1 Introduction

> By means of this he can at any time survey the general whole, without needing to perplex himself in the details. What advantages does he derive from the system of book-keeping by double entry! It is among the finest inventions of the human mind.
>
> Johann Wolfgang von Goethe

Accounting is the language of businesses. Those who wish to value companies and invest successfully in the long term have to be able to understand and interpret financial statements. The primary purpose of accounting is to quantify operational processes and to present them to stakeholders including shareholders and creditors but also suppliers, employees and the financial community. The financial statement forms a condensed representation of these processes. It delineates the assets and liabilities as well as performance indicators such as turnover, profit and cash flow. Evaluating and interpreting this data against the background of business activity is an important component of the valuation process. Developing an understanding of this 'language of businesses' and, at the same time, including qualitative factors in the analysis provides a solid foundation for anyone interested in valuing enterprises. Accountancy illustrates, in one snapshot, the corporate world in the past and the present. Company valuation joins in at this point and attempts to predict the future development and the risks of an enterprise with the help of data obtained from the financial statement. This chapter addresses the weaknesses and limits of modern accounting. A particular disadvantage of accountancy is that it is by nature a purely quantitative model. A sound financial statement analysis, meanwhile, while being quantitative by design, requires the combination of both quantitative facts and qualitative characteristics in order to be a reliable forecast of the future.

This chapter deals primarily with different types of accounting systems, the components of financial statements and the calculation of a first set of key financial ratios. Chapter 2 lays the foundation for further ratio-based analysis, and also for the following qualitative analyses, which are at least oriented towards the financial statement.

1.1 IMPORTANCE AND DEVELOPMENT OF BUSINESS ACCOUNTANCY

The precursors of today's accounting rules came into being after the stock market crash of 1929, when the American Institute of Accountants' special committee first proposed a list of generally applicable accounting principles. By 1939, the first Committee on Accounting Procedure was created in the US in order to establish a coherent and reliable system of accounting standards. This set of rules was meant to tackle the rather dubious and unreliable accounting procedures and helped to restore the trust in financial statements published by listed companies. Now the Financial Accounting Standards Board (FASB) prescribes the main accounting standards in the United States. This set of rules, the US Generally Accepted

Accounting Principles, or US GAAP for short, governs the accounting principles for all companies subject to Securities and Exchange Commission (SEC) regulation.

On the other side of the Atlantic, beginning in 1973, the European Union began harmonizing the diverse accounting rules of its member countries. This process eventually culminated in the creation of the International Financial Reporting Standards. The IFRS have so far been adopted by more than 100 countries, including all the members of the European Union, Hong Kong, Australia, Russia, Brazil and Canada. Whilst there are several differences between the US GAAP and IFRS, both accounting systems are based on a similar set of principles and are, by and large, comparable. Following the previously mentioned international harmonization of accounting standards around the globe, a key future milestone is the planned full adoption of the International Financial Reporting Standards by the SEC. This adoption, when it occurs, will also require US companies to employ the IFRS, which will effectively unify the accounting standards in most developed countries. This process, which was initially aimed to be completed by 2014 but might require more time, will allow investors to directly compare financial figures and ratios between European and American companies without having to adjust them for diverging accounting treatments.

Given the fact that large-scale regulatory projects such as the US GAAP/IFRS convergence are rarely implemented on schedule, this book covers both accounting standards, presenting case studies of companies using the US GAAP as well as IFRS. The book focuses primarily on US-based and British corporations but also considers emerging market companies. This approach is simply a recognition that the vast majority of investors will have access to equity markets around the world.

Whilst the accounting systems in the US and Europe are by and large comparable, the outward appearance of the annual reports is not. Whereas there are virtually no restrictions as to the presentation and quantity of information contained in European annual reports and financial statements, US companies have to complete a predefined form (commonly called form 10-K) which must be filed with the SEC. The latter leaves little room for supplementary charts and data, which may often provide further information about the market and business model of the company. The standardized presentation and submission requirements can be mainly attributed to the US accounting scandals and frauds in the late 1990s which resulted in the passage of the Sarbanes-Oxley Act. As a result of this legislation, financial statements of listed corporations are more or less standardized, and have to be signed by management and filed with the SEC. From an investor's point of view, this offers both benefits and drawbacks. On the one hand, US-style annual reports (10-K) are well structured and clearly laid out once the reader gets used to the numerous legal phrases peppering the reports. Information about the market or additional industry data, however, is only rarely contained within these reports. In contrast, European annual reports not only supply their recipients with the essential annual accounts, but also include additional data intended to deepen an understanding of the company. It can, however, be argued that forming a true opinion of a company's performance and prospects is more likely in the case of a US-style annual report, as the additional information and graphs that can be included in European-style reports have at least the potential of being suggestive. Given the laxer rules, European annual reports also exhibit a considerably lower degree of comparability than their US counterparts. US annual (10-K) and quarterly reports (10-Q) can also be easily accessed via the SEC web page, whereas the reports of European companies can only be obtained directly from their respective investor relations websites.

Having said this, it must be mentioned that the SEC's EDGAR system to access 10-K and 10-Q filing isn't the most user-friendly. Retrieving company reports may sometimes be faster by simply searching for the term '*company name* + Investor Relations' in a search engine.

Listed companies usually publish interim reports on a quarterly basis as well as a more detailed and extensive annual report at the end of each fiscal year. Smaller companies, whose stock is traded in less regulated markets, often face less rigorous reporting obligations. In this case issuers are commonly able to report less frequently and are able to disclose less information to the general public. Irrespective of the extent of the reporting obligations, these publications are usually released a few months after the end of the quarter or the fiscal year and form the basis of financial statement analysis.

Quoted companies are generally organized as an affiliated group, or, in other words, as a consolidated group of individual companies under the roof of a parent company. Therefore it is the *consolidated* financial statements or group accounts that are usually the starting point in any balance sheet analysis. The distinction between consolidated group accounts and the individual accounts of the parent company is important since the vast majority of European companies publish both accounts in their annual reports. In essence, the consolidated group accounts or financial statements present information about the group as that of a single economic entity. So, although big enterprises consist of numerous subsidiaries worldwide, the consolidated financial statement acts as if there was only one company that encompassed the whole group. In the process of consolidating the accounts of all affiliates and subsidiaries into one group account, all interdependencies between the individual group companies are effectively cancelled out. For example, both a receivable and a liability are being created if one company grants a loan to another group affiliate. On a group level, however, this can be considered a non-event and thus has to be eliminated. Therefore the consolidated group accounts always result in a more accurate representation of the state of the group than an analysis of the individual group member accounts could ever yield.

The following example demonstrates the need for compiling consolidated financial statements and the reason why analysing individual financial statements within a group of companies may lead to incorrect analysis results.

Example 1.1 – Consolidated financial statement: holding structure

Parent Inc. has the individual financial statement below. There are currently no other companies in the group beside Parent Inc. The individual financial statement and the consolidated financial statement are therefore one and the same (Table 1.1).

Table 1.1 Parent Inc.'s consolidated balance sheet

Parent Inc.			
Assets	$		Liabilities
Fixed assets	100	Shareholders' equity	150
Receivables	50	Loans	50
Financial assets	0		
Cash	50		
Balance sheet total	200	Balance sheet total	200

Now Parent Inc. decides to split off its operating division into a separate business unit, which is designated Subsidiary Ltd. Newly founded Subsidiary Ltd. is equipped with fixed assets of $100 and a loan from Parent Inc. of $50. The balance sheets of Parent Inc. and Subsidiary Ltd. now look as shown in Tables 1.2 and 1.3.

Table 1.2 Parent Inc.'s unconsolidated balance sheet

Parent Inc.			
Assets	$	Liabilities	
Fixed assets	0	Shareholders' equity	150
Receivables	100	Loans	50
Financial assets	100		
Cash	0		
Balance sheet total	200	Balance sheet total	200

Table 1.3 Subsidiary Ltd.'s unconsolidated balance sheet

Subsidiary Ltd.			
Assets	$	Liabilities	
Fixed assets	100	Shareholders' equity	100
Receivables	0	Loans	50
Financial assets	0		
Cash	50		
Balance sheet total	150	Balance sheet total	150

After splitting off the operating division, Parent Inc.'s individual financial statement contains a noticeably reduced amount of information. Fixed assets were entirely transferred to Subsidiary Ltd., cash was reduced due to the loan to Subsidiary Ltd. and in return receivables increased by $50. Notice also the item 'financial assets', which includes the share in the newly set-up Subsidiary Ltd. In this case Parent Inc. is the so-called holding company, which only takes on administrative and strategic tasks, while the operating business is carried out by Subsidiary Ltd. The group now has to compile a consolidated financial statement summarizing the various individual financial statements into one document in order to give interested external parties an insight into its assets, liabilities, financial position and profit or loss situation.

To do this, all individual balance sheet items are simply added up, with the internal interrelationships consequently eliminated. The resulting consolidated financial statement will give an adequate insight into the financial conditions of the entire group.

The consolidated financial statements predominantly play an informative role and can be considered the pivotal element in the fundamental analysis of any company. Typically, they consist of the following numerical components (British expressions in parentheses):

- balance sheet (statement of financial position)
- income statement (profit and loss account)

- statement of cash flows (cash flow statement)
- statement of investment and distribution to owners
- notes.

In addition to these, most annual reports include wide-ranging management discussions and an analysis of the past year, a description of the business, risk factors and legal proceedings, as well as an outlook and selected financial data intended to permit a quick overview of the company's past performance.

It is crucial, however, to be aware that any accounting system is always simply a model that *attempts* to capture and represent the business reality and does not always mirror an exact and true picture of the company.

Example 1.2 – Differences in accounting systems
Examine the balance sheet and income statement positions of the two companies given for year-end 2006 shown in Table 1.4.

Table 1.4 Differences in accounting standards

Company 1	€m	Company 2	
Net income	7,021	Net income	6,517
Shareholders' equity	49,650	Shareholders' equity	52,599
Earnings per share	17.09	Earnings per share	15.59

The numbers cited for both companies are of about the same magnitude; however, Company 1 has posted a 7.7% higher net income and consequently higher earnings per share, whereas Company 2's equity base is 6% higher. Despite these differences, both figures were in fact released by the same company – the world's largest insurance company, Allianz SE. These differences arise because of different accounting standards used: while the first figures were reported under the IFRS, the second employed the US GAAP. This comparison is possible because Allianz maintained a double-listing in Frankfurt and New York until 2007, and therefore had to comply with SEC rules as well. This example emphasizes that while accounting figures may give a good general overview of a company's performance and are still the best numerical measure of a company's success, they cannot be mistaken for reality and are always only as good as the accounting framework applied. Whilst IFRS and US GAAP are fairly similar accounting principles, the impact of changes in accounting standards can sometimes be puzzling: when Volkswagen AG switched its reporting from national German GAAP to IFRS in 2000, its shareholders' equity nearly doubled – overnight. As we will see later, other alternative accounting treatments, such as leasing contracts for example, can have a substantial effect on the reliability of the reported figures.

1.1.1 Limited significance of financial statements

Despite numerous rules and regulations issued by the regulatory authorities and governments, criminal activity is ubiquitous in the business world. The most impressive case of accounting fraud, which led to the Sarbanes-Oxley Act in 2002, was committed by former

US energy giant Enron. It would have been difficult to uncover this large-scale fraud by applying traditional balance sheet analysis. Even rating agencies such as Standard & Poor's, which have a deeper insight into a company's books than do investors, gave the company a good credit rating shortly before it was declared insolvent in 2001. In fact, there were clearer signs of trouble in 'soft' factors such as corporate identity and communication suggesting that Enron had something to hide. For instance, in its annual report the company referred to itself as 'The World's Greatest Company'. Critical analysts were insulted during annual press conferences when they dared challenge the reported results.

How did Enron manage to cook its books? Some of the practices were simple. Long-term transactions, for example, were entirely recognized as income at inception instead of allocating profits over the total lifetime of the deal. Another method involved carrying out business with its own offshore enterprises, which had been set up by Enron's management, and reporting such transactions as profit. To compound such practices, Enron failed to declare several billion dollars in liabilities in its books and gave assets inflated values by employing questionable valuation models.

Most instances of balance sheet fraud will use the following methods:

1. off-balance sheet accounting
2. profit management (premature recognition of profits)
3. partiality of auditors
4. capitalization of fictitious assets.

When assets, or more significantly liabilities, are kept off the balance sheet, they ordinarily cannot be detected as part of a standard balance sheet analysis. This, in turn, gives the appearance of increased financial stability, which is employed, for example, to improve creditworthiness.

In other cases of accounting fraud, company management used profit management techniques. Profits were declared before the actual transaction took place, or, as in the case of Enron, long-term contracts were instantly recognized and recorded as profits.

The most important component of balance sheet fraud is the partiality of auditors. It used to be common practice for auditors to also be consultants to the same firm, which would often lead to conflicts of interest. In some cases it was this relationship and the advice of the consultants who were also auditors that led to the above-mentioned methods being used in the first place.

Finally, another method is the capitalization of fictitious assets. This happens when a non-existent asset is created on the balance sheet.

The examples above demonstrate the limitations of accounting practice. They reinforce the assertion that those who wish to successfully analyse and invest in an enterprise need to consider other factors besides balance sheet analysis, such as the business model, the quality of management and current macro-trends, in order to arrive at an accurate valuation of a company. At the same time, a detailed analysis of the financial statements will yield sound and quantifiable insights into a business and will form the foundation of further analysis.

1.1.2 Special features of the financial sector

The analysis of financial statements and company valuation, as elucidated in this book, cannot be applied to insurance companies and banks. The reason for this constraint lies in the fundamentally different capital structure and business model of financial institutions. Given the enormous asset base of most banks – J.P. Morgan posted $2.3 trillion in assets as of the end 2012 for example – an in-depth financial statement analysis is doomed to failure simply as a result of the sheer size of the balance sheet of these institutions. Beside the fundamental differences in size and balance sheet structure, the financial institution business model itself also differs substantially from that of ordinary businesses, which is why the valuation methods developed in the book cannot simply be transposed to financial services companies. To further complicate matters, the banking industry has proven to be volatile over time, which also confounds arriving at accurate long-term valuations. The demise of Northern Rock, Bear Stearns or Lehman Brothers during the financial crisis of 2008–9 makes clear that only a thin line separates record earnings from bankruptcy in this industry. While investment banks such as Salomon Brothers, Drexel Burnham and Nomura dominated Wall Street during the 1980s, most of these institutions have now either disappeared or been taken over by competitors. Given the increasing regulatory pressure around the globe, both the business models and the future prospects of this industry have become even more difficult to forecast.

1.2 COMPOSITION AND STRUCTURE OF FINANCIAL STATEMENTS

The most important part of any annual or interim report is the financial statement, containing the income statement, balance sheet, cash flow statement and notes. Moreover, the management's discussion and analysis give a good overview of the past year and help deepen an understanding of the business. Depending on the size and listing location of the company, the transparency requirements as well as the frequency of reporting will vary. Below is a succinct introduction to the different components of a financial statement as well as to the first financial ratios concerning the cost structure of a business.

1.2.1 Income statement

The income statement or profit and loss account presents the revenues and expenses for a specific accounting period. The balance of these two numbers represents the profit or loss for the period. Table 1.5 shows the typical structure of an income statement.

Table 1.5 Income statement

Revenue
less: Cost of sales
= Gross profit
less: Selling, general and administrative expenses less: Depreciation less: Research and development expenses
= Operating profit/EBIT
less: Interest expenses plus: Interest income
= Profit before taxes
less: Tax expense
= Net profit/Profit for the year

Every income statement begins with the revenues (United Kingdom: turnover) for the period. Suppose you are running a lemonade stand and your first customer buys juice worth $5, paying in cash. One would now book this $5 as revenues – congratulations, you sealed your first deal! But what exactly is your profit? The income statement provides the revenues as well as their *corresponding* expenses. The word *corresponding* is of importance here since the income statement records only those variable expenses associated to the actual sale process. You might have purchased more lemons than needed to serve the first customer, but the cost of these lemons is not recorded immediately since they have not been used and are still part of your assets.

The cost of sales consists of the inventory costs of goods sold. These inventory costs not only include the purchase costs, but also allocated overhead expenses as well as additional material and labour costs in case the goods have been transformed internally. In the case of our lemonade stand, for example, the lemons sold to the first customer have been purchased for $1 and an additional $0.50 was paid for sugar and the labour cost in the squeezing process that turned the raw lemons into juice. So the cost of sales amounts to $1.50, giving a gross profit of $3.50.

Gross profit is equal to the difference between the sales amount and the direct costs associated with producing or purchasing the product sold. The gross profit figure is very important in any financial statement analysis since it gives the amount that is available to pay for any operating expenses.

The next positions which are deductions from gross profit are usually the selling, general and administrative expenses (SG&A), and depreciation as well as research and development (R&D) expenses. SG&A expenses are sometimes split up into the selling and the administrative part, enabling an even closer analysis of the cost structure. In the case of our lemonade stand empire these expenses would include the rent of the space taken up by our stand, the sales clerk's salary as well as our back-office function, which manages the book-keeping. Let's say that we pay another $1 to cover these expenses.

The depreciation expenses reveal the decrease in value of the company's asset base over time. If, for example, a new lemon squeezer has been procured, the initial purchase price is not being charged as an expense since the company has merely changed assets for asset: cash in exchange for a new lemon squeezer. However, as time goes by, the value of the lemon squeezer declines, which is reflected as a depreciation expense in the income statement. Assuming a purchase price of $15 for the machine and an expected lifetime of 10 years would yield a depreciation charge of $1.5 per year.

Subtracting selling, general and administrative expenses, depreciation charges and – for some companies – research and development expenses from the gross profit gives the operating profit, or earnings before interest and taxes, EBIT for short. In the case of our lemon business, this figure is $1.

The operating income effectively presents the profitability of the underlying business without taking into account interest and tax payments. The former are deducted in the next step, the financial result. The financial result is composed of interest expenses and income as well as any profits from associated companies. Let's assume that our lemonade business had to take out a $20 loan at an interest rate of 2% in order to finance operations: this would correspond to an interest expense of $0.40. After having deducted or – in the case of debt-free companies – added interest in the financial result, we obtain the earnings before taxes. It is on this figure that taxes have to be paid. Based on pre-tax earnings of $0.60 and a 35% tax rate for our fictional business, tax expenses of $0.21 follow. We have finally arrived at the net profit for the year of $0.39.

Since no business is exactly identical to another, a close analysis of the income statement is warranted in order to be able to understand the earnings drivers as well as major risk factors inherent to the business model. It is to this end that the first financial ratios are being introduced in the next section.

Financial ratios obtained from the income statement usually express the expense and earning positions in the income statement as a fraction of total sales in order to turn them into comparable figures. Expressing income statement positions as fractions rather than absolute numbers makes it easier to compare them to previous years' figures and allows for the comparison of income statements of competitors, different industries, businesses in different countries and – to a limited extent – even other accounting systems.

Gross profit margin

The gross margin is one of the most prominent financial ratios in nearly every analysis. It expresses the gross profit as a percentage of revenues:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Revenues}}$$

The gross profit margin (GP margin) is important for two reasons. First, the cost of sales, which determines the gross profit, is usually the single largest expense position in the income statement. Second, even the most efficiently run company cannot survive without sufficient gross profit to pay for the various fixed costs, interest payments and taxes incurred as a result of running a business.

When compared with other companies, the gross profit margin also indicates the pricing power and input price sensitivity of a company, as can be shown by a simple transformation of this ratio into the related cost of sales margin (CoS ratio):

$$\text{Cost of sales ratio} = \frac{\text{Cost of sales}}{\text{Revenues}}$$

The lower the cost of sales for each unit of revenue, the higher the gross profit margin. In essence it can be said that companies with high gross profit margins are less exposed to input price increases and generally possess a strong basis for negotiation with their customers (higher prices), suppliers (lower wholesale prices) and even their employees (lower salaries).

Whereas the gross profit margin demonstrates how much profit remains after paying for the direct costs of the product, the cost of sales ratio simply demonstrates the costs associated with every transaction. Hence this figure can be viewed as the reciprocal of the average mark-up a company can realize. When Walmart sells apparel for $10 which it purchased for $8 from the manufacturer, its gross profit margin would amount to 20%, its cost of sales ratio to 80% and the mark-up would therefore be 25% (1/0.8 – 1).

In this sense, both ratios are two faces of the same coin, telling the same story but from different perspectives. It is very important to understand which input prices drive the cost of sales for each company. Steel and aluminium producers, for example, are highly dependent on the exploitation and availability of their respective raw materials as well as energy prices. Besides a static analysis of these ratios, it is therefore usually advantageous to compare the development of the gross profit or cost of sales margins and the price trend of the relevant input materials over the past few years.

Table 1.6 demonstrates the calculation of the gross profit and cost of sales margin.

Example 1.3 – Gross profit margin: Alcoa Inc.

Table 1.6 Alcoa Inc.: Shortened income statement

	Alcoa Inc.	
(in US$m)	2012	2011
Sales	23,700	24,951
Cost of goods sold	20,468	20,480

Source: Alcoa 10-K (2012) [US GAAP]

Table 1.6 contains the first two lines of Alcoa's income statement. Alcoa is listed in the Dow Jones Industrial Average and is the world's third largest producer of aluminium. The company does not explicitly state its gross profit. In order to calculate the gross profit margin we therefore first have to subtract the cost of goods sold from the annual sales, yielding a gross profit of $3,232 and $4,471 for 2012 and 2011, respectively.

Based on these figures, the gross profit margin for 2012 is then calculated as follows:

$$\text{Gross profit margin}_{2012} = \frac{\$3{,}232\text{m}}{\$23{,}700\text{m}} = 13.6\%$$

$$\text{Gross profit margin}_{2011} = \frac{\$4{,}471\text{m}}{\$24{,}951\text{m}} = 17.9\%$$

Compared with the prior year, the gross profit margin dropped considerably, by 4.3 percentage points. This worrisome development can also be seen when calculating the cost of sales ratios:

$$\text{Cost of sales ratio}_{2012} = \frac{\$20{,}468\text{m}}{\$23{,}700\text{m}} = 86.4\%$$

$$\text{Cost of sales ratio}_{2011} = \frac{\$20{,}480\text{m}}{\$24{,}951\text{m}} = 82.1\%$$

A decrease in gross profit margins (or, likewise, an increase in the cost of the sales margins) can be attributable to either (i) an increase in input prices, (ii) a decrease in selling prices, or (iii) a combination of both. Without looking deeper into Alcoa's financial statement, it becomes apparent that while the underlying cost of sales remained virtually constant, the sales themselves decreased by more than 5%. Fortunately, Alcoa provides a great deal of additional data as part of its reports in order to help investors better understand the business's development. For example, the shipment of alumina and aluminium products increased by 1.6% to 14,492 kilotonnes (kt), yet sales decreased by 5%. The company appears to have a problem with the selling price, and after delving deeper, it turns out that in fact, the average selling price decreased from $2,636 to $2,327 per kt, a decrease of 11.7%. So, the company sold more products (in terms of kt) in 2012 than in 2011, its cost of sales remained nearly unchanged, but its average selling prices dropped considerably, which was the cause of the sharp drop in its gross margin.

In addition to the comparison with prior years' performance, it is important to know whether a gross margin of 13.6% can be considered good or bad when viewed independently. To this end, let's first take a look at Reckitt Benckiser, a leading producer of health, hygiene and home products, and subsequently at the overall distribution of gross profit margins in the S&P 500.

Example 1.4 – Gross profit margin: Reckitt Benckiser Group plc

Table 1.7 Reckitt Benckiser Group plc: Shortened income statement

	Reckitt Benckiser Group plc	
£m	2012	2011
Net revenue	9,567	9,485
Cost of sales	(4,030)	(4,036)
Gross profit	5,537	5,449

Source: Reckitt Benckiser Group plc (2012) [IFRS]

Reckitt Benckiser, based in Britain, reports its earnings under the IFRS and is subsequently using the British-style income statement, referring to 'net revenue' instead of 'sales' and using the term 'cost of sales' for 'cost of goods sold' (Table 1.7). In addition, the company posts its gross profit directly, which makes it easier to calculate the ratio:

$$\text{Gross profit margin} = \frac{£5{,}537\text{m}}{£9{,}567\text{m}} = 57.9\%$$

Accordingly, the cost of sales margin has to amount to 42.1% since the sum of both figures always has to add up to 1 (or 100%). When compared with Alcoa, this example demonstrates how a 'mere' commodity producer is distinguished from a company that relies on strong brands with their resulting distinct negotiating power. Whereas Alcoa retains only 15 cents for each dollar of sales, Reckitt Benckiser earns nearly 58 pence per pound. In other words, Benckiser sells its products for more than double compared with what it (directly) costs to produce them.

Since the gross margin is highly dependent on the industry, even what at first glance seems to be a low gross margin can actually constitute good value, as for example in the case of big retailers like Walmart and Tesco. Gross margins should therefore generally only be compared within industries.

Figure 1.1 depicts the gross margin distribution of the S&P 500 companies. The median gross margin is 41.5% and only 10% of companies post a gross margin of 70% and above.

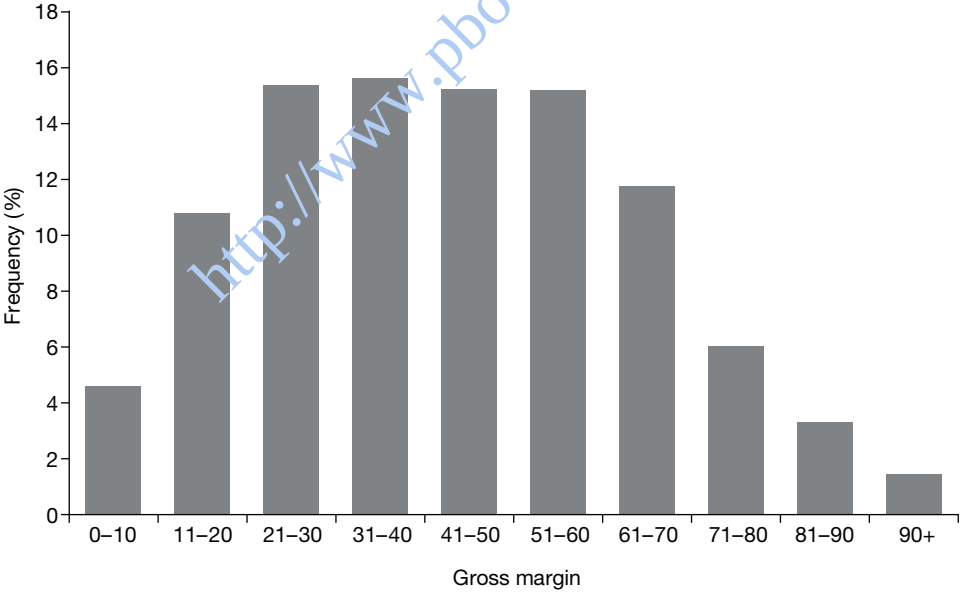

Figure 1.1 S&P 500: Gross margin distribution

Selling, general and administrative margin

After having accounted for the direct cost of sales, operating expenditures like the selling, general and administrative expenses (SG&A ratio) should also be analysed.

$$\text{SG\&A ratio} = \frac{\text{Selling, general and administrative expenses}}{\text{Revenues}}$$

This ratio expresses the primarily fixed-cost-based operating expenses as a percentage of sales. Sometimes the SG&A expense position is further itemized into selling expenses, as well as general and administrative expenses, which consequently allows the calculation of two separate ratios.

Selling expenses are mostly variable and should follow the general trend set by the sales themselves, whereas general and administrative costs usually tend to exhibit a distinct fixed-cost character. Since personnel expenses and rents generally make up a large share of the SG&A, this ratio should always be analysed with regard to the underlying salary development and rent price trends. Disproportionate or excessive general and administrative expenses are usually an indicator of inefficiently run companies. Given the fixed-cost nature of these expenses, they can be a threat to profit margins given the corresponding incapacity to promptly adapt to lower sales volumes. In general, the level of fixed costs is fundamentally linked to the risk profile of a company.

Example 1.5 – SG&A ratio: Coca-Cola Company
The calculation of the SG&A ratio for Coca-Cola in 2012 based on the shortened income statement below is shown in Table 1.8. Note that Coca-Cola uses the term 'net operating revenues' instead of 'sales' or 'revenues'.

Table 1.8 The Coca-Cola Company: Shortened income statement

The Coca-Cola Company		
$m	2012	2011
Net operating revenues	48,017	46,542
Cost of goods sold	19,053	18,215
Gross profit	28,964	28,327
Selling, general and administrative expenses	17,738	17,422
Other operating charges	447	732

Source: The Coca-Cola Company (2012) [US GAAP]

$$\text{SG\&A ratio}_{2012} = \frac{\$17{,}734\text{m}}{\$48{,}017\text{m}} = 36.9\%$$

$$\text{SG\&A ratio}_{2011} = \frac{\$17{,}422\text{m}}{\$46{,}542\text{m}} = 37.4\%$$

The company managed to keep its selling, general and administrative expenses nearly flat year on year, despite growing revenues by 3.2%, which demonstrates Coca-Cola's strict cost management and a demonstrably impressive fixed-cost degression. To further analyse this development, let's have a look at the company's breakdown of its SG&A expenses as shown in Table 1.9.

Table 1.9 The Coca-Cola Company: Notes

$m	2012	2011
Stock-based compensation expense	259	354
Advertising expenses	3,342	3,256
Bottling and distribution expenses	8,905	8,502
Other operating expenses	5,232	5,310

Source: The Coca-Cola Company (2012) [US GAAP]

As can be seen, Coca-Cola managed to keep its advertising expenses nearly stable, but bottling and distribution expenses increased due to higher sales. Analysing Coca-Cola's financial summary sheds more light on the positive developments underlying the SG&A ratio. The statement reads: 'Foreign currency fluctuations decreased selling, general and administrative expenses by 3 percent.' This bit of information is important because, excluding the foreign currency development, which is out of Coca-Cola's reach, the company's operating expenses would have actually outpaced its sales development. Taking all of this into account, while the company shows very healthy margins and expense ratios, the apparent strong cost results for 2012 should not be overrated.

Not all companies will provide such a neat and abbreviated income statement. The world's largest coffee chain Starbucks, for example, provides a much more detailed list of expenses in its income statement.

Example 1.6 – Other operating cost ratios: Starbucks Corporation

Table 1.10 Starbucks Corporation: Shortened income statement

	Starbucks Corporation	
$m	2012	2011
Total net revenues	13,299.5	11,700.4
Cost of sales including occupancy costs	5,813.3	4,915.5
Store operating expenses	3,918.3	3,594.9
Other operating expenses	429.9	392.8
Depreciation and amortization expenses	550.3	523.3
General and administrative expenses	801.2	749.3

Source: Starbucks Corporation (2012) [US GAAP]

As shown in Table 1.10, Starbucks is reporting a number of various expenses which allow for the calculation of various ratios. The release of 'store operating' and 'general and administrative' expenses allows for the impact of the company's rents and salaries related to the stores to be separated from the overhead development in its administration. The ratios are calculated as follows (previous year ratios in parentheses):

$$\text{Store operating expense ratio}_{2012} = \frac{\$3{,}918.3\text{m}}{\$13{,}299.5\text{m}} = 29.5\% \ (30.7\%)$$

$$\text{General and administrative expenses ratio}_{2012} = \frac{\$801.2\text{m}}{\$13{,}299.5\text{m}} = 6.0\%\ (6.4\%)$$

These numbers demonstrate real fixed-cost degression: the store operating expense ratio decreased by 1.2 percentage points, indicating that the company deployed its existing assets (store space and employees) in a more efficient manner. Indeed, this conclusion is also supported by the comparable store sales growth of 7% in that year. The drop in the G&A expenses ratio, meanwhile, shows that the company, at least in 2012, was able to grow revenues without creating too much additional overhead in its administrative costs.

Selling, general and administrative expense ratio distribution: S&P 500

Figure 1.2 shows the distribution of SG&A expenses as a percentage of sales for the S&P 500 constituents. The median value is 21.1%. However, this number is naturally very dependent on the type of business model used. It is noticeable that only 12% of the companies show a SG&A ratio of more than 40%, which makes sense since a very high gross margin is required to post an operating profit when the SG&A expenses alone eat up 40% of revenue.

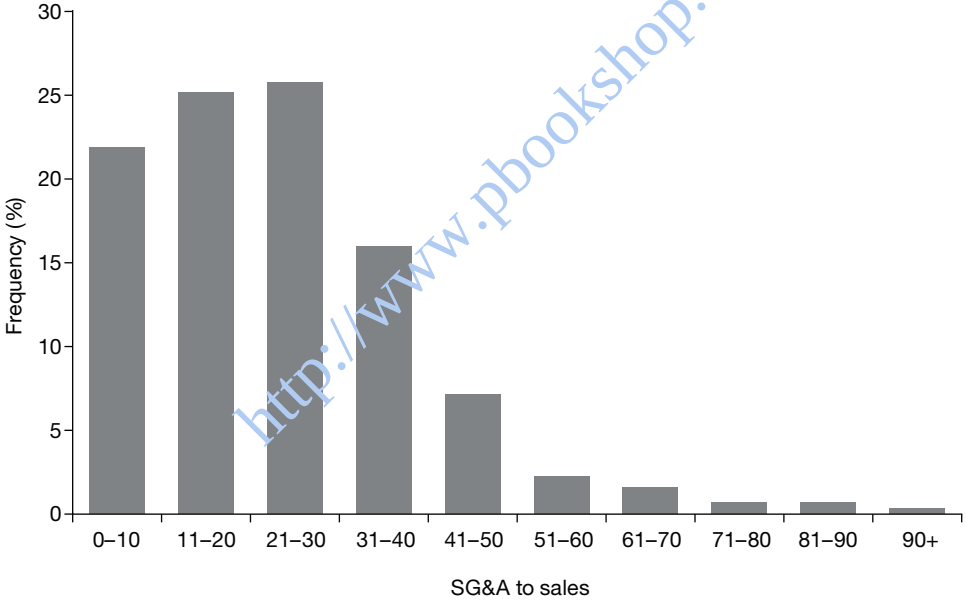

Figure 1.2 S&P 500: Selling, general and administrative expense ratio distribution

Research and development ratio

Innovation is the one key factor distinguishing superior from merely average companies; this is especially true of the technology sector. In the US around 3% to 4% of GDP is spent on R&D annually, underlining the critical importance of research and development activities. With the rise of globalization, however, even seemingly low-tech businesses face the threat

of low-cost competitors in emerging markets, forcing them to continually *reinvent* themselves: if you can't compete on cost, you must be able to compete on quality and innovation. This is the reason why R&D expenses play an ever more significant role for most companies, regardless of their business model.

This ratio displays how many cents need to be invested in order to generate a dollar of sales:

$$\text{Research and development ratio} = \frac{\text{Research and development expenses}}{\text{Revenues}}$$

Example 1.7 – R&D ratio: Stryker Corporation
Stryker Corporation is one of the world's leading medical technology companies, manufacturing and designing products from implants for joint replacements to neurosurgical, neurovascular and spinal devices.

Table 1.11 Stryker Corporation: Shortened income statement

Stryker Corporation		
$m	2012	2011
Net sales	8,657	8,307
Cost of sales	2,781	2,811
Gross profit	5,876	5,496
Research, development and engineering expenses	471	462
Selling, general and administrative expenses	3,466	3,150

Source: Stryker Corporation (2012) [US GAAP]

From the abbreviated income statement in Table 1.11, the R&D ratio is calculated as follows:

$$\text{Research and development ratio} = \frac{\$471\text{m}}{\$8{,}657\text{m}} = 5.4\%$$

This ratio is far in excess of the 1.4% median for all S&P 500 companies (see below) and demonstrates Stryker's R&D focus. However, this ratio usually has a limited comparability between companies, even within the same industry, since businesses that enjoy an advantageous negotiating position and produce innovative products may be able to dictate higher prices (resulting in higher sales) that in turn lead to the R&D ratio appearing low. To illustrate this, imagine the following example: Company A and B both spent $50 per year on R&D. However, while Company A comes up with market-leading products and realizes sales of $1000, Company B's R&D department isn't able to design innovative or trend-setting products, and the company only generates sales of $500 as a result. Calculating the R&D ratios would yield a value of 5% for A and 10% for B. This makes Company B appear to be far more innovative whereas the opposite is true. In the end, it is the quality, not the quantity, of

research efforts that counts. And the assessment of the quality of research efforts is always an objective one; as with all innovation, it may simply come down to a hunch or a gut feeling.

One important thing to note about R&D expenses is their differing accounting treatment under US GAAP and IFRS. While US GAAP generally does not permit the capitalization of R&D expenses, there is more leeway to do so under the International Financial Reporting Standards. Capitalization means that research expenses are not charged against sales directly. They are therefore not reflected in the income statement when they arise, but appear on the balance sheet as an asset which is depreciating over the useful lifetime of the intangible asset. Both approaches are reasonable, but the IFRS-based accounts should especially undergo adjustment for the effects of this treatment since the capitalization of R&D expenses artificially boosts profits in the near term.

Research and development expense ratio distribution: S&P 500

Figure 1.3 shows the distribution of the R&D expense ratio for the S&P 500. The median is 1.4%; only 30% of S&P 500 members spent more than 10% of sales on R&D per year.

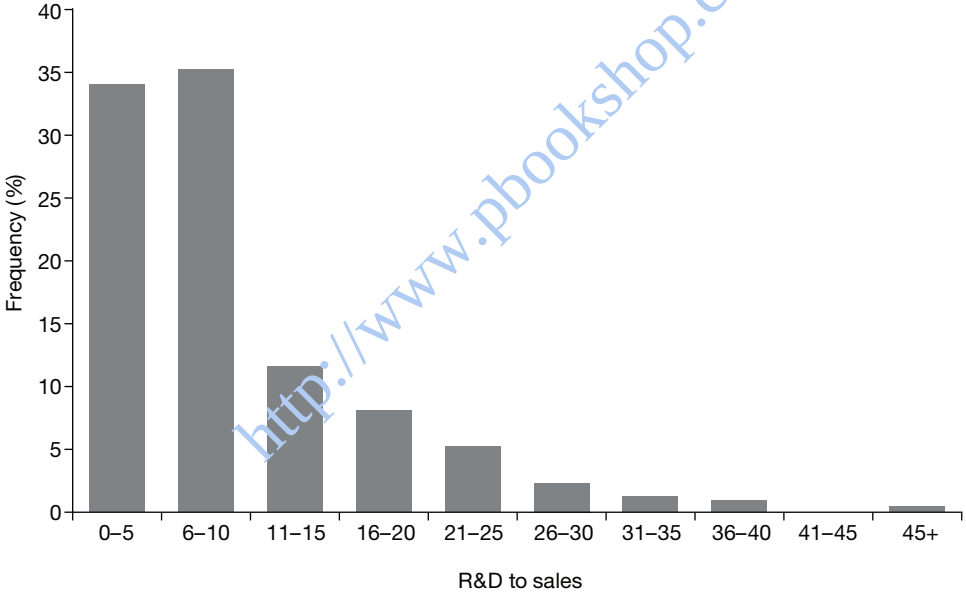

Figure 1.3 S&P 500: Research and development expense ratio distribution

Example 1.8 – Cost ratios: a comparison of two companies

Table 1.12 compares the income statement of H&M Group and Next plc, which are both active in the apparel business. Both companies design fashion products and distribute them through their retail store network internationally.

Table 1.12 H&M AB vs Next plc: Shortened income statements

H&M Hennes & Mauritz AB		Next plc	
SEKm	2012	£m	2012
Sales	120.7	Revenue	3,562
Cost of goods sold	–48.9	Cost of sales	(2,437)
Gross profit	71.8	Gross profit	1,125
Selling expenses	–46.6	Distribution costs	(269)
Administrative expenses	–3.5	Administrative expenses	(201)

Source: H&M Hennes & Mauritz AB (2012) [IFRS], Next plc (2012) [IFRS]

First of all, it becomes apparent that although both companies report under the IFRS, they use different terminology in their income statements. The ratios can, however, be calculated as usual. H&M reports a gross margin of 59.4% against 31.5% for Next. Adding together the selling and administrative expenses (i.e. distribution and administrative expenses for Next) gives a SG&A ratio of 41.5% for H&M and 13.1% for Next. These differences are striking given the fact that both companies operate in the same industry and could even be considered competitors.

Let's recall the factors that determine the gross margin. An increase in gross profit margin can be achieved by either being able to sell products at a higher price or sourcing and producing products at lower prices. H&M might arguably have an advantage in terms of ability to dictate prices given its global brand recognition. However, both companies operate in the low- to mid-price segment of the market, which means that this is not sufficient to explain such substantial gross margin differences. On the cost side, H&M might again have an advantage given the fact that it is three times the size of Next and as a result may be able to apply manufacturing economies of scale. Overall, however, one would expect to see a gross margin difference on this scale only when comparing Next to a luxury brand like Prada or LVMH, rather than to a fairly close peer.

To resolve this mystery, have a closer look at the SG&A ratios. Suddenly, the picture is very different: H&M's advantage in setting prices and procuring goods seems to reverse when it comes to operating expenses. While the Swedish company spends 41.5% of its sales on selling, general and administrative expenses, Next manages to get along with only 13.1%. Both figures, gross margin and SG&A ratios, obviously can't be explained by differences in operating efficiencies. The explanation lies in the fact that the companies simply operate very different business models: H&M runs nearly every store itself, whereas Next has a far greater share of franchised stores. While these differences are not visible for the average customer, they have consequences that are clearly visible on the income statement. H&M designs and procures its products and then passes them on to its own retail operations at a relatively low price, hence the high gross margin. Because H&M operates the stores itself, high operating costs such as rent and staff expenses appear on the income statement, leading to the high SG&A ratio. For Next it's the other way round: because of its partly franchised store base, the company acts mainly as a wholesaler, selling its products to the franchisees at a low price, which explains the low gross margin. Because Next does not operate the majority of 'its' stores itself, it incurs far fewer rent and staff expenses, leading to the low SG&A ratio.

This example underlines the fact that any ratio analysis has to be performed in conjunction with an analysis or at least a close examination of the business model itself. As shown above,

if the business model is left out, a conclusion on the respective performance of the companies would be misleading.

Tax rate

Corporations usually do not pay their income tax based on their revenues, but rather on their pre-tax earnings. The tax rate gives the ratio between tax expenses and the earnings before taxes.

$$\text{Tax rate} = \frac{\text{Income tax expense}}{\text{Earnings before taxes}}$$

The tax rate is highly dependent on the countries in which the company is doing business. US companies usually pay higher tax rates compared with most other developed countries. British companies in particular are set to post lower tax rates in the coming years as Parliament passed a bill decreasing the tax rate from 28% in 2008 to 24% in 2012, with a further decrease to 20% planned by 2015. As an example, let's compare Chevron's 2012 and Tesco's 2011/12 tax rate.

Example 1.9 – Tax rate: Chevron Corporation and Tesco plc

Table 1.13 Chevron Corporation: Shortened income statement

Chevron Corporation	
$m	2012
Income before income tax expense	46,322
Income tax expense	19,996
Net income	26,336

Source: Chevron Corporation (2012) [US GAAP]

$$\text{Tax rate} = \frac{\$19{,}996\text{m}}{\$46{,}322\text{m}} = 43.2\%$$

Table 1.14 Tesco plc: Shortened income statement

Tesco plc	
£m	2011/12
Profit before tax	4,038
Taxation	(874)
Profit for the year	3,164

Source: Tesco plc (2011/12) [IFRS]

$$\text{Tax rate} = \frac{£874\text{m}}{£4{,}038\text{m}} = 21.6\%$$

As can clearly be seen (Tables 1.13 and 1.14), Chevron operates in a high-tax environment, paying out 43.1% of its pre-tax earnings to the Internal Revenue Service, whereas Tesco, the UK's largest retailer, had to share only 21.6% of its profits with HM Revenue & Customs.

These marked differences underline the often drastic effects tax rates can have on a company's profitability. In most countries, as is the case in the US and the UK, tax liabilities are calculated on the basis of pre-tax earnings. There are, however, exceptions: Estonian companies, for example, are taxed based on their dividend payments. This can have tremendous effects on the profitability and cash flow situation of a company since retained and reinvested earnings are taxed only when they are being paid out, compounding interest in the meanwhile. It is useful to note that corporate tax rates, which on the surface may appear clear-cut, can be considerably distorted by other tax policies, most importantly the ability to carry forward losses for tax purposes. This can, for example, often be seen with new companies (start-up losses) or recently restructured corporations that have amassed losses in previous years. Given the complex nature of corporate taxation regimes, as well as the fact that they differ substantially even between countries that are part of the same economic federation (the EU), their effects should be discussed directly with the management or the investor relations department of the company if insight into the tax implications and the future tax rate development is sought. Table 1.15 gives an overview of national corporation tax rates for the largest equity markets worldwide.

Table 1.15 International corporate tax rates

Country	Corporate tax rate
Brazil	34.0%
Canada	26.0%
China	25.0%
France	33.3%
Germany	29.5%
Hong Kong	16.5%
Japan	38.0%
Norway	28.0%
Russia	20.0%
Switzerland	18.0%
United Kingdom	23.0%
United States	40.0%
North America Ø	33.0%
Asia Ø	22.3%
Europe Ø	20.6%
Latin America Ø	27.6%
EU Ø	22.7%
OECD Ø	25.3%
Global Ø	24.0%

Source: KPMG (2013)

Tax rate distribution: S&P 500

Figure 1.4 shows the tax rate distribution for the S&P 500 companies, giving a median of 41%. Most values above 40% can be attributed to exceptional events, whereas most tax rates below 30% are usually due to the application of tax losses carried forward.

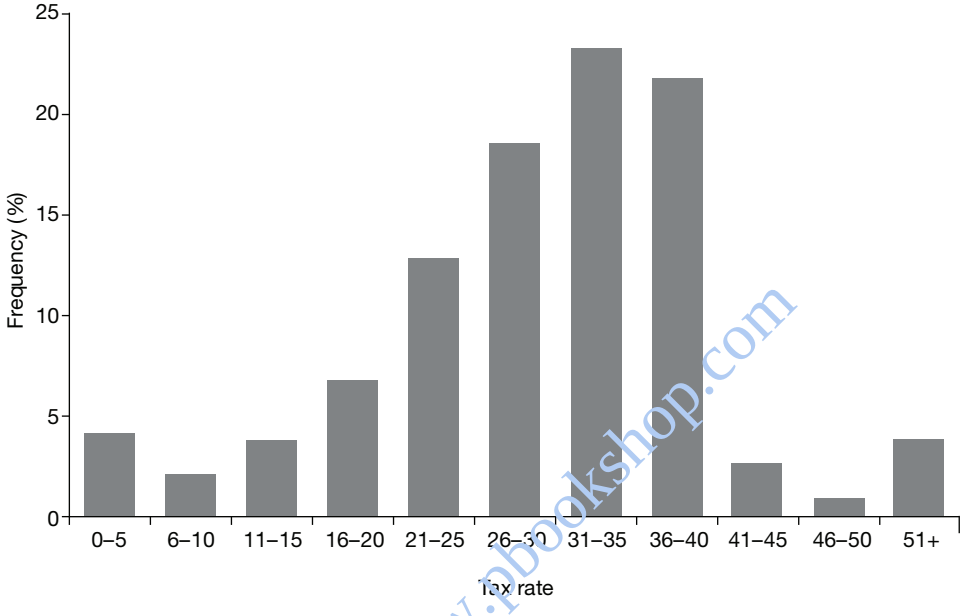

Figure 1.4 S&P 500: Tax rate distribution

1.2.2 Balance sheet

Balance sheets display the origin (liabilities) and purpose (assets) of the company's funds at the reporting date. Assets, liabilities and shareholders' equity of the company are presented in the form of accounts. Hence a balance sheet shows all the assets of a company as well as how they are financed. As a fundamental understanding of the meaning of each balance sheet item is essential for further analysis, this section will briefly look at the most important balance sheet entries.

Assets

The assets side lists all the assets of a company. These are subdivided into non-current assets and current assets, which are sorted according to maturity and liquidity.

Non-current assets normally comprise assets that are available to the company for the long term and are not intended for sale. These are mainly fixed assets like property, plant and equipment, long-term investments and also intangible assets like patents and goodwill.

Current assets form the second part of the balance sheet's asset side, containing assets staying with the company for up to a year, such as inventories, receivables and cash holdings as well as short-term investments.

The following list gives an overview of the most important balance sheet positions on the asset side.

Non-current assets/fixed assets

- *Intangible assets:* Intangible assets are usually purchased rights, patents, software and licences. In certain circumstances internally generated intangible assets may be capitalized by companies using the IFRS. It is therefore advisable, in instances in which the size of this position is unusually high, to verify that these assets are actually recoverable.
- *Goodwill:* Goodwill is the premium paid over the book value of the target company. For instance, company A takes over company B, which has a book value of $50m according to a current valuation of its assets and liabilities. Goodwill occurs when company A takes over company B for more than the book value of $50m. If company A pays $70m, $20m has to be declared as goodwill on A's balance sheet. In line with international accounting rules, this asset is subject to an annual impairment test using traditional valuation methods. If the result of this valuation is lower than the value listed on the balance sheet, an exceptional depreciation (called impairment) takes place, which has a negative impact on the profit and shareholders' equity. However, just like in a regular depreciation, these write-offs are non-cash items. In this context non-cash item means that although an expenditure is recorded on the income statement, no money actually leaves the company. Companies with substantial merger and acquisition activities usually show substantial goodwill on their balance sheet. In many cases this poses a dormant danger of their assets being overvalued.
- *Property, plant and equipment:* These fixed assets comprise factories, branches, car fleets, equipment and plots of land. In industrial enterprises this item is usually the largest entry on the balance sheet.
- *Financial assets:* Financial assets are securities which are permanently in a company's possession. These are mainly financial receivables, long-term securities and minority investments in third-party companies. In principle financial assets can also be allocated to current assets if they are not permanently used in business activity.

Current assets

- *Inventories:* Inventories consist of three sub-categories:
  - raw materials and supplies
  - unfinished goods
  - finished goods and merchandise.

  Raw materials and supplies are goods that are needed for the production of finished goods. These could, for example, be screws or lubricants. Unfinished goods are products that are still in the production process and are not yet ready for sale or distribution.
- *Accounts receivable:* This item contains all the company's receivables from third parties. If a receivable is classified as being in danger of default, it is correspondingly written down and valued at fair value. There is further information in the notes about the arrears of receivables and the necessary impairments concerning receivables to date.
- *Cash and cash equivalents:* Cash comprises a company's cash holdings, bank deposits and cheques. Together with short-term securities, such as money market funds, this item forms the liquid funds on the balance sheet. It is therefore referred to as 'cash position'.

Total equity and liabilities

Total equity and liabilities are the origin of a company's assets, and show how the assets are financed.

Let's assume that a private property costing $500,000 has been purchased using own capital and borrowed funds in equal parts. On completion of the building works the balance sheet of the buyer shows a property worth $500,000 on the asset side and $250,000 each for equity and borrowed capital on the equity and liabilities side. Hence the equity and liabilities side of the balance sheet outlines to what extent the assets have been financed by equity and debt.

In principle, this balance sheet part is subdivided into the company's own capital and liabilities. Liabilities in turn are subdivided into long-term liabilities, short-term liabilities and provisions.

Long-term liabilities have a maturity of more than one year. Short-term liabilities, in contrast, have to be repaid within a year. Provisions, with the exception of pension provisions, are usually part of short-term liabilities, as the expected payout is due within one year.

The difference between borrowed capital and assets results in the net assets, or the shareholders' equity of the company. In the example of the homeowner above, net assets are $250,000, as this is the amount that remains after subtracting the liabilities from the property value. If the value of the house drops to $300,000 the total equity would correspondingly decrease to $50,000, since the reduced value of the property is still burdened with $250,000 worth of liabilities.

Shareholders' equity

Shareholders' equity is the remaining part after all liabilities have been deducted from the asset base. As a residual value, shareholders' equity, unlike borrowed capital, is at the disposal of the company for an unlimited amount of time. In a consolidated balance sheet, shareholders' equity is subdivided into the following components:

- share capital
- retained earnings
- other comprehensive earnings
- treasury stock
- non-controlling interest.

The amount of shareholders' equity is determined by the capital provided by shareholders as well as the retained earnings. Share capital forms the basis of shareholders' equity and corresponds to the nominal value of the outstanding shares as well as any premiums paid over the face value of the shares, the additional paid-in capital. Retained earnings consist mainly of retained profits which have not been paid out yet but can be distributed to shareholders at a later point in time. Treasury stock, representing own shares repurchased in the open market, is deducted from shareholders' equity. Lastly, total equity is completed by the non-controlling interest of minority shareholders. This position represents equity claims of minority shareholders in fully consolidated subsidiaries of the group.

Shareholders' equity corresponds to the book value of the company. If the company was to be shut down, selling off all assets at the value stated on the balance sheet and paying back all debts, shareholders' equity is exactly what would remain.

The statement of changes in equity gives an insight into the movements of shareholders' equity during the year. Besides net income, it is especially the issuance and repurchase of stock as well as dividend distributions that affect the equity base. In addition, the statement of changes in equity shows the other comprehensive income, including expense and income items which are not recorded in the income statement but are directly offset against shareholders' equity. There is a detailed description of the statement of changes in equity at the end of this chapter.

Short-term liabilities/current liabilities

- *Accounts payable:* Accounts payable are trade credits, which are unpaid bills for goods delivered by the company's suppliers. Although a rise in this position increases liabilities, it is not a downside as such because the company may have its own funds available for longer when invoices are paid at a later time. Short-term liabilities are of particular significance in working capital management, which will be addressed in Chapter 4.
- *Notes payable/commercial papers:* Notes payable are interest-bearing debt with a term of less than one year. Depending on the characteristics they are near-to-maturity bonds or short-term bank loans. Another very important type of notes payable are commercial papers. These are mainly issued for short-term financing needs and have a term of up to 270 days.

Long-term debt/liabilities, borrowings

- *Bank loans, long-term debt, interest-bearing loans:* Long-term liabilities are interest-bearing loans with a term of more than one year. This entry usually consists of bank loans and other long-term debt. Total financial liabilities are the result of adding up all long-term and short-term interest-bearing liabilities. Most annual financial statements list details such as interest rates, currencies, maturity structure and other particulars of the different debt instruments in the notes section. Some balance sheets itemize long-term liabilities explicitly as bank credits, loans, bonds or similar.
- *Provisions:* Provisions are established as a type of allowance in case there is a danger of an economic outflow the likelihood and amount of which is not entirely quantifiable. They include guarantee provisions, provisions for pending lawsuits or tax provisions. Depending on the type and duration of the provision they can also be classified as a short-term liability. Pension provisions are another very important balance sheet position, especially in the case of very old companies. Usually, the liabilities arising from pensions are stated as a 'net' position, offsetting the liabilities with accumulated pension assets set aside for servicing future pension-related payouts.

1.2.3 Cash flow statement

Imagine that you run a pub. As your regular customers are short of money again, you let them put the drinks 'on the tab'. You are therefore creating turnover, but there is no money inflow stemming from this in the foreseeable future. This means that no funds are flowing in for the purchase of new goods, payment of employees' salaries and utility bills. While this problem does not appear on the income statement (drinks on the tab are considered income), or only with a substantial delay, it becomes directly visible in the cash flow statement, as the net profit shown on the income statement is adjusted for transactions in which the company actually has not (yet) received an inflow of money.

The cash flow statement is the central element of any financial statement analysis. Since the income statement is not adjusted for non-cash items, only the cash flow statement shows the true cash flows to and from the company during the year.

Non-cash expenses are expenditures but not payments. These are for example write-offs, temporary reductions in the value of securities, but also provisions for potential payouts (e.g. pending lawsuits) which will be due only at later point in time. Moreover, receivables which have not yet been paid and investment in inventories which have not yet been sold are also taken into account. The cash flow statement is divided into three sections:

- cash flow from operating activities
- cash flow from investing activities
- cash flow from financing activities.

The result of the balance of these cash flows is the change in cash at hand at the end of the accounting period. A typical, shortened cash flow statement is structured as shown in Table 1.16.

Table 1.16 Cash flow statement: overview

net income
+ depreciation
+/– change in provisions
+/– other non-cash expenditure/income
+/– changes in net working capital
= cash flow from operating activities
– investment in property, plant & equipment, intangible assets
– payment for acquisitions
+ divestments
= cash flow from investing activities
– debt repayment
+ payment received through borrowing
– repurchase of own shares
– dividend payments
= cash flow from financing activities

Much like the balance sheet and the income statement, the cash flow statement is inadequately standardized. Some companies, for example, list their paid interest as cash flow from operating activities, while others list it as cash flow from financing activities. Cash flow statements should therefore be reviewed and adjusted carefully prior to an analysis being undertaken. This is especially important when comparisons between industry players are being made.

Cash flow from operating activities

Cash flow from operating activities is calculated by correcting the net income for non-cash income statement items and the change in net working capital. The latter is necessary because capital has to be invested in working capital (e.g. inventories), especially during growth

periods, in order to be able to carry out and expand the operating business. As there is a cash outflow until the goods have been sold, this has to be recorded in the cash flow from operating activities.

This process is comparable to a baker who first has to buy raw materials (cash outflows), which are then on display as finished products (capital bound in working capital) and eventually sold (capital inflows).

Similarly a reduction of accounts payable, in other words the payment of supplier bills, will reduce cash flow from operating activities because a corresponding amount of cash has flowed out of the company. In contrast, if large amounts of raw materials or goods have been purchased on credit (increase in accounts payable), this has a positive impact on cash flow from operating activities. Accounts payable can therefore be considered as interest-free credit from the company's suppliers.

Changes in the accounts receivable are treated in a similar way. If receivables increase, a higher turnover and profit may be recorded, but the invoices are not paid quite yet. The net income will therefore have to be reduced by the increase in receivables, as the company has not yet received the turnover that has been generated. The net working capital (NWC) is calculated as follows:

$$\text{NWC} = \text{accounts receivable} + \text{inventories} - \text{accounts payable}$$

The change in net working capital, which is relevant for the cash flow statement, is derived by taking the net working capital in the period in question and subtracting the net working capital in the previous year. However, due to peculiarities of accounting, the changes of NWC in the balance sheet and in the cash flow statement often do not match exactly.

Another significant factor in cash flow statements is depreciation, as it merely simulates the wear and tear of previously purchased assets over their lifetime. It does not represent an actual cash outflow (which happened at the time of purchase/payment) and is correspondingly adjusted in the cash flow statement. The detailed calculation of cash flow from operating activities is as shown in Table 1.17.

Table 1.17 Operating cash flow statement

Net income
+/– depreciation/appreciation
+/– increase/decrease provisions
+/– decrease/increase inventories
+/– decrease/increase receivables
+/– increase/decrease supplier credits
Cash flow from operating activities

Example 1.10 – Cash flow from operating activities

Table 1.18 shows the balance sheet of Specious Inc. on 31 December 2009.

Table 1.18 Specious Inc: Balance sheet

Specious Inc.			
Assets	$	Liabilities	
Inventory	400,000	Shareholders' equity	500,000
Cash	100,000	Liabilities	0
Balance sheet total	500,000	Balance sheet total	500,000

Specious Inc. sells its whole inventory for $500,000 to a customer on credit. The transaction has taken place but the bill has not been paid yet. Moreover, in the course of the year fixed costs of $70,000 accrue for employees and rent. The income statement for the year 2010 is therefore as shown in Table 1.19.

Table 1.19 Specious Inc: Income statement

Specious Inc.	
$	2010
Turnover	500,000
Cost of sales	400,000
Fixed cost	70,000
Net income	30,000

Although a considerable profit has been made, no money has flowed into the company because the inventory was sold on credit. Soon after, the client and debtor is declared insolvent during the course of 2011. This is not visible in the income statement because the accounting record

```
Accounts receivable $500,000 to Turnover $500,000
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does not take into account the actual cash flow situation.

The client's insolvency becomes visible only in the financial statement of the following year, in which a write-down of receivables has taken place. The intelligent investor, however, could have noticed the precarious situation of Specious Inc. by studying the cash flow statement of the year 2010 (Table 1.20).

Table 1.20 Specious Inc: Cash flow statement

Specious Inc.	
$	2010
Net income	+30,000
Change in inventory	+400,000
Change in accounts receivable	–500,000
Cash flow from operating activities	–70,000

This shortened cash flow statement adjusts the net income for changes in receivables and inventory. In this case, receivables increased by $500,000, tying up more capital. At the same time, inventories decreased by $400,000. At the end of the year Specious Inc. displays a cash outflow from operating activities of $70,000 as opposed to a recorded profit of $30,000. Without new sales the company would not be able to pay its fixed costs of $70,000 in the following year, as available cash shrunk from $100,000 to $30,000. The company could face the prospect of bankruptcy. Even though this example simplifies the situation, these developments should not be underestimated in reality. Chapter 4 introduces ratios for identifying tendencies like these in the early stages. In the end, every company depends on its ability to generate cash flow. For this reason the focus of this book is on the cash flow statement, which some market participants wrongly neglect.

Example 1.11 – Operating cash flow: Kellogg Company
The example of Kellogg Company, a major producer of ready-to-eat cereal and convenience foods, will illustrate the purpose and analysis of the cash flow statement. Table 1.21 shows Kellogg's operating cash flow statement as of 2012.

Table 1.21 Kellogg Company: Operating cash flow

	Kellogg Company
$m	2012
Net income	961
Adjustments to reconcile net income to operating cash flow:	
Depreciation and amortization	448
Post-retirement benefit plan expense	419
Deferred income taxes	(159)
Post-retirement benefit plan contributions	(51)
Changes in operating assets and liabilities, net of acquisitions:	
Inventories	(80)
Trade receivables	(65)
Accounts payable	208
Others	53
Net cash provided by (used by) operating activities	1,758

Source: Kellogg Company (2012) [US GAAP]

Kellogg posts a net income of $961m for the fiscal year 2012. This performance metric serves as the basis for the determination of the operating cash flow for the year. The $961m of net income is increased by the $448m in depreciation and amortization, since this figure is an expense which is not associated to a disbursement of cash. A further $419m for the post-retirement benefit plan is also added to the net income since these expenses, connected to the company's sponsorship of health care and welfare benefits for retired employees, have so far not led to a cash outflow. This position was especially large in 2012 as the company changed how to account for its post-retirement benefits. As can be seen, with the depreciation and post-retirement expenses, two big expense positions appear on the company's

income statement without directly affecting its cash flow situation. However, Kellogg had to contribute $51m into its underfunded post-retirement plan, which represents an outflow of funds but not an expense in the income statement and therefore appears as a negative figure (in parentheses) in the cash flow statement. Kellogg also had an outflow of $159m related to deferred income taxes. This is because the company paid down a part of its deferred tax liabilities in 2012. Since this position has been expensed before, it does not appear in the income statement or the net income for this year.

After these rather technical adjustments, the changes in operating assets and liabilities are next. These changes, better known as working capital requirements, present the cash in- and outflows associated with the day-to-day running of the business: if a company wants to grow, it has to purchase more inventory, the consequence of which is a temporary outflow of funds. This effect can also be seen in this case: Kellogg increased its inventory, hence recording an outflow of $80m. The company also shows a cash outflow from increasing trade receivables in the order of $65m. This means that not all of this year's revenue has actually been paid yet, and to account for this the operating cash flow has to be reduced accordingly. To counter these money drains, the company increased its accounts payable by $208m or, to put it more bluntly, it paid its suppliers later. This is a commonly employed strategy by companies, which often try to offset build-ups of inventories and accounts receivables by increasing their accounts payables.

Overall, the company recorded an operating cash flow of $1,758m, significantly ahead of the $961m in net income, which underscores the importance of distinguishing between net income, which is an accounting fiction, and the actual cash inflow received. The actual funds received are, however, not in their entirety at the company's disposal because necessary investments in the maintenance, modernization and expansion have to be financed. These expenditures are reported in the second part of the cash flow statement: the cash flow from investing activities.

Cash flow from investing activities

Whilst the operating cash flow supplies the inflow received from the underlying operating business, the cash flow from investing activities contains the cash in- and outflows connected with investments and divestments in long-term assets. Capital expenditures (CAPEX for short) for property, plant and equipment are usually the single largest and most important position in this part of the cash flow statement. Investments are prefixed with a minus sign (as money flows out) and divestments with a plus sign (as money flows in). In principle divestments should be viewed critically, since the company is selling assets that usually generate cash flows and therefore value. However, as in all aspects of company analysis we have to consider the individual circumstances. A divestment that constitutes a withdrawal from a loss-making business should be viewed positively. Similarly, a decrease in investments in fixed assets leaves the company with more capital at its disposal, but investments are generally necessary for staying competitive and for increasing market share. Few other activities play such a pivotal role in the future success of the business as do capital expenditures. In this area, besides interpreting the figures, gut feelings and instinct are of particular importance. Common sense often tells us more about a particular economic benefit than any formula. Depending on the accounting method, cash flow from investment activities also includes incoming and outgoing payments for financial assets with a term of more than three months

(e.g. fixed-term deposits). As they are not investments in the true sense, the cash flow statement from investment activities should be adjusted for these amounts.

Example 1.12 – Cash flow from investing activities: Kellogg Company
For the fiscal year ended 2012, Kellogg reports the cash flow from investing activities shown in Table 1.22.

Table 1.22 Kellogg Company: Investing cash flow

Kellogg Company	
$m	2012
Additions to properties	(533)
Acquisitions, net of cash acquired	(2,668)
Other	(44)
Net cash provided by (used by) investing activities	(3,245)

Source: Kellogg Company (2012) [US GAAP]

In 2012, the company invested $533m in property, plant and equipment as well as in intangible assets. In the case of manufacturing companies, these expenditures usually consist of investments in new plant, machinery, vehicles, but also software and intellectual property. Usually, this position is referred to as capital expenditures, or CAPEX for short. Beside the capital expenditures, Kellogg spent $2,668m on the acquisition of Pringles, a maker of snack crisps, previously owned by Procter & Gamble. In total, the company spent $3,245m in its investing activities.

Example 1.13 – Cash flow from investing activities: Apple Inc.
Before going on to the last part of the cash flow statement, let's have a quick look at Apple's 2012 cash flow stemming from its investing activities. After posting $50.8bn in operating cash flow and having amassed a cash and securities pile exceeding $120bn, Apple's cash flow from investing activities looks somewhat different than is the case for most other companies (Table 1.23).

Table 1.23 Apple Inc: Investing cash flow

Apple Inc.	
$m	2012
Purchase of marketable securities	(151,232)
Proceeds from maturities of marketable securities	13,035
Proceeds from sale of marketable securities	99,770
Payment made in connection with business acquisitions, net of cash	(350)
Payments for acquisition of property, plant and equipment	(8,295)
Payments for acquisition of intangible assets	(1,107)
Other	(48)
Cash used in investing activities	(48,227)

Source: Apple Inc. (2012) [US GAAP]

Apple purchased securities worth $151.2bn during 2012. The company also received $13.0bn from maturing investments like bonds and another $99.7bn from the sale of securities. While these figures may seem, and indeed are, impressive, they have very little relevance for the cash flow statement analysis. In these transactions, it is merely cash being exchanged for marketable securities like bonds and vice versa. However, technically, these transactions are booked as investing activities because Apple invested its cash in long-term securities which can't be reported as cash and cash equivalents at the end of the year and consequently have to appear on the cash flow statement as an outflow. For the purposes of analysis, the only relevant positions here are the payments for the acquisitions of property, plant and equipment as well as the payments for the acquisition of intangible assets. Added together, these form the CAPEX and the real cash outflow of investing activities for Apple in 2012.

Cash flow from financing activities

The difference between cash flow from operating activities and cash flow from investing activities gives the free cash flow for the period:

Cash flow from operating activities – cash flow from investment activities = free cash flow

The free cash flow represents the operating cash inflow following the undertaking of any necessary maintenance investments as well as capital expenditures to secure and extend the competitive edge of the business respectively. Free cash flow can be used to pay out dividends, repurchase own shares and pay off loans. If the investments of a certain period are higher than the cash inflow from operating activities, the free cash flow is negative. This shortfall can be compensated for by borrowing or using existing cash on hand. From a mathematical point of view one has to pay attention to the correct use of the algebraic signs when calculating free cash flow because investments as a cash outflow are often prefixed with a minus sign. In the formula above cash flow from investment activities is converted to a positive quantity.

Example 1.14 – Free cash flow calculation, Kellogg and Apple
Referring to the example of Kellogg that we discussed above, the free cash flow for the year 2012 amounts to:

$$\text{Free cash flow}_{\text{Kellogg}} = \$1{,}758\text{m} - \$3{,}245\text{m} = -\$1{,}487\text{m}$$

Since Kellogg does not pursue acquisitions on a regular basis, the rather large takeover of Pringles in 2012 can be considered an outlier. Comparing the operating cash flow to the capital expenditures therefore yields a better measure of Kellogg's free cash flow generation power:

$$\text{Free cash flow}_{\text{Kellogg}} = \$1{,}757\text{m} - \$533\text{m} = \$1{,}224\text{m}$$

This figure basically represents the true or underlying cash flow of the company, after taking into account yearly investments that are necessary in order to keep the company growing. As this example shows, the definition of which CAPEX is recurring, and therefore should be subtracted, has a great influence on the resulting free cash flow. Great emphasis should therefore be directed at the current and future composition of capital expenditures.

The same applies in the example of Apple. Following the traditional formula would not lead to useful values since the cash flow from investing activities is distorted by the internal investing entries. In this case, it is again advisable to consider only the actual CAPEX for property, plant and equipment, as well as intangible assets.

$$\text{Free cash flow}_{\text{Apple}} = \$50.8\text{bn} - \$8.3\text{bn} - \$1.1\text{bn} = \$41.4\text{bn}$$

Example 1.15 – Cash flow from financing activities: Kellogg Company
Kellogg used its free cash flow in 2012 for the following purposes, as shown in its cash flow statement (Table 1.24).

Table 1.24 Kellogg Company: Financing cash flow

Kellogg Company	
$m	2012
Net increase (reduction) of notes payable (short-term)	779
Issuances of notes payable (long-term)	724
Reductions of notes payable	(707)
Issuances of long-term debt	1,727
Reductions of long-term debt	(750)
Net issuances of common stock	229
Common stock repurchases	(63)
Cash dividends	(622)
Net cash provided (used in) financing activities	1,317

Source: Kellogg Company (2012) [US GAAP]

The company registered an inflow of $779m from short-term borrowing, adding to another $724m from the issuance of long-term notes. Meanwhile, the company paid back $707m in notes payable. The largest inflow came from the issuances of long-term debt, most likely in the form of bank loans.

In addition to this, the company issued common stock worth $229m, which is therefore recorded as a cash inflow. The appearance of this entry can have two underlying causes. The first possible cause is that the company issued new shares to existing shareholders or outside investors through a capital increase. The second possible cause involves the company paying its employees with newly issued stock instead of cash. Since this is obviously an expense but does not cause a cash outflow, the effect has to be reversed in the cash flow statement. Usually, however, the effects from stock-based compensation are recorded in the operating, rather than the financing, cash flow. The first cause named is therefore the most likely in this case.

The company also repurchased $63m of its own shares in the stock market and, finally, paid out $662m in dividends, which constitutes a cash outflow.

Tallying it all up, the company recorded a net inflow of $1,317m from all financing activities, mainly due to higher borrowings. The attentive reader will not be surprised by this, since

the company spent more money on capital expenditures and the Pringles takeover than it generated through its operations (see the first free cash flow calculation). As a result, Kellogg faced two alternatives: use existing cash on hand or increase borrowings to counterbalance the free cash flow deficit. Kellogg opted for the latter. Indeed, the inflow from financing activities of $1.31bn nearly matches the negative free cash flow of –$1.48bn.

Adding up the three different cash flows gives the total cash in or outflow for the period (Table 1.25).

Table 1.25 Kellogg Company: Cash flow summary

Kellogg Company	
$m	2012
(A) Cash flow from operating activities	1,758
(B) Cash flow from investing activities	(3,245)
(C) Cash flow from financing activities	1,317
(D) Increase/Decrease in cash and cash equivalents	(179)
(E) Cash and cash equivalents at the beginning of the period	460
(F) Cash and cash equivalents at the end of the period	281

Source: Kellogg Company (2012) [US GAAP]

As outlined above, the change in cash and cash equivalents (D) can be calculated by adding up (A) + (B) + (C). In total, the company recorded a decrease of $179m (the $9m variance stems from exchange rate effects). Whilst the cash balance stood at $460m at the beginning of the year, Kellogg ended up with $281m in cash at the end of the year since not the entire negative free cash flow was balanced by additional borrowing.

It is not surprising that liquid assets, i.e. cash and cash equivalents, are listed at the end of the cash flow statement, as they are presented on the balance sheet. Table 1.26 illustrates this.

Table 1.26 Change in liquid assets

	Liquid assets 1 January
+/–	cash flow from operating activities
+/–	cash flow from investment activities
+/–	cash flow from financing activities
=	liquid assets 31 December

The algebraic signs of the items may change in some cases such as excessive borrowing or unusual divestments. Current corporate developments should therefore always be taken into account during analysis of the cash flow statement. The construction of new company headquarters, for example, will lead to high investments, which are, however, only of a temporary nature. In particular, large takeovers that have been financed through borrowed capital will lead to extreme values in different subsections of the cash flow statement. An example of this – not unusual – situation is the takeover of Anheuser-Busch by the Belgian brewery group InBev in 2008.

Example 1.16 – Cash flow statement: InBev

Table 1.27 InBev: Shortened cash flow statement

	InBev	
$m	2008	2007
Cash flow from operating activities	4,189	4,064
Cash flow from investing activities	(42,164)	(2,358)
– thereof: Capital expenditure	(1,640)	(1,440)
– thereof: Acquisition	(40,500)	(920)
Cash flow from financing activities	38,421	(970)
– thereof: Borrowing	35,142	366

In 2007 the cash flow statement shows normal values (Table 1.27). The cash flow from operating activities is positive, InBev reports an outflow from investment activities due to necessary capital expenditures and the cash flow from financing activities is also negative mainly due to dividend payments. In 2008 the picture changes as the cash flow statement is distorted by the Anheuser-Busch acquisition at a price of more than $40bn. The operating cash flow remains positive as the takeover did not interfere with InBev's day-to-day business, but over $42bn flowed out as part of the investment activity, of which $40.5bn was used for the takeover. In order to finance this free cash flow gap, the company borrowed more than $35bn. In total around $38.4bn flowed in as part of the financing activity, giving an overall balanced cash flow situation at the end of the year.

Example 1.17 – Cash flow statement: Sotheby's

Cash flow statements can differ noticeably in form and structure depending on the industry and the accounting standards applied. The value-adding part of the cash flow analysis is the interpretation of data against the backdrop of the actual business model. Therefore thorough familiarity with the underlying business and its business model is a basic prerequisite. The following detailed case study looks at the cash flow statement of the world-famous auction house Sotheby's. Its core business is the auctioning of all types of art and objects. The company generates turnover by charging the seller a fee and the buyer of the object a proportion of the hammer price. Apart from that, Sotheby's also acts as an art dealer, financier and grantor of licences. This basic knowledge can be found in the introductory part of the financial statement and is important for understanding the cash flow statement that follows.

Table 1.28 is an extract of the group's cash flow statement. For reasons of clarity some less important positions have been omitted. The figures therefore do not add up completely. Cash outflows have been marked with brackets, cash inflows without brackets.

Table 1.28 Sotheby's: Cash flow statement

		Sotheby's		
$m		2009	2008	2007
A	**Net (loss) income**	**(6,528)**	**25,456**	**213,139**
B	Depreciation	21,560	24,845	22,101
C	Gain on sale of business	(4,146)	–	–
D	Impairment loss	–	13,189	14,979
E	Share-base compensation	20,568	30,396	28,163
F	**Changes in assets and liabilities**			
G	Accounts receivable	178,670	198,020	(443,307)
H	Due to consignors	(74,472)	(301,073)	200,080
I	Inventory	35,857	(20,923)	(84,859)
J	Accounts payable	(42,304)	(73,563)	33,746
K	**Net cash provided by operating activities**	**158,521**	**(175,478)**	**(37,145)**
L	Funding of receivable and consignor advances	(152,179)	(377,216)	(306,241)
M	Collection of receivable and consignor advances	179,289	371,388	352,381
N	Capital expenditures	(100,879)	(74,192)	(17,398)
O	**Net cash provided by investing activities**	**(65,789)**	**(83,708)**	**163,740**
P	Proceeds from revolving credit facility borrowings	–	390,000	–
Q	Repayments of revolving credit facility borrowings	–	(390,000)	–
R	Proceeds from 3.125% Convertible Senior Notes	–	194,300	–
S	Proceeds from 7.75% Senior Notes	–	145,855	–
T	Dividends paid	(20,434)	(40,651)	(33,326)
U	**Net cash provided by financing activities**	**(24,246)**	**170,255**	**(695)**
V	Exchange rate effect	(375)	(5,854)	1,259
W	Increase (decrease) in cash and cash equivalents	68,111	(94,785)	127,159
X	Cash and cash equivalents at beginning of period	253,468	348,253	221,094
Y	**Cash and cash equivalents at end of period**	**321,579**	**253,468**	**348,253**

Source: Sotheby's (2009) [US GAAP]

Sotheby's: cash flow from operating activities

The cash flow statement starts with the net income of the relevant business year (A). As Sotheby's posted a net loss in 2009, the amount appears inside minus brackets. Position (B) corrects the deficit for incurred depreciation. Despite being an expenditure, depreciation expenses do not cause an actual cash outflow and are hence added back. The sale of businesses (C) forms a cash inflow, but is not counted as part of the operating activity and is therefore removed from the calculation. This item can now be found as a sub-item in the investing cash flow part. Whereas the income statement does not distinguish between normal operating income and non-operating income (speculation in shares, insurance settlements, sale of property, etc.), cash flow statements arrange cash flows according to their nature. In (D) the impairment losses are added back in an analogous way to (B). A common feature observed in the US is to reward employees with stock in the company (E). The position has been corrected as this form of remuneration is (initially) not followed by a direct payout but has nevertheless previously been recorded as an expenditure in the income statement.

The next step is to correct for the change in working capital (F). First, the change in accounts receivable is recorded. The table shows that the company had more funds flowing in, as more accounts were settled than new receivables added. This is partly due to good working capital management, but also partly due to a dramatic downturn in the worldwide art market.

It shows that in a downturn companies collect their receivables quickly and at the same time fewer new receivables are booked. At least in the short term the advantage of this is that tied-up capital is released and can be used to pay back debt or finance future growth. Looking at the corresponding figures for 2007, at the height of the global art bubble, Sotheby's shows a negative amount of more than $400m. Back then the business volume increased strongly and was followed by a higher level of capital commitment: many customers used Sotheby's auctions but paid for the services later. Position (H) clearly mirrors the development of receivables and displays a peculiarity which appears only in cash flow statements of auction houses. The item 'Due to consignors' records the amount that Sotheby's has to transfer to the actual seller of the art object. The corresponding position can therefore be found under 'Short-term debts' on the balance sheet.

Flow of goods: Seller → Sotheby's → Buyer

Flow of cash: Seller ← Sotheby's ← Buyer

If this position decreases, Sotheby's has, technically speaking, cleared its debt. In practice the company has recovered receivables from buyers, kept the corresponding margin and transferred the remaining amount from the purchase price to the seller. In the case of Sotheby's, decreasing receivables are therefore always linked to cash outflows under the item 'Due to consignors'. Recognizing business-level contexts like this is essential for a value-adding analysis. Inventory (I) is normally an important ingredient in balance sheets and cash flow statements. However, since Sotheby's usually acts as an intermediary and as its own art dealership handles only small volumes, changes in inventory do not consume a significant share of cash flow. The same logic applies for the accounts receivable. If inventory increases, more capital is committed; if inventory decreases, capital is released. Correspondingly, inventory increased in the years 2007 and 2008. In 2009, however, inventory was reduced by $35.8m and funds therefore flowed into the company. Position (J) contains accounts payable. If this position increases, the company has, in contrast to accounts receivable, more funds at its disposal. Due to the company's peculiar business model, 'Due to consignors' basically takes on the role of current liabilities. Adding up positions (A)–(J) results in the cash flow from operating activities (K). In 2009 Sotheby's had a cash inflow from its operational business of $158m, which might be surprising against the background of the net loss for the period. When compared with the years 2008 and 2007 it is striking that, in those years, the company had no cash inflow from its operating activities, but rather a cash outflow. This shows that in boom periods investments in working capital often surpass actual profits, thus turning the cash flow from operating activities negative, and that actual cash inflow does not take place until phases of moderate or declining growth. This demonstrates clearly how growth can tie up large amounts of capital which is consequently not available to the company for further investment. All this detailed information cannot be obtained from the income statement, which gives only a very limited perspective on the company and its business model.

Sotheby's: cash flow from investing activities

Similar to the cash flow from operating activities, some of the investing cash flow positions differ from a regular industrial enterprise. As Sotheby's partly finances some works in advance (L) by transferring the minimum hammer price to the seller before the work has been

auctioned, this amount has to be refinanced. Position (L) shows the amount transferred to the seller, (M) shows the 'collection' of this amount after the auction. The amounts in (L) and (M) are almost the same. The reason lies in the maximum term of these transactions (from financing to closure) of up to 12 months. According to additional information in the annual report, these transactions should be concluded within a certain period of time and therefore have little impact at the time of the balance sheet closing date. Business-critical investments 'CAPEX' (N) amount to $100m in 2009 and $74m in the previous year. Compared with the underlying cash earnings (net income + depreciation) of $15m and $50m of the corresponding years, this is a concerning level of investment in fixed assets. It appears that the company invests more than it actually receives from operating activities. In this case, this is due to the extraordinary effect of the construction of a large building. The financial statements from the last five years, in contrast, show an average CAPEX of $10m–15m, which can be considered unproblematic. It is always necessary to review financial statements across several years to avoid pitfalls like this. Adding up the values of points (L)–(N) gives the cash flow from investing activities, which is normally negative, as funds are invested.

Sotheby's: cash flow from financing activities

Positions (P), (R) and (S) each relate to borrowings and loan redemptions (Q). (T) shows the dividends paid in that business year. Adding up (P) to (U) yields the entire cash inflow or outflow from financing activities.

The total sum of these three cash flow categories (K)+(O)+(U), taking into account the effects of exchange rate fluctuations (V), shows the entire change in cash and cash equivalents (W) at the end of the period. The corresponding closing balance of cash and cash equivalents on 31 December (Y) is therefore the result of the opening balance of cash and cash equivalents on 1 January (X) plus the change in cash and cash equivalents during the year (W).

Cash is the life blood of every company and the cash flow statement its blood pressure monitor. Without a steady and sufficient stream of cash, sourcing, production, marketing and distribution, i.e. the operational side of the business, cannot be carried out. In effect, the cash flow statement gives the clearest insight into the condition, the health, of a company by setting off cash inflow from operating activities against cash outflows from investment and financing activities.

1.2.4 Statement of changes in equity

The statement of changes in equity is a component of the financial statement which shows, in detail, the movements in shareholders' equity within a given financial year. Besides net income, dividend payouts, buyback of shares, capital contributions and the other comprehensives, income will also have an impact on shareholders' equity as reported on the balance sheet. The statement of changes in equity lists, in tabular form, the impact of these factors on the various components of shareholders' equity, i.e. the share capital, retained earnings, other comprehensive income and treasury shares. In addition, the development of minority interests in shareholders' equity is usually listed.

1.2.5 Notes

The notes section is used to provide a more detailed explanation of some balance sheet and income statement positions, and for any further clarifications to add context to the financial report. The first section of the notes sets out which accounting and valuation principles have been applied, and addresses the basis of consolidation. It also points out any accounting changes made from the previous year. The next section further clarifies individual positions on the balance sheet and the income statement. The note topics listed in Table 1.29 are usually of particular interest for in-depth financial statement analysis.

Table 1.29 Important notes and additional information

Position	Explanation
Earnings per share (EPS)	EPS calculation and number of shares outstanding
Segment reporting	Revenue and result distribution by segment
Financial result	Composition of the financial result
Tax expense	Expected and actual tax expense
Intangible assets	Book values, additions, disposals and amortization
Fixed assets	Book value, additions, disposals, depreciation
Inventory	Composition and depreciations
Accounts receivables	Structure of receivables and depreciation
Schedule of debt payments	Structure of maturity, volume, currency and interest rate
Additional leasing data	Term, obligations, classification

Segment reporting

Among the items listed in the table above, the segment information and the schedule of debt payments are of particular relevance and will be described in more detail below.

The segment reporting gives information on sales, profits and other relevant key figures connected to specific operating business segments. The subdivision can be based on regions, product groups or, in the case of conglomerates, subsidiaries.

The key ratios for the financial evaluation of a company, which are described in the following chapters, can also be applied on an individual division level. Usually a company's operating divisions have different profit margins and sales results. A detailed divisional report can give a thorough overview and assist in identifying the value drivers within a company and thus indirectly help uncover the company's strengths and weaknesses. This is the reason why divisional analysis can play an important role in the company valuation process.

Example 1.18 – Segment reporting: Hengdeli Holdings Limited

To get an initial impression of how to decipher segment reporting, let's have a look at the 2012 financial statement of Hengdeli Holdings, the largest retailer of Swiss-made luxury watches in Asia (Table 1.30).

Table 1.30 Hengdeli Holdings: Segment reporting

	Hengdeli Holdings Limited					
	Retail					
(in RMBm)	Mainland China	Hong Kong	Taiwan	Wholesale	All others	Total
Revenue from external customers	5,627	3,113	214	2,924	239	12,120
Intersegment revenue	–	–	–	3,075	1	3,076
Reportable segment revenue	5,627	3,113	214	6,000	240	15,197
Reportable segment profit	1,905	753	69	338	88	3,154
Reportable segment assets	2,968	1,371	273	1,016	63	5,693

Source: Hengdeli Holdings (2012) [HK GAAP]

Many corporations trade not only with their external customers, but also within their organization. This is why, in the above example, the individual divisions post their respective external as well as divisional revenues. Hengdeli reports the results for its retail operations in China, Hong Kong and Taiwan as well as for its large wholesale business. The wholesale business acquires watches from Swiss manufacturers such as Omega and Rolex and sells them to retailers in China. Among these retailers are also Hengdeli's own retail operations, which is why the wholesale division reports cross-divisional sales of RMB3,075m. Of course, these transactions do not affect the group's total revenues since the goods are merely passed on within the same corporate group. To analyse the results reported by the divisions, the revenue from external customers is therefore relevant and gives a good indication of the respective division sizes. Another suitable size indicator is the size of reportable assets for each division, which allows us to draw conclusions about the capital intensity of each business unit. In the next step, each division's impact on the group earnings should be examined. In this case, the Mainland China retail business accounts for 60% of group earnings and posts the highest profit margins in terms of earnings as a percentage of sales. Reported division profits should, however, always be interpreted with caution since management can let one segment appear to be very profitable, simply by applying artificially low internal transfer prices, for example by selling the products from wholesale to its own retail units, priced below the market. On the group level, of course, these effects cancel out: one segment's extra gain comes at the expense of the other.

Some companies, but especially those in the United States, report on a geographical rather than a business segment basis. In such a case one has to carefully review whether and how expenses (administrative expenses for example), which usually occur in the home country, are distributed within those segments.

Schedule of liabilities/structure of maturities

The final section of the notes often contains an overview of the liabilities structure grouped by maturity. It is particularly interesting that, in some cases, it is not only the expected cash outflow from financial liabilities that is itemized in chronological sequence, but that the expected payments from supplier credits and cash inflows from receivables are also displayed. This breakdown provides valuable insight into the solvency and liquidity situation

of a company. The case of the Finnish conglomerate Nokia shows the following maturity structure for 2011 (Table 1.31).

Table 1.31 Nokia: Repayment schedule

€m	Total	3 months	3–12 months	1–3 years	3–5 years	5 years+
Long-term liabilities	–5,391	–106	–153	–2374	–316	–2442
Current portion of long-term debt	–387	–61	–326	–	–	–
Short-term liabilities	–1002	–951	–87	–	–	–

For the following 12 months Nokia's need for refinancing is determined by summing up the columns '3 months' and '3–12 months', which results in €1,684m. This figure can now be compared with the cash and cash equivalents on Nokia's balance sheet at year end as well as the free cash flow (see previous section) in order to determine the company's internal financing capacity.

The individual components of financial statements and the consolidated financial statements form the basis of any quantitative fundamental analysis. In summary, it is recommended that the balance sheets, income statements and cash flow statements covering several years are evaluated in order to arrive at the most accurate analysis possible. In a comparison with other companies, differences in accounting rules always have to be considered. When it comes to the balance sheet in particular, the notes section is a useful tool for further analysing individual entries in detail. As with all the following financial ratios it is important to carry out the analysis in light of the actual circumstances and activities of the business. The example of Sotheby's showed that it is very difficult, if not impossible, to perform the analysis without this critical background knowledge. The following three chapters will look in detail at financial ratios from various areas of fundamental analysis and illustrate them with case studies.