The Conceptual Basis

6

Attention!
Qui numerare incipit,
errare incipit.
Who begins to count,
starts to err.

Opening Vignette

Marcel and Max were sitting one pleasant Friday evening at a table in a beer garden. They had known each other for more than 10 years, having met as students of business administration in Mannheim. They had both ended up in Berlin, but neither had known that the other was also in the city. It was only a chance meeting at Potsdamer Platz that had brought them back in contact, and they had decided to meet up after work.

"Tell me more about your job, Max," said Marcel, taking a swig of his craft beer. "Well, as I told you the other day, I'm an accountant. I work for one of the Big Four, running around from client to client, auditing their accounts, and. . ."

He couldn't continue because Marcel interrupted him, "And helping them to minimise their taxes, no doubt!"

"We don't break the law!" replied Max slightly annoyed.

"Maybe not, but you try to find ways and means of reducing the tax burden of these companies," responded Marcel. "And if they don't pay enough tax, then that means they're not contributing to society! They might not break any laws, but they do everything they can to minimise what they pay to society. It reminds me of an old joke I heard—do you want to hear it?"

"Before you start telling jokes, Marcel, tell me more about your work for the government."

Marcel took another swallow of his beer before replying. "I work for the Federal Ministry of Food and Agriculture, I have to do with the advisory board on

P. Eichhorn, I. Towers, *Principles of Management*, Springer Texts in Business and Economics, https://doi.org/10.1007/978-3-319-70902-4_6

agricultural policy, food and consumer health protection, and in particular I work on food labelling."

"Not much happening there, though, is there?" asked Max with something of a smirk. "There's no traffic-light system on labels, is there?"

"Not yet," sighed Marcel, "but we're getting there, slowly but surely."

"What's the point of the system anyway?" said Max.

Marcel answered, "It's to let people know that if the label has a red light because of too much sugar, for example, they shouldn't eat that food very often. I personally would then say to the manufacturers, 'Look, you're selling lots and lots of food that's unhealthy, with too much fat, too much sugar, too many chemicals. People who eat a lot of your food get overweight very quickly, that's bad for them and it's bad for the health system, but you don't care because it doesn't cost you anything, this damage to people's health.'"

He took a breath so Max took the opportunity to get a word in. "At least you can measure exactly how much sugar there is in a litre of beer, but I suppose it's hard to measure how much the fact that people are overweight costs them and the economy."

Marcel nodded and said, "That's one of our problems. And it's one of your problems as an accountant too, I think."

"That's right, accounting isn't as clear cut as people think."

"I know!" Max almost shouted. "Now let me tell you my joke. Someone wanted to hire a new accountant and the interview consisted of only one question—what's two plus two? The first and second candidates said, 'Four.' The third candidate said, 'How many do you want it to be?' and got the job."

6.1 Measuring Quantities and Monetary Value

6.1.1 Operationalisation

We need numbers. Those of us who are not particularly mathematically inclined need not be afraid, though, because it is not necessary to be a mathematical genius to manage efficiently and effectively, but it *is* necessary to be able to deal with numbers. By allowing us to operationalise economic activities, they help us determine economic efficiency and effectiveness. Before any economic analyses are done, it is necessary to think about a basic question: which type of economic efficiency and effectiveness is the goal? As outlined in Chap. 4, the possibilities are needs or returns, self-interest or the common interest, individual or aggregate. Then we must consider whether the measurement categories are adequate for answering the particular question that is being investigated. There is the danger of only analysing that which can be captured in the numbers representing quantity and monetary value.

The former express input factors, factor combinations and combination effects in quantitative terms, for instance the number of employees, hourly wages, land areas, road distances, water consumption, noise reduction in decibels, manufacturing speed, rate of turnover, length of stay, output units etc. The advantage of these units lies in

their **countability**. Of course, like can only be added to or subtracted from like—as the American saying has it, "You can't compare apples and oranges"; to put it more academically, one should not try to sum or subtract unrelated variables.

The disadvantage of these concrete categories is that they often only partly reflect the economic context as they are not able to easily express the scarcity and utility value of the goods. The degree of **scarcity** of a good is a result of growing needs for it and/or less of it being available. The **utility value** of a good is based on its importance in satisfying needs. Scarcity and utility value depend on circumstances of time and place, and on how the good can and does meet individual and collective needs.

By definition, units of quantity cannot say anything about the **unquantifiable**, i.e. abstract phenomena such as industrial safety, workplace health, flexibility of machines, favourability of a location, city image, commitment, well-being, and good corporate citizenship. Efforts are made to capture these elements by developing appropriate indicators, but even with this kind of quantification the difficulties mentioned above do not disappear and little or nothing is revealed about the economic situation.

Compared to most units of quantity, monetary units are much more able to capture the essence of economic efficiency. They provide a **common denominator** that can be used to compare economic characteristics and enables us to more easily analyse and make judgements about the economic context in which the economic agent is acting. Monetary units allow us to use both types of unit in the same calculation, such as when we compute cost efficiency as an expression of the relationship of output (unit of quantity) to factor costs (monetary unit).

Monetary units are not without their problems, a significant one being the **veil of money**. Money itself is a type of good, being a medium of exchange and a store of value and existing in the form of banknotes and coins as well as bank deposits. It is a legal means of payment for all the economic agents of an economy or monetary community and its value depends on the regard is it is generally held in. Behind money as a unit used in calculations is hidden a measure of value that varies, that is affected by subjective or objective influences and is constituted in relation to other goods. This becomes evident when there is a devaluation, meaning that the purchasing power of money is reduced, especially in comparison to foreign currencies. No clearer example of this can be found than the decline in the value of the pound against the euro and the dollar following the Brexit referendum. On 24 June 2016, the day of the referendum one pound was worth 1.23 € or $1.47, and at the end of August 2017 one pound was worth 1.08 € or $1.29. Developments like this have a serious effect on economies and firms, with British exports becoming cheaper and imports to the UK becoming more expensive due to the change in currency rates.

6.1.2 Nominal and Real Values

Differences between the nominal and real value of money lead to the **problem of the proper economic valuation** of input factors and the goods that are produced.

This is not the same issue as that of the difference between price and value. The perceived value of a good that is to be bought is generally higher than the price that must be paid for it, because otherwise there could be no exchange transaction of good in return for money. Economists speak of the buyer's and consumer's surplus. The former is the difference between what buyers receive for a good and the minimum they are willing to accept for it: it is the benefit a producer receives for selling a good on the market. The consumer's surplus is the difference between the total amount consumers are willing to pay for a good and what they actually do pay. At this point, other questions are also of interest, such as: How can fictitious profits be avoided? Are there any hidden reserves? Are any values are wrongly stated and by how much? Which value did a good possess at some point in the past? Is preservation of capital guaranteed?

The valuation is comparatively simple if both values are available and have been established objectively. The **nominal rate of interest** is determined by measuring profit against nominal capital (i.e. share capital). To establish the **effective rate of interest**, the dividend is measured against the market value of a share. The use of fluctuating market prices to evaluate the monetary worth of goods causes their value to fluctuate. Fixed prices are subject to the risk of growing discrepancies between nominal and real value, especially in times of high inflation, in long-term contracts or for export transactions with fluctuating exchange rates. **Indexing** is a method with which prices can be adjusted; nominal values are tied to the movement of a specific price index. An index can be developed for any given type of good or service, such as wages, raw materials, rent, tax and interest rates.

The principle of the **nominal preservation of capital** is applied to balance sheets. Using this principle, valuations are generally based on purchase cost or production cost. Market fluctuations in the value of money or tangible assets play no role, but price increases caused by inflation can lead to paper profits that are subject to taxation. Unlike nominal capital maintenance, the goal of the principle of the **effective preservation of capital** is to express the initial capital in monetary units that represent the equivalent purchasing power, and this is achieved with indexes, so the asset mentioned above might be shown as having a value of 110,000 €, this change being due to inflation.

The aim of applying the principle of the **preservation of assets** is to show the quantity of assets that exist behind their monetary value, rather than their monetary value itself. This is the case when, for example, there are the same number of assets in inventory at the end of a period as at the beginning. Absolute preservation of assets means that the goods consumed over a period during the production process are replaced in the same amount and quality by the proceeds of sales during that period. The relative (qualified) preservation of assets takes into account technological progress and economic growth (more usually growth in the industry). This concept was devised by Fritz Schmidt (1882–1950), who called it the principle of value consistency. Under this principle, goods are arranged in an organic balance sheet (organic in the sense of an enterprise as a part of the economic organism of a nation) in such a way that tangible assets are covered by equity and financial assets

are covered by debt capital. A change in the monetary value on one side of the organic balance sheet is compensated for by value gains on the other side. In practice this means that inflation reduces the value of receivables, bank balances and cash on hand, but at the same time also the value of liabilities.

6.2 Outpayments and Receipts of Payment

6.2.1 Definitions and Types

Its use as a means of payment means that money comes into and goes out of economic agents. Legal means of payment are cash and deposits at banks, the latter also known as book money. There is an **outpayment** when money flows out and a **receipt of payment** when money flows in. Liquid funds flow in one direction or the other at cash registers or via accounts held at banks (including central banks). The difference between outpayments and receipts of payment results in either a positive or negative cash balance or account balance.

Starting with the opening balance of liquid funds, cash-based and bank deposit-based inflows and outflows are added and subtracted to reach the closing balance, as shown in Fig. 6.1.

Typical outpayments are cash payments, cash withdrawals and payments for everything from wages to donations to charities, from insurance premiums to income tax, from interest on loans to unemployment insurance. **Typical receipts of payment** are cash receipts, cash deposits, incomes from sales, tax refunds, donations etc. Various types of payment can be identified: recurring or one-time, regular or irregular, planned or completed, expected or unexpected, one-way or with something in return, fixed or variable, voluntary or involuntary, affecting or not affecting net income, affecting or not affecting assets.

Outpayments and receipts of payment can take place with or without any other economic agent being involved; an example of the former is when a company makes a payment to another company, and of the latter is when a company transfers money from one to another of its own accounts. **Payment streams** occur within firms, within a single national economy and between currency zones. The speed of the payment streams is relevant from the perspective of individual economic entities as well as at the level of the national and global economy; it depends on what structures exist for the movement of money and on payment arrangements.

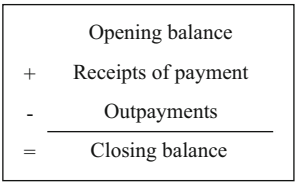

Fig. 6.1 Calculating the closing balance

Legal considerations, the structure of the banking industry, competition and payment habits all vary by region.

6.2.2 Liquidity Calculations

The survival of economic agents generally depends on payments. There are a few exceptions to the rule—the barter of goods or services or when goods and services are provided by one side with no expectation of payment by the other. Households, firms, associations and public administrations need to maintain the **ability to pay**, i.e. preserve liquidity, over their whole lifespan. If they are faced with an **inability to pay** (non-liquidity), they are threatened by bankruptcy, dissolution or liquidation, and individuals affected (whether as a member of a household, business owner or employee) can face social decline and poverty.

The ability to pay must be accompanied by the willingness to pay, but this in itself is not enough because the objective of economic agents is to protect liquidity in a way that is most economically efficient. In Chap. 5 we discussed the magic triangle of corporate policy that emphasised the interdependencies between the goals of profitability, liquidity and security. These three objectives are, in different ways, applicable to all economic agents. Liquidity planning—short and longer-term finance planning—is used to manage these three goals and involves predicting inflows, outflows and balances for a given period, which could be decades, years, months, weeks, days, even hours, minutes or seconds (as is the case for banks involved in high-speed trading). The planning of payment streams makes possible their management and supervision. **Optimal liquidity management** is achieved when the needed amount of funds is available at the right time for the necessary period and at the best possible conditions (e.g. interest rate and size of collateral in the case of loans). The implication of this is that funds not immediately required should be invested at favourable rates of interest, securely and should be accessible when needed. In the reverse case, liquid funds can be procured through payments from a bank (loans, credit lines, overdrafts) and/or higher receivables or by bringing forward receivables. Liquid funds are what connect all the parts of an economic entity; cash flows like blood through a body and is always in motion. For this reason, behaviour related to liquidity is dynamic and influenced by the past, and is based on financial calculations.

Various types of liquidity measures are available:

- the creation of a liquidity plan that is constantly monitored and changed as needed, bearing in mind the longer the period the plan covers, the greater the uncertainty and the higher the risks involved,
- permanent monitoring of monetary inflows and outflows,
- reduction of cycle times in production, in pre-production and post-production warehousing, in distribution (e.g. through the implementation of just-in-time manufacturing),
- a moratorium on new investments,

Fig. 6.2 Short-term coverage ratios

$$\text{Cash ratio} = \frac{\text{Cash equivalents} + \text{Marketable securities}}{\text{Current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Cash equivalents} + \text{Marketable securities} + \text{Receivables}}{\text{Current liabilities}}$$

$$\text{Current ratio} = \frac{\text{Cash equivalents} + \text{Marketable securities} + \text{Receivables} + \text{Inventory}}{\text{Current liabilities}}$$

- reduction of the time allowed for payments to be made (e.g. by not waiting long to send out reminders, a tactic that is only possible with when a company has a sound market position),
- avoidance of liquidity peaks (e.g. by ensuring that not all moneys due are received over a very short period),
- ensuring that liquidity reserves are in place (but not too high),
- liquidating unnecessary business assets, and
- arranging credit relationships with banks (e.g. establishing a line of credit that can be used if the situation warrants it).

Calculations about future liquidity serve as planning tools whose value lies in the comparisons that are made between the actual state of liquidity and the planned state. Financial analyst use liquidity ratios to analyse companies' economic performance, but it should be noted that these ratios say nothing about the ability to pay (see Sect. 5.3.1). These ratios are calculated through comparison of assets and liabilities and measure a company's ability to meet its financial obligations; a more accurate term for them is **short-term coverage ratios**.

Three of the most common are shown in Fig. 6.2.

These balance sheet analysis ratios present information on the relationship between current assets and current liabilities, but since a company possesses both current and long-term assets, and current and long-term liabilities, they are not enough to capture the full extent of the relationship between a company's assets and liabilities. We therefore need other ratios to capture the relationships between long-term assets and liabilities and total assets and liabilities.

Examples of these are seen in Fig. 6.3. Long-term coverage ratios are an essential tool for understanding the state of a company's solvency and should be calculated on a constant basis.

Based on hard-won experience, a **golden rule of financing** has emerged over the years, according to which current assets should be financed by current liabilities, and long-term assets should be financed by long-term liabilities (some even argue that long-term assets should be financed by owners' equity). In other words, the life-

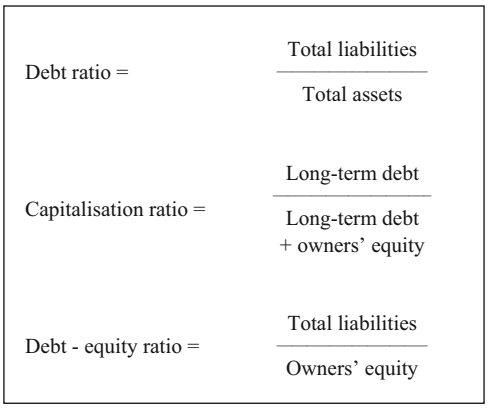

Fig. 6.3 Long-term coverage ratios

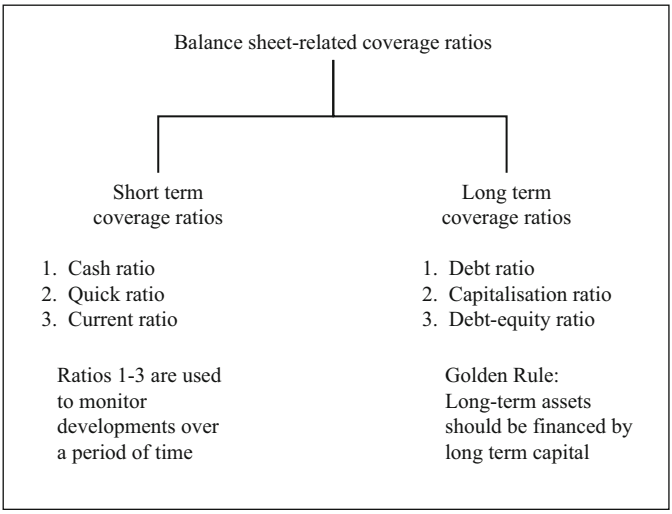

Fig. 6.4 Ratios and the golden rule

time use of the asset and the length of the financial commitment that permitted its acquisition should match. Figure 6.4 presents the golden rule.

All these ratios reflect the extent of coverage only at a specific point in time while the ability to pay depends on actual outflows and inflows over a period of time. According to Ludwig Mülhaupt (1912–1997), this makes necessary **cumulative cash-based liquidity planning** which analyses payment streams and forecasts how they will develop based on probabilities and taking the state of the economy and businesses into account. For example: liquidity planning should take into

account the likelihood that a major customer might go bankrupt. The planning of the flows of funds is mainly done on a short-term basis and is based to a great extent on the financial transactions related to the flows of the goods and services that are procured as factors of production and that are sold in the course of the current financial year.

Managers involved in liquidity planning use **cash flow analysis**, in which past movements of financial resources serve as a foundation for future financial decisions, but using only this method is not adequate for safeguarding liquidity. Cash flow is calculated from line-items in financial statements, mainly the income statement. Cash flow statements have three sections:

1. Cash flows from operative activities. This is cash generated from day-to-day operations and the starting point is net income. Some adjustments need to be made to this to arrive calculate cash flows. These include:
   - Non-cash expenses are eliminated. Examples include depreciation and written-off debts.
   - Non-cash income is eliminated (e.g. write-ups, which is an increase to the book value of an asset).
   - Interest income is excluded because it is presented elsewhere in the cash flow statement.
2. Cash flow from investing activities. This section of the statement includes cash flows from activities other than those which are the company's main business activities, e.g. if a car manufacturer sells a factory, the cash flow would appear in this section of the statement, while cash from the sale of cars would appear in the operative activities section. The main components of cash flow from investing activities are:
   - outflows due to the purchase of investments and fixed assets, and
   - inflows of income from investments and the disposal of investments and fixed assets
3. Cash flow from financing activities. This section includes movements due to:
   - inflows after issuing share capital, and
   - outflows caused by the cost of finance (e.g. dividends and expense interest).

At the bottom of the cash flow statement is a number that shows the liquid funds that a company has at the end of the period and that enables predictions to be made about the company's future ability to make investments, pay off debts and distribute dividends. The result of estimating future cash flows and discounting them back to their present value is the discounted cash flow, an important figure that represents the current value of a listed corporation.

Figure 6.5 shows a simplified formula for calculating cash flows from operating activities.

Fig. 6.5 Cash flow calculation

	Profit for the year
+	Depreciation / – Write-ups
+	Increase in / – Reduction of long term accruals
=	Gross cash flow
–	Taxes on profits
–	Distribution of profits
=	Net cash flow

6.2.3 Capital Budgeting

In contrast to liquidity planning, which analyses and manages inflows and outflows of financial resources in the interest of liquidity, capital budgeting is concerned with profitability and security, and establishing whether, and to which extent, an investment is worthwhile. Investment planning is carried out before the investment decision, and after the investment has been made, investment monitoring follows.

What an investment is—the **investment concept**—can be defined in narrower or broader terms, depending on the nature of the problem or objective of the analysis. In a **narrow** sense, an investment is considered as a transformation of money into tangible assets (e.g. the purchase of a vehicle), in the **broader** sense as payments for tangible and financial assets (e.g. an investment in shares) and in the **broadest** sense an investment is understood as a term that covers all outflows of financial resources for asset-creating and non-asset-creating use. Examples of the latter are the wage costs of the workers operating a machine and payments for inventories, insurance etc.

We can distinguish between individual investments and when when procured for a common purpose, multiple investments are part of a project, and these can then be combined into an investment programme. This makes it easier for managers and other interested parties to take all dimensions of the organisational context into account when analysing investments and making decisions.

Investments can be classified according to **investment types**. There are investments that are expected to generate a financial return on the capital employed, and there are investments that are not expected to generate a return due to the goals for which the investment is being made—these investments are financed by levies on the public (e.g. taxes) or private donations. We can also differentiate between investments in real or tangible assets and finance investments, and to this we can add investments in people, which can take the form of creating new jobs, employing staff and raising the levels of knowledge and skills. The purpose of the investment can also be categorised: reinvestment, investments to replace, maintain and renew (including major repairs) assets on one hand and investments in new or additional assets, investments in modernisation and rationalisation on the other. One-off investments can be distinguished from ongoing investments.

Three questions need to be asked when making investment decisions.

- Will the investment (e.g. a machine, another company, an equity interest, acquisition) be profitable?
- Which of the various available alternatives should be chosen?
- When should an existing investment be replaced?

The quality of the investment appraisal plays a central role in making sure that the correct answers are found. The capital budgeting calculation must take into consideration the initial purchase price, incidental costs, associated monetary inflows and outflows, the lifespan of the asset and its residual value. The next step is to use this information to calculate the present value of the asset, using a realistic interest rate. It is often not easy to allocate to the asset all associated payments, nor is it straightforward to identify all possible risks. Changes in the labour market, technical progress, new legal restrictions, higher interest rates that affect financing arrangements and changes in consumer tastes are examples of risks that can influence the outcome of investment decisions.
There are in essence two **methods of capital budgeting**. Practitioners tend to prefer static methods that only take a single period into account; dynamic methods consider several periods. Static methods see all inflows and outflows of financial resources as having the same value, whereas dynamic methods are based on the concept of the time value of money, i.e. the concept that the value of future inflows and outflows is not the same as the value of identical amounts today. We discuss this further in Chap. 7.

6.3 Expenditures and Revenues

6.3.1 Definitions and Types

Expenditures and revenues can be understood as **purchases and sales in monetary terms**. In legal terms they are based on the obligation to pay for goods or services received and the right to payment for goods or services delivered. In the business world, expenditures and revenues are not the same as outpayments and receipts of payment because of the role that **credit transactions** play. Expenditures consist of outpayments, reductions in receivables and increases in debt, while revenues consist of receipts of payment, increases in receivables and reduction of debt. Only in the case of payment on delivery does expenditure match outpayment, and revenue match payments received—this is the case when we buy something form a shop and pay with cash, for instance. However, credit transactions are much more common in the business-to-business world and expenditures are incurred without a corresponding payment (e.g. purchases on credit) and revenues are generated without payment being received (e.g. sales on credit).

See Fig. 6.6 for an overview.

Payment transactions:	Payments made	Payments received
Credit transactions:	+ Decreases in receivables	+ Increases in receivables
	+ Increases in liabilities	+ Decreases in liabilities
	= Expenditures	= Revenues
Exceptions:	Payment made = Revenue (e.g. repaying a loan)	
	Payment received = Expenditure (e.g. taking out a loan)	

Fig. 6.6 Characteristics of expenditures and revenues

6.3.2 Finance Calculations

Finance calculations are prepared for payments made and received, expenditures and revenues, credit transactions, including liabilities and receivables related to tangible assets, and allowances from the transfer without payment of financial or tangible means. Finance calculations are different to liquidity and earnings calculations:

- Liquidity calculations are concerned with maintaining financial equilibrium over a short-term (usually up to a year) in a way that makes economic sense.
- The aim of earnings calculations is to ensure the success of capital investments, mainly by showing the inflows and outflows over the period that starts with the first payment received and ends with the last payment.

Dealing primarily with **finance requirements** and their **financing**, finance calculations' aim is to find the optimal capital structure, which is one that incorporates the optimal relationship of equity and debt capital, taking into account the three goals of liquidity, profitability and security. It will be remembered that security is concerned with protection against insolvency and the ability to keep business-related processes up and running over time.

Financing and capital budgeting analyses provide the foundations for **internal decisions** on:

- the proportion of equity to debt capital (cf. the discussion of the leverage effect in Chap. 5),
- the need for capital as business activities expand, and
- the possibilities of external and internal sources of financing.

The analyses are of no less interest to **external providers of capital** (shareholders, investment funds, credit institutions, pension funds, insurance companies) because they allow judgements to be made on earning capacity, credit-worthiness, debt coverage and growth.

In most management literature, finance calculations generally focus on the capital need and the capital ratios of **profit-earning companies**, distinguishing between one-off and continuous capital needs. When determining capital requirements for the one-off procurement of an asset, the following expenditures may need to be taken into consideration:

- design, development and trials,
- market analyses,
- the initial costs of forming a company (legal fees, registration costs etc.),
- raw materials and bought-in parts (enough to meet minimum inventory levels, reserves of sufficient consumables to enable production to proceed without interruption),
- establishing organisational structures and building up relationships with suppliers and customers,
- wages and other forms of compensation,
- marketing, from setting up web-sites to package design and PR, and
- covering start-up losses.

The sum of all relevant expenditures represents the **one-off capital requirement.**

Continuous capital needs are calculated by multiplying daily expenditures on wages, materials, services etc. by the cycle time in days or the costs of the capital tied up in the production process. The forecast expenditures of one day are based on the planned operating rate and expenditures per output unit.

Managers use the cash conversion cycle as a tool to manage working capital, i.e. the financial resources an economic agent has on hand—see Fig. 6.7.

Traditional business management books typically ignore the finance requirements of any economic entity that is not a firm. The financial requirements of private households, non-profit old people's homes, hospitals, museums, public broadcasters, state and municipal administrations have much in common with those of companies, but each type of economic agent has aspects that are specific to it because particular requirements can have many origins: the promotion of health, the fair distribution of national wealth, human dignity, charity, sustainability, the ecological use of resources, social policies and so on.

Finance calculations have two main tasks: they must determine one-off and recurring finance requirements, and how they can best be covered. In this respect, it is helpful to split financial management activities into structural and procedural financing.

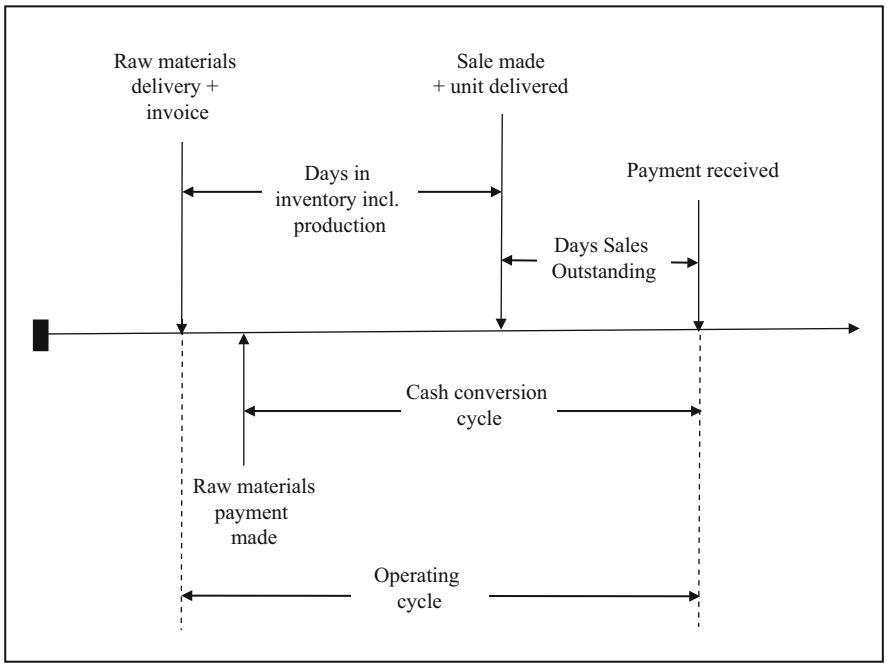

Fig. 6.7 Cash conversion cycle

Structural financing involves activities related to equity, debt and allowance financing. The first two areas are analysed intensively in traditional business management literature, but the third one is neglected. It is of importance when financing shortfalls are covered by finance allocations (e.g. from the government), investment contributions, capital grants, subsidies or other contributions from third parties to the acquisition of assets.

Procedural financing comes from sales revenues, income and tax contributions. Businesses focus mainly on managing turnover, because the existence of sales revenues that are not directly needed to make payments opens up decision-making possibilities in the areas of depreciation, rationalisation, accruals, financial restructuring and self-financing through retained profits. When companies debate how they should finance themselves, they can take into account all forms of income, including income subsidies and non-operational income. The same applies to households and other economic agents. Associations are either predominantly financed by from membership fees or social contributions from employers and employees. Public administrations mainly finance themselves through charges on the public, like taxes, fees and duties.

Figure 6.8 provides an overview of all forms of financing, not just those relevant for firms.

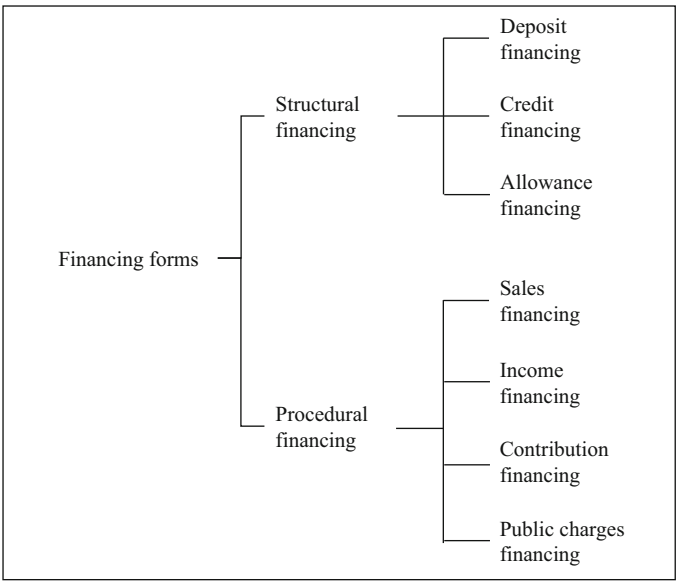

Fig. 6.8 General forms of financing

6.4 Expenses and Income

6.4.1 Definitions and Types

When expenditures and revenues are related to one accounting period, they become—in accounting terms—expenses and income. They then form the basis of the earnings calculations used to determine performance during that accounting period.

It is important to identify the various type of income that can flow into a company and the various types of expenses that flow out. The income that is received in exchange for goods sold or services rendered as part of the organisation's primary business activities is sales revenue or operating income. Operating expenses are incurred to purchase the goods and services that are needed to produce the organisation's main output. There is generally a close relationship between operating income and expenses in profit-earning companies, but this may not be the case for other types of economic agent that provide services without charging for them (e.g. non-profits).

There are several ways in which we can categorise expenses and income that occur in a given period. The first of these is based on how they are categorised from an accounting point of view:

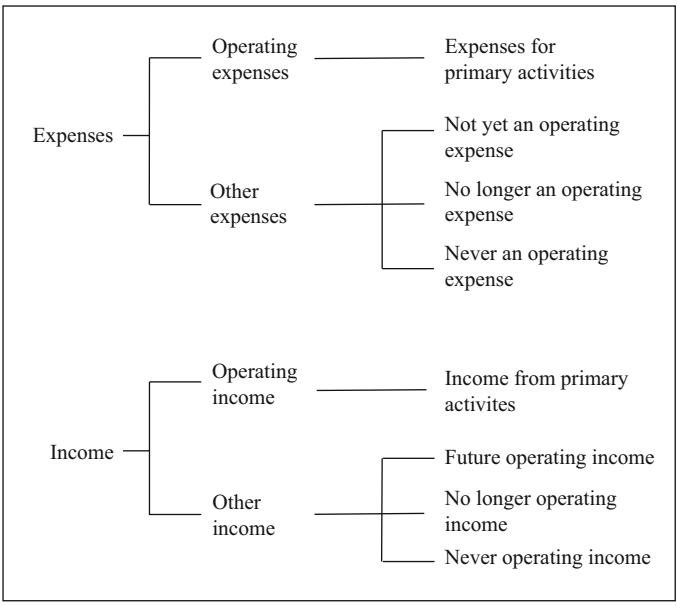

Fig. 6.9 Types of expenses and income

- Future operating expense: when a company buys parts from suppliers for later use. These parts are assets.
- No longer an operating expense: payment for goods that were used in a previous period. This is a reduction of liabilities.
- Never an operating expense: taking money out of cash for private use.
- Future operating income: payment in advance by customers. This is an asset.
- No longer operating income: customers pays debt for goods/service received in previous period. This is a reduction in receivables and increase in bank.
- Never operating income: adding more owner's equity.

Figure 6.9 summarises this.

Companies and other organisations make a **breakdown** to be in a position to measure earnings over a given period. A distinction is made between operating expenses and income and other types of expenses and income, which are called neutral expenses and income in the German-speaking world, while in the Anglo-Saxon world they fall into the general category of non-operating expenses and income. This is the basis of our second categorisation.

There are four categories of non-operating expenses:

- non-operating (i.e. expenses for activities other than the company's primary business activity),
- accounting period-unrelated (e.g. additional tax charges),

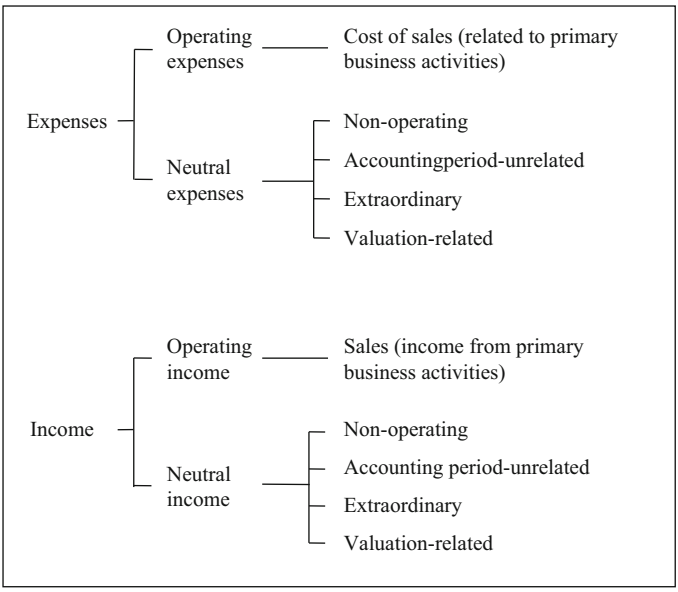

Fig. 6.10 Categories of expenses and income

- extraordinary (e.g. fire damages), and
- valuation-related (e.g. special depreciation due to fiscal regulations).

Non-operating income can be categorised similarly:

- non-operating (e.g. profits from equity investments),
- accounting period-unrelated (e.g. tax refunds),
- extraordinary (e.g. sale of fixed assets above net book value), and
- valuation-related (e.g. valuation of capitalised company-produced assets).

Figure 6.10 provides an overview of these categories.

Differentiating between operating and non-operating income is not always straightforward. For example, if an airline states it is making an operating loss, this would normally be taken to mean that that it is losing money in its primary activity of flying people from A to B. It can compensate the operating loss either completely or in part by selling services (e.g. on-board articles, servicing aircraft of other companies, catering and through foreign currency earnings) and by disposing of assets. But where does the border lie between core and non-core business, i.e. between the results of operating and non-operating activities? With single-product firms the border is much easier to identify.

Expenses and income are not necessarily expenditures and revenues in the same period, so a differentiation can be made according to whether or not expenditures and revenues are connected to the operating result, as Fig. 6.11 shows.

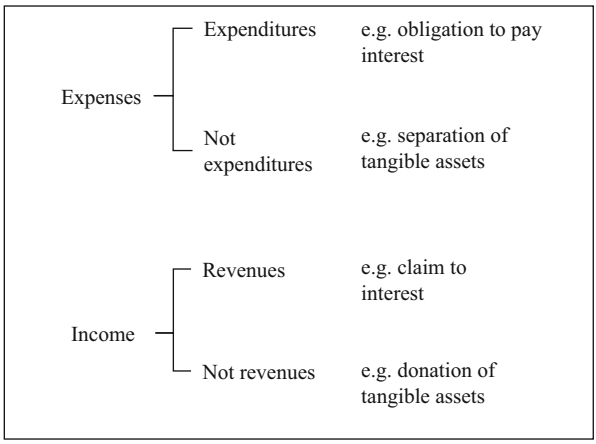

Fig. 6.11 Differentiating expenses and expenditures, income and revenues

6.4.2 Earnings Calculations

The types of expenses and income described in the previous section are used for earnings calculations which produce the income statement (often referred to as a profit-and-loss statement), the operating income statement and the non-operating income statement. The results of these statements change depending on how inflows and outflows of financial resources are classified.

The **income statement** contains all the expenses and income of an accounting period and is one of the three core financial statements that all companies use as a basis for financial management; the others are the balance sheet and statement of cashflows. Joint-stock companies must put their financial figures into context by adding notes and managers' comments about the line items in the financial statements. It is expected that they mention risks and significant developments that have influenced or may affect the company. There will be an analysis of the company and its performance, discussion of its fields of activity, and a look to the future. Bell Canada's 2016 annual report is typical; the management's discussion and analysis section is over 80 pages in length, while the financial statements themselves take up only six pages.

Two forms of income statement exist: total cost format and cost of sales format. In the former, all income items (sales revenues, capitalised company-produced additions to plant and equipment, and other operating income) and all expenses are grouped together, while the latter presents sales revenues and the costs of production, distribution and general administration. Most US companies, for instance, prefer the latter and this raises an important point: the format chosen for income statements depends on accounting standards, national legislation, company tradition and policies, and what stakeholders expect. Deutsche Telekom, as a German company, must provide its financial statements in a form that conforms to German GAAP (Generally Accepted Accounting Principles). In the case of the income statement, they use the

total cost method, which takes as a starting point total operating performance of the period (sales ± changes in inventories) and then subtracts the relevant costs. Deutsche Telekom changed to this form of presenting their income statement in January 2016, having previously used the cost of sales format.

Both formats are depicted in Fig. 6.12. They meet the requirements of Article 275 of the German Commercial Code (Handelsgesetzbuch—HGB).

No matter which format is used, the end result will be the same, as the example in Fig. 6.13 shows.

The size of expenses and income depends on the valuation of assets (influenced by depreciation, stocks of raw material etc.) and rating of liabilities (e.g. accrued remaining amounts). The balance on an income statement represents an **annual surplus or deficit**, often referred to as **net income**. The surplus is used to build up earnings reserves or to cover an annual deficit from the previous period. If a surplus or a deficit carried forward from the previous period is included, the result is a **net surplus** (a balance sheet profit) that could, for example, be distributed, or a **net deficit** (a balance sheet loss).

Shown in Fig. 6.14, which is based on the multiple-step format of the income statement, is where the annual surplus or deficit come from and how they are dealt with. *Other income* refers to income over and above sales revenues, e.g. income from equity investments and interest income. Similarly, *other expenses* include items such as labour costs, depreciation, interest expenses and taxes.

With increasing internationalisation and the need to compare the performance of firms, the published financial results of joint-stock companies nearly always show the following indicators of performance:

- EBIT—earnings before interest and taxes, and
- EBITDA—earnings before interest, taxes, depreciation and amortisation.

They are used because they eliminate the effects of capital structures and the effect that different national tax regimes have on profits. EBIT is also known as the **operating profit** or **operating income**; it is however not an official GAAP financial measure so should be interpreted carefully.

As Fig. 6.15 shows, EBITDA is a narrower measure of company performance than EBIT. EBIT indicates a company's earning power, while EBITDA is a cash flow value that indicates the fiscal claim of shareholders and the possible financing of replacement investments.

One of most popular measure for comparing the performance of listed companies is the price/earnings (P/E) ratio as shown in Eq. (6.1).

$$P/E\ Ratio = \frac{(Market\ price\ per\ share)}{(Earnings\ per\ share)} \tag{6.1}$$

Equation 6.1 P/E Ratio

Total Cost Format	Cost of Sales Format
1. Sales revenues	1. Sales revenues
2. Increase or decrease of finished goods and work in progress	
3. Other company-produced additions to plant and equipment	
4. Other operating income	
5. Material expenses	2. Production costs for the outputs realized in order to generate the sales revenues
a) Expenses for raw materials and supplies	
b) Expenses for procured goods and services	
6. Labour expenses	3. Gross result from sales
a) Salaries and wages	
b) Social levies and expenses for pension schemes and for support	4. Distribution costs
7. Depreciation	
a) On intangible assets and tangible assets as well as capitalized expenses for start-up and extension of business operations	
b) On current assets, as long as the depreciation exceeds the common depreciation in the limited company	5. General administration costs
	6. Other operating income
8. (7.) Other operating expenses	
9. (8.) Income from equity investments	
10. (9.) Income from other shares and loans	
11. (10.) Other interest and similar income	
12. (11.) Depreciation on finance assets	
13. (12.) Interest and similar expenses	
14. (13.) Result from ordinary business activities	
15. (14.) Extraordinary income	
16. (15.) Extraordinary expenses	
17. (16.) Extraordinary result	
18. (17.) Taxes on revenue and income	
19. (18.) Other taxes	
20. (19.) Profit for the year / loss for the year	

Fig. 6.12 Structure of income statements

Total Cost Format		Cost of Sales Format	
Total operating performance	12	Sales revenues	9
i.e. Sales revenues	9	– Expenses	5
± Changes in inventory	3	i.e. Production expenses	8
– Production expenses	8	± Changes in inventory	3
= Net income	4	= Net income	4

Fig. 6.13 Two income statement formats

	Sales revenues
+	Other income
–	Materials expenses
–	Other expenses
=	Annual surplus / deficit
+	Surplus carried forward / – deficit carried forward
+	Transfer from reserves
–	Allocation to reserves
=	Net surplus / deficit

Fig. 6.14 From annual surplus to net surplus

For example, a share price of 80 € and a profit of 10 € per share results in a P/E ratio of 8. Financial analysts use the P/E ratio to judge how a company's performance has changed over a given period and also to compare the value of companies with one another. The average P/E ratio varies strongly between individual industries.

Company valuations are required when the firm is affected by an acquisition, a merger, dissolution, an expropriation and or when it needs to be restructured. Valuations are also needed for analyses of creditworthiness and may sometimes be required by tax authorities. It soon becomes evident when performing an evaluation that book values as seen in the balance sheet do not reflect the overall worth of a concern, so other tools are needed.

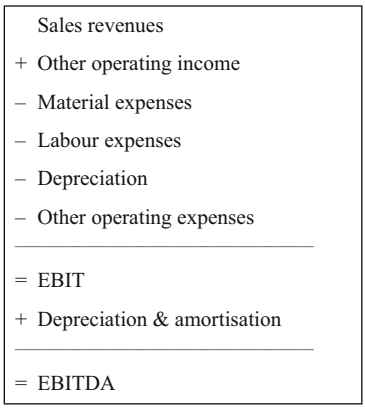

Fig. 6.15 EBIT and EBITDA calculation

The **net asset value method** is based on the assumption that a solvent company could sell off its assets and pay its liabilities. The valuer works on the basis that she is trying to construct an identical company and calculates the reproduction or reconstruction cost value for the necessary working assets, taking only the items that can be included in the balance sheet and valuing them at market value. The **earning capacity value method** is based on profits. Using past returns (often the average of the last 5 years) a value is calculated, with certain assumptions about company lifespan and the typical rate of interest. Both approaches are combined in the **average value method**, where the company's estimated value is half of the value of its net assets plus half of the value of its earning capacity. A fourth method is the **market value approach**, which uses the sale of comparable companies as a basis of calculation. Of course, it may be difficult to find comparable companies when trying to put a value on a large and complex one.

Other values may be taken into consideration during negotiations for the sale of a company. The **liquidation value** of assets represents what they can be sold for when the seller is under duress—the assets have to be sold quickly so are not exposed to potential buyers for a long enough period. The **going concern value** of a company is the value of a company as an operating venture and includes goodwill.

The **operating income statement** shows the earning power of the core business. Transactions that affect this statement need to be charged to the appropriate accounting period, using **accruals**. Accruals are adjustments for revenues that have been earned or for expenditures that have been incurred but have not yet been recorded in the accounts. For example, the supplier of household water used staff and resources to provide water in December. However, the meters are only read in January, so the company needs to show that it earned incomes in December, even though it only received payment in January—operating income needs to be charged to the correct accounting periods. The operating result is the bottom line of a statement of operating income statement, as it captures a company's performance

in a single accounting period that is one of the many accounting periods that make up the lifetime of the company.

Even though the **statement of non-operating income** is viewed by some people simply as a 'nice to have', it very often performs an important function because it permits analysts to see the extent to which non-core activities contribute to a company's overall financial performance. Income from financial activities (e.g. buying and selling shares or bonds), for example, can contribute considerably to the overall performance of an industrial company and in certain circumstances make up for disappointing results in the core business.

6.5 Costs and Outputs

6.5.1 Terms and Types

Costs and revenues are usually paired with each other in everyday language, reflecting a monetary relationship. Two German authors are well known in their own country for their pioneering work on the definitions of these two concepts. Following Eugen Schmalenbach's (1873–1955) **value-based definition**, costs are understood as the value of the resources that are consumed to produce an output and revenues measure the value of the outputs produced in monetary terms. At the heart of this definition is the understanding that factors of production are employed, used, transformed or consumed and combined in the process of producing the (tangible or intangible) good. Both what goes into the transformation process and what emerges is measured in monetary terms. The values that are given to the inputs depend on the accounting purpose and can be stated in nominal or real terms, they can be historic or predictive, orientated to monitoring or planning, and intended for an internal or external audience.

Schmalenbach's definition leads to ambiguity, so Helmut Koch (1919–2015) tried to bring clarity with his **payment-based definition**. He treats costs as payments for the factors of production that are employed in operational processes and, correspondingly, sales revenues are payments received for goods sold. However, even though valuation problems are rarely an issue, the value-based definition has proved to be more useful in practice because it makes it possible to align valuations with the various accounting purposes and thereby differentiate between them. In addition, the terms *operating expenses* and *operating income* essentially cover Schmalenbach's understanding of costs and revenues. In the medium term *costs* become identical with *expenditures*, and *revenues* with *income*, while over the longer term *costs* become *outpayments* and *revenues* become *receipts of payment*.

This view however leads to a new and complex problem. No matter how we define *costs* and *outputs*, we always express them in terms of money and only with reference to the economic agent involved. A significant consequence and weakness of this is that the only costs which are included in income and other financial statements of the economic agent are its own costs: demands placed on third parties

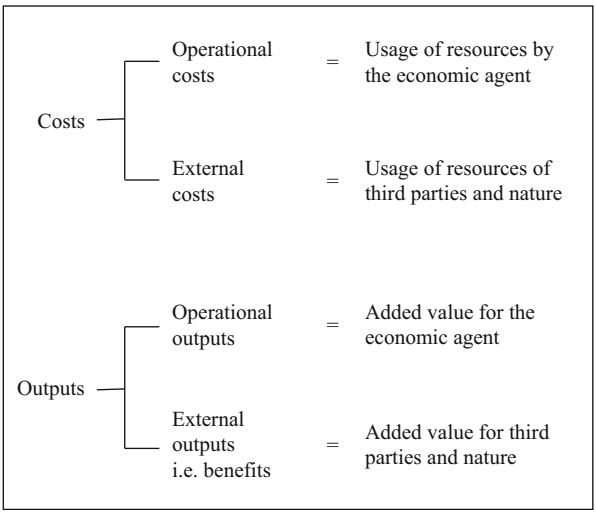

Fig. 6.16 Categories of costs and outputs

and nature (earth, water, air and space) are ignored. More equitable would be a **division of costs** into operational and external. Viewed this way, costs represent in general the values of the inputs necessary to produce tangible and intangible goods. Operational costs are carried by the economic subject and reflect the values of the factors of production that have been consumed to produce the output.

To simply treat operational costs as the counterpart of sales revenues (as understood in both the value-based and payment-based definitions) is insufficient, because the outputs of many economic agents are not intended for sale (thereby generating sales revenues), nor are they measured in monetary terms. Voluntary work, religious activities, domestic work, basic research, administrative acts by the state, internal and external national security, unused capacity, the implied warranty offered by public authorities and jurisprudence are examples of this. Just like the products and services of commercial organisations, they are the outputs of operational activities and can be measured both qualitatively and quantitively. They represent value added to their inputs, measured in monetary or non-monetary ways (such as appreciation). We therefore propose a **division of outputs**: in a narrower sense, outputs as tangible and intangible goods produced through operational activities, and in a broader sense, outputs that generate positive external effects or benefits, such as better education, health or security, improved infrastructure and increased quality of life.

Figure 6.16 shows this categorisation of costs and outputs. Internal cost accounting is concerned with operational costs and outputs, whereas external cost-benefit-analyses deal with what happens externally.

We now look at operational costs in more depth. Depending on which factors of production are employed, different **cost types** arise, such as personnel costs, costs of capital, material costs including depreciation, costs for maintenance and repairs, costs for energy, costs for services and rights of third parties and environmental

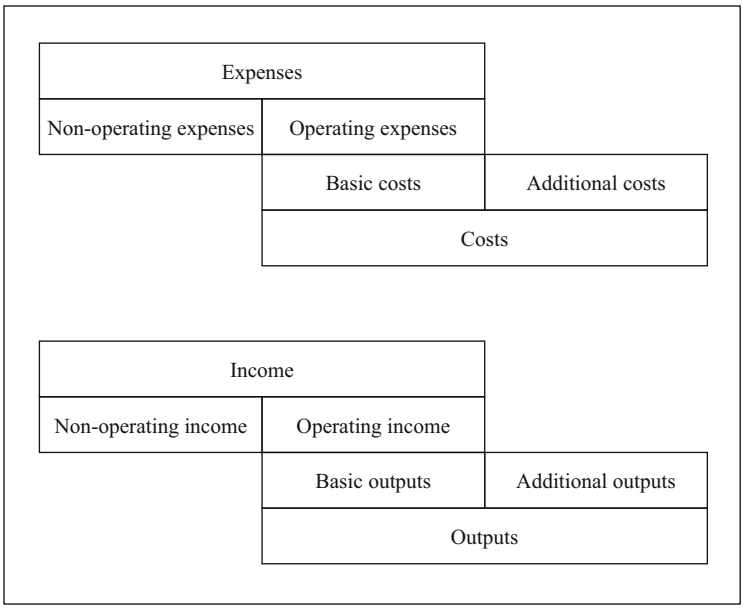

Fig. 6.17 Categories of costs and outputs

costs. (We are not concerned here with resources that can be used for no charge, of which nature is often one of the most important ones.) **Basic costs** are the expenses that are necessary for operations. In contrast, **additional costs** do not represent expenses, but rather lost income as they are the opportunity costs that a firm gives up when using its factors of production; for example, a company could rent or sell its property rather than using it for the production of goods and services. These costs are not recorded in any financial report.

Different **output types** can also be identified. The operational output of a company comprises sales revenues (from the sale of products, i.e. output for the market), the increase in stocks of finished goods and work-in-progress (i.e. output for stock) and internal outputs (e.g. machines or vehicles produced by the company for its own use, which are valued at the cost of production). Gains from equity investments are not outputs for an industrial company, but non-operating (neutral) income. Free-of-charge goods and services however are output; they contribute to reaching substantive goals. Outputs produced to generate operating income are **basic outputs. Additional outputs** have no corresponding income and are therefore not included in the income statement; an example of this is a product that is given away. Free-of-charge goods and services are always by definition additional outputs.

Eugen Schmalenbach's schema (Fig. 6.17) shows the various categories.

How can we measure efficiency? Efficiency is an expression of the relationship between output and input, so when we want to measure economic efficiency, we must calculate the **ratio of costs to outputs.** It is necessary to be specific when

defining the numerator and denominator; we can measure per unit, per product type or programme, per workplace, department or area of production and/or over a specific period. Denominator and numerator can be expressed in terms of quantity, of value or by a mixed approach. A quantity ratio provides information on the productivity (technical efficiency) of the processes involved in the production of goods and services. Since costs are always expressed in monetary units, using quantity as a denominator tells us the quantity of the factor of production that was used. The relationship of quantity-based outputs to costs is cost efficiency. The reverse relationship, e.g. sales to number of employees, provides information about the revenues generated per unit of that specific factor of production.

Many ratios are used to measure economic efficiency. Two of the most significant are **planned and actual costs** and **planned and actual outputs**. Figure 6.18 shows some of the more common ratios used by managers.

6.5.2 Cost Accounting

The tasks of cost accounting are generally stated to be: (i) **cost planning** to aid decision making about what should be done in the future, (ii) the **cost management** of current activities and (iii) **cost monitoring** (German: *Kostkontrolle*) which continuously reviews actual costs against planned costs and identifies measures that should be taken when there is a discrepancy. Since costs always stand in relation to outputs, cost accounting of necessity involves **output planning**, **output management** and **output monitoring**. The distinction between cost accounting and management accounting is not a clearly defined one in English as the definitions of each of them are somewhat imprecise. For us, management accounting is the generation of accounting information to facilitate decision making by managers, and cost accounting provides information specifically about costs. Cost accounting can therefore be viewed as a subset of management accounting.

Questions to which cost accounting provides answers include: How much do actual costs deviate from planned costs? Are the causes of differences to be found in planning activities or in the production process? Make or buy—does it more economic sense for a company to produce itself some or all of goods and services it needs for its own operations, or should they be bought in? Which option is the most cost-effective: purchase, rent or lease? How do cost changes affect the range of products and services offered? What effects do changes in the capacity utilisation rate of assets have on cost structures (e.g. in terms of fixed and variable costs, total and marginal costs)? What is the optimal size of a company from a costs point of view? What is the relationship between job lot size and costs? What is the lowest price for an individual product? Which cost increases are to be expected when external costs are included (i.e. when social and ecological costs are internalised rather than externalised)?

The information needed for future decisions and analysis of past and present decisions is obtained by collecting and recording costs, and then by allocating them. One must identify which costs occur (cost types, e.g. staff, energy), where they

Max ! $\frac{\text{Outputs}}{\text{Costs}}$ Min ! $\frac{\text{Costs}}{\text{Outputs}}$

$\frac{\text{Actual output}}{\text{Planned output}} \times 100 \geq 100\%$ $\frac{\text{Actual costs}}{\text{Planned costs}} \times 100 \leq 100\%$

Quantity-based approach:

Productivity = $\frac{\text{Output quantity}}{\text{Factor input quantity}}$

Value-based approach:

Profitability = $\frac{\text{Total costs}}{\text{Sales revenues}} \times 100$

Mixed approaches:

Cost efficiency = $\frac{\text{Output volume}}{\text{Costs}}$

Factor output = $\frac{\text{Sales revenues}}{\text{Number of personnel}}$

Staff performance = $\frac{\text{Number of meals}}{\text{Number of kitchen}}$

Productivity of transport company = $\frac{\text{Passenger-km (paid)}}{\text{Number of personnel}}$

Various (in percentages) $\frac{\text{Personnel costs}}{\text{Total costs}} \times 100$

$\frac{\text{Costs of administrative staff}}{\text{Personnel costs}} \times 100$

$\frac{\text{Costs of energy}}{\text{Total costs}} \times 100$

Staff turnover = $\frac{\text{Replaced leavers}}{\text{Average number of}} \times 100$

Disposal rate = $\frac{\text{Disposal costs}}{\text{Costs of production}} \times 100$

Waste rate = $\frac{\text{Waste volume}}{\text{Product volume}} \times 100$

Packaging ratio = $\frac{\text{Packaging weight}}{\text{Sales weight}} \times 100$

Water efficiency = $\frac{\text{Water volume}}{\text{Product quantity}} \times 100$

Level of activity = $\frac{\text{Actual output}}{\text{Planned output}} \times 100$

Capacity utilisation = $\frac{\text{Actual output}}{\text{Attainable output}} \times 100$

Fig. 6.18 Examples of financial ratios

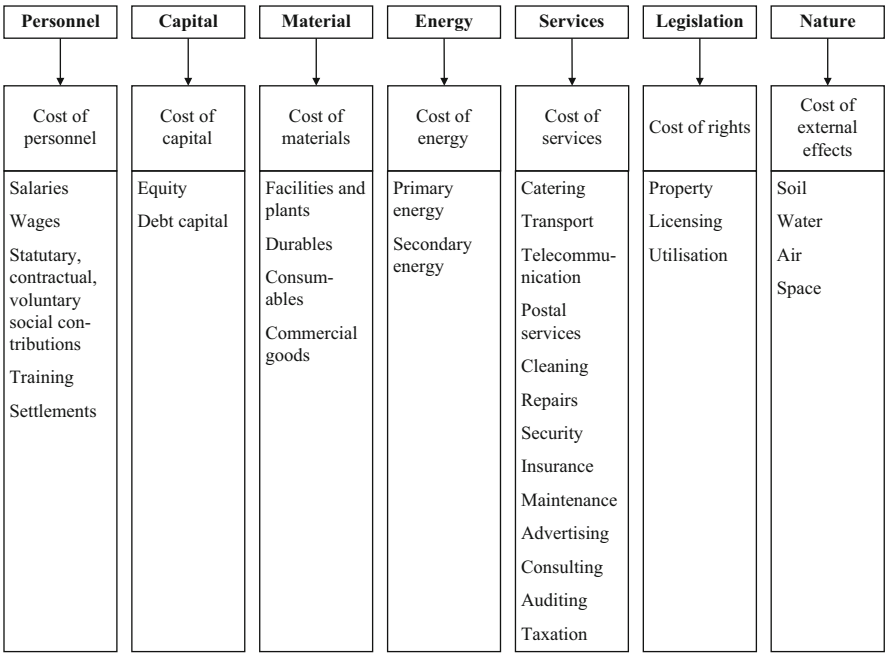

Fig. 6.19 Factors of production and cost types

occur (cost centres) and for what (cost units, which are the units of service or products for which costs can be ascertained—the appropriate cost unit depends on the industry and what is being measured, e.g. passenger km. (transport companies), chair (furniture manufacturer)). Cost accounting then consists of **cost type, cost centre and cost unit accounting**. The first two generate the overhead allocation sheet, while the latter involves calculating the costs of goods sold or to be sold.

Various ways of categorising cost types exist. In Fig. 6.19 we show a scheme based on the factors of production (see Sect. 5.2.2).

A **uniform system of accounts** is a list of accounts which is used to record financial and operating transactions (including costs). In some countries, including Germany, systems of accounts for a particular industry are determined by an outside body. In Germany, the Bundesverband der deutschen Industrie (BDI, Federation of Geman Industry) has established such systems for industrial companies. They provide a framework that can be adapted to better meet individual requirements; each company develops its own unified system which includes the accounts necessary to capture the costs associated with the various cost types, as illustrated in Fig. 6.20, which shows a typical uniform system of accounts as seen in practice.

We can also classify cost types based on operational activity, cost allocation, origin and cost behaviour pattern as illustrated in Fig. 6.21.

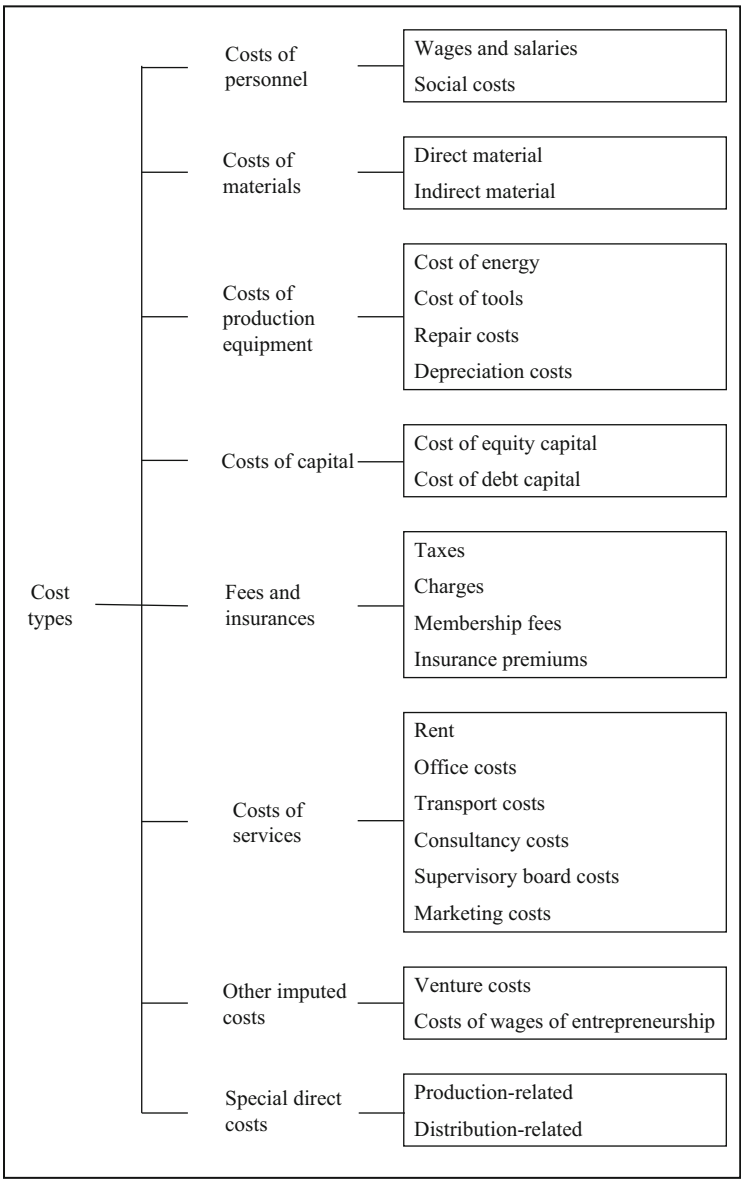

Fig. 6.20 Chart of accounts

The goal of a **cost centre plan** is to make it possible to assign costs to a particular department which is then made responsible for the costs. This makes it easier to manage costs because their sources are easier to identify, thus avoiding confusion. Individual cost centres can be grouped on the basis of the organisation's activities, allowing for bigger picture of the origin of costs to merge. Operational

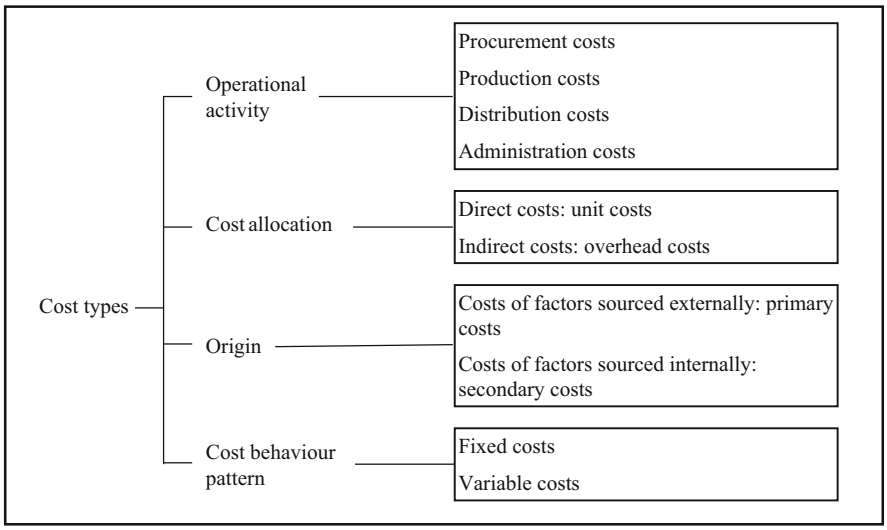

Fig. 6.21 Further categories of cost types

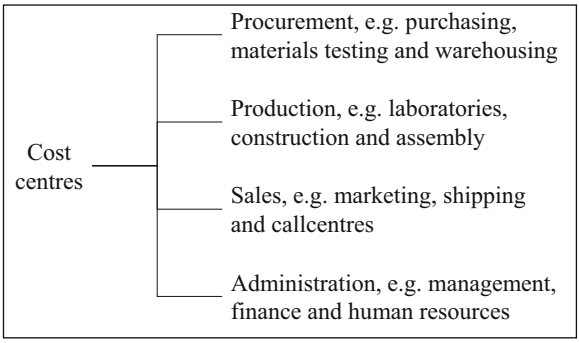

Fig. 6.22 Cost centres

functions serve as a basic structure, with relevant departments being defined as cost centres, as shown in Fig. 6.22.

Cost centre accounting allocates costs that have been recorded according to cost type to cost centres. Since cost centres are more or less closely connected to cost units, they are allocated to *final cost centres* for the output produced for customers, and to *preliminary cost centres* for preliminary inputs like purchased materials and services from other firms. Final cost centres can be divided further into *primary cost centres* for the actual operational output, the costs of which are directly allocated to the cost units (i.e. to their products or services) through cost unit accounting, and into *secondary cost centres*. Primary cost centres record costs, such as those of operating resources, that accrue constantly, and secondary cost

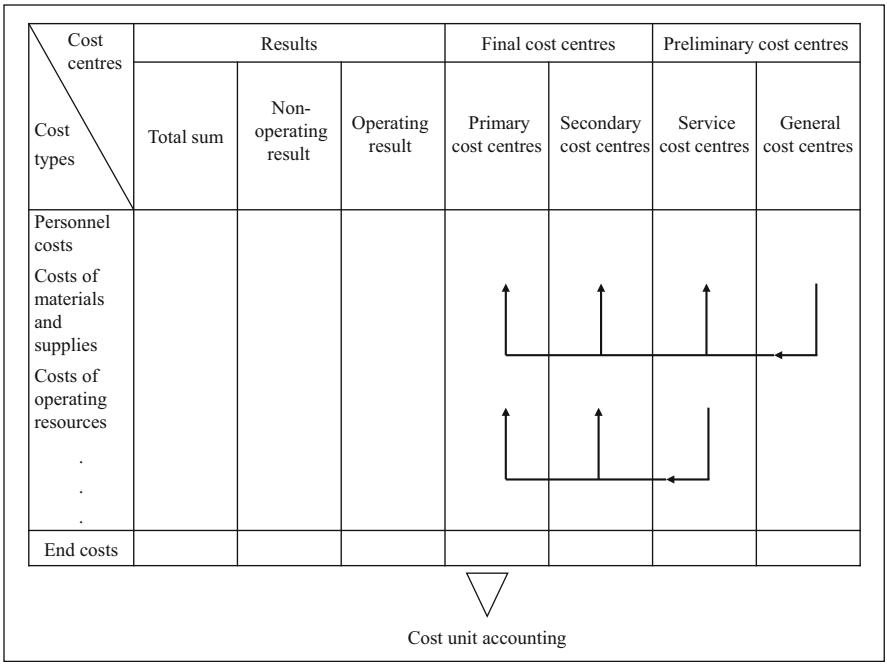

Fig. 6.23 Basic structure of an overhead allocation sheet

centres record non-operating costs that should be allocated to other areas. Preliminary cost centres comprise (i) *service cost centres* that do not transfer costs directly to the cost units, but rather to one or more final cost centres on the basis of what was actually done (e.g. number of hours worked or kilometres driven), and (ii) *general cost centres* whose output is used by other cost centres; they are therefore actually *overhead cost centres*. With the help of allocation formulas, the costs are initially allocated to the general cost centres and then via service cost centres to the final cost centres according to the step-ladder method. The primary cost centres create the link to cost unit accounting.

Figure 6.23 shows the structure and method of cost allocation, with the arrows indicating the flow of allocated costs.

The task of **cost unit accounting** is to allocate the costs incurred by the production of goods and services to the output according to the principle of causation, i.e. costs are allocated on the basis of where they originated. Cost units come into existence either because of external orders (from customers or distributors) or internal orders (for internally produced outputs that can be capitalised like plant and equipment, or in-house goods and services like repairs and other activities that form general overhead and which cannot be capitalised). The costs extracted from the overhead allocation sheet serve to calculate the production costs and cost price per unit or order: this process is referred to as **unit-of-output costing** (other terms are *output cost accounting*, *product cost accounting*, *cost price accounting* or simply *costing*). The

cost price is (or expressed differently, the prime costs are) the lower price limit (i.e. the break-even price) and creates the basis for the quotation price or, in more general terms, the pricing policy. Costing is based on the assumption that operations have been recorded (e.g. in terms of number of units or hours). When the sales revenues per product unit or cost unit are known, unit-of-output costing can be extended to generate a unit-of-output profit statement.

Two main forms of costing methods exist, with the one chosen depending on the type of production process: output costing and job order costing. Output costing is common when there is mass production of uniform products without changes in stock (single-stage output costing, e.g. power generation) and with changes in stock (double- or multi-stage output costing, e.g. manufacture of cement). It involves taking total costs, or the costs incurred in individual areas (production costs on the one hand, administration and distribution costs on the other hand) over a given period and dividing this sum by the number of products produced or sold during the same period, as shown in Eq. (6.2).

$$Unit\ costs = \frac{Costs}{Output} \tag{6.2}$$

Equation 6.2 Unit costs

Continuous batch production is used for products that are similar in nature (it can be found in breweries or brickworks, for example), whose costs are in a more or less fixed relation with each other. The relation of the costs of the different cost units for an identical number of units produced is expressed through an equivalence coefficient (leading to single, double or multi-staged **equivalence coefficient costing**). An equivalence coefficient of 1 for product A and 1.2 for product B means that 120% of the costs for A are incurred when product B is produced.

A further type of output costing is **joint-product costing**. This procedure is used when a production process unavoidably creates more than one kind of product. For example, the joint products of refineries are gas, petrol, oil and tar, and the joint products of university clinics are medical research, teaching and medical services. Since costing according to the principle of causation for individual joint products is not possible, it is necessary to either:

- apply averages by subtracting the sales revenues of the by-products (minus additional costs from further processing) from the total costs of the joint production and then dividing the residual costs by the volume of the main product (the residual value-method), or
- not differentiate into main and by-products, but instead to estimate equivalence coefficients that can be used to allocate costs to the joint products (the distribution method). In practice, this is similar to the calculation of equivalence coefficients, with the difference that equivalence coefficients measure the sources of costs in batch production, whereas they measure cost carrying capacity in joint product costing.

Production of goods

Direct material costs
\+ Material overhead costs

= Material costs

Direct labour costs
\+ Production overheads
\+ Special direct production costs

= Manufacturing costs

Material costs
\+ Manufacturing costs

= Production costs
\+ Administration overhead costs
\+ Distribution overhead costs
\+ Special direct distribution costs

= Prime costs

Fig. 6.24 Cost estimate sheet for goods

Job order costing is principally employed in job (one-off) and mass production where outputs are the result of multi-stage processes with various causes of costs and continuous changes in stock. Unlike output costing, job order costing always differentiates between direct and overhead costs. Direct costs are allocated straight to cost units, whereas overhead costs are distributed on the basis of ratios which are established by, and are therefore an output of, cost centre accounting. There are two common methods; the choice is dependent on the quantities involved and the job itself. The first method—**summary job order costing**—involves relating total direct costs to total overhead costs and then calculating a costing rate. This simple technique assumes that there is a constant relationship between direct and overhead costs in all cost units, which is often not the case. **Elective job order costing** is the second method. Here, overhead cost types are grouped, with the proviso that they must be closely related to a particular type of direct cost. Once this has been done, costs can be calculated and allocated as fairly as possible using the principle of causation.

Cost estimate sheets have been developed for this sophisticated method and are in widespread use. Figures 6.24 and 6.25 provide examples for manufacturing and services.

Figure 6.26 provides an overview of the costing methods described above.

Unit-of-output costing is followed by **cost unit period accounting**. Based on accruals accounting, its task is to determine the total costs incurred in an accounting

Production of services	
	Direct costs of personnel
+	Direct material costs
+	Direct imputed costs
+	Directly chargeable services

=	Costs of producing service
+	Charge for costs of building (as % of costs of producing service)
+	Charge for other overheads (as % of costs of producing service)

=	Prime costs
+	Charge for executive functions (as % of prime costs)

=	Total costs

Fig. 6.25 Cost estimate sheet for services

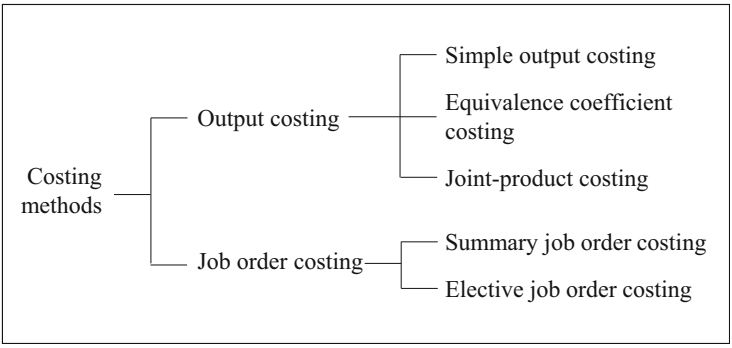

Fig. 6.26 Costing methods

period, with the costs being grouped according to type of output. While costs per unit are captured in unit-of-output costing (as its name implies), costs that arise over the given period are recorded for cost unit period accounting. If operating income from the company's goods and services is included, the cost unit period accounting statement becomes a **statement of operating result**, produced on a weekly, monthly or annual basis. The statement balance—the operating result—shows how well the company is performing in terms of its business purpose since it does not include expenses or income from non-operating activities. The operating

Basic outputs	-	Basic costs	=	Operating profit/loss
+		+		+
Additional outputs	-	Additional costs	=	Additional profit/loss
(Total) Outputs	-	(Total) Costs	=	(Total) Operating profit/loss

Fig. 6.27 Components of an operating statement

result includes income and expenses of core (basic) activities; these are calculated by financial accounting. In addition, it includes outputs and costs from additional activities; these are calculated by internal cost accounting. Figure 6.27 shows the components of an operating statement.

Two **costing systems** can be identified, with the differentiating factors being time and scope. We can identify three costings based on the different periods to which cost accounting is being applied:

- **actual costing** is used when costs have incurred in the past (actual costs = actual quantities used × actual prices),
- **normal costing** for costs incurred in the past that are calculated with average quantities and prices (normal costs), and
- **standard costing** estimates future costs with the attendant uncertainties, and allocates them to cost centres and cost units. The actual costs are recorded on a regular basis. If the costs cannot be captured directly (e.g. depreciation), a pro rata figure is used. Average actual costs then become normal costs, a process which means that large cost fluctuations do not distort costing activities. Unlike actual and normal costs, standard costs include estimates of future factor consumption (standard costs = planned quantity × planned price for the planned level of activity).

Cost monitoring in order to eliminate inefficiency involves the comparison of actual costs with target costs which, unlike standard costs, are based on actual activities (target costs = planned quantities × planned price for the actual level of activity). Cost variances are determined and their causes are analysed. The difference between standard costs and target costs reflects a variance in the level of activity.

There are two costings with different scopes: **full costing** which records all costs and allocates them to the appropriate cost unit(s), and **marginal costing** which only assigns a part of the costs to the cost units. It can be argued that full costing does not adequately capture cost causation, since fixed costs and overheads are also allocated to outputs. This is done on the basis of pre-defined rules, which means that the costs to produce a product or service depend on which rules are applied. As a result, wrong decisions may be taken for the short term when knowledge of variable or direct costs is essential. Full costing's assignment of fixed costs to outputs means that costs per unit are high when few units are produced, and that costs sink as more

Fig. 6.28 Combinations of costing systems

Scope / Period	Full costing	Marginal costing
Actual costing	✓	✓
Normal costing	✓	✓
Standard costing	✓	✓

units are produced. This information is only of limited use for the calculation of product prices, and in such a situation marginal costing is helpful because it is based on the principle of cost-causation. Instead of dealing with averages and the principle of cost carrying capacity as does full costing, marginal costing means that only a part of incurred costs is passed on to the cost unit.

With marginal costing based on variable costs (direct costing method), only the variable costs—direct costs and overheads—are allocated, since they change with the level of activity. Marginal costing on the basis of relative direct costs, as devised by Paul Riebel (1918–2001), assumes that all costs can be direct costs, depending on the chosen base. An appropriate hierarchy of bases permits any cost to be recorded as a direct cost and to be assigned to cost units.

A combination of both costing systems results in the six options shown in Fig. 6.28, all of which can be found in practice. It is by no means the case that marginal costing is replacing full costing, because total costs (with the inclusion of fixed costs and overheads) are still relevant. The type of costing that should be used depends on the business purpose, objectives and the decision to be made.

Marginal costing can be used to produce statements of operating result, commonly known as operating statements, through the inclusion of sales revenues. These are essentially short-term income statements for the production and provision of goods and services. In full costing, all costs are assigned to the cost units and the operating result equals sales revenues minus these total costs. In marginal costing the resulting balances are contribution margins for covering costs which have not yet been allocated to cost units. **Contribution costing** with variable costs and relative direct costs is another possibility, depending on the type of marginal costing. In practice, contribution costing can be done by actual costing or standard costing.

These differences are shown in Fig. 6.29. For business entities with a high share of fixed costs in the total costs (e.g. labour-intensive companies or public administrations) it is recommended that instead of applying a single contribution margin to cover all fixed costs, these should be split up and several contribution margins used in costing. The starting point of multi-stage contribution costing is the sales revenues of a product, from which are subtracted the variable costs per product (contribution margin I), the fixed costs of the product (contribution margin II), the fixed costs of the product group (contribution margin III), the fixed costs of the unit responsible for the product, such as a department or an office (contribution margin IV) etc.

Full costing	Marginal costing	
	Direct costing method	Relative direct cost method
Sales revenues - Total costs = Operating result	Sales revenues - Variable costs * = Contribution margin - Fixed costs = Operating result * including (variable) direct costs and variable overhead costs (e.g. variable production overhead costs)	Sales revenues - Direct costs = Contribution margin - Overhead costs = Operating result

Fig. 6.29 Methods of calculating the operating result

The constant increase of overhead costs in industrial as well as service companies, together with a greater customer orientation, a higher number of product versions and increasing complexity in production have raised awareness of internal performance processes and cost structures. Since contribution costing treats the major share of overhead costs as unchangeable on a short-term basis, the goal remains of determining relevant process costs in order to optimise planning and monitoring systems, procurement processes, automatisation, digitalisation, just-in-time deliveries and other value adding processes. Processes are the base of **activity based costing**, which is a form of full costing; they are the cost units. The preferred field of application is overhead costs, for the method is not as suitable for the areas of a manufacturing company that are directly involved in production. Of special interest are the triggers of processes—the cost drivers. These are the activities in cost centres that are carried out following a quantifiable stimulus (e.g. number of orders) and can be understood as sub-processes. The costs per element of a sub-process are established and the sub-processes clustered to form an overarching process (e.g. the complete process of procurement) that may span more than one cost centre. The costs of the process are then assigned to cost units (or products) based on utilisation.

The customer orientation in highly competitive buyer markets has also led to **target costing**, a method that originated in Japan. Unlike the more common costings, which take supply-led costs and prices as their basis, here the emphasis

is on demand-oriented pricing and cost calculation. The starting point is the probable target price for a company's product as determined by market research. This price is what can be reached on the market, and from it is subtracted the profit margin (e.g. a 12% return on sales). The result of this calculation is the allowable costs for the market, and these mark the long-term minimum selling price. They are then compared to the mostly higher current costs (drifting costs, standard costs) in the company with its current (and possible future) technological processes, and the target costs are derived from this comparison. Since the allowable costs are often not immediately attainable, a value is determined for the target costs which lies between the allowable costs and the drifting costs. Depending on the intensity of competition and corporate strategy, the goal is to reduce the target costs to the height of allowable costs through cost reduction measures. In essence, target costs form a moving target.

6.6 External Costs and Benefits

6.6.1 Terms and Types

The total costs of operational activities (factor procurement, production and distribution of goods and services) are regularly higher than the operational costs: the difference is made up of external costs, i.e. those that are generated outside the company. These are the social and ecological costs that represent the negative externalities caused by the operational activities. Two types of negative externalities can be distinguished: buyers' surplus and diseconomies.

Buyers' surplus is the amount of money that an economic agent is willing to pay for a factor compared to its market price because it values the benefit of the factor as being worth more than its market price. If the factor could realise a higher price if used for a different purpose, its supplier is missing out on the difference in the two prices. Whereas such a factor rent is linked to market activities and can be quantified, **diseconomies**—damage to the natural world and to people—are found outside the market. It is not easy to capture these negative externalities and even their causes cannot easily be determined since there is rarely a single one. In addition, there are the problems in measuring the size of negative externalities and even larger problems in coming up with a valuation.

The counterparts of external costs are external benefits which are the result of operational outputs and can be divided into consumers' surplus and general social benefits.

The **consumers' surplus** is the amount of money that a consumer would be willing to pay over and above the market price before giving up on the purchase of a product, i.e. deciding not to buy it. The consumer values the utility of a product more than the purchase price, or in other words, the producer offers a benefit that exceeds the market price. The difference between the two is influenced by various factors, for instance how dependent on this good the consumer is, or demand

elasticity (i.e. the extent to which demand for a good changes as the price or income changes).

Positive externalities, where third parties and nature benefit from operating activities, are a **general social benefit**. They represent the counterpart to external diseconomies. Among the third parties that can profit from operating activities are, for example, neighbours, the local economy, the community, the state, the national economy through jobs, income, research, education and advanced training and so on. As with diseconomies, it is not straightforward to identify the causes of general social benefit or to put a value to it.

6.6.2 Benefit Calculations

Benefit calculations go beyond the earnings calculations of a company as shown in its income statement; they show the social and ecological effects of operational activities. Originally developed for large national projects such as dams, waterways, highways, bridges, defence facilities and weaponry, their intention was and still is to determine if, and to what extent, commercially unprofitable investments deliver a positive net benefit. What is the optimal size of such projects and which is the best alternative? There are three types of analysis that help in this respect: the cost-benefit analysis, the cost-effectiveness analysis and the utility-value analysis. The starting point for all three analyses is a goal defined in terms of operational benefits (e.g. the improvement of the municipal traffic situation) and its sub-goals (e.g. flow volume, speed, traffic safety, noise pollution, air pollution and the safeguarding of urban planning priorities).

The purpose of a **cost-benefit analysis** is to measure all costs (i.e. operating costs and external costs) and all benefits (i.e. revenues and external benefits) and compare them with each other. Costs can include: the willingness to pay in order to prevent negative impacts (usually captured in a survey of those impacted); extra costs for those affected; damages; secondary effects (losses due to a reduction in business activity caused by the project in question or due to a reduction in the value of assets that are indirectly affected); opportunity costs. Regarding benefits, an effort is made to determine: the willingness to pay for goods and services that are not provided in return for payment; cost savings; damages that will be prevented; secondary effects (e.g. increases in the value of assets that are indirectly affected); shadow prices (values assigned to resources, goods or services for which there is no market price). In the best case of being able to express all costs and benefits in monetary terms, we obtain the cost-benefit difference or the cost-benefit ratio. Costs and benefits generally occur at different points in time, so the capital value method is used to determine values.

Figures 6.30 and 6.31 summarise the valuation methods.

If the benefits of the project under analysis cannot be measured in monetary terms, a different method is required. The **cost-effectiveness analysis** develops scales of effectiveness for the benefits on the basis of a system of goals, where each goal is given its own weighting. The costs continue to be determined in monetary

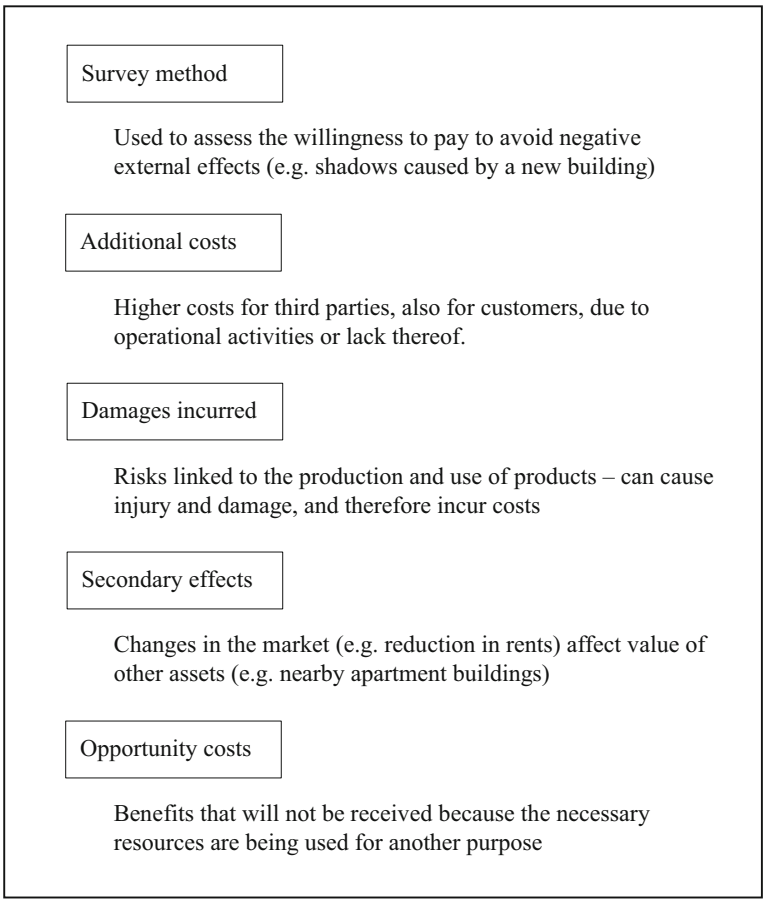

Fig. 6.30 Valuation methods for external costs

units. For example: the costs of a research project might be viewed in relation to indicators of success. In this case, success could be expressed in terms of knowledge gains, follow-up research, citation frequency and patents. Since the goals often have different dimensions, the only measures that can be excluded from the group of possible measures are those that are worse than others as far as meeting targets is concerned.

The consolidation of goals that have different dimensions into a consolidated goal—utility value—is the task of a **utility-value analysis**. It is based on measuring of individual goals, just as with the cost effectiveness analysis. According to Christof Zangemeister (1972), the starting point of a utility value analysis is to develop a hierarchy of goals. There is a main goal, and under it and supporting it are other goals (sub-goals) that are weighted in two ways—their relationship to the goal at the next level up in the goal hierarchy (node-weighting), and their relationship to

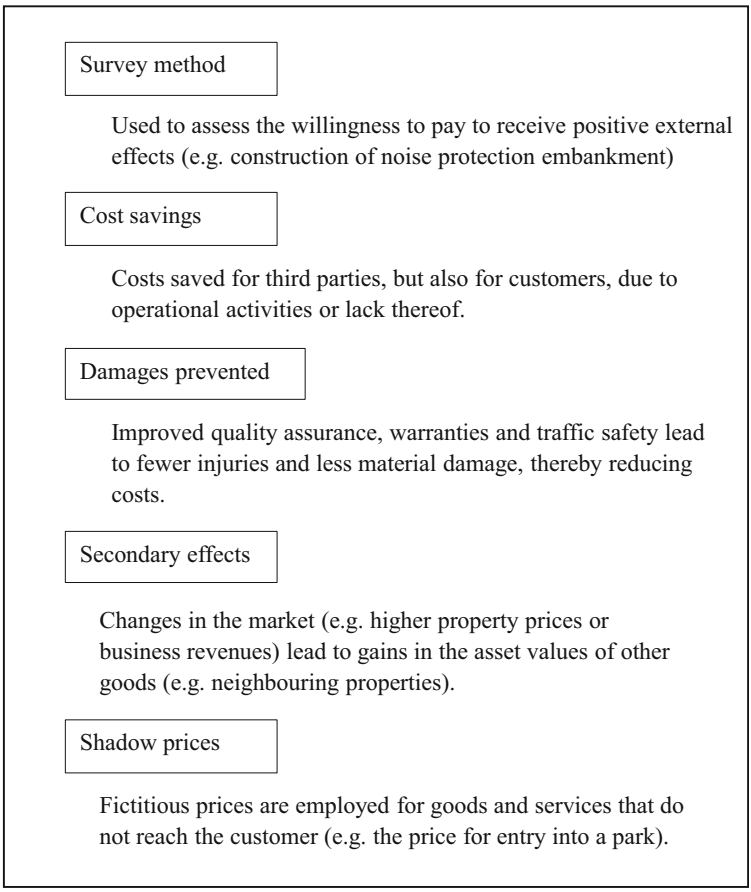

Fig. 6.31 Valuation methods for external benefits

the overall goal (tier weighting). The total for both weightings is 100. The effects on these goals of the measures being (potentially) taken are measured with the help of indicators. In the next step, alternatives are compared with each other with regard to their ability to meet goals and given a score which is then multiplied by the weightings and added to the utility value. For example, production processes can be classified according to their capital value, their technical characteristics and external effects. Each of these parameters can be divided further into other criteria. Taken together, the weighting, goal-related performance and an adequate scale result in utility values that are used to rank the alternatives.

Common to all three types of analyses is that they judge the economic efficiency of projects from an economics point of view. Consequently, categories drawn from economics are the most widely used—examples of this are: aggregated input and output volumes, factor and product prices, income, assets, and willingness to pay.

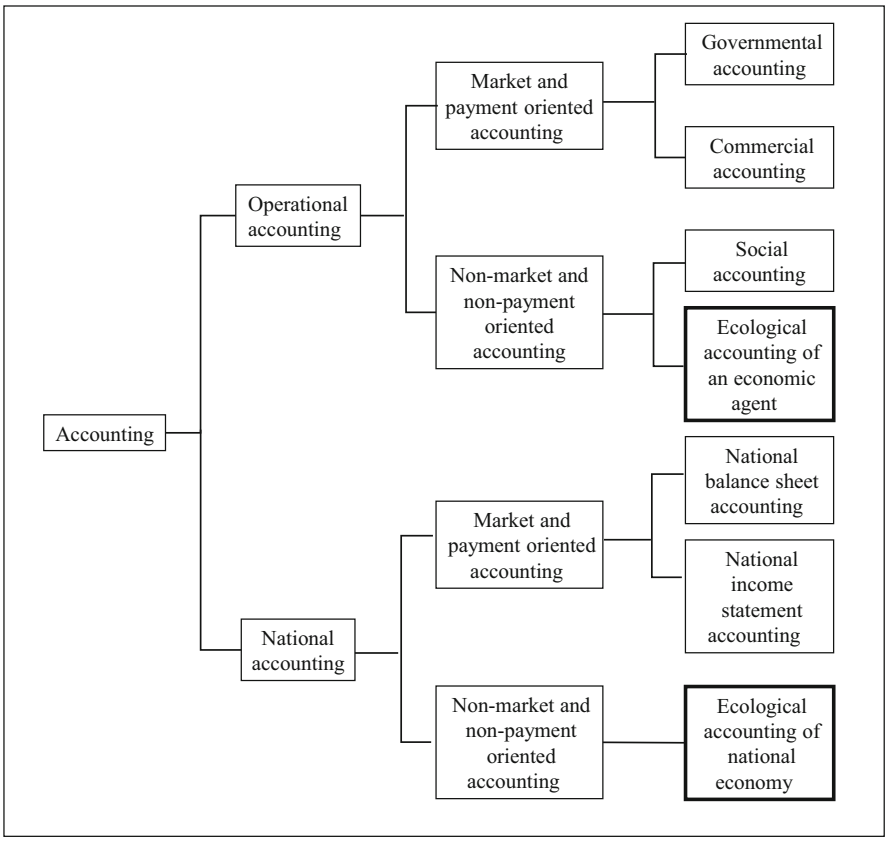

Fig. 6.32 Ecological accounting in the accounting system

Even though their methods are similar, the benefit calculations of companies and other economic agents have specific features. **Operational benefit calculations** allocate external costs and benefits to the company responsible and do not include individual or combined benefit calculations of affected third parties. External costs and benefits are those which have not already been considered by commercial accounting. Operational benefit calculations supplement commercial calculations; by no means do they replace them. Operational benefit calculations not only reflect the economic context, but also social, political, cultural, health-related and ecological effects of both a positive and negative nature. The present stage of research identifies two types of operational benefit calculations: society-related and ecology-related.

In order to show their position more clearly, Fig. 6.32 presents them in relationship to other types of accounting.

Different types of accounting in companies are shown in Fig. 6.33.

Social accounting, also known as socio-economic accounting, can be carried out on a narrow or broad basis. **Socio-economic accounting in the narrower sense**

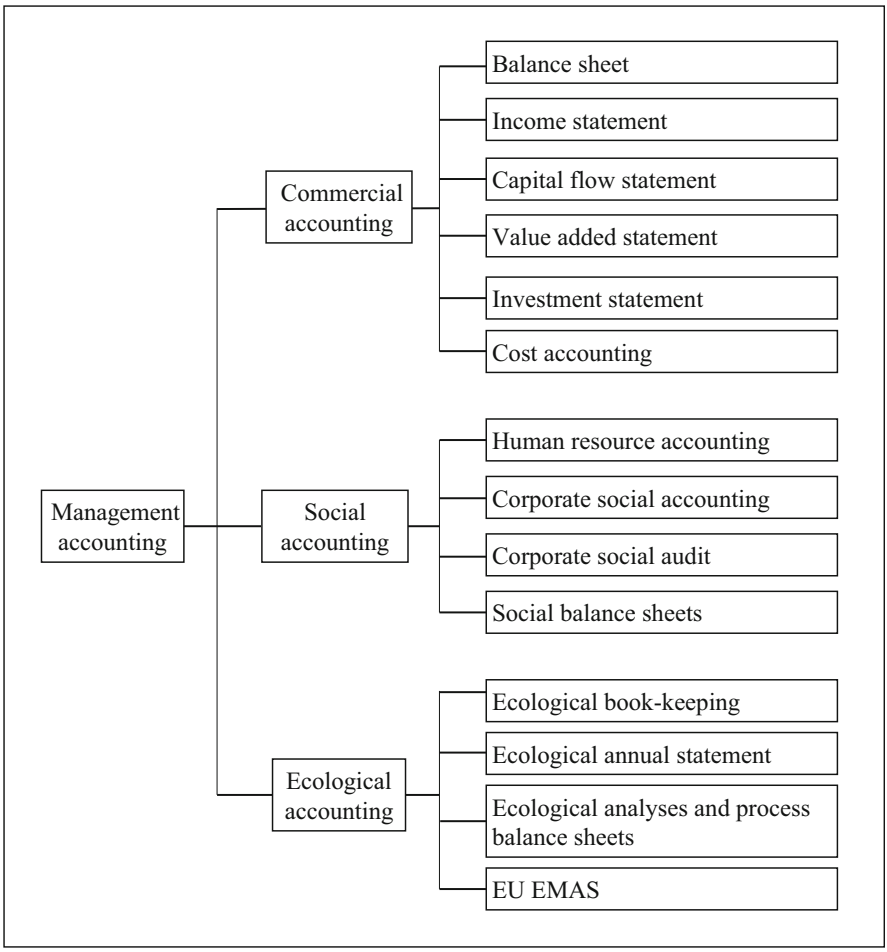

Fig. 6.33 Types of accounting in companies

is concerned with determining the value of the regular workforce for the company. **Human resource accounting** is concerned with assessing the workforce's future contributions to performance. This is achieved by assessing the expected increases or decreases in the value of the human capital. That is determined by hiring new employees and training staff on the one hand (increasing value); a reduction in the number of employees, harmful influences as well as knowledge becoming obsolete on the other hand (decreasing value). These changes in value are captured in special statements (as described in Sect. 6.8) and show up in asset and flow accounts. Human capital represents a kind of social claim of the company against its staff. The opposite is human liabilities or social liabilities that result when a company has neglected to invest in the performance potential of its employees. In view of the size and continued growth of the tertiary sector with its labour-intensive service

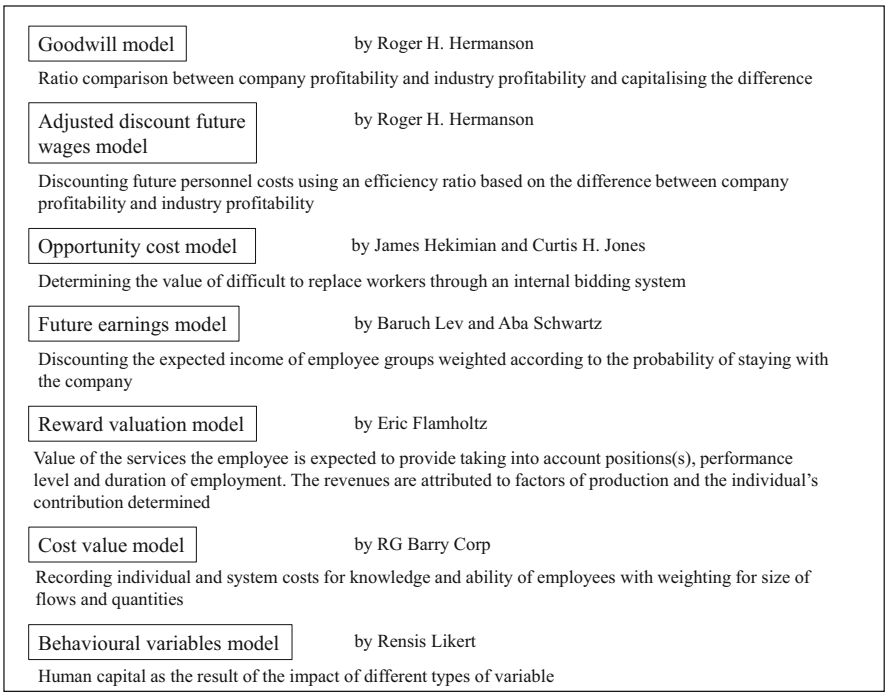

Fig. 6.34 Human resource accounting

companies, personnel is becoming ever more significant as a factor of production, so the maintenance and improvement of competence levels—i.e. making the most of employees' potential—is crucial. Traditional financial statements are unsatisfactory in this area; the income statement only mentions labour as an expense, and it only shows up in the balance sheet in the context of the provision for pensions.

Seven well-known approaches to human resource accounting are shown in Fig. 6.34.

Socio-economic accounting in the broader sense compares positive and negative external effects, taking into account employees (the internal environment of the company) and the external environment, in the form of stakeholders (customers, general public, municipalities, the state) and areas such as research, waste disposal and nature. Among the better known approaches are **corporate social accounting** and the **corporate social audit**, both of which go beyond the reporting of the performance potential of the employees in financial terms to include the external effects on society of corporate activities outside the market. Corporate social accounting is concerned with the quantitative recording and valuation of the ways in which the company affects the (non-commercial) environment; it is only recently that these have started to be quantified and expressed in monetary terms. A corporate social audit involves the development of standards for social accounting, ideally by external experts in order to increase their credibility and objectivity. A

basis for the standards can be the specifications of the European Union and national regulatory bodies (such as the German Institute for Standardisation (DIN)). In order to increase the value of the statement, and in particular to show the timing and size of the external effects, variables that measure flows and quantities should be used.

Most of the approaches to social accounting developed by companies and associations in Germany do not come close to the approaches described in the last paragraph. Indeed, some of them are not just unsuitable but also misleading, and do not really justify being called social accounting statements—external benefits (such as job safety, education and advanced training, time savings) and external costs (such as contaminated land, educational deficits, health risks, air pollution) are not contrasted.

Ecological accounting deals with the outcomes and impacts of operational activities on natural resources, energy resources, the climate, animal and plant protection as well as health. One method is **ecological bookkeeping** as developed by Ruedi Müller-Wenk (born 1934). Its focus is on capturing quantitatively and then weighting positive and harmful effects on the physical environment. It looks at the relationships between manufactured products and the associated consumption of materials and energy, waste products, wasted heat and water, disruption, noise, soot, other emissions as well as relief through further deliveries. This is all (only!) recorded in terms of volume, and each type of effect is given an equivalence coefficient. Multiplying the volumes by the equivalence coefficients (which provide a relative scale for negative and positive ecological effects), allows the calculation and comparison of individual outputs. The equivalence coefficients are determined on the basis of ecological scarcity. The rate of scarcity of an emission represents the critical rate, beyond which an ecologically inacceptable effect is reached. *Cumulative scarcity* illustrates the foreseeable depletion of the resource as goods are consumed. One goal is that the state should determine and adjust equivalence coefficients. This method endeavours to make the different external effects comparable on the basis of a single dimension, but this concept does not go further than providing a quantitative mapping.

Matthias Schellhorn (born 1962) proposed a way of integrating an **annual ecological statement** into traditional end-of-year financial statements. He regards the natural environment as a supplier of inputs and as a medium that absorbs wastes. The utilisation of these external assets has to be accounted for, but this cannot be achieved by stating the environmental protection costs that the company must carry. Instead, the environmental pollution caused by the company should be determined and expressed in monetary units. The utilisation of the environment can be determined by using quantities that have already been captured internally (e.g. the costs of soil pollution through the use of land for mining coal), and by taking external costs caused by the utilisation of resources (e.g. air pollution by carbon dioxide, sulphur dioxide, nitrogen dioxide and particles). Important characteristics and assumptions of this model are: pollutants spread evenly, allowing emission values to be weighted with critical immission values; only national emissions can be recorded; the quantities of pollutants emitted are over the period of 1 year; cumulative effects

and synergistic effects are ignored. Weighting coefficients provides a common denominator for detrimental effects on health and damage to materials and plants. Values provided by national environmental agencies form the basis for the costs of polluted air per ton of pollutant. Schellhorn's model extends the traditional income statement by including the costs of industrial land utilisation and the external environmental costs of air pollution and, as an offsetting accounting entry, a corresponding liability toward third parties is recorded in the traditional balance sheet.

Next we present several accounting methods that we categorise as ecological analyses and process balance sheets because they are concerned with more specific problems. **ABC environment analyses** are based on a more qualitative valuation method that rates its objects against each other in order to record and prevent environmental pollution. A company is assessed in ecological terms on whether it meets the requirements of environmental law, and to which extent. Further considerations are the extent to which it complies with societal demands, pollutes the environment through its activities and operational mishaps; makes public internalised environmental costs; pollutes the environment through the pre-production of input factors. The ABC classification is as follows:

A. Environmental laws are ignored, the company is facing criticism, critical thresholds are being exceeded: there is a great need for action.
B. There is a degree of concern, a medium risk exists, harm to health is possible: the need for action is not so urgent.
C. No environmental pollution: no need for action.

An **event pollution analysis** examines the environmental effects of events (fairs, sport events etc.) by recording the pollution caused by the event organiser and by visitors (energy and water consumption, emission of pollutants, noise pollution, amount of waste, land use, changes to the landscape or cityscape).

An example was provided by CeBIT, the largest computer fair in the world. In the late 1990s there were typically around 700,000 visitors a year who produced 69 tons of rubbish daily during the 8 days of the fair, and 455,000 bottles and cans had to be removed from the site. Twelve gigawatt hours of electricity were used by the exhibitors and suppliers, and travel to the event was responsible for 700 million kilowatt hours (one kilowatt hour is typically needed for each kilometre travelled). In order to supply each visitor with brochures, 31,000 trees were chopped down and 380,000 cubic metres of water were polluted (equivalent to the annual consumption of a small town of 7000 inhabitants).

An **eco-efficiency analysis** (developed and used by BASF) sets the total operating costs of alternative projects, processes or products against the possible or actual pollution they might or do cause. Standardised total operating costs (that the customer has to pay) are set against standardised environmental pollution (expressed in weighted points scores and calculated according to ISO 14040 and 140044). A graph of these data-points is produced, where the higher the costs and

the higher the pollution, the lower the score, so a project with a high level of eco-efficiency will be found in the upper right quadrant. For example, the environmental pollution caused by the process of dying indigo is shown in five categories. The input side (representing 50% of the total) measures energy (25%) and raw material consumption (25%), while the factors measured on the output side (50% of the total) are the unintended outcomes of risks (10%), toxic waste (20%) and emissions (20%). The latter are divided into water emissions (35%), waste (15%) and air emissions (50%). Air pollution is then further subdivided based on its potential for different kinds of harmful outcomes: greenhouse gases (50%), damage to the ozone layer (20%), producing photochemical ozone (20%) and outputs that contribute to acidic rain (10%).

The investigation and assessment of the environmental benefits and issues of products is the goal of **product line analysis** (also referred to as life cycle analysis and life cycle assessment). It records external effects, from the extraction of raw materials to the consumption of products and their disposal, including transport, storage and production. This tool is used for individual case analyses and also for general analyses in which ecological aspects take priority, although social and economic aspects are not ignored. The data basis is often poor and there is a wide range of valuation methods, so the results of these analyses cannot often be directly compared with each other. Such an analysis could, for example, be carried out on ways in which milk can be packaged for home consumption: reusable bottles, milk cartons or milk bags (made of plastic). The total consumption of raw materials, water and energy would be analysed, as well as transportation requirements, air pollution and the amount of waste.

The aim of an **environmental risk analysis** is to detect potential dangers for the environment and ensure that companies are not affected. Depending on the situation, an environmental risk analysis may be needed when forecasting the consequences of technical progress or carrying out a credit-worthiness check (needed because banks examine the ecological risk factors of collateral, e.g. the possibility of contaminated soil on land). Other occasions where such an analysis is necessary include building up an eco-fund (an investment portfolio containing the shares of environmentally friendly companies), producing an eco-rating by ranking companies according to their ecological performance—environmental risks faced by a supplier can be business risks for the buyer. An environmental risk analysis is used mainly by bank credit officers and financial analysts.

A materials balance and an energy balance are ecological accounting statements which focus on transformation processes. The roots of this kind of ecological accounting lie in science and technology rather than business. These **process statements** are prepared by and for individual companies, and for the economy as a whole. Process statements use physical units as the starting point of valuations; they are not statements of stocks at a particular point in time but are statements of flows over a period. Materials and energy inputs are set against outputs, which should be equal in size because they represent transformed materials and energy (following the

first law of thermodynamics) and the "consumption" of materials and energy is measured. The aim is to find alternatives (savings, substitutions) for manufacturing processes and for the use of materials (including a better utilisation of waste by recycling) that reduce the burden on nature. One of the main goals of these statements is to inform the public about environmental protection measures by showing what is taken from the environment and what is put back into it.

Common to all types of **ecological accounting** is that they all have their own standards and methods of recording and judging effects on the environment. Uniform, coherent and generally accepted standards and regulations do not exist at either the national or international level. Consequently, the results of the analyses vary, which then increases the amount of criticism against ecological accounting. It is true that the problems are complex. One of many other issues, for example, is the unresolved problem of environmental pollution by substances whose harmful effects only become known at a later point in time. Asbestos, chlorofluorocarbons (CFCs) and several wood preservatives were introduced as environmentally friendly substances and were only later found to be harmful to health. In conventional commercial accounting, problems of valuation are circumvented because legal guidelines (e.g. the historic cost principle) and accounting frameworks exist (e.g. GAAP—Generally Accepted Accounting Principles). Why should it not be possible to establish similar kinds of principles for ecological accounting?

The European Union tried to find an answer when it established the **Eco-Management and Audit Scheme** (EMAS) in 1993, the goal of which is for all kinds of organisation to evaluate and report on their environmental performance, and then, of course, to improve it. The core elements of EMAS are:

- Performance—actions are taken to achieve and evaluate environmental policy targets.
- Credibility—third-party, independent, auditors verify the information provided.
- Transparency—the public is provided with information about environmental performance of organisations.

The key indicators are energy efficiency, material efficiency, water, waste, biodiversity and emissions. The environmental statement required by EMAS must include:

- a clear description of the company and its activities,
- the environmental policy and a brief description of the organisation's environmental management system,
- a description of all the significant direct and indirect environmental aspects which result in significant environmental impacts,
- a description of the environmental objectives and targets, and
- summary of the data available on the performance of the organisation against its environmental objectives and targets, including core indicators.

ISO 14001 is the main standard in a family of standards developed by the International Organisation for Standards for organisations' use in designing and implementing environmental management policies and procedures. EMAS and ISO 14001 share the same objective, but EMAS goes further by requiring that the auditor be independent and that employees be actively involved, for example. Another standard for reporting is provided by the **Global Reporting Initiative** (GRI) whose guidelines for sustainability reporting are used internationally by over 7500 organisations of all types. The guidelines include indicators on economic, social, environmental and governance performance.

If the division between social and ecological accounting is abandoned, and if all positive and negative effects are summarised, the result is **outcome-impact** or **effects statements** that take into account the themes discussed above. Outcomes and impacts are the external effects of inputs and outputs that are not recorded by commercial accounting. For firms, these represent side-effects, but for other kinds of organisation (e.g. non-government organisations and charities) they are the primary objective. Outcomes and impacts take the form of buyers' and consumers' surpluses when they occur in relation to market processes. Outcomes and impacts beyond the market consist of beneficial and harmful effects on the social environment, and factors which help or damage the natural environment. **Outcome-impact statements** do not provide any evidence of money spent on health and safety measures, social services, the promotion of research, culture and sport, tax payments, the protection of animals, plants and nature—all of which are recorded and calculated by commercial accounting. However, what these statements do show—in monetary units whenever possible—are the attributable positive and negative external effects (whether caused directly or not) on employees, customers, suppliers, shareholders, stakeholders, the general public and nature.

By taking elements from standard commercial bookkeeping—double-entry, debits and credits—and elements from the approaches discussed above, it is possible to develop two new forms of statement: the **outcome-impact operating result statement** and the **outcome-impact balance sheet**. The former records the external benefits and costs incurred within a specific period (e.g. 1 year), whereas the latter shows the potential positive and negative effects—or those that have been foregone—on the internal and external environment on the date of the balance sheet. In this way information is obtained about a company's contribution towards the improvement of the environment (in the negative case: deterioration of the environment); this is over and above its results in the market (sales, costs, profit, profitability).

Ultimately of interest is a company's **overall performance** (market, social and ecological) with respect to means and ends (efficiency) and to planned and actual use of factors of production (effectiveness). Social success in this context is the value added to society and state. A company is acting efficiently in the sense of the maximum principle if the greatest possible positive outcome and impact is achieved for the given production and use of a given product, as shown in Eq. (6.3).

$$\text{Max!}\ \frac{Positive\ outcome + Impact}{Production + Product} \tag{6.3}$$

Equation 6.3 Maximum principle and positive outcome and impact

According to the minimum principle, firms are efficient when the lowest possible negative outcome and impact is realised for the given production and use of a given product. Equation (6.4) illustrates this.

$$\text{Min!}\ \frac{Negative\ outcome + Impact}{Production + Product} \tag{6.4}$$

Equation 6.4 Minimum principle and negative outcome and impact

If outcome and impact are given, business results can be derived in a similar manner, as Eqs. (6.5) and (6.6) show.

$$\text{Max!}\ \frac{Profit}{Outcome + Impact} \tag{6.5}$$

Equation 6.5 Maximum principle and business results

$$\text{Min!}\ \frac{Loss}{Outcome + Impact} \tag{6.6}$$

Equation 6.6 Minimum principle and business results

When analysing effectiveness, the extent to which a target was achieved is assessed, as can be seen in Eq. (6.7).

$$Activity\ level = \frac{Actual\ output}{Target\ output} \times 100 \tag{6.7}$$

Equation 6.7 Activity level

In respect to overall performance, as Eq. (6.8) shows, a company is efficient if the actual outcome and impact are as close as possible to the desired result for the production and use of a given product.

$$Effectiveness = \frac{Actual\ result}{Target\ result} \times 100 \tag{6.8}$$

Equation 6.8 Effectiveness

The desired outcome and impact are derived from national specifications and/or self-determined standards. It is possible that a high degree of effectiveness is accompanied by an extremely costly production and product. Overall performance is highly relevant in this regard. Conventional accounting contributes towards determining this by reflecting market success.

Figure 6.35 shows how an **outcome-impact result statement** measures social and ecological success.

6.7 Assets and Capital

6.7.1 Terms and Types

The concepts that we have considered so far have in common that they are concerned with flows over a period of time, measured in terms of quantity and expressed as financial values. The sizes of flows need to be complemented by balance sheet items. Taking the form of statements of assets at a particular point in time (reporting date), balance sheets serve as starting points for the allocation to the correct period of processes and results (e.g. profitability). The starting point is the opening balance, which is adjusted as additions and disposals occur during the period, giving the quantity of items available at the end of the period. For example, the positive or negative development of liquid cash reserves is shown by comparing the opening cash balance with the closing cash balance. So in general, the **result for a period** can be determined not only by measuring flows but also by the **comparison of asset levels**.

The assets of an economic agent are comprised of all its tangible and financial assets. Examples of **tangible assets** are land, buildings, machines, inventories, furniture, works of art, equipment and tools; **financial assets** include investments, shares, receivables, patents, licenses, and cash. It is normally the case that there exists a legal relationship between the assets and the economic agent. One relationship is ownership, and a second one is possession, which means having control over an asset.

Many questions need to be addressed concerning assets: What is its value? How is it to be valued as part of hidden reserves? How are assets treated from a tax point of view? What quantity of operationally necessary assets and free assets does the

External costs	External benefits
I. Factor rent (Buyers' surplus) for personnel capital material energy services legislation nature negative consumers' surplus	I. Consumers' surplus for product A product B product C product D product E positive factor rent (positive buyers' surplus)
II. Disadvantages for workers customers suppliers shareholders stakeholders general public	II. Advantages for workers customers suppliers shareholders stakeholders general public
III. Harmful effects for earth water air space	III. Relief from harmful effects for earth water air space
IV. External net benefits (balance)	IV. External net costs (balance)

Fig. 6.35 Outcome-impact result statement

economic agent have? Which purposes do the assets serve? What is the optimal asset structure? How long is the commitment period of assets? How long does it take to transform them into money? What relationships exist between assets and capital?

Tangible assets and financial assets represent **net assets,** determined by subtracting debt from **gross assets**. In the German speaking world, reference is made to the *active* and *passive* sides of a balance sheet, and we will follow that terminology here. Assets form the active side of the balance sheet; capital—without which there could be no assets—is on the passive (liabilities) side. Seen from the perspective of the capital, the passive side shows the origin of funds and the active side the use of funds. When assets are being reported in a balance sheet, there is now

a common global practice in which assets are divided first into fixed and current assets, and then further categorised according to the period of commitment. Liabilities are reported differently. They are categorised based on capital rights, i.e. there is equity and debt capital. **Equity** is the difference between assets and debt capital, and is therefore identical with **net worth**, which is another term for net assets.

Fixed assets are composed of tangible assets (e.g. properties, buildings, machines and tools), intangible assets (e.g. patents and licenses) and financial assets (e.g. equity interests, shares and long-term receivables from loans). **Current assets** consist of inventories (e.g. raw materials and consumables, semi-finished and finished goods, commodities), receivables, securities (of short-termed nature) and liquid assets (e.g. bank balances and cash on hand).

The active side of the balance sheet includes objects that are assets, the passive side of the balance sheet is more abstract, listing the capital and the rights to capital of the owners and creditors.

Equity capital can originate from shareholders, owners, members of a cooperative, donors or entrepreneurs; it can be self-financed through retained profits or surpluses; in associations it can come from membership fees, or in the case of professional bodies and social insurance from contributions, and in public administrations from the taxpayer. The equity capital of incorporated firms can have several sources: share capital or nominal capital, retained income, capital reserves, any provisions which are no longer required (through overvaluation of liabilities), profits carried forward and profit. Changes in equity of joint-stock companies can be the result of raising or reducing capital, while contributions and withdrawals have similar effects in partnerships, as well as generally of profits and losses. Equity also accrues from the undervaluation of assets in the form of hidden reserves.

Debt capital is comprised of the resources provided to an economic agent by third parties, mostly in the form of bank, supplier and customer credits (the latter through advance payments), bonds (federal, state and municipal bonds, covered bonds, industrial bonds, convertible, option and income bonds) and loans from individuals, companies and public programmes. A differentiation is made between short-term credit (in some circumstances short term means 3 months, in others 12 months), medium-term credits (depending on circumstances up to 5 years) and long-term credits (above 5 years).

6.7.2 Commercial Balance Sheets

The most common statement that summarises the situation of an economic agent is the commercial balance sheet, i.e. the annual balance sheet which is drawn up in Germany according to commercial law, which is different from the tax balance sheet which follows tax law. (It is important to distinguish between this type of balance sheet and the balance of trade which is calculated for the national economy

Active side (Assets)	Passive side (Liabilities)
A: Fixed assets I. Intangible assets II. Tangible assets III. Financial assets B. Current assets I. Inventories II. Receivables and other assets III. Marketable securities IV. Cash on hand/ Bank deposits C. Accrued and deferred items	A: Equity I. Subscribed capital II. Capital reserves III. Retained income IV. Profit carried forward/ Loss carried forward V. Annual surplus/ Annual deficit B. Provisions C. Liabilities D. Accrued and deferred items

Fig. 6.36 Structure of balance sheet

and whose active side shows the export of goods and passive side the import of goods from and to a country over a given time period).

A balance sheet issued as one of the annual statements of German companies is shown in Fig. 6.36. The structure is defined by Para. 266 of the German Commercial Code (Handelsgesetzbuch—HGB).

The optimum amounts of assets and capital depend on priorities (formal or substantive goals, growth targets), the business purpose (offering services, manufacturing goods, trading goods etc.), the composition of the factors of production (personnel, capital, materials and/or energy intense), the development of demand and stage of the market (introduction, expansion, maturity and stagnation), technical progress (invention and innovation processes, diffusion of innovations) and financial conditions (expectations, terms, costs, restrictions, tax burdens). These **diverse factors** emphasise that there is not just one single asset and capital statement, but that balance sheets depend on estimates and valuations. Consequently, there is no single correct answer to questions such as: Should the vehicle be bought, leased or rented? How high should the minimum reserves be? What percentage of total capital should equity? The annual balance sheets of companies must meet legal requirements and follow bookkeeping and accounting principles for the purposes of taxation, transparency, uniformity and comparability. Apart from management and staff, parties interested in balance sheets are shareholders and creditors, tax offices, financial analysts, trade unions and associations, the media and the public.

A balance sheet is a statement of position, i.e. it shows the state of an economic agent at a particular moment. The difference between two statements of position can be found in a **flow balance sheet** which covers the period in question. It is also

Simple form

Use of funds	Origin of funds
Increase in assets	Decrease in assets
Decrease in liabilities	Increase in liabilities
Loss (balance)	Profit (balance)

Extended form

Use of funds	Origin of funds
A. Decrease in equity	A. Increase in equity
I. Distribution of profits	I. Capital increase
II. Capital withdrawals	II. Transfer to reserves
III. Balance sheet loss	III. Balance sheet profit
B. Increase in investments	B. Decrease in investments
I. Tangible assets	
II. Intangible assets	
C. Increase in working capital	C. Decrease in working capital
I. Inventories	
II. Receivables	
D. Debt servicing	D. Increase in debt
E. Increase in liquid funds	E. Decrease in liquid funds

Fig. 6.37 Flow balance sheet

known as a **capital-flow statement**, because it shows how line items (positions) have changed over a period by setting the use of funds against their origin. Changes in line items will either be a profit or loss, so the flow balance sheet shows which changes in which line items contributed to success.

Figure 6.37 shows a basic and an extended flow balance sheet.

Apart from the annual balance sheets, joint-stock companies often also issue quarterly balance sheets, and there are various types of commercial **special-purpose balance sheets**. Examples of these are the balance sheet produced when a company is

founded, when it is reorganised or when subject to takeover or merger. Balance sheets are usually also necessary when there is a legal dispute, or when the company is being made insolvent or put back on its feet.

6.8 External Assets and Liabilities

6.8.1 Terms and Types

In this section statements of positions at a given point in time—i.e. balance sheets—are treated similarly to calculations of benefits over given periods of time. They follow the logic of double-entry bookkeeping with its T-accounts, profit and loss accounts, and asset and liability accounts. *External* refers to the effects of business operations outside the market and beyond payment transactions. External assets and liabilities arise when operating activities add value to or remove value from the assets of third parties through mechanisms that are outside the marketplace. The discussion of benefit calculations showed that external costs and benefits occurring in a single period or over several periods can be captured in statements of the size of flows which can be transformed to statements of the size of positions. As with capital budgeting calculations, this is done by using the capital value method to calculate the present value of an investment. An external snapshot of the **human assets** of a company records the performance potential of employees at a specific point in time. This social balance sheet is a representation of the knowledge, skills and competencies of the executives and skilled labour of a company that could be used in the future to improve its performance and competitiveness—this is like having a reservoir. Neglecting to provide sufficient training, for example, can lead to the level of the reservoir sinking and possibly to the reservoir drying completely out. **Human liabilities** can also arise if safety regulations are missing or faulty and through other dangers that have not been removed.

Positive and negative external effects can be established when the external environments of companies or other economic agents is considered. These effects are not the result of market activities, as market transactions, compensation and tax payments are already recorded by commercial accounting. When society and nature are considered, additional types of external assets and liabilities can be identified. Operating activities can create common assets and common liabilities, and natural assets and natural liabilities. **Common assets** are the values created by the company which the general public receives free of charge. This value may be a more pleasant townscape, improved access to goods and services, the successful integration of apprentices or an increase in urban attractiveness—a newspaper publisher's added value, for example, is freedom of the press and diversity of opinions. Expressed in balance sheet terms, they are social receivables for the company, owed by the public. **Common liabilities**, e.g. works traffic, smells and noise, are detrimental to the general community and may be classed as social liabilities. Similarly, both positive and negative ecological effects exist. Those that either maintain or increase

nature assets (e.g. environmentally-friendly recycling, disposal, recultivation of waste land and reforestation), while the reduction of natural resources through consumption creates **nature liabilities**.

6.8.2 External Balance Sheets

Because of the special difficulties of recording and valuing the many and varied external effects and discounting them individually to a cutoff date in order to prepare a balance sheet, an alternative would be to develop separate balance sheets for employees, society and nature. We take a different approach. The central ideas of a uniform external balance sheet are an **integrative approach** that combines insights from the humanities, science, social and business studies, and a **holistic approach** that does not view the effects in isolation but considers how they interact over the long term. The interconnections of effects can be captured in an effects balance sheet that presents outcomes and impacts at a specific point in time.

The **outcome-impact balance sheet** complements the outcome-impact result statement, which depicts benefits and harm that occurred over a period. The outcome-impact balance sheet shows the potential and obligations an economic agent has in terms of its internal and external environment. It does not show its market situation or provide information relevant for tax purposes, for these are dealt with by commercial accounting.

Figure 6.38 shows an outcome-impact balance sheet.

External assets	External liabilities
I. Human assets (= value of performance potential of staff as developed by company; potential improved performance of staff is an external receivable for the company)	I. Human liabilities (= value of unused performance potential of staff; unused potential is an external debt owed to staff)
II. Common assets (= same concept applied to social groups and general public)	II. Common liabilities (= same concept applied to social groups and general public)
III. Nature assets (= same concept applied to earth, water, air and space)	III. Nature liabilities (= same concept applied to earth, water, air and space)
IV. Net external costs (Balance)	IV. Net external benefits (Balance)

Fig. 6.38 Outcome-impact balance sheet

6.9 Examples and Exercises

6.9.1 Calculating the Closing Balance

Situation
The Yildiz family operates a small corner shop in one of the trendier areas of Stuttgart. On Monday morning Hasan Yildiz, the son of the owners, checked the bank balance of the account they used on a day-to-day basis—he was happy to see that it was 7525.00 €. It is possible to pay by cash or debit card in the shop. It was a fairly busy day, during which they sold:

	€
Beer	750.00
Other drinks	100.00
Cigarettes	250.00
Snacks	120.00
Newspapers and magazines	60.00
Bicycle hire	80.00

Mr Yildiz went to the wholesaler and bought some supplies, paying 350.00 € by debit card. At the end of the day he deposited all the cash that the shop had taken in that day. What was the closing balance?

Solution
We start with the opening balance, and receipts of payment and subtract outpayment to calculate the opening balance.

	€
Opening balance	7525.00
+	
Receipts of payment	1360.00
−	
Outpayments	350.00
=	
Closing balance	8535.00

6.9.2 Financial Ratios

Situation
Monique Desautels owns a company—Great Sounds—that manufactures hi-fi equipment. She is an excellent designer, but as she herself admits, is not the comfortable with financing and book-keeping. Her accountant has prepared a

balance sheet for her, but she cannot really interpret it so has asked for your help. She is particularly concerned about her liquidity, because she knows that many companies fail because they run out of cash.

She gives you the balance sheet, which was prepared in the format used in the US because many of her investors live there—what would you tell her?

Great Sounds Balance Sheet 31 December 2017 (all figures in Euros).

Assets		Liabilities	
Current assets		Current liabilities	
Cash	3500	Accounts payable	90,900
Petty cash	200	Wages payable	8500
Temporary investments	10,000	Interest payable	4400
Accounts receivable	40,500	Taxes payable	7200
Inventory	81,000		
Supplies	3800		
Total current assets	139,000	Total current liabilities	111,000
Investments	36,000	Long-term liabilities	
		Mortgage	220,000
Non-current assets		Long-term loan	200,000
Land	12,000	Total long-term liabilities	420,000
Buildings	286,000		
Equipment	201,000	Total liabilities	531,000
Non-current assets	499,000		
Intangible assets		Owners' equity	
Patents	135,000	Common stock	300,000
Trade names	200,000	Retained earnings	178,000
Total intangible assets	335,000	Total Owners' equity	478,000
Total assets	1,009,000	Total liab. & Owners' equity	1,009,000

Solution

As Monique already knows, liquidity is critical to survival. You apply the short-term coverage ratios to the figures she has supplied.

$$Cash\ ratio = \frac{Cash\ equivalents + Marketable\ securities}{Current\ liabilities}$$
$$= \frac{(3500\ € + 200\ €) + 10,000}{111,000\ €} = 0.12$$

$$Quick\ ratio = \frac{Cash\ equivalents + Marketable\ securities + Receivables}{Current\ liabilities}$$
$$= \frac{(3500\ € + 200\ €) + 10,000\ € + 40,500\ €}{111,000\ €} = 0.48$$

$$Current\ ratio = \frac{Cash\ equivalents + Marketable\ securities + Receivables + Inventory}{Current\ liabilities} = \frac{(3500\ € + 200\ €) + 10,000\ € + 40,500\ € + 81,000\ €}{111,000\ €} = 1.21$$

Monique naturally wants to know what are the implications of a cash ratio of 0.12, a quick ratio of 0.48 and a current ratio of 1.21.

The current ratio looks relatively good—it means that Monique's company has more than one euro in current assets for every euro of current liabilities. It is important to compare Monique's current ratio with that of other companies in the same industry and to carefully monitor trends in its development.

The quick ratio result of 0.48 is, of course, lower than the current ratio as it does not include inventory. Most companies hope to have a quick ratio of around 1, so Monique should start thinking about managing her liquidity. She owes more than twice as much to her suppliers than her customers owe to her, and she also has a relatively high level of inventory.

A cash ratio of 0.12 is a cause for concern, because it means that Monique has very low cash reserves. Industry comparisons are important, because in some industries operate with higher liabilities and lower cash reserves. Too high a cash ratio could also be a sign that the company is not using its cash efficiently.

Long-term coverage ratios are also very useful tools, so you also apply them.

$$Debt\ ratio = \frac{Total\ liabilities}{Total\ assets} = \frac{531,000\ €}{1,009,000\ €} = 0.52$$

$$Capitalisation\ ratio = \frac{Long - term\ debt}{Long - term\ debt + Owners' equity} = \frac{420,000\ €}{420,000\ € + 478,000\ €} = 0.46$$

$$Debt - equity\ ratio = \frac{Total\ liabilities}{Owners'\ equity} = \frac{531,000\ €}{478,000\ €} = 1.11$$

Monique asks you what a debt ratio of 0.52, a capitalisation ratio of 0.46 and a debt-equity ratio of 1.11 all mean.

The debt ratio says something about a company's leverage—the higher it is, the more leveraged the company. In Monique's case, the debt ratio indicates that the company is not too highly leveraged, which is positive in that the higher the leverage, the higher the risk. At the same time, however, historical and industry comparisons must be made. In industries with volatile cash flows, a debt ratio of even 0.25 might be seen as too high.

The capitalisation ratio is also helpful to see how leveraged a company is. In capital intensive industries, which require large investments, capitalisation ratios

will tend to be higher. A significant issue for Monique is whether the cashflows of her company are adequate for servicing the debt.

A high debt-equity ratio usually indicates that a company has been financing its growth mainly through debt. This ratio is important for lenders, because the higher the ratio, the more risky the loan. Monique's company's ratio shows that she has been fairly conservative in financing the company's growth.

The Golden Rule is that long-term assets should be financed by long-term debt. Monique's company has 499,000 € of long-term assets and 420,000 € of long-term liabilities, so she is not breaking this rule.

6.9.3 Estimating Costs

Situation

Erwin von der Grün is a chemist with a major multinational firm. He is also a keen triathlete and in his spare time he has been developing an energy bar that should help athletes to improve their performance if they consume it during a triathlon or marathon. He has finally decided to leave his job and set up a company to sell and market the product.

He has decided that the most effective way to distribute it would be through the internet and so he is planning to set up a sales and promotion web site called TaktiFit.com. He will produce the bars himself and outsource the development of the web site. How can he best estimate his costs?

Solution

He should use a cost estimate sheet for goods.

Production of goods		Comments
	Direct material costs	His direct material costs will be those of the ingredients for his bars, plus the wrappers.
+	Material overhead costs ----------	
=	Material costs	
	Direct labour costs	Direct labour costs will be the gross wages of any staff he hires to produce the bars. Production overheads can include maintenance, testing and health certification costs.
+	Production overheads	
+	Special direct production costs ----------	
=	Manufacturing costs	
	Material costs	Erwin may need to hire someone to run his office. He is going to selling online, so his distribution costs will be quite high. Special distribution costs would be incurred if he takes a stand at a triathlon event.
+	Manufacturing costs ----------	
=	Production costs	
+	Administration overhead costs	
+	Distribution overhead costs	
+	Special direct distribution costs ----------	
=	Prime costs	

6.9.4 Calculating the Return on Investment of Volunteers

Situation
Fatima Al-Sharif runs CommonSense, an organisation that provides support to young people in difficult situations and which uses many volunteers. It has 4 full-time staff, part of whose time is spent on coordinating volunteer activities. She is thinking about applying to the European Union to get a grant. She is aware that the EU will want to know about the value for money they would be getting for their money, so Fatima wants to come up with some monetary values for what her organisation achieves. She decides to start with their volunteer programme.

Solution
Quantifying the benefits that CommonSense brings is difficult. The first steps must include having a very clear idea of the costs of the volunteers to the organisation, which in the case of CommonSense look like this for the 12 months to 30 September 2017:

Staff costs (33% of their time @ 60,000 €/year, including benefits)	20,000 €
Marketing activities for finding volunteers	10,000 €
Training	5000 €
Rewarding volunteers (awards, meals)	1000 €
Software (Better Impact volunteer management software suite)	1500 €
Website (used for coordination)	1000 €
Office overhead (15% of overall budget to cover use of facilities)	25,000 €
Total	63,500 €

The second step is to calculate the value of the time the volunteers contributed. Fatima's data show they have on average 60 volunteers who contribute 100 h/year, a total of 6000 h. The challenge is to convert this into a monetary value. Fatima finds the website of the Corporation for National and Community Service, where she finds that the estimated value of volunteer time in the US is $24.14/h. She can't find a figure for Germany, so she decides to assume a value of 25 €/h.

She can now calculate the volunteer wage value: 25 € × 6000 = 150,000 €. She can now calculate Return on Investment: (150,000 € − 63,500 €) ÷ 63,500 € = 1.36 €. She concludes that every 1 € invested in the volunteer programme, 1.36 € worth of work is done.

Fatima decides to go further and starts to calculate the benefits that their work brings. She looks at her data and finds, for example:

Category	Savings	Value
Unemployment—CommonSense was able to help 15 young people to avoid unemployment for 2 months each. She estimates that they would otherwise have received social benefits from the state.	Social benefits are approximately 900 €/month	27,000 €

(continued)

Psychiatric help—she concludes that the organisation's counselling service was able to keep 5 clients to keep out of psychiatric hospitals. Typical length of stay per patient is 1 month.	One month of psychiatric care in a hospital costs approximately 5000 €/month	25,000 €

Fatima is now in a position to prepare statements that express in monetary terms the benefits of what her organisation does.

6.9.5 MyCompany Project

One of your main concerns as the owner of a coffee shop is liquidity, and managing this while at the same time bearing in mind profitability and security. You must have a realistic understanding of the financial needs of your business and you will need to have a complete set of financial records.

- Investigate the available software solutions for financial planning. Look at the differences between them and decide which one you would choose.

Costs
Use a cost estimate sheet such as those in Figs. 6.24 and 6.25 to identify the costs you will incur.

- What are the cost types?
- How can you estimate what your actual costs will be?

These are operational costs, but as the chapter suggests, they are only a part of the whole story, because you will also be incurring external costs.

- Which external costs will you incur? Will you have to pay them or will society as a whole?

Revenues
You will have to decide how people will pay for your products.

- What methods would you choose apart from cash?
- What procedures would you follow so you could handle cash safely?

Your revenues come from your operational outputs.

- Is your cafe responsible for any external benefits?

Overall

- Which financial ratios are helpful in a cafe? (See Fig. 6.18 for some ideas.)
- Go the website of Starbucks and look at their financial statements. Is there anything you could learn from them in this respect?
- What would your outcome-impact result look like?

6.9.6 Self-Test Questions

- *Why is it important to operationalise?*
- *What payment streams exist?*
- *What does the golden financing rule say?*
- *How is cash flow calculated?*
- *What are the general forms of financing and what do each of them compromise?*
- *How is a performance split conducted?*
- *How are income statements structured?*
- *What is the structure of a balance sheet?*
- *What is the goal of creating a cost centre plan?*
- *What is the task of cost unit accounting?*
- *What is an operating statement?*
- *What is the difference between the direct costing-method and the method of relative direct costs?*
- *What is the goal of the cost-benefit analysis?*
- *How can the benefits of a project be analysed if it cannot be measured in monetary terms?*
- *Which accounting branches are part of the systematic arrangement of management accounting?*
- *What is the eco-efficiency analysis?*
- *What are the contents of outcome-impact-result statements?*
- *What is a flow statement?*
- *What is included in an outcome-impact-balance sheet?*
- *What are external assets and liabilities?*
- *Distinguish between expenditures and expenses.*
- *What is the difference between revenues and income?*