial problems was by Jensen and Meckling (1976). Jensen and Meckling (1976, 310) describe firms as "(...) legal fictions which serve as a nexus for a set of contracting relationships among individuals." Contracts are central in this analysis; they specify (implicitly or explicitly) how future cash flows are distributed.

Due to information asymmetry, the agent may pursue their own interests. The principal can reduce information asymmetry by closely monitoring the agent. However, this monitoring incurs costs: monitoring costs. The agent can also try to reduce the information problem, leading to bonding costs. There remains a residual category of agency costs that are not efficiently reducible (the measures cost more than the reduction of these agency costs). According to Jensen and Meckling, the total agency costs consist of:

- monitoring costs
- bonding costs
- residual loss

The first two types of costs result from reducing information asymmetry. The residual loss pertains to the consequences of the remaining information asymmetry. Contracting parties will seek to minimize agency costs. In the following paragraphs, the conflict between shareholders and management will be elaborated upon. Subsequently, the manner in which debt capital can alleviate this conflict will be discussed. However, the use of debt capital also incurs agency costs, raising questions about the legitimacy of debt capital.

#### The Conflict Between Shareholders and Management

Jensen and Meckling begin their analysis with a manager/chief executive officer who operates a firm (e.g., a BV) to which, under an optimal activity composition, maximum value can be attributed. The manager can transfer value from the firm to private accounts through dividends, luxury executive offices, expensive business trips, and by exerting less effort. This diminishes the market value, and the manager/chief executive officer bears the full consequences.

The agency problem (due to the separation of management and ownership) arises when the manager decides to sell a portion of the shares. After the sale, the manager's stake decreases. If the new shareholders can enforce at no cost that the manager restricts this value transfer back to the original level (before the share sell-off), they are willing to pay the

actual value of the shares. However, information is not free, giving the manager opportunities to increase his utility by enhancing the value transfer. The manager will recognize that the costs of this increase, the decline in the firm's market value, are spread across all shareholders. He bears only a portion of these costs. Yet, if shareholders are rational, they will anticipate this behavioral change from the manager. They will charge the manager for these costs ex ante. The firm's market value decreases due to the sale of the share package.

Monitoring or bonding can reduce this opportunistic behavior. Rational investors will also pass on the costs incurred by this behavior to the manager ex ante. The advantage of monitoring and bonding will be capitalized into the value of the share, benefiting the manager entirely. The conflict between shareholders and management is based on a "closed firm" entering the capital market. As long as shareholders correctly anticipate the manager's incentives, they will charge him for those costs ex ante. The manager thus has a vested interest in reducing those costs.

The manager/chief executive officer's personal stake can be increased by issuing fewer shares (externally) and replacing them with debt capital. This reduces the aforementioned costs, but introduces other agency costs.

#### Conflict Between Shareholders and Bondholders

Jensen and Meckling (1976) identify three types of agency costs resulting from the conflict between shareholders and bondholders:

##### 1. Incentive Effects

- Bondholders receive a fixed return on the capital they provide. This capped compensation has a drawback. When the firm performs well, bondholders receive the fixed return, but in adverse scenarios, they may receive nothing. Bondholders only share in the negative outcomes of the firm.
- Shareholders have an incentive, after the contract with bondholders is finalized, to increase the firm's risk. Bondholders do not receive compensation for the added risk, potentially leading to a decrease in the market value of their claim. In this way, value can be shifted to shareholders.

##### 2. Monitoring and Bonding Costs

- The conflict between shareholders and bondholders arises from the information disparity. Both parties can reduce this information asymmetry, but it incurs costs, such as incorporating a non-investment provision in the contract and monitoring compliance. Preventing the aforementioned management games is the rationale behind using covenants.

##### 3. Bankruptcy and Restructuring Costs

- Jensen and Meckling (1976) consider bankruptcy and restructuring costs as part of agency costs. Even if bankruptcy costs are assumed to be negligible, agency costs can still arise because bondholders have a lower likelihood of receiving interest and repayments. The level of bankruptcy costs influences agency costs, as the increase in risk due to the 'incentive effect' raises the likelihood of these costs occurring in the future.

In the conflict between shareholders and bondholders, as long as bondholders are rational, they will charge these costs ex ante to the firm. Ultimately, shareholders bear the costs, as they benefit from reducing these costs, reflected in the capitalized value of their shares.

### Information Asymmetry and Finance Theory

In finance-theoretical models with information asymmetry, the information disparity revolves around the quality of the firm: the firm's value. These models assume that the management can better predict the "underlying" value of the firm. Investors are unable to distinguish between good and bad (under- and overvalued) firms. The capital market is efficient: all publicly available information is reflected in stock prices.

### Application of Information Asymmetry: Myers and Majluf Model

An example of an application of information asymmetry is the model of Myers and Majluf (1984). This model explores the interaction between investments and funding methods. It does not explain the capital structure but attempts to provide a theoretical (economically rational) explanation for certain financing methods. Myers (1984) further developed this idea into the (dynamic) pecking order theory. This theory opposes the static capital structure theory (which balances tax benefits against bankruptcy costs).

In a perfect and complete market, according to the first proposition of Modigliani and Miller, the method of financing does not impact the market value of the firm. The firm should execute all investments that generate a positive net present value. Whether the firm has cash reserves or needs to obtain funds through the sale of securities does not matter, as these securities are efficiently sold at their proper value. A good project naturally finances itself.

However, Myers and Majluf demonstrate that this decision rule is not always in the best interest of existing shareholders. The primary assumption in this model is that the management is more knowledgeable about the firm's value than the stock market. They know whether a stock is over or undervalued. For instance, if an investment project arises that can only be financed through a new share issuance, and both the management of good and bad firms opt for issuance, the average issuance price is correct.

In some cases, the management of good firms may find the share price so unfavorable that they refuse to issue shares, allowing the investment project option to expire. Investors aware of their information lag will view this positively. They evaluate any potential issuance negatively; shares of issuing firms are overvalued.

Allowing the investment option to expire leads to a pre-emptive decline in the firm's value (the market value also anticipates future growth options). However, there are ways to mitigate this potential value loss. One option is to decouple the investment and financing decisions. The challenge is that the market cannot differentiate between project-specific information and information about the potential undervaluation or overvaluation of the firm. This can be resolved by holding cash reserves to avoid tapping into the capital market.

These cash reserves are valuable as they enable the firm to execute any investment project with a positive net present value freely.

An alternative to holding cash reserves is issuing bonds. Myers and Majluf suggest that risk-free bonds can serve the same purpose as cash reserves. Risk-free bonds are inherently not undervalued or overvalued. If the bonds are not risk-free, the degree of undervaluation or overvaluation becomes crucial. Option theory implies that the likelihood of undervaluation or overvaluation for bonds is lower than equity. While the fluctuation in bond values is less volatile because the interest is capped, the value of the firm is higher ex ante when the firm has good prospects for attracting debt capital. This is because there is a lower chance that projects with positive value will not be executed, and the borrowing capacity of a firm represents a certain value.

When considering the possibility of debt capital, the outcome of Myers and Majluf's model suggests that stock issuances never occur. This contrasts with most management approaches that emphasize the necessity for firms to be subject to market discipline to avoid misallocating capital for (excessive?) company growth. In Myers and Majluf's approach, the focus shifts away from determining the optimal capital structure. Firms adopt a pecking order regarding financing methods.

Myers (1984) further elaborated on this pecking order theory. According to Myers, firms prioritize financing options for an investment project in the following order:

1. Internal capital
2. External capital
  - a. Bond issuance
  - b. Stock issuance

Models based on the interaction between financing methods and investments are dynamic in nature. The financing decision is decoupled from the existing capital structure. Each financing needed for investments is assessed separately. In business economics, this is known as partial financing.

#### Existence of Debt Capital

Despite the agency costs associated with bonds, firms extensively utilize this form of capital. Jensen and Meckling (1976, 333) argue that the tax advantages of debt capital are not the main explanatory factor, as firms were already financing with debt before the introduction of profit taxation. In addition to the advantage mentioned by Jensen and Meckling of financing with debt capital, there are other benefits (besides the general disadvantage of increased financial risk and the likelihood of bankruptcy and associated costs).

A benefit of financing with (temporary) debt capital is that it imposes fixed future obligations on the management. The advantage here is that the management must seek access to the capital market sooner, making them more subject to market discipline more frequently. An associated benefit is that with higher debt capital, the management is compelled to exert more effort to avoid bankruptcy, along with the accompanying costs and losses in

reputation, image, and human capital, preventing it from deteriorating ("foreign eyes compel").

#### Benefits of Debt Capital

Another advantage is that fixed obligations can mitigate the consequences of information asymmetry between managers and shareholders. Jensen (1986) assumes that managers seek company growth, which could lead them to invest in projects with negative net present value (overinvestments) – projects that spur growth but do not create value. Increasing debt capital results in the available cash flow being skimmed because a portion must be allocated to interest and repayment obligations. For firms with strong growth prospects, maintaining a good solvency, compared to mature industries, is optimal as it reduces the likelihood of overinvestments and resulting value loss. The optimal solvency depends partly on future investment opportunities with positive net present value.

In addition to the issue of overinvestments, there is also the problem of underinvestments. Increasing debt capital has two opposing effects. The benefit is that if the firm retains a cash flow after funding all profitable investments, this cash flow gets skimmed. However, the downside is that if the firm records a low cash flow in a year, projects with positive net present value may remain unexecuted.

Harris and Raviv (1990) emphasize the informative value of financing with debt capital. Meeting repayment obligations provides informational value as it indicates the minimum cash flow level obtained.

A final benefit of debt capital is that credit institutions specialize in monitoring activities. Delegation of monitoring to these institutions results in specialization advantages. Furthermore, by concentrating monitoring activities at financial institutions, duplication of monitoring is avoided.

The agency problem can be resolved through methods beyond the capital structure. In addition to the options already mentioned, the specific design of capital securities can be adjusted. For example, reducing the agency problem between shareholders and bondholders can be achieved by issuing convertible bonds, where payments to bondholders are not capped.

The agency theory can provide rational (economic) explanations for certain phenomena, such as the publication of annual reports (bonding) and the inclusion of covenants in loan agreements.

The agency problems of a firm can vary depending on the company's situation. Brealey et al. (2009) also acknowledge this, viewing the agency problem as part of bankruptcy issues, as management games are likely to occur, especially in situations with poor prospects or financial distress. Jensen's analysis (1986) assumes a more favorable scenario, cautioning against investing available cash flow into projects with negative net present value during high-cash-flow periods, as management may overly prioritize growth. In the former scenario, debt capital should be reduced to mitigate the risk for debt providers, while in the latter, debt capital should increase to reduce the available cash flow.