Chapter 2

Financial Statement and Cash Flow Analysis

OPENING FOCUS

Accounting for the numbers

Accounting is the language of business, but, as we know, the elements of language can be changed and rearranged to make different stories. So too with accounting information. Studies by professors from Duke University in the USA have shown that executives are adept at making changes to accounting information, perfectly legally, which can have a dramatic impact on the 'bottom line'.

John Graham and Campbell Harvey, with their colleague Shivaram Rajgopal from Washington University, surveyed over 400 finance executives in large companies. What they discovered was that companies focus very heavily on 'bottom line' earnings, particularly earnings per share. The vast majority of companies would defer a good, profitable project if by taking it on in this accounting period they would impact on the earnings per share number in a manner that would surprise the stock market. Managers would trade off good value projects in favour of smoother earnings. None of these practices are in any way fraudulent or illegal. Rather they show how closely the managers watch the analysts who watch the earnings of the companies that the managers manage.

By contrast, other research, such as that by Rebecca Rosner, shows that companies that later go into bankruptcy engage pre bankruptcy in accounting manipulation of a more substantive nature.

This chapter provides you with the basic skills to analyse and interpret, from a finance perspective, the accounts of modern corporations.

Sources: Campbell Harvey, John Graham and Shivaram Rajgopal (2006) 'The Economic Implications of Corporate Financial Reporting', *Journal of Accounting and Economics*, 40; Rebecca Rosner (2003) 'Earnings Manipulation in Failing Firms', *Contemporary Accounting Research*, 20(2): 361–408.

LEARNING OBJECTIVES

After studying this chapter you should be able to:

- List and define the key financial statements that firms are required to provide to their shareholders.
- Evaluate a firm's cash flows using its financial statements, including the statement of cash flows.
- Calculate and interpret liquidity, activity and debt ratios.
- Review the popular profitability ratios and the role of the DuPont system in analysing the firm's returns.

SMART PRACTICES VIDEO

Jon Olson, Vice President of Finance, Intel Corporation

'At Intel, accounting is a fundamental requirement of a financial analyst.'

See the entire interview at **www.cengage.co.uk/megginson**

A major challenge for the financial manager is *measuring* the relevant benefits and costs associated with both existing and proposed operations. The accounting profession provides a variety of 'standardized' company data, particularly financial statements, that frequently serve as a starting point for measuring relevant benefits and costs.

It is often said that accounting is the language of business. Corporate finance relies heavily on accounting concepts and language, but the primary focus of finance professionals and accountants differs significantly. Accountants apply generally accepted accounting principles (GAAP) to construct financial statements that attempt to portray fairly how a company has performed in the past. Accountants generally construct these statements using an **accrual-based approach**, which means that accountants record revenues at the point of sale and costs as they are incurred, not necessarily when a firm receives or pays out cash. These widely accepted accounting principles and practices allow corporate financial managers and others, barring fraud, to feel confident with the financial representation contained in audited financial statements.

accrual-based approach
Revenues are recorded at the point of sale and costs when they are incurred, not necessarily when a firm receives or pays out cash.

cash flow approach
Used by financial professionals to focus attention on current and prospective inflows and outflows of cash.

In contrast to accountants, financial professionals use a **cash flow approach** that focuses more attention on current and prospective inflows (benefits) and outflows (costs) of cash. The financial manager must convert relevant accounting and tax information into cash outflows and cash inflows, which after adjustment for timing differences and risk factors, represent the relevant marginal costs and marginal benefits needed for decision making. This divergence is sometimes also characterized as an economic (cash flow and finance professional) perspective versus an accounting perspective.

SMART PRACTICES VIDEO

Howard Millar, Ryanair

The problems of different accounting systems.

See the entire interview at **www.cengage.co.uk/megginson**

This chapter describes how financial professionals use accounting information and terminology to analyse the firm's cash flows and financial performance. If accounting is the language of business, this chapter can be considered as a primer on how to use the language to say what is relevant to finance. We begin with a brief review of the major financial statements, then use them to demonstrate some of the key concepts involved in cash flow analysis. We give special emphasis to the firm's cash flows, free cash flows, the classification of inflows and outflows of cash, and the development and interpretation of statements of cash flows. Then, we discuss some popular financial ratios used to analyse the firm's financial performance.

2.1 FINANCIAL STATEMENTS

As noted in Chapter 1, financial managers focus primarily on cash flows rather than on accrual-based accounting data. In spite of this focus, it is important for financial managers to understand financial statements, which serve as a window through which outsiders – investors, lenders and others – view the firm's financial performance and position.

National governments require public companies to generate financial statements based on widely accepted accounting rules. In the United States, the Securities and Exchange Commission (SEC) is responsible for regulating publicly traded US companies, as well as the nation's stock and bond markets. Every other industrialized country has an agency similar to the SEC, and most developed countries mandate that companies generate financial statements that follow international accounting standards (IAS). An important force in the internationalization of accounting standards has been that the SEC has historically insisted that all non-US companies report results based on US rules if they wish to sell their securities directly to US investors. However, the corporate accounting scandals of 2001 and 2002 tarnished the reputation of these rules and enhanced that of IAS. More recently there has been an increased effort to

harmonize internationally the rules underlying the presentation of accounting statements. Again, thinking of accounting as a language, the existence of different grammars – ways in which the language can be meaningfully put together – can cause confusion. Thus, in recent years the International Accounting Standards Board (IASB) has come to the forefront of the debate. In February 2006 the SEC reaffirmed its commitment to convergence and its wish to work with the IASB on the required convergence issues. Thus, the emergence of a world standard for accounting information, a world grammar, appears possible.

In this chapter we use data taken from the Thomson ONE database. Worldscope is a trade name of Thomson Financial, the providers of Banker One Business School Edition, a subscription to which is bundled with this text. In that package are accounts and statements from a large number of companies. However, the material in the package is a small sample of what is generally available from Worldscope, as the entire dataset covers 96 per cent by market value of world equity markets. Worldscope data are harmonized, based on analysis of original statements from companies. This harmonization is undertaken by the analysts at Thomson, and the resulting data are designed to be internationally comparable. Worldscope data are used worldwide by thousands of academics, analysts, bankers and investors. However, despite this de facto world standard, you should realize that the Worldscope data and accounts have no legal basis. A further issue is that the analysts at Worldscope on occasion use slightly different formulae for ratios from those that appear here. On the Thomson ONE site, right clicking on a number, ratio or element of a statement will show you how it is made up.

The key financial statements of any company are (1) the balance sheet, (2) the income statement and (3) the statement of cash flows. Companies may well, in their annual or quarterly reports, use different names. However, the information presented is the same. (In the USA an important further requirement is to provide a statement of retained earnings.) Our concern in this section is to review the information presented in these statements. Throughout, we present the financial statements from the 2006 annual report of LVMH, the French-based luxury goods producer, as an example of the use of standards and methods.

Balance sheet

A firm's balance sheet presents a 'snapshot' view of the company's financial position at a specific point in time – the financial year-end. By definition, a firm's assets must equal the combined value of its liabilities and shareholders' equity. Phrased differently, either creditors (lenders) or equity investors (owners) finance all of a firm's assets.

A balance sheet shows assets on the left-hand side and the claims of creditors and shareholders on the right-hand side. Both assets and liabilities by convention appear in descending order of liquidity, or the length of time it takes for accounts to be converted into cash in the normal course of business. The most liquid asset, cash, appears first, and the least liquid, fixed assets, comes last. Similarly, accounts payable represents the obligations the firm must pay with cash within the next year, whereas the last entry on the right-hand side of the balance sheet, shareholders' equity, quite literally never matures. This 'double entry' system is not new. Fra Luca Bartolomeo de Pacioli published the *Summa*, a coherent account of double entry bookkeeping and accounting, in 1494, but balance sheets in recognizably modern form are available from the early 14th century.

Table 2.1 presents LVMH's balance sheet as at 31 December 2006. As is standard practice in annual reports, the table also shows previous year accounts for comparison. Cash and cash equivalents are assets such as current account balances at commercial banks that can be used directly as a means of payment. 'Other current assets' represent very liquid, short-term investments, which financial analysts view as a form of 'near cash'. Such securities would include short, fixed-term deposit accounts. Accounts

receivable represent the amount customers owe the firm from sales made on credit. Inventories include raw materials, work in progress (partially finished goods) and finished goods held by the firm. Note also that LVMH is obviously owed rebates on income tax paid, which it expects to receive within the year, which makes it a current asset.

The entry for property, plant and equipment is the book value of all real property, structures and long-lived equipment owned by the firm. Net property, plant and equipment represents the difference between this original value and accumulated depreciation – the cumulative expense recorded for the depreciation of fixed assets since their purchase. Tax authorities allow companies to depreciate, or charge against taxable earnings, a fraction of a fixed asset's cost each year to reflect a decline in the asset's economic value over time. The one fixed asset that is not depreciated is land, because it generally does not decline in value over time. To obtain the gross value of these assets for LVMH it is necessary to examine the account notes. Finally, brands and other intangibles include valuable items such as patents, trademarks, copyrights, exploration rights or other tradable assets. Although intangible assets are usually nothing more than legal rights, they are often extremely valuable, as the discussion of the market value of global brands in the Comparative Corporate Finance insert later in this chapter vividly demonstrates. In the case of LVMH, the value of the brands would reflect the world leading position it holds in areas of luxury goods, with brands such as Louis Vuitton, Pucci, Dior and Tag Heuer.

Turning our attention to the other side of the balance sheet, current liabilities include accounts payable, which are amounts owed for credit purchases by the firm; short-term borrowings comprise outstanding short-term loans, such as overdrafts and term loans typically from commercial bank, and also include the short-term component of long-term debt, in other words the part of long-term debt that will be repaid within one year;

TABLE 2.1

Balance sheet for LVMH, end-2004, 2005 and 2006 (€mn)

	2006	2005	2004		2006	2005	2004
Current assets	**9 165**	**8 516**	**7 412**	**Current liabilities**	**6 356**	**6 591**	**6 076**
Inventories and work in progress	4 383	4 134	3 598	Short-term borrowings	2 100	2 642	2 529
Accounts receivable	1 461	1 370	1 364	Accounts payable	1 899	1 732	1 581
Income tax	512	317	113	Income tax	692	373	201
Other current assets	1 587	1 225	1 302	Provisions	255	305	259
Cash and cash equivalents	1 222	1 470	1 035	Other current liabilities	1 410	1 539	1 506
Fixed assets	**19 620**	**19 537**	**18 105**	**Long-term liabilities**	**10 835**	**10 978**	**10 766**
Brands and other intangibles	8 227	8 530	7 838	Long-term borrowings	3 235	3 747	4 188
Goodwill	4 537	4 479	4 048	Provisions	983	949	883
Property, plant and equipment net	5 173	4 983	4 541	Deferred tax	2 862	2 925	2 458
Investments in associates	126	128	115	Other non-current liabilities	3 755	3 357	3 237
Non-current financial assets	504	451	718				
Other non-current assets	658	660	628	**Equity**	**11 594**	**10 484**	**8 675**
Deferred tax	395	306	217	Share capital	147	147	147
				Share premium account	1 736	1 736	1 736
				Treasury shares	−1 019	−972	−1 006
				Minority interests	991	1 025	893
				Translation adjustment	−119	292	−200
				Group share of net profit	1 879	1 440	1 194
				Reserves	7 979	6 816	5 911
Total assets	**28 785**	**28 053**	**25 517**	**Total liabilities and equity**	**28 785**	**28 053**	**25 517**

and 'other current liabilities', which are usually accrued expenses (costs incurred by the firm that have not yet been paid). Examples of accruals include taxes owed to the government and wages due to employees. Accounts payable and accruals are often called 'spontaneous liabilities' because they tend to change directly with changes in sales.

In many countries, laws permit firms to construct two sets of financial statements, one for tax purposes and one for reporting to the public. For example, when a firm purchases a long-lived asset, it can choose to depreciate this asset rapidly for tax purposes, resulting in large, immediate tax write-offs and smaller tax deductions later. When the firm constructs financial statements for release to the public, however, it may choose a different depreciation method, perhaps one that results in higher reported earnings in the early years of the asset's life and lower earnings later. The **deferred taxes** entry on the balance sheet is a long-term liability that reflects the discrepancy between the taxes that firms actually pay and the tax liabilities they report on their public financial statements. **Long-term debt** represents debt that matures more than one year in the future. Note also that LVMH has entries for provisions, which are monies due for liabilities such as pension fund reserve rebalancing and medical care of retirees. Some of these are due within the year, making them current, while others are longer term in nature.

deferred taxes
Reflect the discrepancy between the taxes that firms actually pay and the tax liabilities they report on their public financial statements.

long-term debt
Debt that matures more than one year in the future.

The shareholders 'equity section provides information about the claims of investors who own preference and ordinary shares. LVMH has no **preference shares**, but if it had they would appear first in the shareholders' equity section, as they take precedence over ordinary shares Next, the amount paid in by the original purchasers of **ordinary shares**, the most basic form of corporate ownership, is shown by two entries – share capital and share premium account. The share capital entry equals the number of outstanding ordinary shares multiplied by the **par value** per share. The par value of a share is an arbitrary value with little or no economic significance. The **share premium account** equals the number of shares outstanding multiplied by the original selling price of the shares, net of the par value. Therefore, the combined value of ordinary shares and paid-in capital equals the proceeds the firm received when it originally sold shares to investors. **Reserves (retained earnings)** are the cumulative total of the earnings that the firm has reinvested since its inception. It is important to recognize that these retained earnings do not represent a reservoir of unspent cash. They represent shareholders' funds that they have decided to keep in the company rather than pay in dividends or spend on other investments.

preference shares
A form of ownership that has preference over ordinary shares with regard to income and assets.

ordinary shares
The most basic form of corporate ownership.

par value
(ordinary shares) An arbitrary value assigned to ordinary shares on a firm's balance sheet.

share premium account
The number of ordinary shares outstanding times the original selling price of the shares, net of the par value.

reserves (retained earnings)
The cumulative total of the earnings that a firm has reinvested since its inception.

In the case of LVMH there is another element of shareholders' equity, the **minority interest**, representing the value of shares that the company holds in subsidiaries of the company. The **treasury shares** entry records the value of ordinary shares that the firm currently holds in reserve. Usually, treasury shares appear on the balance sheet because the firm has reacquired previously issued shares through a share repurchase programme. We also see an item, 'Translation adjustment', which in the case of LVMH represents losses or gains on foreign exchange transactions, or incurred when translating foreign exchange. Equity consists of the total of all equity invested in the company.

minority interest
The value of shares that a company holds in subsidiaries of the company.

Income statement

Table 2.2 presents LVMH's income statement for the year ended 31 December 2006. As with the balance sheet, LVMH's income statement also includes data from 2004 and 2005 for comparison.[1] In the vocabulary of accounting, income (also called profit,

treasury shares
Shares that were issued and later reacquired by the firm through share repurchase programmes and are therefore being held in reserve by the firm.

[1] When reporting to shareholders, firms typically also include a common-size income statement that expresses all income statement entries as a percentage of sales.

TABLE 2.2
LVMH income statements for the years ended 31 December 2004–2006 (€mn)

	2006	2005	2004
Revenue	15 306	13 910	12 481
Cost of goods sold	5 481	5 001	4 373
Gross profit	**9 825**	**8 909**	**8 108**
Marketing and sales expenses	5 364	4 892	4 512
General and administrative expenses	1 289	1 274	1 224
Operating profit	**3 172**	**2 743**	**2 372**
Other income and expenditure	120	221	199
Earnings before interest and taxes (EBIT)	**3 052**	**2 522**	**2 173**
Net finance charges	53	143	220
Income tax	839	711	551
Net profit or income after taxes	2 160	1 668	1 402
Minority interest	281	228	208
Income to shareholders	**1 879**	**1 440**	**1 194**

earnings or margin) equals revenue minus expenses. LVMH's income statement, however, has several measures of 'income' appearing at different points. The first income measure is gross profit, which is the amount by which sales revenue exceeds the cost of goods sold (the direct cost of producing or purchasing the goods sold). Next, various operating expenses, including selling expense, general and administrative expense, are deducted from gross profits. The resulting operating profit of €3172 million represents the profits earned from the sale of products, although this amount does not include financial and tax costs. Other income, earned on transactions not directly related to producing and/or selling the firm's products, is added to operating income to yield earnings before interest and taxes (EBIT) of €3052 million. When a firm has no 'other income', its operating profit and EBIT are equal. Next, €53 million of interest expense – representing the cost of debt financing – is subtracted from EBIT to arrive at pre-tax income, in this case €2099 million. The final step is to subtract taxes from pre-tax income to arrive at net income, or net profit after taxes, of €2160 million. Net income is the proverbial 'bottom line' and the single most important accounting number for both corporate managers and external financial analysts. As we have seen earlier, LVMH has minority interests, and the share of income attributable to those outside interests is deducted in the last stage.

COMPARATIVE CORPORATE FINANCE

Assessing the market values of global brands

How much is a global brand name worth? Interbrand Corporation, a New York-based consulting firm, has been trying to answer this question for several years, and *Business Week* has been publishing the rankings annually since 2001. The accompanying table details what this firm considers the 25 most valuable brands of 2006. The total brand values are large and are dominated by brands of US-based companies. Additionally, the rankings are remarkably stable from year to year; the 2003 rankings listed the same top five, in order, and only one new brand entered the top 25 during 2004.

Although American companies are not required to disclose estimated brand values in their financial statements, large publicly traded British and Australian firms must do so. Brand values do, however,

have a significant effect on US accounting rules in one important area – accounting for the 'goodwill' created when a firm is acquired by another company for more than the acquired firm's book value. This premium over book value represents the higher market (versus book) value of intangible assets such as patents, copyrights and trademarks, as well as brand names and business relationships that are not accounted for at all. Charges arising from goodwill impairment can have a dramatic effect on reported earnings.

RANK	BRAND	COUNTRY	SECTOR	VALUE ($mn)	CHANGE OVER YEAR
1	Coca-Cola	US	Beverages	67 000	−1%
2	Microsoft	US	Computer	56 926	−5%
3	IBM	US	Computer	56 201	5%
4	GE	US	Diversified	48 907	4%
5	Intel	US	Computer	32 319	−9%
6	Nokia	Finland	Telecom	30 131	14%
7	Toyota	Japan	Automotive	27 941	12%
8	Disney	US	Media/Entertainment	27 848	5%
9	McDonald's	US	Restaurants	27 501	6%
10	Mercedes	Germany	Automotive	21 795	9%
11	Citi	US	Financial	21 458	7%
12	Marlboro	US	Tobacco	21 350	1%
13	Hewlett-Packard	US	Computer	20 458	8%
14	American Express	US	Financial	19 641	6%
15	BMW	Germany	Automotive	19 617	15%
16	Gillette	US	Personal Care	19 579	12%
17	LVMH	France	Luxury	17 606	10%
18	Cisco	US	Computer	17 532	6%
19	Honda	Japan	Automotive	17 049	8%
20	Samsung	South Korea	Electronics	16 169	8%
21	Merrill Lynch	US	Financial	13 001	8%
22	Pepsi	US	Beverages	12 690	2%
23	Nescafé	Switzerland	Beverages	12 507	2%
24	Google	US	Internet	12 376	46%
25	Dell	US	Computer	12 256	−7%

Source: Interbrand Corporation.

Statement of cash flows

The statement of cash flows provides a summary of a firm's cash flows over the year. This is accomplished by isolating the firm's operating, investment and financing cash flows and reconciling them with changes in its cash and marketable securities during the year. LVMH's statement of cash flows for the year ended 31 December 2006, is presented in Table 2.4. We should also stress that other information presented in financial statements can be very useful to financial managers and analysts. This is especially true about the 'notes' to financial statements.

Notes to financial statements

A public company's financial statements include detailed explanatory notes keyed to the relevant accounts in the statements. These notes provide detailed information on

the accounting policies, calculations and transactions underlying entries in the financial statements. Consider for example CRH, a cement, aggregates and building company with operations worldwide. In the firm's 2006 annual report the notes to the accounts consist of 42 pages in total. These contain a wealth of information on the geographical origin of sales, the operation of the company share option schemes, directors' remuneration, details on hedging and so forth.

Notes typically provide additional information about a firm's revenue recognition practices, income taxes, fixed assets, leases and employee remuneration plans. This information is particularly useful to professional security analysts who look for clues that shed more light on the firm's past and future performance.

CONCEPT REVIEW QUESTIONS

1. What role do the IASB and SEC play in determining the content and structure of financial statements?
2. Are balance sheets and income statements prepared with the same purpose in mind? How are these two statements different, and how are they related?
3. Which statements are of greatest interest to creditors, and which would be of greatest interest to shareholders?
4. Why does the balance sheet have to balance?

2.2 CASH FLOW ANALYSIS

Although financial managers are interested in the information contained in the firm's accrual-based financial statements, their primary focus is on cash flows. Remember, cash is king! Without adequate cash to pay obligations on time, to fund operations and growth, and to compensate owners, the firm will fail. The financial manager and other interested parties can gain insight into the firm's cash flows over a given period of time by using some popular measures of cash flow and by analysing the firm's statement of cash flows.

The firm's cash flows

Figure 2.1 illustrates the firm's cash flows. Note that the figure treats cash and marketable securities as perfect substitutes. Both cash and marketable securities represent a reservoir of liquidity that increases with cash inflows and decreases with cash outflows. Also note that the figure divides the firm's cash flows into (1) operating flows, (2) investment flows and (3) financing flows. The **operating flows** are cash inflows and outflows directly related to the production and sale of the firm's products or services. **Investment flows** are cash flows associated with the purchase or sale of both fixed assets and business equity. Clearly, purchases result in cash outflows, whereas sales generate cash inflows. The **financing flows** result from debt and equity financing transactions. Taking on new debt (short term or long term) results in a cash inflow, whereas repaying existing debt represents a cash outflow. Similarly, the sale of shares results in a cash inflow, whereas the repurchase of shares or payment of cash dividends generates a cash outflow. In combination, the firm's operating, investment and financing cash flows during a given period will affect the firm's cash and marketable securities balances.

operating flows
Cash inflows and outflows directly related to the production and sale of a firm's products or services.

investment flows
Cash flows associated with the purchase or sale of both fixed assets and business equity.

financing flows
Result from debt and equity financing transactions.

Monitoring cash flow is important for financial managers employed by the firm and for outside analysts trying to estimate how much the firm is worth.

Inflows and outflows of cash Table 2.3 classifies the basic inflows and outflows of cash for corporations (assuming other things are held constant). For example, if a firm's accounts payable increases by €1000 during the year, this change would be an inflow of cash. If the firm's inventory increases by €2500, the change would be an outflow of cash.

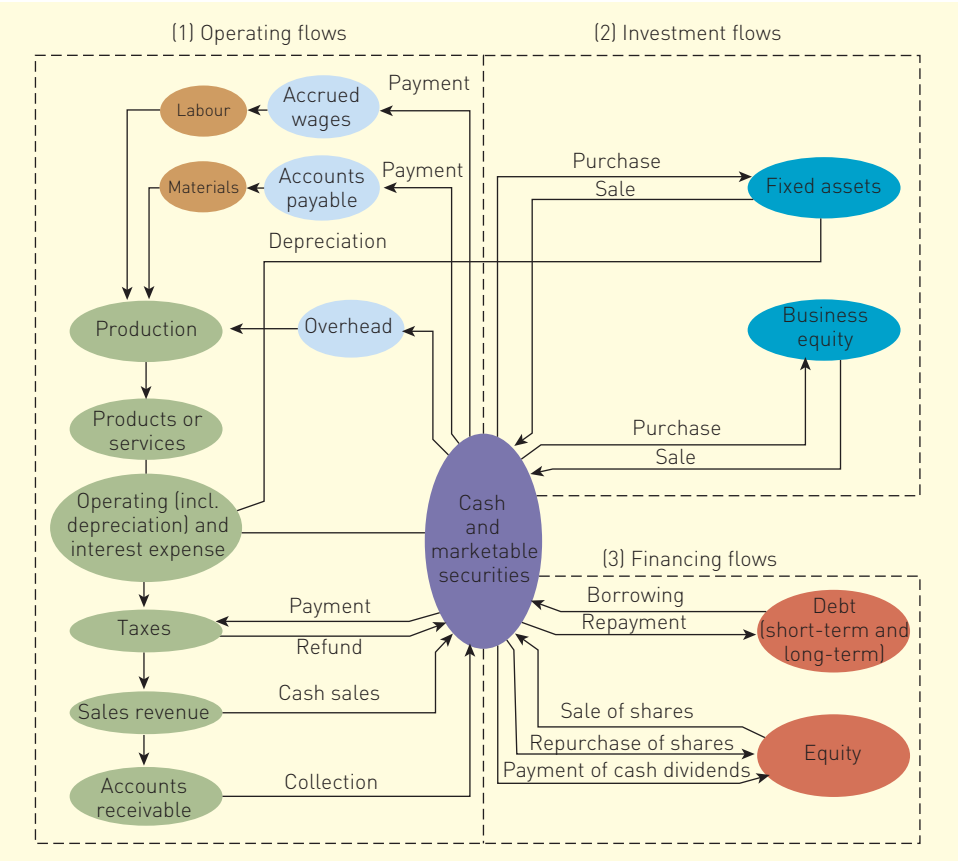

FIGURE 2.1
The pattern of cash flows through a firm

The firm's reservoir of liquidity, containing both cash and marketable securities, is impacted by changes in (1) operating flows, (2) investment flows and (3) financing flows.

INFLOWS	OUTFLOWS
Decrease in any asset	Increase in any asset
Increase in any liability	Decrease in any liability
Net income (profit after tax)	Net loss
Depreciation and other non-cash charges	Dividends paid
Sale of shares	Repurchase or retirement of shares

TABLE 2.3
The inflows and outflows of corporate cash

A few additional points can be made about the classification scheme in Table 2.3.

1 A *decrease* in an asset, such as the firm's inventory balance, is an *inflow of cash* because cash that has been tied up in the asset is released. Managers can use it for some other purpose, such as repaying a loan. In contrast, an *increase* in the firm's inventory balance (or any other asset) is an *outflow of cash* because additional inventory ties up more of the firm's cash. Similar logic explains why an increase in any liability is an inflow of cash, and a decrease in any liability is an outflow of cash.

2 Our earlier discussion noted why depreciation and other non-cash charges are considered cash inflows. Logic suggests that if net income is a cash inflow, then a net loss (negative net profits after taxes) is an outflow of cash. The firm must balance its losses with an inflow of cash, such as selling off some of its fixed assets (reducing an asset) or increasing external borrowing (increasing a liability). Note (from Equation 2.1, page 41) that a firm can have a net loss (EBIT – taxes) and still have positive cash flow when depreciation and other non-cash charges

during the period are greater than the net loss. Therefore, the statement of cash flows treats net income (or net losses) and non-cash charges as separate entries.

Applying the Model

Below we see the current assets and liabilities of Juventus Football Club for the financial years ending June 2004 and 2005 (in millions of euros).

ELEMENT	2005	2004
Cash	6.54	53.14
Short-term investments	2.04	2.04
Accounts receivable	71.08	61.04
Inventory	0	0
Accounts payable	17.01	12.57
Short-term debt	24.97	0

In terms of current assets, accounts receivable increased during the year, representing an outflow of cash for Juventus. Cash decreased, representing a cash inflow. It may seem strange to think of a decrease in cash balances as a source of cash, but that simply means that Juventus used some of its cash flow to 'disinvest in liquidity' rather than use the cash for another purpose. Not surprisingly, the club has no inventories (although some might consider the stock of players that are not gaining first team places as equivalent). On the liabilities side, accounts payable increased, representing a cash inflow for Juventus, while short-term debt increased, representing an inflow of cash for the club.

Developing and interpreting the statement of cash flows

The statement of cash flows summarizes the inflows and outflows of cash during a given period. Accountants construct the statement of cash flows by using the income statement for the year, along with the beginning- and end-of-year balance sheets. The procedure involves classifying balance sheet changes as inflows or outflows of cash; obtaining income statement data; classifying the relevant values into operating, investment and financing cash flows; and presenting them in the proper format.[2] The statement of cash flows for LVMH for the year ended 31 December 2006 appears in Table 2.4. Note that the statement assigns positive values to all cash inflows and negative values to all cash outflows. Notice under the investment activities section that the statement records the increase in gross fixed assets, rather than net fixed assets, as a cash outflow. Depreciation accounts for the difference between changes in gross and net fixed assets, but depreciation expense appears in the operating activities section of the statement. Thus, the focus on changes in gross fixed assets avoids double counting depreciation in the statement. For a similar reason, the statement does not show a specific entry for the change in retained earnings as an inflow (or outflow) of cash. Instead, the factors that determine the change in retained earnings – profits or losses and dividends – appear as separate individual entries in the statement.

[2] For a description and demonstration of the detailed procedures for developing the statement of cash flows, see any recently published financial accounting text.

By adding up the items in each category – operating, investment and financing activities – we obtain the net increase (decrease) in cash and marketable securities for the year. As a check, this value should reconcile with the actual yearly change in cash and marketable securities, obtained from the beginning- and end-of-year balance sheets. By applying this procedure to LVMH's income statement and balance sheets, we obtain the firm's statement of cash flows (see Table 2.4).

The statement of cash flows allows the financial manager and other interested parties to analyse the firm's cash flow over a period of time. Unusual changes in either the major categories of cash flow or in specific items offer clues to problems that a firm may be experiencing. For example, an unusually large increase in accounts receivable or inventories resulting in major cash outflows may signal credit or inventory problems, respectively. Financial managers and analysts can also prepare a statement of cash flows developed from projected, or pro forma, financial statements. They use this approach to determine whether the firm will require additional external financing or will generate excess cash that can be reinvested or distributed to shareholders. After you learn the concepts, principles and practices of corporate finance presented in the text, you will be able to glean a good amount of useful information from the statement of cash flows.

free cash flow (FCF) The net amount of cash flow remaining after the firm has met all operating needs and paid for investments, both long term (fixed) and short term (current). Represents the cash amount that a firm could distribute to investors after meeting all its other obligations.

Free cash flow

Free cash flow (FCF) is the amount of cash flow available to investors – the providers of debt and equity capital. It represents the net amount of cash flow remaining after the firm has met all operating needs and paid for investments – both long term (fixed) and short term (current). Free cash flow for a given period can be calculated in two steps.

First we find the firm's **operating cash flow (OCF)**, which is the amount of cash flow generated by the firm from its operations. It can be calculated using the following equation:

operating cash flow (OCF) The amount of cash flow generated by a firm from its operations. Mathematically, earnings before interest and taxes (EBIT) minus taxes plus depreciation.

$$OCF = EBIT - Taxes + Depreciation$$

EQUATION 2.1

TABLE 2.4
Statement of cash flows for LVMH for the years ended 31 December 2004–2006 (€mn)

	2006	2005	2004
Operating activities			
Operating profit	3 052	2 522	2 173
Increase in depreciation and amortization	474	639	529
Other	−22	−72	6
Cash flow from operations before working capital changes	3 504	3 089	2 708
Interest and taxes paid	−174	−222	−215
Taxes	−784	−616	−389
Net cash from operations before working capital	2 546	2 251	2 104
Change in inventories	−351	−281	−252
Change in accounts receivable	−146	−67	29
Change in accounts payable	208	27	−88
Other	31	64	92
Net cash from operations	2 288	1 994	1 885
Investing activities			
Investing activities	−712	−818	−951
Operating investments	−749	−679	−588
Financial investments	37	−139	−363
Financing activities			
Financing activities	−1 153	−407	−76
Borrowings	785	1 192	1 599
Repayments	−1 757	−1 559	−1 686
Current investments	−181	−40	11

non-cash charges Expenses, such as depreciation, amortization and depletion allowances, that appear on the income statement but do not involve an actual outlay of cash.

Note that because depreciation is a non-cash charge, it is added back to determine OCF. **Non-cash charges**, such as depreciation, amortization and depletion allowances, are expenses that appear on the income statement but do not involve an actual outlay of cash. Almost all firms list depreciation expense on their income statements, so we focus on depreciation rather than amortization or depletion allowances, but they are treated in a similar fashion. Substituting the values from the LVMH 2006 income statement (from Table 2.2) into Equation 2.1, we derive LVMH operating cash flow:

$$OCF = 3052 - 784 + 474 = 2742$$

LVMH OCF is €2742 million. Next, we convert this operating cash flow to free cash flow (FCF) by deducting the firm's net investments (denoted by the 'change' symbol Δ) in fixed and current assets from operating cash flow, as shown in the following equation:

EQUATION 2.2

$$FCF = OCF - \Delta FA - (\Delta CA - \Delta AP - \Delta \text{accruals})$$

Note that because they occur automatically with changes in sales, only spontaneous current liability changes are deducted from current assets to find the net change in short-term investment. From the preceding calculation, we know that LVMH's OCF in 2006 was €2742 million. Using Table 2.1 we can calculate the changes in gross fixed assets, current assets, accounts payable and accruals between 2005 and 2006. Substituting these values into Equation 2.2, we derive the following:

$$FCF = 2742 - (-252) - (649 - 167 - (-138)) = 2374$$

LVMH thus has free cash flow in 2006 of €2374 million available to pay investors who provide the firm with debt and equity financing.

CONCEPT REVIEW QUESTIONS

5 How do depreciation and other non-cash charges act as sources of cash inflow to the firm? Why does a depreciation allowance exist in the tax laws? For a profitable firm, is it better to depreciate an asset quickly or slowly for tax purposes? Explain.

6 What is operating cash flow (OCF)? What is free cash flow (FCF), and how is it related to OCF?

7 Why is the financial manager likely to show great interest in the firm's statement of cash flows? What type of information can be obtained from this statement?

2.3 ANALYSING FINANCIAL PERFORMANCE USING RATIO ANALYSIS

Analysis of a firm's financial statements is of interest to shareholders, creditors and the firm's own management. In many cases, the constituents of a firm want to compare its financial condition to that of similar firms, but doing so can be very tricky. For example, suppose you are introduced to a new acquaintance named Bill who tells you that he runs a company that earned a profit of €10 million last year. Would you be impressed? What if you knew that Bill's last name was Gates? Most people would agree that a profit of €10 million would be a great disappointment for Microsoft, the firm run by Bill Gates.

The point here is that the sales, profits and other items that appear on a firm's financial statements are difficult to interpret unless we have some way to put the numbers in perspective. To analyse financial statements, we need relative measures that normalize size differences. Effective analysis of financial statements is thus based

on the knowledge and use of ratios or relative values. **Ratio analysis** involves calculating and interpreting financial ratios to assess a firm's performance and status.

ratio analysis
Calculating and interpreting financial ratios to assess a firm's performance and status.

Using financial ratios

Different constituents will focus on different types of financial ratios. The firm's creditors are primarily interested in ratios that measure the short-term liquidity of the company and its ability to make interest and principal payments. A secondary concern of creditors is the firm's profitability; they want assurance that the business is healthy and will continue to be successful. Both current and prospective shareholders are interested in ratios that measure the firm's current and future levels of risk and return, because these two dimensions directly affect the firm's share price. The firm's managers must be concerned with all aspects of the firm's financial situation, so they use ratios to generate an overall picture of the company's financial health and to monitor the firm's performance from period to period. The managers carefully examine unexpected changes to isolate developing problems.

An additional complication of ratio analysis is that, for any given ratio, what is normal in one industry may be highly unusual in another. For example, by dividing a firm's earnings available for shareholders by its sales, we obtain the net profit margin ratio. Net profit margins vary dramatically across industries. An outstanding net profit margin in the retail grocery industry could look paltry in the software business. Therefore, when making subjective judgements about the health of a given company, analysts usually compare the firm's ratios to two benchmarks. First, analysts compare the financial ratios in the current year with previous years' ratios, hoping to identify trends that help them evaluate the firm's prospects. Secondly, analysts compare the ratios of one company with those of other 'benchmark' firms in the same industry (or to an industry average obtained from a trade association or third party provider).

We discuss the use of ratios by examining those for LVMH: note that the emphasis is on interpretation as opposed to detailed calculation. We focus on this company merely as an example, and you should note that the ratios presented in the remainder of this chapter can be applied to nearly any company. Of course, many companies in different industries use ratios that focus on aspects peculiar to their industry. For example, airlines pay close attention to the ratio of revenues to passenger miles flown. Retailers diligently track the growth in same-store sales from one year to the next. We cover the most common financial ratios and group them into five categories: liquidity, activity, debt, profitability and market ratios.

Liquidity ratios

Liquidity ratios measure a firm's ability to satisfy its short-term obligations as they come due. Because a common precursor to financial distress and bankruptcy is low or declining liquidity, liquidity ratios are good leading indicators of cash flow problems. The two basic measures of liquidity are the current ratio and the quick (acid-test) ratio.

The **current ratio**, one of the most commonly cited financial ratios, measures the firm's ability to meet its short-term obligations. It is defined as current assets divided by current liabilities, and thus presents in ratio form what **net working capital** measures by subtracting current liabilities from current assets. The end-2006 current ratio for LVMH is computed as follows:

$$CR = \frac{CA}{CL} = \frac{9165}{6356} = 1.44$$

How high should the current ratio be? The answer depends on the type of business under consideration and on the costs and benefits of having too much versus too

liquidity ratios
Measure a firm's ability to satisfy its short-term obligations as they come due.

current ratio
A measure of a firm's ability to meet its short-term obligations, defined as current assets divided by current liabilities.

net working capital
Profitability that represents the percentage of each sales euro remaining after all costs and expenses, including interest, taxes and preference share dividends, have been deducted.

little liquidity. For example, a current ratio of 1.0 is considered acceptable for a utility but may be unacceptable for a manufacturing firm. The more predictable a firm's cash flows, the lower the acceptable current ratio. Because LVMH is in the luxury goods business with highly cyclical annual cash flows, its current ratio of 1.44 indicates that the company takes a fairly aggressive approach to managing its liquidity.

quick (acid-test) ratio
A measure of a firm's liquidity that is similar to the current ratio except that it excludes inventory, which is usually the least liquid current asset.

The **quick (acid-test) ratio** is similar to the current ratio except that it excludes inventory, which is usually the least liquid current asset. The generally low liquidity of inventory results from two factors: (1) many types of inventory cannot be easily sold because they are partially completed items, special-purpose items and the like; and (2) inventory is typically sold on credit, which means that it becomes an account receivable before being converted into cash. The quick ratio is calculated as follows:

$$ATR(QR) = \frac{Cash + Receivables}{CL} = \frac{1222 + 1461}{6356} = 0.42$$

The quick ratio for LVMH in 2006 is 0.42. The quick ratio provides a better measure of overall liquidity only when a firm's inventory cannot be easily converted into cash. If inventory is liquid, the current ratio is a preferred measure of overall liquidity. Because LVMH inventory is mostly products that can be readily converted into cash, the firm's managers might consider it correct to focus on the current ratio rather than the quick ratio.

Activity ratios

activity ratios
A measure of the speed with which a firm converts various accounts into sales or cash.

inventory turnover
A measure of how quickly a firm sells its goods.

Activity ratios measure the speed with which the firm converts various accounts into sales or cash. Managers and outsiders use activity ratios as guides to assess how efficiently the firm manages assets such as inventory, receivables and fixed assets, as well as the current liability, accounts payable.

Inventory turnover provides a measure of how quickly a firm sells its goods. LVMH's 2006 inventory turnover ratio is as follows:

$$ITR = \frac{COGS}{Inventory} = \frac{5481}{4383} = 1.25$$

Notice that we use cost of goods sold rather than sales in the numerator because inventory is valued at its cost on the firm's balance sheet. Also note that in the denominator we use the ending inventory balance to calculate this ratio. If inventories grow over time or exhibit seasonal patterns, analysts sometimes use the average level of inventory throughout the year rather than the ending balance to calculate this ratio. This approach is used by default in Worldscope. The resulting turnover of 1.25 indicates that the firm basically sells outs its inventory just slightly more than one and a quarter times per annum. This value is only meaningful when it is compared with that of other firms in the same industry or with the firm's past inventory turnover. Inventory turnover is easily converted into an **average age of inventory** by dividing the turnover figure into 360. (Note 360 is used, purely by convention, rather than 365.)

average age of inventory
A measure of inventory turnover, calculated by dividing the turnover figure into 360.

Applying the Model

Inventory ratios, like most other financial ratios, vary a great deal from one industry to another. Looking at the Thomson ONE Banker data, we can see this if we compare company inventory ratios to peer groups. If we select three

companies in three different industries, this becomes evident. In all cases we select as a peer group only those companies that are in the Europe/Africa region.

INDUSTRY	COMPANY	INVENTORY TURNOVER RATIO	PEER AVERAGE
Commercial printing	Wyndeham Press plc	19.22	19.03
Packaged foods and meats	Cadbury Schweppes	4.18	17.60
Gas distribution	Gaz de France	13.03	63.29

The **average collection period**, or average age of accounts receivable, is useful in evaluating credit and collection policies.[3] It measures the average amount of time that elapses from a sale on credit until the payment becomes usable funds for a firm. It is computed by dividing the firm's average sales per day into the accounts receivable balance. On average, in 2006 it took LVMH 34 days to receive payment from a credit sale.

average collection period
The average amount of time that elapses from a sale on credit until the payment becomes usable funds for a firm. Calculated by dividing accounts receivable by average sales per day. Also called the average age of accounts receivable.

$$ASPd = \frac{Sales\ Revenue}{360} = \frac{15306}{360} = 42.51$$

$$ACP = \frac{Accounts\ Receivable}{ASPd} = \frac{1461}{42.51} = 34.37$$

The average collection period is meaningful only in relation to the firm's credit terms. If LVMH extends 30-day credit terms to customers, an average collection period of 34.37 days may indicate a poorly managed credit or collection department, or both. The lengthened collection period could also be the result of an intentional relaxation of credit term enforcement in response to competitive pressures.

Firms use the **average payment period** to evaluate their performance in paying suppliers. It measures the average length of time it takes the firm to pay its suppliers. It equals the firm's average daily purchases divided into the accounts payable balance. To calculate average daily purchases, an analyst may have to estimate the firm's annual purchases, often by taking a specified percentage of cost of goods sold. This estimate is necessary because annual purchases are not reported on a firm's published financial statements. Instead they are embodied in its cost of goods sold. In a fashion similar to the average collection period, the average payment period is meaningful only when viewed in light of the actual credit terms extended to the firm by its suppliers.

average payment period
A measure of the average length of time it takes a firm to pay its suppliers.

The **fixed asset turnover** measures the efficiency with which a firm uses its fixed assets. The ratio tells analysts how many euros of sales the firm generates per euro of fixed asset investment. The ratio equals sales divided by net fixed assets (fixed assets less intangibles):

fixed asset turnover
A measure of the efficiency with which a firm uses its fixed assets, calculated by dividing sales by net fixed asset investment.

$$FAT = \frac{Sales}{NFA} = \frac{15306}{(19620 - 8227)} = 1.34$$

[3] The average collection period is sometimes called the days' sales outstanding (DSO). As with the inventory turnover ratio, the average collection period can be calculated using end-of-year accounts receivable or the average receivables balance for the year.

The fixed asset turnover for LVMH in 2006 is 1.34. This means that the company turns over its net fixed assets 1.34 times a year. Put another way, LVMH generates just over €1.34 in sales for every €1.00 of fixed assets. As with other ratios, the 'normal' level of fixed asset turnover varies widely from one industry to another.

An analyst must be aware that (when using this ratio and the total asset turnover ratio described next) the calculations use the *historical costs* of fixed assets. Because some firms have significantly newer or older assets than others, comparing fixed asset turnovers of those firms can be misleading. Firms with newer assets tend to have lower turnovers than those with older assets, which have lower book (accounting) values. A naïve comparison of fixed asset turnover ratios for different firms may lead an analyst to conclude that one firm operates more efficiently than another, when, in fact, the firm that appears to be more efficient simply has older (i.e. more fully depreciated) assets on its books. Also, for a company with large values of brands and other intangibles, it is not clear that excluding these from the analysis is in fact correct.

total asset turnover
A measure of the efficiency with which a firm uses all its assets to generate sales; calculated by dividing the value of sales a firm generates by the value of assets used.

The **total asset turnover** ratio indicates the efficiency with which a firm uses *all* its assets to generate sales. Like the fixed asset turnover ratio, total asset turnover indicates how many euros of sales a firm generates per euro of asset investment. All other factors being equal, analysts favour a high turnover ratio because it indicates that a firm generates more sales (and ideally more cash flow for investors) from a given investment in assets. LVMH's total asset turnover in 2006 equals 0.53, calculated as follows:

$$FAT = \frac{Sales}{TA} = \frac{15306}{28785} = 0.53$$

Debt ratios

Firms finance their assets from two broad sources – equity and debt. Equity comes from shareholders, whereas debt comes in many forms and from many different lenders. Firms borrow from suppliers, from banks and from widely scattered investors who buy publicly traded bonds. Debt ratios measure the extent to which a firm uses money from creditors rather than shareholders to finance its operations. Because creditors' claims must be satisfied before firms can distribute earnings to shareholders, current and prospective investors pay close attention to the debts on a firm's balance sheet. Lenders share these concerns because the more indebted the firm, the higher the probability that the firm will be unable to satisfy the claims of all its creditors.

In general, the more debt a firm uses in relation to its total assets, the greater its financial leverage. Fixed-cost sources of financing, such as debt and preference shares, create **financial leverage** that magnifies both the risk and the expected return on the firm's securities.[4] The more a firm borrows, the riskier its outstanding shares and bonds, and the higher the return that investors require on those securities. A detailed discussion of the effect of debt on the firm's risk, return and value is included in Chapter 12. Here we emphasize the use of debt ratios to assess a firm's indebtedness and its ability to meet the fixed payments associated with debt.

financial leverage
Using fixed-cost sources of financing, such as debt and preference shares, to magnify both the risk and expected return on a firm's investments.

Broadly speaking, there are two types of debt ratios. One type focuses on balance sheet measures of outstanding debt relative to other sources of financing. The other

[4] By fixed cost we mean that the cost of this financing source does not vary over time in response to changes in the firm's revenue and cash flow. For example, when a firm borrows money at a variable rate, the interest cost of that loan is not fixed through time, but the firm's obligation to make interest payments is 'fixed' regardless of the level of the firm's revenue and cash flow.

type, known as the **coverage ratio**, focuses more on income statement measures of the firm's ability to generate sufficient cash flow to make scheduled interest and principal payments. Investors and credit rating agencies use both types of ratios to assess a firm's creditworthiness.

coverage ratio
A debt ratio that focuses more on income statement measures of a firm's ability to generate sufficient cash flow to make scheduled interest and principal payments.

The **debt ratio** measures the proportion of total assets financed by the firm's creditors. The higher this ratio, the greater the firm's reliance on borrowed money to finance its activities. The ratio equals total liabilities divided by total assets, and LVMH's debt ratio is 0.59. or 59 per cent. This figure indicates that the company has financed more than half of its assets with debt.

debt ratio
A measure of the proportion of total assets financed by a firm's creditors.

$$DR = \frac{TL}{TA} = \frac{17191}{28785} = 0.59$$

A close cousin of the debt ratio is the **assets-to-equity (A/E) ratio**, sometimes called the **equity multiplier**:

assets-to-equity (A/E) ratio
A measure of the proportion of total assets financed by a firm's equity. Also called the equity multiplier.

$$EM = \frac{TA}{Equity} = \frac{28785}{11594} = 2.49$$

The resulting value indicates that LVMH's assets in 2006 are two-and-a-half times greater than its equity.

equity multiplier
A measure of the proportion of total assets financed by a firm's equity. Also called the assets-to-equity (A/E) ratio.

An alternative measure of the firm's leverage that focuses solely on the firm's long-term debt is the **debt-to-equity ratio**, calculated by dividing long-term debt by shareholders' equity. The 2006 value of this ratio for LVMH is calculated as follows:

debt-to-equity ratio
A measure of the firm's financial leverage, calculated by dividing long-term debt by shareholders' equity.

$$DER = \frac{LTD}{Equity} = \frac{3235}{11594} = 0.28$$

LVMH's long-term debts are therefore only around 30 per cent as large as its shareholders' equity. Note, however, that both the debt ratio and the debt-to-equity ratio use book values of debt, equity and assets. Analysts should be aware that the market values of these variables may differ substantially from book values. In addition, depending on which aspects of the company the analyst is focused on, certain elements of debt (such as convertible bonds) may be omitted from the debt figures.

The **times interest earned ratio**, which equals earnings before interest and taxes divided by interest expense, measures the firm's ability to make contractual interest payments. A higher ratio indicates a greater capacity to meet scheduled payments. The times interest earned ratio for LVMH in 2006 equals 57.58, indicating that the firm could experience a substantial decline in earnings and still meet its interest obligations:

times interest earned ratio
A measure of the firm's ability to make contractual interest payments, calculated by dividing earnings before interest and taxes by interest expense.

$$TIE = \frac{EBIT}{Interest} = \frac{3052}{53} = 57.58$$

Profitability ratios

Several measures of profitability relate a firm's earnings to its sales, assets or equity. Profitability ratios are among the most closely watched and widely quoted financial ratios. Many firms link employee bonuses to profitability ratios, and share prices react sharply to unexpected changes in these measures.

gross profit margin
A measure of profitability that represents the percentage of each sales euro remaining after a firm has paid for its goods.

The **gross profit margin** measures the percentage of each sales euro remaining after the firm has paid for its goods. The higher the gross profit margin, the better. Note

that Worldscope defines gross profit as Net sales less COGS less Depreciation, while the ratio below, as before, does not adjust for depreciation:

$$GPM = \frac{Gross\ profit}{Sales} = \frac{9825}{15306} = 0.64$$

operating profit margin
A measure of profitability that represents the percentage of each sales euro remaining after deducting all costs and expenses other than interest and taxes.

The **operating profit margin** measures the percentage of each sales euro remaining after deducting all costs and expenses other than interest and taxes. As with the gross profit margin, the higher the operating profit margin the better. This ratio is of interest because it tells analysts what a firm's bottom line looks like before deductions for payments to creditors and tax authorities.

The **net profit margin** measures the percentage of each sales euro remaining after all costs and expenses, including interest, taxes and payments to preference shareholders, have been deducted. Net profit margins vary widely across industries.

SMART ETHICS VIDEO

Frank Popoff, Chairman of the Board (retired), Dow Chemical
'Overstating or understating the performance of the enterprise is anathema . . . it's just not on.'

See the entire interview at www.cengage.co.uk/megginson

$$OPM = \frac{Operating\ profit}{Sales} = \frac{3052}{15306} = 0.19$$

$$NPM = \frac{Net\ income}{Sales} = \frac{1879}{15306} = 0.12$$

SMART IDEAS VIDEO

John Graham, Duke University
'We asked companies, "Do you manage your earnings?"'

See the entire interview at www.cengage.co.uk/megginson

Probably the most closely watched financial ratio of them all is earnings per share (EPS). The earnings per share represent the monies earned on behalf of each outstanding ordinary share. The investing public closely watches EPS figures and considers them an important indicator of corporate success. Many firms tie management bonuses to meeting specific EPS targets. Earnings per share are calculated as follows:

$$EPS = \frac{Net\ income}{\#\ Shares} = \frac{1879}{471.90} = 3.98$$

net profit margin
A measure of profitability that represents the percentage of each sales euro remaining after all costs and expenses, including interest, taxes and preference share dividends, have been deducted.

The value of LVMH's earnings per share outstanding in 2006 is €3.98. This figure represents the money amount earned on behalf of each share outstanding. The amount of earnings actually distributed to each shareholder is the dividend per share.

The **return on total assets (ROA)**, often called the return on investment (ROI), measures the overall effectiveness of management in using its assets to generate returns.[5] The return on total assets for LVMH in 2006 equals 6.53 per cent:

$$ROA = \frac{Net\ income}{TA} = \frac{1879}{28785} = 0.0653$$

return on total assets (ROA)
A measure of the overall effectiveness of management in generating returns to ordinary shareholders with its available assets.

return on equity (ROE)
A measure that captures the return earned on the ordinary shareholders' (owners') investment in a firm.

A closely related measure of profitability is the **return on equity (ROE)**, which captures the return earned on the ordinary shareholders' (owners') investment in the firm. For a firm that uses only shares to finance its operations, the ROE and ROA figures are identical. With debt or preference shares on the balance sheet, these ratios usually differ. When the firm earns a profit, even after making interest payments to creditors and paying dividends to preference shareholders, the firm's use of leverage magnifies the return earned by ordinary shareholders, and ROE exceeds ROA.

[5] Naturally, all other things being equal, firms prefer a high ROA. However, as we will see later, analysts must be cautious when interpreting financial ratios. We recall an old Dilbert comic strip in which Wally suggests boosting his firm's ROA by firing the security staff. The reduction in expenses would boost the numerator while the reduction in security would lower the denominator.

Conversely, if the firm's earnings fall short of the amount it must pay to lenders and preference shareholders, leverage causes ROE to be less than ROA. For LVMH, the return on equity for 2006 is 16.2 per cent, substantially above its return on total assets:

$$ROE = \frac{Net\ income}{SE} = \frac{1879}{11594} = 0.162$$

DuPont system of analysis Financial analysts sometimes conduct a deeper analysis of the ROA and ROE ratios using the **DuPont system**, which uses both income and balance sheet information to analyse the ROA and ROE ratios into component parts. This approach highlights the influence of the net profit margin, total asset turnover and financial leverage on a firm's profitability. In the DuPont system, the return on total assets equals the product of the net profit margin times total asset turnover. By definition, the net profit margin equals earnings available for ordinary shareholders divided by sales, and total asset turnover equals sales divided by total assets. When we multiply these two ratios together, the sales figure cancels, resulting in the ROA measure:

duPont system
An analysis that uses both income and balance sheet information to break down the ROA and ROE ratios into their component pieces.

$$\frac{Sales}{TA} \times \frac{Net\ income}{Sales} = \frac{Net\ income}{TA}$$

Naturally, the ROA value for LVMH using the DuPont system is the same value we calculated before, but now we can think of the ROA as a product of how much profit the firm earns on each euro of sales and of the efficiency with which the firm uses its assets to generate sales. Holding the net profit margin constant, an increase in total asset turnover increases the firm's ROA. Similarly, holding total asset turnover constant, an increase in the net profit margin increases ROA.

We can push the DuPont system one step further by multiplying the ROA by the ratio of assets-to-equity (A/E), or the equity multiplier. The product of these two ratios equals the return on equity. Notice that for a firm that uses no debt and has no preference shares, the ratio of assets-to-equity equals 1.0, so the ROA equals the ROE. For all other firms, the ratio of assets-to-equity exceeds 1. It is in this sense that the ratio of assets-to-equity represents a leverage multiplier.

$$ROE = ROA \times EM$$

We can apply this version of the DuPont system to LVMH in 2006 to recalculate its return on common equity:

$$ROE = 0.062 \times 2.48 = 0.162$$

Note that for LVMH the ratio of assets-to-equity is 2.49, which means that LVMH's return on equity is over twice as large as its return on total assets. Of course, using financial leverage has its risks. Notice what would happen if LVMH's return on total assets were a negative number rather than a positive one. The financial leverage multiplier would cause LVMH's return on equity to be even more negative than its ROA.

The advantage of the DuPont system is that it allows the firm to break down its return on equity into a profit-on-sales component (net profit margin) that ties directly to the income statement, an efficiency-of-asset-use component (total asset turnover) that ties directly to the balance sheet and a financial-leverage-use component (assets-to-equity ratio) that also ties directly to the balance sheet.

Market ratios

Market ratios relate the firm's market value, as measured by its current share price, to certain accounting values. These ratios provide analysts with insight into how

investors think the firm is performing. Because the ratios include market values, they tend to reflect on a relative basis the shareholders' assessment of all aspects of the firm's past and expected future performance. Here we consider two popular market ratios, one that focuses on earnings and an other that considers book value.

price/earnings (P/E) ratio
A measure of a firm's long-term growth prospects that represents the amount investors are willing to pay for each euro of a firm's earnings.

The most widely quoted market ratio, the **price/earnings (P/E) ratio**, is often used as a barometer of a firm's long-term growth prospects. The P/E ratio measures the amount investors are willing to pay for each euro of the firm's earnings. The price/earnings ratio may indicate the degree of confidence that investors have in the firm's future performance. A high P/E ratio is believed to indicate that investors believe a firm will achieve rapid earnings growth in the future; hence, companies with high P/E ratios are referred to as 'growth stocks'. Simply stated, investors who believe that future earnings are going to be higher than current earnings are willing to pay a lot for today's earnings, and vice versa. The price of LVMH shares on the Euronext exchange at end-2006 was €79.95, which given the EPS of €3.98 reported earlier, gives a PE ratio of 20.1. This figure indicates that investors were paying €20.01 for each €1.00 of LVMH's earnings.

market/book (M/B) ratio
A measure used to assess a firm's future performance by relating its market value per share to its book value per share.

The **market/book (M/B) ratio** provides another assessment of how investors view the firm's past and, particularly, its expected future performance. It relates the market value of the firm's shares to their book value. The shares of firms that are expected to perform well – improving profits, growing market share, launching successful products and so forth – typically sell at higher M/B ratios than those firms with less attractive prospects. Simply stated, firms that investors expect to earn high returns relative to their risk typically sell at higher M/B multiples than those expected to earn low returns relative to risk.

CONCEPT REVIEW QUESTIONS

8 Which of the categories and individual ratios described in this chapter would be of greatest interest to each of the following parties?

- **a** Existing and prospective creditors (lenders)
- **b** Existing and prospective shareholders
- **c** The firm's management.

9 How could the availability of cash inflow and cash outflow data be used to improve on the accuracy of the liquidity and debt coverage ratios presented previously? What specific ratio measures would you calculate to assess the firm's liquidity and debt coverage, using cash flow rather than financial statement data?

10 Assume that a firm's total assets and sales remain constant. Would an increase in each of the ratios below be associated with a cash inflow or a cash outflow?

- **a** Current ratio
- **b** Inventory turnover
- **c** Average collection period
- **d** Average payment period
- **e** Debt ratio
- **f** Net profit margin

11 Use the DuPont system to explain why a slower-than-average inventory turnover could cause a firm with an above-average net profit margin and an average degree of financial leverage to have a below-average return on equity.

12 How can you reconcile investor expectations for a firm with an above-average M/B ratio and a below-average P/E ratio? Could the age of the firm have any effect on this ratio comparison?

2.4 SUMMARY AND CONCLUSIONS

- The three key financial statements are (1) the balance sheet, (2) the income statement and (3) the statement of cash flows. Notes describing the technical aspects of the financial statements are normally included with them.
- Depreciation is the most common non-cash charge on income statements; others are amortization and depletion allowances. Depreciation is added back to EBIT after taxes to find a firm's operating cash flow. A measure of cash flow that is important to financial analysts is free cash flow, the cash flow available to investors. Free cash flow equals operating cash flow less the firm's net investment in fixed and current assets.
- The statement of cash flows, in effect, summarizes the firm's cash flows over a specified period of time, typically one year. It presents cash flows divided into operating, investment and financing flows. When interpreting the statement, an analyst typically looks for unusual changes in either the major categories of cash flow or in specific items to find clues to problems that the firm may be experiencing.
- Financial ratios are a convenient tool for analysing a firm's financial statements to assess its performance over a given period. A variety of financial ratios are available for assessing various aspects of a firm's liquidity, activity, debt, profitability and market value. The DuPont system is often used to assess various aspects of a firm's profitability, particularly the returns earned on both the total asset investment and the owners' equity in the firm.
- Financial decision makers must be conversant with basic corporate tax concepts, because taxes are a major measurement challenge that affect both benefits and costs. Taxes are a major outflow of cash to the profitable firm; they are levied on both ordinary income and capital gains. The marginal tax rate is more relevant than the average tax rate in financial decision making.

INTERNET RESOURCES

Note: This textbook includes numerous internet links, both within the discussions and at the end of each chapter. Because some links are likely to change or be eliminated during the life of this edition, please go to the book's website (www.cengage.co.uk/megginson) to obtain updated links.

http://www.carol.co.uk/
Free annual reports for many international companies.

http://www.iasb.org.uk/
The International Accounting Standards Board website.

http://www.quicken.com
A fairly extensive ratio analysis of a given company can be retrieved by typing in a ticker symbol.

http://www.rmahq.org/Ann_Studies/asstudies.html
Provides a sample of a Risk Management Association industry analysis and the material that explains the ratios, quartile, and other information that is available from RMA.

http://www.yahoo.com
Contains a link to Yahoo! Finance for retrieval of recent financial statements and a wide variety of other financial information for many firms.

KEY TERMS

accrual-based approach
activity ratios
assets-to-equity (A/E) ratio
average age of inventory
average collection period
average payment period
cash flow approach
coverage ratio
current ratio
debt ratio
debt-to-equity ratio
deferred taxes
DuPont system
equity multiplier
financial leverage
financing flows
fixed asset turnover
free cash flow (FCF)
gross profit margin
inventory turnover
investment flows
liquidity ratios
long-term debt
market/book (M/B) ratio
minority interest
net profit margin
net working capital
non-cash charges
operating cash flow (OCF)
operating flows
operating profit margin
ordinary shares
par value (of share)
preference shares
price/earnings (P/E) ratio
quick (acid-test) ratio
ratio analysis
reserves (retained earnings)
return on equity (ROE)
return on total assets (ROA)
share premium account
times interest earned ratio
total asset turnover
treasury shares

SELF-TEST PROBLEMS

ST2-1 Use the financial statements below to answer the questions about S&M Manufacturing's financial position at the end of the calendar year 2006.

S&M Manufacturing
Balance sheet at 31 December 2006 (€000)

Assets		**Liabilities and equity**	
Current assets		Current liabilities	
Cash	€ 140 000	Accounts payable	€ 480 000
Marketable securities	260 000	Notes payable	500 000
Accounts receivable	650 000	Accruals	80 000
Inventories	800 000	Total current liabilities	€1 060 000
Total current assets	€1 850 000		
Fixed assets		Long-term debt	
Gross fixed assets	€3 780 000	Bonds outstanding	€1 300 000
Less: Accumulated depreciation	1 220 000	Bank debt (long-term)	260 000
		Total long-term debt	€1 560 000
Net fixed assets	€2 560,000	Shareholders' equity	
Total assets	**€4 410 000**	Preference shares	€180 000
		Par value of shares	200 000
		Paid-in capital in excess of par	810 000
		Retained earnings	600 000
		Total shareholders' equity	€1 790 000
		Total liabilities and equity	**€4 410 000**

S&M Manufacturing
Income statement for year ended 31 December 2006 (€000)

Sales revenue		€6 900 000
Less: Cost of goods sold		4 200 000
Gross profits		€2 700 000
Less: Operating expenses		
Sales expense	€ 750 000	
General and administrative expense	1 150 000	
Leasing expense	210 000	
Depreciation expense	235 000	
Total operation expenses		2 345 000
Earnings before interest and taxes		€ 355 000
Less: Interest expense		85 000
Net profit before taxes		€ 270 000
Less: Taxes		81 000
Net profits after taxes		**€ 189 000**
Less: Preference shares dividends		10 800
Earnings available for ordinary shareholders		**€ 178 200**
Less: Dividends		75 000
To retained earnings		**€ 103 200**
Per share data		
Earnings per share (EPS)	€ 1.43	
Dividends per share (DPS)	€ 0.60	
Price per share	€ 15.85	

a How much cash and near cash does S&M have at year-end 2006?

b What was the original cost of all of the firm's real property that is currently owned?

c How much in total liabilities did the firms have at year-end 2006?

d How much did S&M owe for credit purchases at year-end 2006?

e How much did the firm sell during 2006?

f How much equity did the ordinary shareholders have in the firm at year-end 2006?

g What is the cumulative total of earnings reinvested in the firm from its inception through to the end of 2006?

h How much operating profit did the firm earn during 2006?

i What was the total amount of dividends paid out by the firm during the year 2006?

j How many shares did S&M have outstanding at year-end 2006?

ST2-2 The partially complete 2006 balance sheet and income statement for Challenge Industries are set out below, followed by selected ratio values for the firm based on its completed 2006 financial statements. Use the ratios along with the partial statements to complete the financial statements. *Hint*: Use the ratios in the order listed to calculate the missing statement values that need to be installed in the partial statements.

Challenge Industries
Balance sheet at 31 December 2006 (in €000)

Assets		Liabilities and equity	
Current assets		Current liabilities	
Cash	€ 52 000	Accounts payable	€150 000
Marketable securities	60 000	Notes payable	?
Accounts receivable	200 000	Accruals	80 000
Inventories	?	Total current liabilities	?
Total current assets	?	Long-term debt	€425 000
Fixed assets (gross)	?	Total liabilities	?
Less: Accumulated depreciation	240 000	Shareholders' equity	
Net fixed assets	?	Preference shares	?
Total assets	**?**	Par value of shares	150 000
		Paid-in capital in excess of par	?
		Retained earnings	390 000
		Total shareholders' equity	?
		Total liabilities and shareholders' equity	**?**

Challenge Industries
Income statement for the year ended 31 December 2006 (in €000)

Sales revenue		€4 800 000
Less: Cost of goods sold		?
Gross profits		?
Less: Operating expenses		
Sales expense	€690 000	
General and administrative expense	750 000	
Depreciation expense	120 000	
Total operating expenses		1 560 000
Earnings before interest and taxes		?
Less: Interest expense		35 000
Earnings before taxes		?
Less: Taxes		?
Net income (Net profits after taxes)		**?**
Less: Preference dividends		15 000
Earnings available for ordinary shareholders		**?**
Less: Dividends		60 000
To retained earnings		**?**

Challenge Industries
Ratios for the year ended 31 December 2006

Ratio	Value
Total asset turnover	2.00
Gross profit margin	40%
Inventory turnover	10
Current ratio	1.60
Net profit margin	3.75%
Return on equity	12.5%

QUESTIONS

Q2-1 What information (explicit and implicit) can be derived from financial statement analysis? Does the standardization required by IFRS add greater validity to comparisons of financial data between companies and industries? Are there possible shortcomings to relying solely on financial statement analysis to value companies?

Q2-2 Distinguish between the types of financial information contained in the various financial statements. Which statements provide information on a company's performance over a reporting period, and which present data on a company's current position? What sorts of valuable information may be found in the notes to financial statements? Describe a situation in which the information in the notes would be essential to making an informed decision about the value of a company.

Q2-3 If you were a commercial credit analyst charged with the responsibility of making an accept/reject decision on a company's loan request, with which financial statement would you be most concerned? Which financial statement is most likely to provide pertinent information about a company's ability to repay its debt?

Q2-4 What is operating cash flow (OCF)? How is it calculated? What is free cash flow (FCF)? How is it calculated from OCF? Why do financial managers focus attention on the value of FCF?

Q2-5 Describe the common definitions of 'inflows of cash' and 'outflows of cash' used by analysts to classify certain balance sheet changes and income statement values. What three categories of cash flow are used in the statement of cash flows? To what value should the net value in the statement of cash flows reconcile?

Q2-6 What precautions must one take when using ratio analysis to make financial decisions? Which ratios would be most useful for a financial manager's internal financial analysis? Which for an analyst trying to decide which stocks are most attractive within an industry?

Q2-7 How do analysts use ratios to analyse a firm's financial leverage? Which ratios convey more important information to a credit analyst – those revolving around the levels of indebtedness or those measuring the ability to meet the contractual payments associated with debt? What is the relationship between a firm's levels of indebtedness and risk? What must happen for an increase in financial leverage to be successful?

Q2-8 How is the DuPont system useful in analysing a firm's ROA and ROE? What information can be inferred from the decomposition of ROE into contributing ratios? What is the mathematical relationship between each of the individual components (net profit margin, total asset turnover and assets-to-equity ratio) and ROE? Can ROE be raised without affecting ROA? How?

PROBLEMS

Financial statements

P2-1 Obtain financial statements for Microsoft for the last five years either from its website (http://www.microsoft.com) or from the SEC's online EDGAR site (http://www.sec.gov/edgar/searchedgar/webusers.htm). First, look at the statements without reading the notes. Then, read the notes carefully, concentrating on those about executive stock options. Do you have a different perspective after analysing these notes?

Cash flow analysis

P2–2 Given the balance sheets and selected data from the income statement of SMG Industries that follow, answer parts (a)–(c).

- **a** Calculate the firm's operating cash flow (OCF) for the year ended 31 December 2004, using Equation 2.1.
- **b** Calculate the firm's free cash flow (FCF) for the year ended 31 December 2004, using Equation 2.2.
- **c** Interpret, compares and contrast your cash flow estimates in parts (a) and (b).

SMG Industries balance sheets (€mn)

Assets	31 December 2004	31 December 2003	Liabilities and shareholders' equity	31 December 2004	31 December 2003
Cash	€ 3 500	€ 3 000	Accounts payable	€ 3 600	€ 3 500
Marketable securities	3 800	3 200	Notes payable	4 800	4 200
			Accruals	1 200	1 300
Accounts receivable	4 000	3 800	Total current liabilities	€ 9 600	€ 9 000
			Long-term debt	€ 6 000	€ 6 000
Inventories	4 900	4 800	Ordinary shares	€11 000	€11 000
Total current assets	€16 200	€14 800	Retained earnings	6 400	5 800
			Total shareholders' equity	€17 400	€16 800
Gross fixed assets	€31 500	€30 100			
			Total liabilities and shareholders' equity	€33 000	€31 800
Less: Accumulated depreciation	14 700	13 100			
Net fixed assets	€16 800	€17 000			
Total assets	**€33 000**	**€31 800**			

Income statement data (2004, €mn)

Depreciation expense	€1 600
Earnings before interest and taxes (EBIT)	4 500
Taxes	1 300
Net profits after taxes	2 400

P2-3 Classify each of the following items as an inflow (I) or an outflow (O) of cash, or as neither (N).

Item	Change (€)	Item	Change (€)
Cash	+600	Accounts receivable	−900
Accounts payable	−1 200	Net profits	+700
Notes payable	+800	Depreciation	+200
Long-term debt	−2 500	Repurchase of shares	+500
Inventory	+400	Cash dividends	+300
Fixed assets	+600	Sale of shares	+1 300

Analysing financial performance using ratio analysis

P2-4 Manufacturers Bank is evaluating Aluminium Industries, which has requested a €3 million loan, to assess the firm's financial leverage and risk. On the basis of the debt ratios for Aluminium, along with the industry averages and Aluminium's recent financial statements (which follow), evaluate and recommend appropriate action on the loan request.

Aluminium Industries income statement for the year ended 31 December 2006

Sales revenue		€30 000 000
Less: Cost of goods sold		21 000 000
Gross profit		€ 9 000 000
Less: Operating expenses		
Selling expense	€3 000 000	
General and administrative expenses	1 800 000	
Lease expense	200 000	
Depreciation expense	1 000 000	
Total operating expense		6 000 000
Operating profit		€3 000 000
Less: Interest expense		1 000 000
Net profit before taxes		€2 000 000
Less: Taxes (rate = 40%)		800 000
Net profits after taxes		€1 200 000

Aluminium Industries balance sheet as at 31 December 2006

Assets		Liabilities and Stockholders' Equity	
Current assets		Current liabilities	
Cash	€ 1 000 000	Accounts payable	€ 8 000 000
Marketable securities	3 000 000	Notes payable	8 000 000
Accounts receivable	12 000 000	Accruals	500 000
Inventories	7 500 000	Total current liabilities	€16 500 000
Total current assets	€23 500 000	Long-term debt (including leases)	€20 000 000
Gross fixed assets (at cost)		Shareholders' equity	
Land and buildings	€11 000 000	Preference shares (25,000 shares, €4 dividend)	€ 2 500 000
Machinery and equipment	20 500 000	Shares (1million shares, €5 par)	5 000 000
Furniture and fixtures	8 000 000	Paid-in capital in excess of par	4 000 000
Gross fixed assets	€39 500 000	Retained earnings	2 000 000
Less: Accumulated depreciation	13 000 000	Total shareholders' equity	€13 500 000
Net fixed assets	€26 500 000	Total liabilities and shareholders' equity	€50 000 000
Total assets	€50 000 000		

Industry averages

Debt ratio	0.51
Debt-to-equity ratio	1.07
Times interest earned ratio	7.30

P2-5 Use the information below to answer the questions that follow.

Income statements for the year ended 31 December 2006

	Heavy Metal Manufacturing (HMM)	Metallic Stamping (MS)	High-Tech Software Co. (HTS)
Sales	€75 000 000	€50 000 000	€100 000 000
−Operating expenses	65 000 000	40 000 000	60 000 000
Operating profit	€10 000 000	€10 000 000	€ 40 000 000
−Interest expenses	3 000 000	3 000 000	0
Earnings before taxes	€ 7 000 000	€ 7 000 000	€ 40 000 000
−Taxes	2 800 000	2 800 000	16 000 000
Net income	€ 4 200 000	€ 4 200 000	€ 24 000 000

Balance sheets as of 31 December 2006

	Heavy Metal Manufacturing (HMM)	Metallic Stamping (MS)	High-Tech Software Co. (HTS)
Current assets	€ 10 000 000	€ 5 000 000	€ 20 000 000
Net fixed assets	90 000 000	75 000 000	80 000 000
Total assets	€100 000 000	€80 000 000	€100 000 000
Current liabilities	€ 20 000 000	€10 000 000	€ 10 000 000
Long-term debt	40 000 000	40 000 000	0
Total liabilities	€ 60 000 000	€50 000 000	€ 10 000 000
Shares	€ 15 000 000	€10 000 000	€ 25 000 000
Retained earnings	25 000 000	20 000 000	65 000 000
Total equity	€ 40 000 000	€30 000 000	€ 90 000 000
Total liabilities and equity	€100 000 000	€80 000 000	€100 000 000

a Use the DuPont system to compare the two heavy metal companies shown above (HMM and MS) during 2006. Which of the two has a higher return on equity? What is the cause of the difference between the two?

b Calculate the return on equity of the software company, HTS. Why is this value so different from those of the heavy metal companies calculated in part (a)?

c Compare the leverage levels between the industries. Which industry receives a greater contribution from return on total assets? Which industry receives a greater contribution from the financial leverage as measured by the assets-to-equity (A/E) ratio?

d Can you make a meaningful DuPont comparison across industries? Why or why not?

P2-6 Refer to Problem 2-5, and perform the same analysis with real data. Download last year's financial data from Air Liquide (http://www.airliquide.fr), ENI (www.eni.it) and BASF (www.basf.com) Which ratios demonstrate the greatest difference between Air Liquide and BASF? Which of the two is more profitable? Which ratios drive the greater profitability?

P2-7 A common-size income statement for Aluminium Industries' 2005 operations follows. Using the firm's 2006 income statement presented in Problem 2-4, develop the 2006 common-size income statement (see footnote 1) and compare it with the 2005 statement. Which areas require further analysis and investigation?

Aluminum Industries common-size income statement for the year ended 31 December 2005

Sales revenue (€35 000 000)		100%
Less: Cost of goods sold		65.9
Gross profit		34.1%
Less: Operating expenses		
Selling expense	12.7%	
General and administrative expenses	6.3	
Lease expense	0.6	
Depreciation expense	3.6	
Total operating expense		23.2
Operating profit		10.9%
Less: Interest expense		1.5
Net profit before taxes		9.4%
Less: Taxes (rate = 40%)		3.8
Net profits after taxes		5.6%

P2-8 Use the following financial data for Greta's Gadgets to determine the effect of using additional debt financing to purchase additional assets. Assume that an additional €1 million of assets is purchased with 100 per cent debt financing with a 10 per cent annual interest rate.

Greta's Gadgets
Income statement for the year ended 31 December 2006

Sales	€4 000 000
−Costs and expenses @ 90%	3 600 000
Earnings before interest & taxes	€ 400 000
−Interest (0.10 × €1 000 000)	100 000
Earnings before taxes	€ 300 000
−Taxes @ 40%	120 000
Net income	€ 180 000

Greta's Gadgets
Balance sheet as at 31 December 2006

Assets		Liabilities and shareholders' equity	
Current assets	€ 0	Current liabilities	€ 0
Fixed assets	2 000 000	Long-term debt @ 10%	€1 000 000
Total assets	€2 000 000	Total liabilities	€1 000 000
		Shares equity	€1 000 000
		Total liabilities and shareholders' equity	€2 000 000

a Calculate the current (2006) net profit margin, total asset turnover, assets-to-equity ratio, return on total assets and return on equity for Greta's.

b Now, assuming no other changes, determine the effect of purchasing the €1 million in assets using 100 per cent debt financing with a 10 per cent annual interest rate. Further, assume that the newly purchased assets generate an additional €2 million in sales and that the costs and expenses remain at 90 per cent of sales. For the purposes of this problem, further assume a tax rate of 40 per cent. What is the effect on the ratios calculated in part (a)? Is the purchase of these assets justified on the basis of the return on equity?

c Assume that the newly purchased assets in part (b) generate only an extra €500 000 in sales. Is the purchase justified in this case?

d Which component ratio(s) of the DuPont system is (are) not affected by the change in sales? What does this imply about the use of financial leverage?

P2-9 Tracey White, owner of the Buzz Coffee Shop chain, has decided to expand her operations. Her 2006 financial statements follow. Tracey can buy two additional coffeehouses for €3 million, and she has the choice of completely financing these new coffeehouses with either a 10 per cent (annual interest) loan or the issuance of new shares. She also expects these new shops to generate an additional €1 million in sales. Assuming a 40 per cent tax rate and no other changes, should Tracey buy the two coffeehouses? Why or why not? Which financing option results in the better ROE?

Buzz Coffee Shops 2006 financial statements

Balance sheet

Current assets	€ 250 000
Fixed assets	750 000
Total assets	€1 000 000
Current liabilities	€ 300 000
Long-term debt	0
Total liabilities	€ 300 000
Equity	€ 700 000
Total liabilities and shareholders' equity	€1 000 000

Income statement

Sales	€500 000
−Costs and expenses @ 40%	200 000
Earnings before interest and taxes (EBIT)	€300 000
−Interest expense	0
Net profit before taxes	€300 000
−Taxes @ 40%	120 000
Net income	€180 000

P2-10 The financial statements of Access Corporation for the year ended 31 December 2006 follow.

Access Corporation income statement for the year ended 31 December 2006

Sales revenue		€160 000
Less: Cost of goods sold[a]		106 000
Gross profit		€ 54 000
Less: Operating expenses		
Sales expense	€16 000	
General and administrative expense	10 000	
Lease expense	1 000	
Depreciation expense	10 000	
Total operating expense		37 000
Operating profit		€ 17 000
Less: Interest expense		6 100
Net profit before taxes		€ 10 900
Less: Taxes @ 40%		4 360
Net profits after taxes		€ 6 540

[a] Access Corporation's annual purchases are estimated to equal 75 per cent of cost of goods sold.

Access Corporation balance sheet as at 31 December 2006

Assets		Liabilities and shareholders' equity	
Cash	€ 500	Accounts payable	€ 22 000
Marketable securities	1 000	Notes payable	47 000
Accounts receivable	25 000	Total current liabilities	€ 69 000
Inventories	45 500	Long-term debt	€ 22 950
Total current assets	€ 72 000	Total liabilities	€ 91 950
Land	€ 26 000	Shares[a]	€ 31 500
Buildings and equipment	90 000	Retained earnings	26 550
Less: Accumulated depreciation	38 000	Total liabilities and shareholders' equity	€150 000
Net fixed assets	€ 78 000		
Total assets	**€150 000**		

[a] The firm's 3000 outstanding shares closed 2006 at a price of €25 per share.

a Use the preceding financial statements to complete the following table. Assume that the industry averages given in the table are applicable for both 2005 and 2006.

b Analyse Access Corporation's financial condition as it relates to (1) liquidity, (2) activity, (3) debt, (4) profitability and (5) market value. Summarize the company's overall financial condition.

Access Corporation's financial ratios

	Industry average	Actual ratio 2005	Actual ratio 2006
Current ratio	1.80	1.84	_____
Quick (acid-test) ratio	0.70	0.78	_____
Inventory turnover	2.50	2.59	_____
Average collection period[a]	37 days	36 days	_____
Average payment period[a]	72 days	78 days	_____
Debt-to-equity ratio	50%	51%	_____
Times interest earned ratio	3.8	4.0	_____
Gross profit margin	38%	40%	_____
Net profit margin	3.5%	3.6%	_____
Return on total assets (ROA)	4.0%	4.0%	_____
Return on equity (ROE)	9.5%	8.0%	_____
Market/book (M/B) ratio	1.1	1.2	_____

[a] Based on a 365-day year and on end-of-year figures.

P2-11 Given the following financial statements, historical ratios and industry averages, calculate UG Company's financial ratios for 2006. Analyse its overall financial situation both in comparison with industry averages and over the period 2004–2006. Break down your analysis into an evaluation of the firm's liquidity, activity, debt, profitability and market value.

UG Company income statement for the year ended 31 December 2006

Sales revenue		€10 000 000
Less: Cost of goods sold[a]		7 500 000
Gross profit		€ 2 500 000
Less: Operating expenses		
Selling expense	€300 000	
General and administrative expense	650 000	
Lease expense	50 000	
Depreciation expense	200 000	
Total operating expense		1 200 000
Operating profit (EBIT)		€ 1 300 000
Less: Interest expense		200 000
Net profits before taxes		€ 1 100 000
Less: Taxes (rate = 40%)		440 000
Net profits after taxes		€ 660 000
Less: Preference shares dividends		50 000
Earnings available for ordinary shareholders		€ 610 000
Earnings per share (EPS)		€ 3.05

[a] Annual credit purchases of €6.2 million were made during the year.

UG Company balance sheet as of 31 December 2006

Assets		Liabilities and shareholders' equity	
Current assets		Current liabilities	
Cash	€ 200 000	Accounts payable	€ 900 000
Marketable securities	50 000	Notes payable	200 000
Accounts receivable	800 000	Accruals	100 000
Inventories	950 000	Total current liabilities	€ 1 200 000
Total current assets	€ 2 000 000	Long-term debt (including financial leases)	€ 3 000 000
Gross fixed assets	€12 000 000	Shareholders' equity	
Less: Accumulated depreciation	3 000 000	Preference shares (25,000 shares, €2 dividend)	€ 1 000 000
Net fixed assets	€ 9 000 000	Shares (200,000 shares, €3 par)[a]	600 000
Other assets	€ 1 000 000	Paid-in capital in excess of par	5 200 000
Total assets	€12 000 000	Retained earnings	1 000 000
		Total shareholders' equity	€ 7 800 000
		Total liabilities and shareholders' equity	€12 000 000

[a] On 31 December 2006 the firm's shares closed at €27.50.

Historical and industry average ratios for UG Company

Ratio	Actual 2004	Actual 2005	Industry Average 2006
Current ratio	1.40	1.55	1.85
Quick (acid-test) ratio	1.00	0.92	1.05
Inventory turnover	9.52	9.21	8.60
Average collection period[a]	45.0 days	36.4 days	35.0 days
Average payment period[a]	58.5 days	60.8 days	45.8 days
Fixed asset turnover	1.08	1.05	1.07
Total asset turnover	0.74	0.80	0.74
Debt ratio	0.20	0.20	0.30
Debt-to-equity ratio	0.25	0.27	0.39
Times interest earned ratio	8.2	7.3	8.0
Gross profit margin	0.30	0.27	0.25
Operating profit margin	0.12	0.12	0.10
Net profit margin	0.067	0.067	0.058
Return on total assets (ROA)	0.049	0.054	0.043
Return on equity (ROE)	0.066	0.073	0.072
Earnings per share (EPS)	€ 1.75	€ 2.20	€ 1.50
Price/earnings (P/E) ratio	12.0	10.5	11.2
Market/book (M/B) ratio	1.20	1.05	1.10

[a] Based on a 365-day year and on end-of-year figures.

P2-12 Choose a company that you would like to analyse and obtain its financial statements. Next, select another firm from the same industry and obtain its financial data from the internet. Perform a complete ratio analysis on each firm. How well does your selected company compare with its industry peer? Which components of your firm's ROE are superior, and which are inferior?

SMART SOLUTIONS
See the problem and solution explained step-by-step at **www.cengage.co.uk/megginson**

THOMSON ONE Business School Edition

Access financial information from the Thomson ONE – Business School Edition website for the following problem(s). Go to http://tabsefin.swlearning.com/. If you have already registered your access serial number and have a username and password, click **Enter**. Otherwise, click **Register** and follow the instructions to create a username and password. Register your access serial number and then click **Enter** on the aforementioned website. When you click Enter, you will be prompted for your username and password (please remember that the password is case sensitive). Enter them in the respective boxes and then click **OK** (or hit **Enter**). From the ensuing page, click **Click Here to Access Thomson ONE – Business School Edition Now!** This opens up a new window that gives you access to the Thomson ONE – Business School Edition database. You can retrieve a company's financial information by entering its ticker symbol (provided for each company in the problem(s)) in the box below 'Name/Symbol/Key'. For further instructions on using the Thomson ONE – Business School Edition database, please refer to *A Guide for Using Thomson ONE – Business School Edition*.

P2-13 Compare the profitability of Ryanair and British Airways for the latest year. Using return on equity (ROE), determine which firm is more profitable. Use the DuPont system to determine what drives the difference in the profitability of the two.

P2-14 Analyse the financial condition of Puma over the last five years. Use financial ratios that relate to its liquidity, activity, debt, profitability and market value. In which areas has the company improved, and in which areas has the company's financial position worsened?

MINICASE *Financial statement and cash flow analysis*

You have been hired by EquiCredito Bank SA as a financial analyst. One of your first job assignments is to analyse the present financial condition of Bradley Stores. You are provided with the following 2006 balance sheet and income statement information for Bradley Stores. In addition, you are told that Bradley Stores has 10 000 000 shares outstanding, currently trading at €9 per share, and has made annual purchases of €210 000 000.

Your assignment calls for you to calculate certain financial ratios and to compare these calculated ratios with the industry average ratios that are provided. You are also told to base your analysis on five categories of ratios: (a) liquidity ratios, (b) activity ratios, (c) debt ratios, (d) profitability ratios and (e) market ratios.

Balance Sheet (in €000)

Cash	€ 5 000	Accounts payable	€ 15 000
Accounts receivable	20 000	Notes payable	20 000
Inventory	40 000	Total current liabilities	€ 35 000
Total current assets	€ 65 000	Long-term debt	€100 000
Net fixed assets	135 000	Shareholders' equity	€ 65 000
Total assets	€200 000	Total liabilities and equity	€200 000

Income statement (in €000)

Net sales (all credit)	€300 000
Less: Cost of goods sold	250 000
Earnings before interest and taxes	€ 50 000
Less: Interest	40 000
Earnings before taxes	€ 10 000
Less: Taxes (40%)	4 000
Net income	€ 6 000

Industry averages for key ratios

Net profit margin	6.4%
Average collection period (365 days)	30 days
Debt ratio	50%
P/E ratio	23
Inventory turnover ratio	12.0
ROE	18%
Average payment period (365 days)	20 days
Times interest earned ratio	8.5
Total asset turnover	1.4
Current ratio	1.5
Assets-to-equity ratio	2.0
ROA	9%
Quick ratio	1.25
Fixed asset turnover ratio	1.8

Assignment

Use the following guidelines to complete this job assignment. First, identify which ratios you need to use to evaluate Bradley Stores in terms of its (a) liquidity position, (b) business activity, (c) debt position, (d) profitability and (e) market comparability. Next, calculate these ratios. Finally, compare these ratios to the industry average ratios provided in the problem and answer the following questions.

1 Based on the provided industry average information, discuss Bradley Stores liquidity position. Discuss specific areas in which Bradley compares positively and negatively with the overall industry.

2 Based on the provided industry average information, what do Bradley Stores activity ratios tell you? Discuss specific areas in which Bradley compares positively and negatively with the overall industry.

3 Based on the provided industry average information, discuss Bradley Stores debt position. Discuss specific areas in which Bradley compares positively and negatively with the overall industry.

4 Based on the provided industry average information, discuss Bradley Stores profitability position. As part of this investigation of firm profitability, include a DuPont analysis. Discuss specific

areas in which Bradley compares positively and negatively with the overall industry.

5 Based on the provided industry average information, how is Bradley Stores viewed in the market-place? Discuss specific areas in which Bradley compares positively and negatively with the overall industry.

6 Overall, what are Bradley's strong and weak points? Knowing that your boss will approve new loans only to companies in a better-than-average financial position, what is your final recommendation (approval or denial of loan)?