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Valuation and securities analysis

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Undergraduate study in
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THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

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This is one of a series of subject guides published by the University. We regret that due to pressure of work the authors are unable to enter into any correspondence relating to, or arising from, the guide. If you have any comments on this subject guide, favourable or unfavourable, please use the form at the back of this guide.

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Notes

Chapter 1: Introduction

Route map to the guide

The aim of this subject guide is to help you to interpret the syllabus. It outlines what you are expected to know for each area of the syllabus and suggests relevant readings to help you to understand the material.

Unlike many of the International Programmes courses there are only two set textbooks which you must read for this course. Much of the information you need to learn and understand is contained in examples and activities within the subject guide itself.

We would recommend that you work through the guide in chapter order. First read through a whole chapter to get an overview of the material to be covered. Subsequently re-read the chapter and follow up the suggestions for reading in the Essential reading or Further reading. Then you need to engage in the activities identified.

At the end of each chapter you will find a checklist of your learning outcomes – this is a list of the main points that you should understand once you have covered the material in the guide and the associated readings.

Having said this, it is important that you appreciate that different topics are not self-contained. There is a degree of overlap between them and you are guided in this by the cross-referencing between different chapters. In terms of studying this subject, the chapters of this guide are designed as self-contained units of study, but for examination purposes you need to have an understanding of the subject as a whole.

Structure of the guide

This subject covers three broad topics: financial analysis, securities valuation and returns to fundamental and technical analysis.

- Chapter 1 serves as a foundation to understanding.
- Chapter 2 introduces the case study used throughout this subject guide. The case study illustrates valuation and securities analysis.
- Chapter 3 introduces the framework used for securities analysis and valuation, and outlines the structure and articulation of the financial statements. It aims to enable you to produce reformulated financial statements to be used for valuation purposes.
- Chapter 4 introduces the tools required to assess the performance of a firm from the point of view of its shareholders.
- Chapter 5 explains a firm's bottom-line performance through an analysis of financial leverage and business performance.
- Chapter 6 covers strategic and accounting analysis.
- Chapter 7 projects the financial analysis in the future. It is all about forecasting.
- Chapter 8 covers the set of valuation methods. It builds on the forecasting techniques introduced in Chapter 7.
- Chapter 9 discusses implications of financial analysis for price multiples (price-to-earnings and price-to-book ratios).
- Chapter 10 covers the link between financial information and stock prices.

- Chapter 11 provides some application of valuation methods described in Chapter 8, as regard internet stocks and merger and acquisitions (M&A).
- Chapter 12 reviews empirical evidence on the returns to fundamental analysis.
- Chapter 13 reviews empirical evidence on the returns to technical analysis.

Introduction to the subject guide

AC3143 Valuation and securities analysis is a 300 course offered on the Economics, Management, Finance and the Social Sciences (EMFSS) suite of programmes. It provides insights and understanding of security analysis and valuation from both theoretical and empirical perspectives. It is aimed at students who are interested in equity research, corporate finance and fund management.

We jointly teach a more advanced course at LSE where it is offered as an MSc course. Our MSc course is based on an economics framework and draws on articles published in the financial analysis and financial economic literatures to address issues related to the use of information in security analysis, fundamental and technical analysis, and efficient market research. Students in our course are furthermore provided with an opportunity to apply their skills in a corporate valuation project.

We hope that you enjoy studying this course.

Syllabus

This course covers three broad topics: financial analysis, securities valuation and returns to fundamental and technical analysis.

Introduction

The analysis framework and financial statements

Introduction to the analysis framework using financial statements. The setting: investors, firms, securities and financial markets. The framework for analysis. Business strategy analysis. Industry analysis. Competitive strategy analysis. Sources of competitive advantage. Achieving and sustaining competitive advantage. Accounting analysis. Financial analysis. Prospective analysis.

Introduction to stylised financial statements. Stylised profit and loss, balance sheet and cash flow statements. Accounting relations governing the stylised financial statements.

Part 1: The framework for analysis

Financial analysis: performance evaluation

Concept of comprehensive earnings. Earnings and stock returns. Bottom-line profitability. Cost of equity capital. Concept of residual earnings. Accounting rates of return and stock rates of return.

Financial analysis: the determinants of performance

Business profitability. Economic value added. Link between business and bottom-line profitability. Determinants of business profitability. Business profitability and free cash flows.

Accounting and strategy analysis

Overview of the institutional setting. Industry analysis. Corporate strategy analysis. Sources of competitive advantage. Accounting analysis. Factors influencing accounting quality. Assessing the quality of accounting

Prospective performance evaluation and valuation

Forecasting: simple forecasting and full information forecasting. Empirical evidence on the behaviour of accounting rates of return, residual earnings, economic value added, financial leverage. A full-information forecasting template.

Part 2: Securities valuation

Securities valuation

Introduction to valuation methods based on dividends, free cash flows, residual earnings and economic value added. Inferences on valuation accuracy. Comparison of valuation methods: empirical evidence.

Implications for price-to-earnings and price-to-book ratios

Determinants of price-to-book ratios. Residual earnings growth. Determinants of price-to-earnings ratios. Empirical evidence. Strategic taxonomy. Implications of strategic taxonomy for price-to-book and price-to-earnings ratios. Empirical evidence on the joint distribution of price-to-book and price-to-earnings ratios.

Financial information and stock prices

Usefulness of earnings to investors: the empirical evidence from capital markets research. Earnings response coefficients. Competing hypotheses to explain the earnings response conundrum. Fundamental information analysis and stock prices.

Applications

Internet stock. Financial measures vs usage measures in the valuation of internet stocks. A time trend analysis of the relative importance of financial vs usage measures.

Mergers and acquisitions. Motivation for mergers and acquisitions. Strategic and financial analysis of mergers and acquisitions. Acquisition pricing. Accounting issues. Acquisition financing. Acquisition outcome.

Part 3: Empirical evidence on returns to fundamental and technical analysis

Returns to fundamental analysis

Contrarian strategies. Implications of current earnings for future earnings. Do stock prices fully reflect information in accruals and cash flows about future earnings? Earnings management and the long run performance of IPOs.

Returns to technical analysis

Contrarian strategies. Momentum strategies. Reconciliation of empirical evidence.

Changes to the syllabus

The material in this subject guide reflects the syllabus for the year 2013–2014. The field of accounting changes regularly and there may be updates to the syllabus for this course that are not included in the subject guide. Any such updates will be posted on the VLE. It is **essential** that you check the VLE at the beginning of each academic year (September) for new material and changes to the syllabus. **Any additional material posted on the VLE will be examinable.**

Aims of the course

This course is aimed at students who are interested in equity research, corporate finance and fund management. It is designed to provide you with the tools, drawn from accounting, finance, economics and strategy, required to:

- analyse the performance of securities
- value securities
- assess returns on active investment strategies.

Furthermore, it provides empirical evidence on returns to fundamental and technical analysis.

Learning outcomes for the course

On completion of this course and the Essential reading and activities, you should be able to:

- carefully analyse the financial performance of given securities and critically review equity research published by financial analysts
- competently apply valuation technologies required in corporate finance with minimum guidance
- critically assess third-party valuation reports
- recall main insights and key facts of the fund management industry
- clearly recognise the difficulties associated with measuring abnormal returns in fundamental and technical analysis.

Overview of learning resources

Essential reading

You should purchase:

Palepu, K., V. Bernard and P. Healy *Business analysis and valuation*. (Mason, OH: South-Western College Publishing, 2012) fifth international edition [ISBN 9781133434863].

Penman, S. *Financial statement analysis and security valuation*. (Boston, MA: McGraw-Hill, 2012) fifth edition [ISBN 9780071326407].

Each chapter of the subject guide begins by identifying the appropriate chapters from these textbooks. In instances where these textbooks are inadequate or simply do not cover a particular topic, we have recommended additional or supplementary reading.

Detailed reading references in this subject guide refer to the editions of the set textbooks listed above. New editions of one or more of these textbooks may have been published by the time you study this course. You can use a more recent edition of any of the books; use the detailed chapter and section headings and the index to identify relevant readings. Also check the virtual learning environment (VLE) regularly for updated guidance on readings.

Essential journal articles

Bernard, V. and J. Thomas 'Evidence that stock prices do not fully reflect implications of current earnings for future earnings', *Journal of Accounting and Economics* 13 1990, pp.305–41.

DeBondt, W. and R. Thaler 'Does the stock market overreact?', *Journal of Finance* 40 1985, pp.793–805.

Fama, E. and K. French 'The cross-section of expected stock returns', *Journal of Finance* 47(2) 1992, pp.427–65.

Jegadeesh, N. and S. Titman 'Returns to buying winners and selling losers: Implications for stock market efficiency', *Journal of Finance* 48(1) 1993, pp.65–91.

Jensen, M.C. and R.S. Ruback 'The market for corporate control: the scientific evidence', *Journal of Financial Economics* 11 1983, pp.5–50.

Jorion, P. and E. Talmor 'Value relevance of financial and non financial information in emerging industries: the changing role of web traffic data', SSRN Working Paper, November 2001.

Kothari, S.P. 'Capital markets research in accounting', *Journal of Accounting and Economics* 31 2001, section 4.3.

Lakonishok, J., A. Shleifer and R.W. Vishny 'Contrarian investment, extrapolation, and risk', *Journal of Finance* 49(5) 1994, pp.1541–78.

Lev, B. and R. Thiagarajan 'Fundamental information analysis', *Journal of Accounting Research* 31(2) 1993, pp.190–215.

Ou, J. and S. Penman 'Financial statement analysis and the prediction of stock returns', *Journal of Accounting and Economics*, 11(4) 1989, pp.295–329.

Sloan, R.G. 'Do stock prices fully reflect information in accruals and cash flows about future earnings?', *Accounting Review* 71(3) 1996, pp.289–315.

Teoh, S.H., I. Welch and T.J. Wong 'Earnings management and the long-run market performance of initial public offerings', *Journal of Finance* 53(6) 1998, pp.1935–74.

Trueman, B., M.H.F. Wong and X. Zhang 'The eyeballs have it: Searching for the value in internet stocks', *Journal of Accounting Research* 38 (Supplement) 2000, pp.137–62.

Further reading

Please note that as long as you read the Essential reading you are then free to read around the subject area in any text, paper or online resource. You will need to support your learning by reading as widely as possible and by thinking about how these principles apply in the real world. To help you read extensively, you have free access to the VLE and University of London Online Library (see below).

A full bibliography of the Further reading is provided below.

Books

Barker, R. *Determining value: Valuation models and financial statements*. (Harlow: Pearson Education Limited, 2001) [ISBN 9780273639794], Chapter 9.

Copeland, T., T. Koller and J. Murrin *Valuation. Measuring and managing the value of companies*. (New York: John Wiley and Sons, 2000) third edition [ISBN 9780471361916] Chapter 8.

Damodaran, A. *Investment valuation. Tools and techniques for determining the value of any asset*. (New York: John Wiley and Sons, 2002) second edition [ISBN 9780471414889] Chapters 23 and 25.

Hillier, D., M. Grinblatt and S. Titman *Financial markets and corporate strategy*. (Boston, MA: McGraw-Hill, 2008) second (international) edition [ISBN 9780077119027].

Journals

Bradley, M., A. Desai and E. Kim 'The rationale behind interfirm tender offers: Information or synergy?', *Journal of Financial Economics* 11 1983, pp.183–206.

Brock, W., J. Lakonishok and B. LeBaron 'Simple technical trading rules and stochastic properties of stock returns', *Journal of Finance* 47(5) 1992, pp.1731–64.

Core, J.E., R.G. Wayne and A. Van Burskirk 'Market valuations in the new economy: an investigation of what has changed', *Journal of Accounting and Economics* 34(1) 2003, pp.43–67.

Francis, J., P. Olsson and D. Oswald 'Comparing the accuracy and explainability of dividends, free cash flow and abnormal earnings equity valuation models', Working Paper, University of Chicago, 1997.

Hand, J.R.M. 'The role of book income, web traffic, and supply and demand in the pricing of US internet stocks', *European Finance Review* 5 2001, pp.295–317.

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Healy, P.M., K.G. Palepu and R.S. Ruback 'Does corporate performance improve after mergers?', *Journal of Financial Economics* 31 1992, pp.135–75.

Jarrell, G., J. Brickley and J. Netter 'The market for corporate control: the empirical evidence since 1980', *Journal of Economic Perspectives* 2(1) 1988, pp.49–68.

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Keating, E.K., T.Z. Lys and R.P. Magee 'Internet downturn: Finding valuation factors in spring 2000', *Journal of Accounting and Economics* 34(1–3) 2003, pp.189–236.

Lang, L.H.P. and R.M. Stulz 'Tobin's q, corporate diversification, and firm performance', *Journal of Political Economy* 102(6) 1994, pp.1248–80.

Nissim, D. and S. Penman 'Ratio analysis and equity valuation: from research to practice', *Review of Accounting Studies* 6 2001, pp.109–54.

Penman, S.H. and T. Sougiannis 'A comparison of dividend, cash flow, and earnings approaches to equity valuation', *Contemporary Accounting Research* 15(3) 1998, pp.343–83.

Teoh, S.H., T.J. Wong and G.R. Rao 'Are earnings during initial public offerings opportunistic?', *Review of Accounting Studies* 3 1998, pp.97–122.

Works cited

For certain topics, we will also list journal articles or texts as supplementary references to the additional reading. It is not essential that you read this material, but it may be helpful if you wish to further understand some of the topics in this subject guide. A full bibliography of the cited references is provided below:

Akerlof, G. 'The market for lemons: Quality uncertainty and the market mechanism', *Quarterly Journal of Economics* 84 1970, pp.488–500.

Ali, A. and P. Zarowin 'The role of earnings level in annual earnings-returns studies', *Journal of Accounting Research* 30 1992, pp.286–96.

Ball, R. and P. Brown 'An empirical evaluation of accounting income numbers', *Journal of Accounting Research* 6 1968, pp.159–78.

Ball, R. and R. Watts 'Some time series properties of accounting income', *Journal of Finance* 27(3) 1972, pp.663–81.

Basu, S. 'The conservatism principle and the asymmetry timeliness of earnings', *Journal of Accounting and Economics* 24 1997, pp.3–37.

Beaver, W., R. Lambert and D. Morse 'The information content of security prices', *Journal of Accounting and Economics* 2 1980, pp.3–28.

Bernard, V. and J. Thomas 'Post-earnings-announcement drift: Delayed price response or risk premium?', *Journal of Accounting Research* 27 1989, pp.1–36.

Bernard, V. and J. Thomas 'Evidence that stock prices do not fully reflect implications of current earnings for future earnings', *Journal of Accounting and Economics* 13 1990, pp.305–41.

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Collins, D., E. Maydew and I. Weiss 'Changes in the value-relevance of earnings and book values over the past forty years', *Journal of Accounting and Economics* 24 1997, pp.39–67.

Comment, R. and G.A. Jarrell 'Corporate focus and stock returns', *Journal of Financial Economics* 37 1995, pp.67–87.

Damodaran, A. *Investment valuation*. (Chichester: Wiley, 1996) [ISBN 0471751219] Chapter 9.

Dechow, P. 'Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals', *Journal of Accounting and Economics* 18 1994, pp.3–42.

DeLong, J.B., A. Shleifer, L.H. Summers and R.J. Waldmann 'Positive feedback investment strategies and destabilising rational speculation', *Journal of Finance* 45 1990, pp.379–95.

Demers, E.A. and B. Lev 'A rude awakening: Internet shakeout in 2000', *Review of Accounting Studies* 6(2/3) 2001, pp.331–59.

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Sharpe, W.F. 'Capital asset prices: A theory of market equilibrium under conditions of risk', *Journal of Finance* 19(3) 1964, pp.425–42.

Watts, R.L. and R.W. Leftwich 'The time series of annual accounting earnings', *Journal of Accounting Research* Autumn 1977, pp.253–71.

Williams, J.B. *The theory of investment value*. (Cambridge, MA: Harvard University Press, 2012) [ISBN 9781607964704].

Online study resources

In addition to the subject guide and the Essential reading, it is crucial that you take advantage of the study resources that are available online for this course, including the VLE and the Online Library.

You can access the VLE, the Online Library and your University of London email account via the Student Portal at: http://my.londoninternational.ac.uk

You should have received your login details for the Student Portal with your official offer, which was emailed to the address that you gave on your application form. You have probably already logged in to the Student Portal in order to register! As soon as you registered, you will automatically have been granted access to the VLE, Online Library and your fully functional University of London email account.

If you have forgotten these login details, please click on the 'Forgotten your password' link on the login page.

The VLE

The VLE, which complements this subject guide, has been designed to enhance your learning experience, providing additional support and a sense of community. It forms an important part of your study experience with the University of London and you should access it regularly.

The VLE provides a range of resources for EMFSS courses:

- **Electronic study materials:** All of the printed materials which you receive from the University of London are available to download, to give you flexibility in how and where you study.
- **Discussion forums:** An open space for you to discuss interests and seek support from your peers, working collaboratively to solve problems and discuss subject material. Some forums are moderated by an LSE academic.
- **Videos:** Recorded academic introductions to many subjects; interviews and debates with academics who have designed the courses and teach similar ones at LSE.
- **Recorded lectures:** For a few subjects, where appropriate, various teaching sessions of the course have been recorded and made available online via the VLE.
- **Audiovisual tutorials and solutions:** For some of the first year and larger later courses such as Introduction to Economics, Statistics, Mathematics and Principles of Banking and Accounting, audio-visual tutorials are available to help you work through key concepts and to show the standard expected in exams.
- **Self-testing activities:** Allowing you to test your own understanding of subject material.
- **Study skills:** Expert advice on getting started with your studies, preparing for examinations and developing your digital literacy skills.

Note: Students registered for Laws courses also receive access to the dedicated Laws VLE.

Some of these resources are available for certain courses only, but we are expanding our provision all the time and you should check the VLE regularly for updates.

Making use of the Online Library

The Online Library (http://onlinelibrary.london.ac.uk) contains a huge array of journal articles and other resources to help you read widely and extensively.

To access the majority of resources via the Online Library you will either need to use your University of London Student Portal login details, or you will be required to register and use an Athens login.

The easiest way to locate relevant content and journal articles in the Online Library is to use the **Summon** search engine.

If you are having trouble finding an article listed in a reading list, try removing any punctuation from the title, such as single quotation marks, question marks and colons.

For further advice, please use the online help pages (http://onlinelibrary.london.ac.uk/resources/summon) or contact the Online Library team: onlinelibrary@shl.london.ac.uk

Examination advice

You should ensure that all four questions are answered, allowing an approximately equal amount of time for each question, and attempting all parts or aspects of a question. Pay attention to the breakdown of marks associated with the different parts of each question. Some questions may contain both numerical and essay-based parts. Examples of these types of questions (or parts of questions) are provided at the end of each chapter of this subject guide.

Answers with a clear structure and which show a good understanding of the material and originality in the approach will be likely to achieve a good mark. Conversely, answers that simply repeat the subject guide material in a relevant way may be given a pass at best. In this regard, please use material only when relevant to the question. Answers that include a large amount of irrelevant material are likely to be marked down.

Examination structure

Important: the information and advice given here are based on the examination structure used at the time this guide was written. Please note that subject guides may be used for several years. Because of this we strongly advise you to always check both the current *Regulations* for relevant information about the examination, and the VLE where you should be advised of any forthcoming changes. You should also carefully check the rubric/instructions on the paper you actually sit and follow those instructions.

The examination paper for this course is **three hours** in duration and you are expected to answer **four** questions, from a choice of 10. The examiners attempt to ensure that all of the topics covered in the syllabus and subject guide are examined. Some questions could cover more than one topic from the syllabus since the different topics are not self-contained. A Sample examination paper along with a sample *Examiners' commentary* is available on the VLE.

The *Examiners' commentaries* contain valuable information about how to approach the examination and so you are strongly advised to read them carefully. Past examination papers and the associated reports are valuable resources when preparing for the examination.

Remember, it is important to check the VLE for:

- up-to-date information on examination and assessment arrangements for this course
- where available, past examination papers and *Examiners' commentaries* for the course which give advice on how each question might best be answered.

List of abbreviations

AE	Abnormal Earnings
AEG	Abnormal Earnings Growth
AEM	Abnormal Earnings Method
AOI	Abnormal Operating Income
AOIM	Abnormal Operating Income Method
ARNOA	Abnormal Return on Net Operating Assets
AROCE	Abnormal Return on Common Equity
AT	Asset Turnover
ATO	Operating Asset Turnover
C	Cash flow from operations
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CE	Comprehensive Earnings
CSE	Common Shareholders' Equity
DCF	Discounted Cash Flow
DCFE	Discounted Cash Flow to Equity
DDM	Dividend Discount Method
EBILAT	Earnings Before Interest Less Adjusted Taxes
ERC	Earnings Response Coefficients
EVA	Economic Value Added
FA	Financial Assets
FCF	Free Cash Flow
FCFE	Free Cash Flow to Equity-holders
FE	Financial Expense
FLEV	Financial Leverage
FO	Financial Obligations
FR	Financial Revenue
GAAP	General Accepted Accounting Principles
GGM	Gordon Growth Method
I	Cash investments in operations
IE	Interest Expense
IFRS	International Financial Reporting Standards
IPO	Initial Public Offering
NBC	Net Borrowing Costs
NFA	Net Financial Assets
NFE	Net Financial Expense
NFO	Net Financial Obligations
NI	Net Income
NOA	Net Operating Assets
NOPLAT	Net Operating Profits Less Adjusted Taxes
OA	Operating Assets

OE	Operating Expense
OI	Operating Income
OL	Operating Liabilities
OLL	Operating Liability Leverage
OR	Operating Revenues
PB	Price-to-Book ratio
PCFO	Price-to-Cash-Flow ratio
PE	Price-to-Earnings ratio
PM	Profit Margin
PS	Price-to-Sales ratio
PVAE	Present Value of Abnormal Earnings
PVED	Present Value of Expected Dividends
PVFCF	Present Value of Expected Free Cash Flows
PVFCFE	Present Value of Free Cash Flows to Equity-holders
ReOI	Residual Operating Income
RNOA	Return on Net Operating Assets
ROA	Return on Assets
ROCE	Return on Common Equity
ROS	Return on Sales
SAR	Stock Abnormal Return
SARR	Stock Abnormal Rate of Return
SR	Stock Return
TA	Total Assets
WACC	Weighted Average Cost of Capital

Chapter 2: Introduction to the Ryanair case study

Aim of the chapter

The aim of this chapter is to introduce the case study used in this subject guide to illustrate the valuation steps involved in the valuation process.

Learning outcome

By the end of this chapter, you will have accessed the information that was used to value Ryanair.

Ryanair

Ryanair Ltd is an Irish low-cost airline, established in 1985, with a strategy not unlike Tesco or Ikea: pile them high and sell them cheap. Its head office is at Dublin Airport with its primary operational bases at Dublin Airport and also at London Stansted Airport. Ryanair's largest bases include European destinations such as Milan-Bergamo, Charleroi and Alicante. Ryanair has been characterised by rapid expansion, as a result of the deregulation of the aviation industry in Europe in 1997 and the success of its low-cost business model.[1]

[1] *http://en.wikipedia.org/wiki/Ryanair#2011*

Ryanair went public in May 1997 and shortly thereafter was voted 'Airline of the Year' by the Irish Air Transport Users Committee, 'Best Managed National Airline' in the world by *International Aviation Week* magazine, 'Best Value Airline' by the UK's *Which* consumer magazine and most popular airline on the web by Google. The number of passengers transported by Ryanair increased from 5.2m in 1999 to 34.8m in 2006, 42.5m in 2007, 50.3m in 2008, 58.6m in 2009, 66.5m in 2010 and 68.5m in 2011.

At the end of 2011, it was Europe's largest airline on a market capitalisation basis – by a long way. Its market capitalisation was £5bn compared to the British Airways owner IAG at £3.2bn; easyJet's was valued at £1.9bn and Air France-KLM, at €1.2bn.[2] Some of Ryanair's biggest competitors are easyJet, Southwest Airlines and Icelandair. The evolution of Ryanair's market capitalisation between 2006 and 2011 is illustrated in Figure 2.1. Ryanair's share performance compared to the Euro Stoxx 50 index between 2006 and 2011 is illustrated in Figure 2.2.

[2] *www.telegraph.co.uk/finance/markets/questor/9050223/Questor-share-tip-Ryanair-holds-course-as-slowdown-boosts-profits.html*

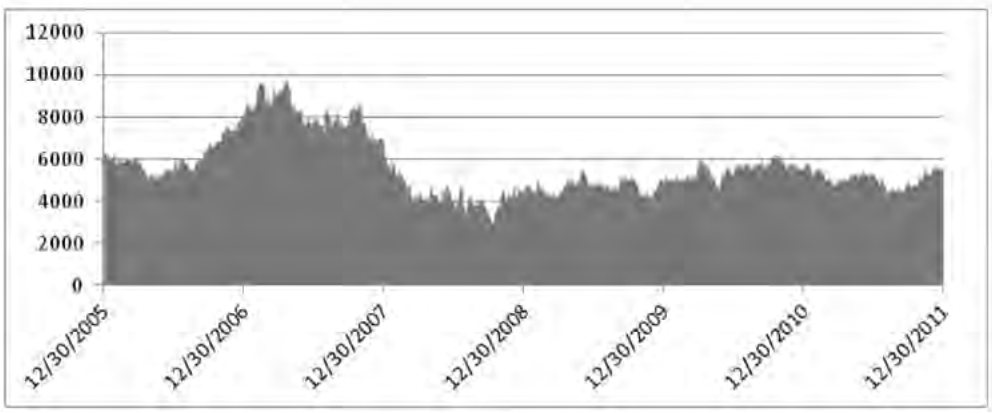

Figure 2.1: The evolution of Ryanair's market capitalisation between 2006 and 2011.

(Source: Datastream)

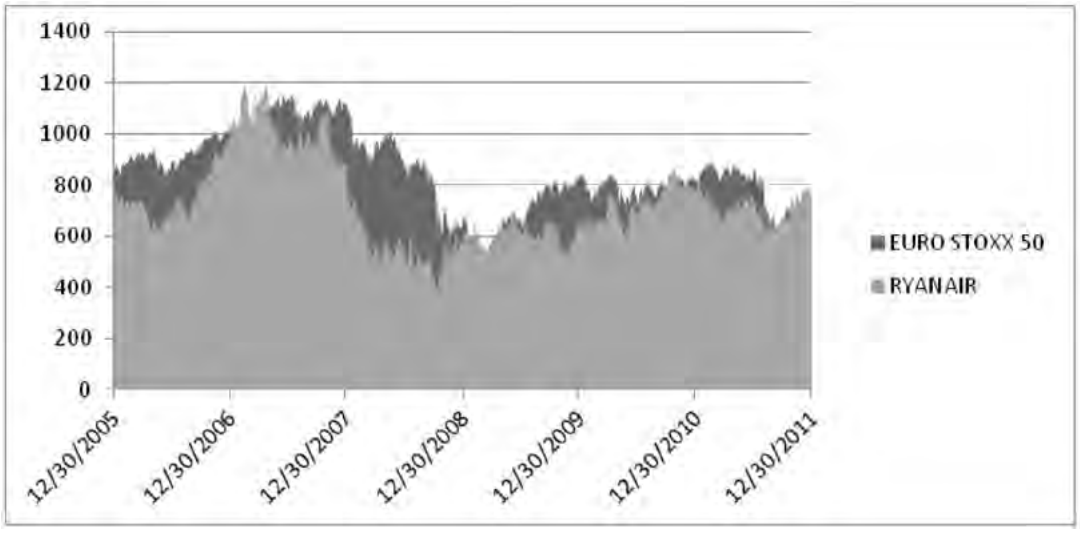

Figure 2.2: Ryanair's share performance compared to the Euro Stoxx 50 index between 2006 and 2011.

(Source: Datastream)

At the end of 2011, Ryanair operated over 290 aircrafts, had 8,900 employees and reported €374.6m of net income for that year. Reformulated financial statements for Ryanair for the years 2006 to 2011 are provided in Tables 2.1 and 2.2. Excerpts from financial statements for easyJet and Southwest Airlines are provided in Tables 2.3 and 2.4.

Over the past few years, Ryanair has been very profitable (with one exception) in spite of events such as the SARS outbreak, the Iraq war, disruptions due to the 'wrong type of snow' and the eruption of an Icelandic volcano.

Some of the reasons put forward to explain Ryanair's profitability include cut-price deals, point-to-point flights, quick aircraft turnarounds, flights to secondary airports, no staff overnighting, a single class, one aircraft type only, low staff costs and high staff incentives, low expenditure on marketing and an extremely high proportion of internet bookings. More recently, however, some secondary airports (such as Charleroi in Belgium) have rebelled by refusing to subsidise Ryanair. Ryanair also was unable to agree prices with Boeing for the purchase of new aircrafts and, as a result, Ryanair has started to pay dividends. Ryanair has also been criticised for poor employment relations, charging excessive fees for 'optional extras', poor customer service and controversial extras.

Europe's economic slowdown is helping all low-cost carriers to become more profitable, since consumers are switching to cheaper ways of travelling. However, the increases in fuel costs do not leave space for huge profits.

At the end of 2011, Ryanair was presented with an important opportunity when Spain's fourth largest airline, Spanair, collapsed. Howard Millar, Ryanair's chief financial officer, said that staff had been sent to Spain and that the airline would offer special 'emergency fares' to attract the former customers of the Barcelona-based Spanair. Miller ruled out a bid for the group, but said that Ryanair would be interested in some of its more attractive routes. Ryanair already had a substantial presence in Barcelona and it was anticipated that that the collapse would boost yields.

Among the latest news about Ryanair's operations, competitors and strategic movements is Ryanair's announcement of 26 new routes from

Budapest. This move came in response to the cessation of operations by the Hungarian carrier Malev, ending 66 years of almost continuous service, after some of its planes were held overseas for unpaid debts.[3] In a move to take advantage of this, Ryanair, which had announced plans to fly five routes from Budapest, increased that number to 31.

[3] *http://news.airwise.com/story/view/1328296595.html*

The biggest future threat to Ryanair is a spike in fuel costs. At the end of 2011, the group was hedged at about $99 per barrel, with the total fuel bill expected to rise by about €350m. The oil price is currently being driven by Iranian sabre-rattling and political brinkmanship over its nuclear programme. However, Iran postponed a decision it was expected to make in early 2012 to halt oil exports to the EU with immediate effect. That would have cut supply to the market and sent prices soaring. This was good news, but Iran has made it clear the country is prepared to engineer a spike in the oil prices as one of its defensive weapons.[4] However, Ryanair is doing well with a pricing policy that could increase its prices and keep it cheaper than its competitors.

[4] *www.telegraph.co.uk/finance/markets/questor/9050223/Questor-share-tip-Ryanair-holds-course-as-slowdown-boosts-profits.html*

(in €000)	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**
Revenues	3629500	2988100	2942000	2713822	2236895	1692530
Cost of Sales	2986700	2441200	2697500	2159574	1741355	1303572
Gross Margin	**642800**	**546900**	**244500**	**554248**	**495540**	**388958**
Administrative Expenses	154600	144800	151900	17168	23795	13912
Operating Income from Sales	**488200**	**402100**	**92600**	**537080**	**471745**	**375046**
Tax on Op. Income from Sales	53,637	40,803	-7,835	49,663	16,113	35,571
Op. Income from Sales after Tax	**434,563**	**361,297**	**100,435**	**487,417**	**455,632**	**339,475**
Other Operating Gains/(-)Losses						
Foreign Exchange	-600	-1000	4400	-5606	-906	-1234
Impairment of available-for-sale financial asset	0	-13500	-222500	-91569	0	0
Disposal of PPE	0	2000	0	12153	91	815
Total Other Operating Gains	**-600**	**-12500**	**-218100**	**-85022**	**-815**	**-419**
Total Operating Income after Tax	**433,963**	**348,797**	**-117,665**	**402,395**	**454,817**	**339,056**
Net Financing Expense						
Interest Expense	93,900	72,100	130,500	97,088	82,876	73,958
Interest Income	-27,200	-23,500	-75,500	-83,957	-62,983	-38,219
Net interest expense before tax	66,700	48,600	55,000	13,131	19,893	35,739
Tax benefit of debt	7,337	5,103	3,465	1,444	676	3,395
Net financing expense after tax	**59,363**	**43,497**	**51,535**	**11,687**	**19,217**	**32,344**
NET INCOME	**374,600**	**305,300**	**-169,200**	**390,708**	**435,600**	**306,712**

Table 2.1: Ryanair's reformulated income statement.

RYANAIR AIRLINES - Reformulated Balance Sheet (Euro in thousands)						
(in €000)	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**
Net Operating Assets						
Operating Assets						
Operating Cash	20283	14779	15832	14708.49	13464.19	14390.04
Accounts Receivable	50600	44300	41800	34178	23412	29909
Inventories	2700	2500	2100	1997	2420	3422
Prepaid Exp. and Other Curr. Assets	94500	74100	85800	159566	123669	20377
Current Tax Prepaid	500	0	0	1585	0	0
Total Operating Current Assets	**168583**	**135679**	**145532**	**212034.5**	**162965.2**	**68098.04**
Property, Plant, and Equipment	4933700	4314200	3644800	3582126	2901505	2532988
Other Operating Assets	46800	46800	46800	46841	46841	46841
Total Operating Assets	**5149083**	**4496679**	**3837132**	**3841001**	**3111311**	**2647927**
Operating Liabilities						
Accounts Payable	150800	154000	132700	129289	127243	79283
Tax Payable	0	2600	400	0	20822	15247
Other Current Operating Liabilities	1224300	1086500	905800	919349	807136	570614
Total Current Operating Liabilities	**1375100**	**1243100**	**1038900**	**1048638**	**955201**	**665144**
Deferred Tax	267700	199600	155500	148088	151032	127260
Provisions	89600	102900	72000	42790	28719	16722
Other Operating Liabilities	126600	136600	106500	101950	112177	46066
Total Operating Liabilities	**1859000**	**1682200**	**1372900**	**1341466**	**1247129**	**855192**
Net Operating Assets	**3290083**	**2814479**	**2464232**	**2499535**	**1864182**	**1792735**
Net Financial Assets						
Cash Equivalents	2008017	1463121	1567368	1456141	1332955	1424614
Available for Sale Financial Assets	114000	116200	93200	311462	406075	0
Derivative Financial Instruments	274000	69000	-1500	-207168	-61983	-89679
Interest Receivable	4900	6500	5200	10014	9028	9076
Restricted Cash	42900	67800	291600	292431	258808	204040
Financial Assets: Cash > 3 months	869400	1267700	403400	406274	592774	328927
Current Portion of Long term Debt	-336700	-265500	-202900	-366801	-178918	-153311
Long Term Debt	-2465600	-2129200	-1607700	-1489394	-1441862	-1408642
Capital Leases	-847100	-561500	-587800	-410300	-241286	-115775
	-336183	**34121**	**-39132**	**2658.51**	**675590.8**	**199250**
Common Stockholders' Equity	**2953900**	**2848600**	**2425100**	**2502194**	**2539773**	**1991985**

Table 2.2: Ryanair's reformulated statements of financial position.

(in £000)	2010	2009	2008	2007	2006
Operating Income from Sales	173600	60100	91000	172000	117800
Tax on Op. Income from Sales	36855.2	-18130.8	22296	44876.8	32026.4
Op. Income from Sales after Tax	136744.8	78230.8	68704	127123.2	85773.6
Other gains/losses(-)	0	0	0	10600	0
Net Financing Expense					
Interest Expense	26700	27900	34000	35400	24100
Interest Income	-7100	-22500	-53200	-54600	-35400
Net interest expense before tax	19600	5400	-19200	-19200	-11300
Tax benefit of debt	4155.2	-1630.8	-4704	-4723.2	-3073.6
Net financing expense after tax	15444.8	7030.8	-14496	-14476.8	-8226.4
NET INCOME	**121300**	**71200**	**83200**	**152200**	**94000**
OPERATING ASSETS					
	2010	**2009**	**2008**	**2007**	**2006**
Net Operating Assets					
Operating Assets					
Operating Cash	9119	7886	6322	7191	8607
Assets Held for sale	73200	73200	194900		
Accounts Receivable	194100	241800	236900	223600	227200
Goodwill	365400	365400	365400	309600	309600
Other	86800	81700	80600	60200	56200
Current Tax Prepaid	0	400	500	400	300
Property, Plant, and Equipment	1928100	1612200	1102600	935800	695700
Total Operating Assets	**2656719**	**2382586**	**1987222**	**1536791**	**1297607**
Operating Liabilities					
Accounts Payable	828700	750700	653000	461700	414100
Tax Payable	27500	57700	73200	89700	46800
Maintenance Provisions	215500	213700	216300	138800	139000
Deferred Tax	147900	76700	107800	35000	32000
Deferred Income/others	56600	52600	68800	136000	125100
Total Operating Liabilities	**1276200**	**1151400**	**1119100**	**861200**	**757000**
Net Operating Assets	**1380519**	**1231186**	**868122**	**675591**	**540607**

Table 2.3: Excerpts from easyJet's reformulated financial statements.

(in $000)	2010	2009	2008	2007	2006
Operating Income from Sales	988000	262000	449000	791000	934000
Tax on Op. Income from Sales	345520	133508	137336	442250	307192
Op. Income from Sales after Tax	642480	128492	311664	348750	626808
Other Operating Gains/(-)Losses					
Capitalised Interest	18000	21000	25000	50000	51000
Other net gains/losses	–106000	54000	-92000	292000	–151000
Total Other Operating Gains	–88000	75000	-67000	342000	–100000
Total operating Income after tax	554480	203492	244664	690750	526808
Net Financing Expense					
Interest Expense	167000	186000	130000	119000	128000
Interest Income	–12000	–13000	–26000	–44000	–84000
Net interest expense before tax	155000	173000	104000	75000	44000
Tax benefit of debt	59520	68508	37336	29250	16192
Net financing expense after tax	95480	104492	66664	45750	27808
NET INCOME	**459000**	**99000**	**178000**	**645000**	**499000**
OPERATING ASSETS					
2011	**2010**	**2009**	**2008**	**2007**	**2006**
Net Operating Assets					
Operating Assets					
Operating Cash	12610	11140	13680	22130	13900
Inventories	243000	221000	203000	259000	181000
Accounts Receivable	195000	169000	209000	279000	241000
Depreciation Allowance	–5765000	–5254000	–4831000	–4286000	–3765000
Other	606000	277000	375000	1512000	816000
Current Tax Prepaid	214000	291000	365000	0	0
Property, Plant, and Equipment	16343000	15888000	15871000	15160000	13859000
Total Operating Assets	**11848610**	**11603140**	**12205680**	**12946130**	**11345900**
Operating Liabilities					
Accounts Payable	739000	732000	668000	759000	643000
Air Traffic Liabilities	1198000	1044000	963000	931000	799000
Other accrued Liabilities	863000	729000	1012000	3107000	1323000
Tax Payable	2493000	2200000	1904000	2535000	2104000
Others	465000	493000	802000	302000	333000
Total Operating Liabilities	5758000	5198000	5349000	7634000	5202000
Net Operating Assets	**6090610**	**6405140**	**6856680**	**5312130**	**6143900**

Table 2.4: Excerpts from Southwest Airlines' reformulated financial statements.

Part 1: The framework for analysis

Notes

Chapter 3: The analysis framework and financial statements

Introduction

Capital markets play an important role in channelling financial resources from savers to entrepreneurs who require capital to fund projects. Business analysis and valuation, based on financial statements and other publicly available information, is an essential tool that savers and financial intermediators, such as bankers, rely on in the resource allocation process. This course provides an economic framework for performing a 'business analysis and valuation' and this chapter introduces the steps involved as well as the financial statement used in this framework.

Aim

The aim of this chapter is to introduce both the analysis framework and the stylised financial statements supporting the analysis. The chapter explains the role played by capital markets, and securities analysis and valuation in an economy. It then outlines the key steps used in the analysis framework and how they relate to each other. It then finally shows how to reformulate financial statements into the stylised ones used to perform the analysis and explains how the components of the reformulated financial statement relate to each other (under the so-called accounting relations). For each statement we will first introduce the form/content according to the US GAAP, and then explain the template needed for its reformulation to highlight operating and financing activities.

Learning outcomes

By the end of this chapter, and having completed the Essential readings and activities, you should be able to:

- briefly recall the role of capital markets in the economy
- critically assess the value of securities analysis in capital markets
- articulate the five steps involved in securities analysis and valuation in detail
- fully explain how financial statements are used in securities analysis and valuation
- discuss how financial statements can be reformulated, and prepare reformulated statements with minimal supervision
- clearly identify what assets and liabilities typically fall into operating and financing categories, and effectively explain the reasons for given classifications
- cogently explain the problems associated with the GAAP statement of cash flow, and adequately perform the adjustments needed to identify operating, financing and investing activities
- carefully contrast the direct and indirect calculations of cash flow from operations
- aptly calculate free cash flows from reformulated income statements and balance sheets autonomously

- thoroughly relate different components of the financial statement to each other (under the so-called accounting relations).

Essential reading

Palepu, K., V. Bernard and P. Healy *Business analysis and valuation*. (Mason, OH: South-Western College Publishing, 2012) fifth edition, Chapter 1.

Penman, S. *Financial statement analysis and security valuation*. (Boston, MA: McGraw-Hill, 2012) fifth edition, Chapters 7, 8, 9 and 10.

Works cited

Akerlof, G. 'The market for lemons: Quality uncertainty and the market mechanism', *Quarterly Journal of Economics* 84 1970, pp.488–500.

Myers, S. and N. Majluf 'Corporate financing and investment decisions when firms have information that investors do not have', *Journal of Financial Economics* 13 1984, pp.187–221.

Capital markets and the role of valuation and securities analysis

One of the main challenges in any economy is to allocate savings by investors to entrepreneurs with good investment opportunities. A good match is valuable as it results in a higher wealth shared in the economy. The matching process is, however, fraught with potential difficulties, coming in the form of both information asymmetries and incentive problems. As a result of both information asymmetries and incentive problems, capital markets may break down as investors may be unwilling to provide any financing to the entrepreneurs (Akerlof, 1970). Furthermore, even if capital markets do not break down, investors may end up financing some projects with negative net present values and some entrepreneurs endowed with positive net present value projects may elect not to invest in them (Myers and Majluf, 1984).

The market for lemons

The market for lemons (Akerlof, 1970) can be illustrated in the following example. Consider an economy consisting of two types of firms, either 'good' or 'bad', with the fundamental value of a 'good' firm being £10m and the fundamental value of a 'bad' firm being worth £2m. These firms are currently privately owned by entrepreneurs. Each entrepreneur, who has private information and knows the true worth of their firm, is considering selling their firm to a group of competing potential investors in an initial public offering (IPO). The potential investors do not know the true worth of any of the firms but know that half of the firms are 'bad' and half of the firms are 'good'.

Each entrepreneur has the option to go through an IPO but will only do so if they expect that potential investors will bid either the true value of their firm or more. Potential investors are only getting any value from buying a firm if the price paid for the firm is less than or equal to the true value of the firm. In a competitive market, potential investors therefore bid their expectation of true worth of the firm.

Let us first assume that the potential investors believe that all the entrepreneurs are selling their firms through IPOs. The potential investors will bid the *ex ante* expectation of any firm's true worth, that is, £6m (50% £10m + 50% £2m). Given the potential investors' bidding strategies, the entrepreneurs with the good firms are not willing to go though IPOs. In

equilibrium, only the entrepreneurs endowed with bad firms are willing to sell their firms and the potential investors therefore bid the true value of the 'bad' firms, that is, £2m.

Information asymmetry between the entrepreneurs and potential investors therefore leads to a market breakdown. In a setting characterised by a continuum of types of firms, only the worst type of firm goes through an IPO.

Distortions in investment decisions

Asymmetry of information between managers and investors can lead to distorted investment decisions (Myers and Majluf, 1984). Consider an economy consisting of a population of firms differing in both the quality (intrinsic value) of their assets in place and the quality (net present value) of their investment projects. Any investment project has to be financed through an issue of equity. Assume also that the managers of any firm are better informed about both the quality of their firm's assets in place and the quality of their firm's investment project than are outsiders. Furthermore, assume that managers act in the interest of their firm's existing shareholders.

Only managers know whether the equity of their firm is over- or underpriced though, and this creates an opportunity for them to exploit the market in order for existing shareholders to profit. The existence of information asymmetries thus implies that the market can misprice corporate equity: some firms' equity may be overpriced and others will be underpriced.

In this setting, managers may raise equity for two reasons. They may wish to invest in a positive net present value investment, which would result in an increase in the value of the firm's equity. Alternatively, they may wish to issue overpriced equity, which would result in a transfer of wealth from the new to the old shareholders. Given rational expectations, the financial market correctly recognises both incentives to raise equity. In equilibrium, managers of low-quality firms, that is, managers of firms with assets in place whose true worth is low enough (and are hence overvalued), raise equity in order to take projects with a small but negative net present value. The benefit to the existing shareholders resulting from issuing overvalued equity exceeds the cost resulting from taking the negative net present value project. Similarly, managers of high-quality firms, that is, managers of firms with assets in place whose true worth is high enough (and are hence undervalued), abstain from raising equity and hence taking projects with a small but positive net present value. The dilution to the existing shareholders resulting from issuing undervalued equity exceeds the benefit resulting from the positive net present value generated by taking the project. The presence of information asymmetries between managers and shareholders hence leads to distortions in investments.

The role of valuation and securities analysis

As shown in the previous sub-sections, information asymmetries in capital markets can lead to a breakdown of the capital markets. When capital markets do not break down, information asymmetries can generate distorted investment decisions. Valuation and securities analysis plays an important role in any economy by reducing asymmetries of information. Valuation and securities analysis can lead to more active capital markets, better valuation in capital markets, better investments by firms and a higher wealth shared in the economy.

Introduction to the valuation and securities analysis framework

A firm's managers are responsible for acquiring physical and financial resources from the firm's environment and using them to create value for the firm's investors. Intuitively, value is created when the firm earns a return on its investment in excess of the cost of capital. The longer the period over which the firm is able to enjoy superior performance, the higher the firm's intrinsic value. The excess of a firm's return on common equity over its cost of equity capital may be due to a superior performance in the product markets. The superior performance in the product markets reflects both the attractiveness of the industry and the success of the firm's competitive and corporate strategies. Alternatively, the excess of the firm's return on common equity over its cost of equity capital could be generated by successful financial engineering. Finally, it could be due to accounting distortions. Sustainability of performance through time, and hence value, is shown to depend on the source of performance.

This chapter introduces a framework for securities analysis and valuation. This framework consists of five key steps:

- a strategy analysis
- an accounting analysis
- a financial analysis
- a prospective analysis
- a valuation.

Step 1: Strategy analysis

The purpose of the strategy analysis is to assess the company's profit potential at a qualitative level through an industry analysis, competitive strategy analysis and corporate strategy analysis.

- The industry analysis is used to assess the profitability of each of the industries in which the company is competing. The profitability of any industry is shown to depend on the degree of actual and potential competition among firms and the relative bargaining power of both the industry's suppliers and buyers. The degree of actual and potential competition is in turn shown to depend on the degree of rivalry among existing firms within the industry, the threat of new entrants into the industry and the threat of substitute products from other industries.
- The competitive strategy analysis is used in order to determine the manner in which the company is competing in each of the industries in which it is competing. In order to build a sustainable competitive advantage, the company could adopt either a cost leadership strategy or a differentiation strategy. Cost leadership enables the company to supply the same product or service at a lower cost than its competitors. Differentiation may enable the company to supply a unique product or service at a lower cost than the price premium customers are willing to pay.
- The corporate strategy analysis is used in order to assess the way in which the company is creating and exploiting synergies across the industries in which it is competing.

The strategy analysis is an essential step in the securities analysis and valuation framework as it provides a foundation for subsequent analysis. It furthermore enables analysts to ground the subsequent financial and prospective analysis in business reality.

Step 2: Accounting analysis

The purpose of accounting analysis is to evaluate the degree to which a firm's accounting captures the underlying economic reality. An accounting analysis normally consists of the following:

- An analysis of the operating assets and liabilities used in the firm's industry. In this context, an analyst will consider the main 'economic' operating asset and liabilities and check how these assets and liabilities are captured in the financial statements.
- An analysis of the key success factors and risks identified in the strategy analysis. In this context, an analyst will assess the accounting policies and estimates the firm uses to measure its key success factors and risks.
- A 'red flags' analysis. In this context, an analyst will look for red flags pointing towards earnings management. These red flags are also used by auditors in order to allocate effort when looking for misstatements.

An accounting analysis enables an analyst to assess the degree of distortion in a firm's financial statements and possibly undo any accounting distortions by recasting the firm's accounting numbers. The accounting analysis is an essential step in the securities analysis and valuation framework as it improves the reliability of inferences made from the financial analysis.

Step 3: Financial analysis

The purpose of a financial analysis is to evaluate a firm's performance and assess its sustainability. A financial analysis may assess the firm's performance either from the point of view of its shareholders (bottom-line performance) or from the point of view of all claimholders in the capital structure (business performance). It allows an analyst to determine whether any abnormal performance, as far as shareholders are concerned, is generated by abnormal performance in the product markets or financial engineering. It enables the analyst to explain any abnormal performance in the product markets through an abnormal asset turnover or margin. Finally, it helps to explain the dynamics of free cash flows.

A financial analysis may involve comparison of a firm's performance with the firm's relevant cost of capital. It may also involve either a cross-sectional analysis or a time-series analysis:

- in a cross-sectional analysis, analysts compare the firm's performance with peers' performance in the same industry
- in a time-series analysis, analysts examine the firm's relative performance over time to determine whether it is improving or deteriorating.

The financial analysis is an essential step in the securities analysis and valuation framework as it improves an analyst's understanding of a firm's current performance and future prospects.

Step 4: Prospective analysis

The purpose of a prospective analysis is to forecast the future flows, such as dividends, free cash flows, abnormal earnings or abnormal operating income, which are used in the valuation step. These flows are not forecast directly by any analyst. Instead, in any prospective analysis, the analyst forecasts future financial statements, such as balance sheets and income statements, over a number of years. The set of projected financial statements then generates a set of projected flows used in the valuation step.

The set of projected financial statements implies some levels of performance and growth, which must be consistent with the output of the financial analysis. The prospective analysis is an essential step in the securities analysis and valuation framework as it generates the input to the valuation step.

Step 5: Valuation

The purpose of a valuation is to determine the intrinsic (fundamental) value of a firm's equity or a firm's net operating assets (enterprise value). This subject guide will consider both accounting-based valuation methods, such as the abnormal earnings method and the abnormal operating income method, and cash flow-based valuation methods, such as the dividend discount method, the discounted cash flow to equity-holders method and the discounted cash flow method. Any valuation includes the present value of some flow in the future, where the flow could be a dividend, cash flow to equity-holders, free cash flow, abnormal earnings or abnormal operating income. The future consists of an explicit forecasting period, in which the analyst takes the present value of some flow generated by the set of projected financial statements from the prospective analysis, and a post-horizon period, in which the analyst makes some simplifying assumption about the flow's growth.

The five steps used in valuation and securities analysis and introduced in this chapter will be covered in more detail in subsequent chapters. The remaining part of this chapter introduces the stylised financial statements used in valuation and securities analysis.

Introduction to stylised financial statements

In this section we focus our attention on financial statements, which can be described as a lens that provides a picture of the business. The three primary financial statements required by the accounting rules at international level are the balance sheet, the income statement and the cash flow statement. (According to the US rules, firms must produce a fourth statement, known as statement of shareholders' equity, that reconciles beginning and ending shareholders' equity, whereas according to international rules, firms have simply to produce an explanation of changes in shareholders' equity.)

In the USA, the Financial Accounting Standards Board (FASB) establishes the widely accepted set of rules, standards and procedures for reporting financial information, known as GAAP (General Accepted Accounting Principles). Other countries have similar requirements: namely, the International Accounting Standards Board (IASB) develops financial reporting standards (known as International Financial Reporting Standards, IFRS) with international application. Note that US-listed firms must also file an annual 10-K report and a quarterly 10-K report with the Securities and Exchange Commission (SEC). Throughout this subject guide the reference will be to the US GAAP.

Activity 3.1

Please visit the websites of FASB (www.fasb.org) and IASB (www.ifrs.org) to have a view of the activity of these accounting bodies. Then download the PricewaterhouseCoopers' document available at www.pwc.com/us/en/issues/ifrs-reporting/publications/ifrs-and-us-gaap-similarities-and-differences/jhtml and read pages 3–10 to have a view of the main similarities and differences between IFRS and US GAAP.

Although reported financial statements are useful tools, they do not provide an appropriate picture of the business for valuation purposes. Therefore, the first step of any valuation is to reformulate the financial statements in a way that better aligns the reported stocks and flows with the business activities that generate value. The aim is to produce stylised financial statements (also referred to as reformulated financial statements) clearly highlighting operating and financing activities. These same statements are then used to apply valuation models, as illustrated in the next chapters.

Financing activities involve raising cash from the capital market, where the investors become claimants on the value generated by the firm. These claimants can be both debt-holders and shareholders. Operating activities combine assets with inputs of the production process (like labour and materials) to produce products and services, which in turn will be sold to customers to obtain cash. If successful, the excess cash generated by operating activities can be reinvested in assets to be employed in operations, or to be returned to claimants. Investing activities use the cash raised from financing activities and generated in operations to acquire (physical and intellectual) assets to be used in operations. Given the nature of investing activities, it is common to refer to the operating and investing activities together as operating activities. Therefore in the rest of the subject guide we will refer to operating activities (that include investing activities) and financing activities.

The aim of this chapter is to answer the following questions. How are IFRS/GAAP financial statements organised? How are operating and financing assets/liabilities/income/cash flows identified in the financial statements? How are the financial statements reformulated to separate operating and financing activities? To do so, for each statement we will first introduce the form (i.e. the way in which the financial statement is organised) and content (i.e. the way in which line items in the financial statement are measured) according to the US GAAP. We will then explain the template needed for the reformulation of financial statements. We will also provide a practical application to an airline company. (Note that throughout the subject guide you will need to use your pre-existing technical knowledge about financial statements, with a view to be able to prepare them in a useful way for financial statement analysis and valuation.)

Stylised income statement

The IFRS/GAAP income statement (known as profit and loss statement in the UK) indicates the sources of net income, which represents the bottom-line measure of value added to shareholders' equity during a period of time. These sources are classified as revenues (value coming from sales) and expenses (value used to earn the revenues). The typical form of an IFRS/GAAP income statement is represented in Figure 3.1.

	Net revenues
–	Cost of goods sold
=	Gross margin
–	Operating expenses
=	Operating income (also referred to as earnings before interests and taxes, EBIT)
–	Net interest expenses
=	Income before taxes

–	Taxes
=	Income after taxes
+/–	Extraordinary items
=	Net income
–	Preferred dividends
=	Net income available to common shareholders

Figure 3.1: Income statement under IFRS/GAAP.

Activity 3.2

Go to Ryanair's website at:

www.ryanair.com/doc/investor/2011/Annual_Report_2011_Final.pdf

http://classic.ryanair.com/doc/investor/2008/Annual_Report_2008_web.pdf

www.ryanair.com/doc/investor/2006/94_2006_doc.pdf

Here download the financial statements (balance sheet, income statement and cash flow statement) for the company for the years 2006–2011. It is very important that you download these statements because we will refer to Ryanair – the leader in the low-cost sector of the European airline industry – throughout this guide, so that you will be able to see a complete analysis of this firm carried out, which in turn can be used as a template to develop a concrete analysis and valuation of any firm.

For equity valuation, however, analysts need to reformulate the IFRS/GAAP income statement by distinguishing operating and financing activities. The distinction between these two types of activity is important because operating activities are typically the source of value generation, and it is these operating activities that we will particularly focus on when we analyse firms. (Note that the reformulated income statement also includes 'dirty-surplus' items removed from common equity to produce a statement of comprehensive earnings, as we will extensively explain in Chapter 4.)

Operating activities combine net operating assets (such as property, plant and equipment) with inputs from suppliers (of labour, materials and so on) to produce products and services, which in turn will be sold to customers. Thus operating activities involve trading with suppliers (and thus imply the occurrence of operating expenses) and trading with customers (and thus determine the obtainment of operating revenues). Financing activities instead relate to the trading in capital markets, or rather to the transactions between the firm and the two categories of claimants (shareholders and debt-holders). Trading with debt-holders (namely bondholders, banks and other creditors) involves the payment of interests (financial expenses) and the repayments of principal for the cash borrowed from these creditors: in this case the firm has financial obligations (also known as financial liabilities). Alternatively, the firm can also buy financial assets from debt issuers (governments, banks or other firms). This represents a financing activity (of a lending nature instead of a borrowing nature), and involves the receipt of interests (financial revenues) and the repayments of principal to the firm: in this case the firm holds financial assets.

Operating income (OI) represents the results of operating activities, and it is obtained as the difference between operating revenues and operating expenses. Net financial expense (NFE) instead represents the result of financing activities when financial expense is greater than financial revenue (in the opposite case the amount is called net financial income). Operating income is combined with net financial expense to give a measure of total value added to shareholders, known as net income (NI) or comprehensive

earnings (CE) (for an investigation of the differences between net income and comprehensive earnings, please refer to Chapter 4). Figure 3.2 shows the typical content of a stylised income statement.

Operating revenue	OR	
Operating expense	(OE)	
Operating income		OI
Financial expense	FE	
Financial revenue	FR	
Net financial expense		(NFE)
Net income		NI

Figure 3.2: Reformulated income statement.

The reformulation of the IFRS/GAAP income statement is required mainly because the reported operating income and the reported net financial expense are typically incomplete; hence the adjustments. The first step of the reformulation requires you to distinguish between operating income that comes from sales and operating income that does not come from sales. Note that in the reformulation the lack of disclosure is often a problem (see for example, the little explanation provided in the financial statements for a large expense item like selling, administrative and general expenses).

A typical problem in the reformulation concerns tax allocation, or rather the allocation of the one single income tax number reported in the financial statements to the two components of income (operating and financing). This requires first the calculation of the tax shield of debt, which is the tax benefit of deducting interest expense on debt for tax purposes and allocating it to operating income. Formally, this after-tax net interest expense can be calculated as:

$$\text{After-tax net interest expense} = \text{Net interest expense} - \text{Tax benefit} = \text{Net interest expense} \times (1 - \text{tax rate}) \quad (3.1)$$

The tax rate typically used in this calculation is the marginal tax rate (i.e. the highest rate at which income is taxed), but the effective tax rate (which is tax expense divided by net income before tax in the income statement) can also be used.

Without the tax benefit of debt, the taxes on operating income would be higher; therefore the tax benefit has to be added back to the taxes on operating income, as shown below.

$$\text{Tax on operating income} = \text{Reported tax expense} + \text{Tax benefit} = \text{Reported tax expense} + (\text{Net interest expense} \times \text{Tax rate}) \quad (3.2)$$

Activity 3.3*

Go back to the income statement of Ryanair downloaded for Activity 3.2. Calculate the tax on operating income from sales for each year in the period 2006–2011.

(*The solution to this activity can be found at the end of the subject guide.)

Another typical issue in the reformulation concerns extraordinary items. Some have to be considered operating items (e.g. abnormal gains and abnormal losses in extraordinary items and income from discontinued operations), while others (e.g. gain and losses from debts retirement) are financing items.

Activity 3.4

Go back to the income statement of Ryanair downloaded for Activity 3.2. Prepare the reformulated income statement for the years 2006–2011. Then compare your answer with the reformulated income statement provided here below.

RYANAIR AIRLINES - *Reformulated Income Statements (Euros in millions)*						
	2011	**2010**	**2009**	**2008**	**2007**	**2006**
Revenues	3629.5	2988.1	2942.0	2713.8	2236.9	1692.5
Cost of Sales	2986.7	2441.2	2697.5	2159.6	1741.4	1303.6
Gross Margin	642.8	546.9	244.5	554.2	495.5	389.0
Administrative Expenses	154.6	144.8	151.9	17.2	23.8	13.9
Operating Income from Sales	488.2	402.1	92.6	537.1	471.7	375.0
Tax on Op. Income from Sales	53.6	40.8	-7.8	49.7	16.1	35.6
Op. Income from Sales after Tax	434.6	361.3	100.4	487.4	455.6	339.5
Other Operating Gains/(-)Losses						
Foreign Exchange	-0.6	-1.0	4.4	-5.6	-0.9	-1.2
Impairment of available-for-sale financial asset	0.0	-13.5	-222.5	-91.6	0.0	0.0
Disposal of PPE	0.0	2.0	0.0	12.2	0.1	0.8
Total Other Operating Gains	-0.6	-12.5	-218.1	-85.0	-0.8	-0.4
Total Operating Income after Tax	**434.0**	**348.8**	**-117.7**	**402.4**	**454.8**	**339.1**
Net Financing Expense						
Interest Expese	93.9	72.1	130.5	97.1	82.9	74.0
Interest Income	-27.2	-23.5	-75.5	-84.0	-63.0	-38.2
Net interest expense before tax	66.7	48.6	55.0	13.1	19.9	35.7
Tax benefit of debt	7.3	5.1	3.5	1.4	0.7	3.4
Net financing expense after tax	59.4	43.5	51.5	11.7	19.2	32.3
NET INCOME	**374.6**	**305.3**	**-169.2**	**390.7**	**435.6**	**306.7**
Effective Tax Rate	11.0%	10.5%	6.3%	11.0%	3.4%	9.5%
Reported Tax Expense	46.3	35.7	-11.3	48.2	15.4	32.2
Tax Benefit	7.3	5.1	3.5	1.4	0.7	3.4
Tax on Operating Income	53.6	40.8	-7.8	49.7	16.1	35.6

Above you can find the reformulated income statement of Ryanair for the years 2006–2011. A derivation of these reformulated income statements can be found in a spreadsheet available on the VLE. From this template you can have a view of the classification of the typical items found in the income statement of any company.

Stylised balance sheet

The IFRS/GAAP balance sheet represents the assets, liabilities and shareholders' equity of a given firm, as shown in Figure 3.3. With reference to a given point in time, it shows the resources (assets) the firm controls and how it has financed these assets. Assets are investments that are expected to generate future economic benefits. Liabilities are obligations to the firm's claimants other than owners. Shareholders' (stockholders') equity is the claim by the owners. Both assets and liabilities are classified into current (i.e. duration less than one year) and long-term categories.

Assets	**Liabilities and equity**
Current assets:	**Current liabilities:**
Cash and cash equivalents	Accounts payable
	Accrued liabilities
Short-term investments	**Total current liabilities**
Accounts receivable	Long-term debt
Inventories	
Total current assets	**Total liabilities:**
Property, plant and equipment (net)	Shareholders' equity
Investments	Preferred stocks
	Common stocks
	Retained earnings
	Total shareholders' equity
Total assets	Total liabilities and shareholders' equity

Figure 3.3: IFRS/GAAP balance sheet.

Once again for equity analysis, the published balance sheets are better reformulated by dividing into operating activities and financing activities (both for the asset and liability side). Firms often issue debt (financial obligations) and hold debt (financial assets) at the same time. The stock of net debt-holding can thus alternatively be net financial assets (if financial assets are greater than financial liabilities), or net financial obligations (in the opposite case). Firms also invest in operating assets (such as land, factories, inventories) and use operating liabilities (such as accounts payable) to produce goods for sales.

Positive operating stocks are known as operating assets (OA), while negative operating stocks are called operating liabilities (OL). Their difference represents net operating assets (NOA). Financing stocks can also be either financial assets (FA) or financial obligations (FO). Their difference can be either negative (and thus generate net financial obligations, NFO) or positive (and thus be known as net financial assets, NFA). The common shareholders' equity (CSE) can be considered as an investment in net operating assets and net financial assets. (Note that common shareholders are known as ordinary shareholders in the UK.) A typical reformulated balance sheet is shown in Figure 3.4.

Net operating assets		Net financial obligations and equity	
Operating assets	(OA)	Financial obligations	(FO)
Operating liabilities	(OL)	Financial assets	(FA)
		Net financial obligations	NFO
		Common shareholders' equity	CSE
Net operating assets	**NOA**	**NFO + CSE**	

Figure 3.4: Reformulated balance sheet.

Activity 3.5

Go back to the balance sheet statement of Ryanair downloaded for Activity 3.2. Then classify all the items in the statement according to the categories identified in Figure 3.4.

In distinguishing between operating and financing activities, several issues arise:

- Cash and cash equivalents. Working cash (also called operating cash) is the cash needed to carry out normal business and thus represents an operating asset. However, cash equivalents (i.e. investments with less than three months' maturity) and cash invested in short-term securities

are financial assets. Usually operating cash and cash equivalents are reported together, so analysts need some hypothesis/calculation to isolate the amount of operating cash. The amount of operating cash is very much related to the actual business of the firm. A procedure often used is to calculate it as a percentage of sales: for most industrial companies this percentage is between 1 and 2 per cent.

- Leases. Leases that are capitalised, known as capital leases, represent in substance purchases of an asset; therefore in the reformulated balance sheet statement the lease asset is treated as an operating asset and the lease obligation as a financial obligation. Leases that do not represent a purchase, called operating leases, do not appear in the balance sheet (just the rent payments are included in the income statement as an expense).
- Preferred stocks. These represent a financial obligation from the point of view of a common shareholder.
- Minority interests. These represent an equity sharing in the results of the consolidated operations, and not a financial obligation. Therefore they should be included as a separate line item in the common shareholders' equity.

Activity 3.6

Go back to the balance sheet statement of Ryanair downloaded for Activity 3.2. Prepare the reformulated balance sheet statement for the years 2006–2011. Then compare your answer with the reformulated balance sheet provided below.

RYANAIR AIRLINES - *Reformulated Balance Sheet (Euro in millions)*

	2011	2010	2009	2008	2007	2006
Net Operating Assets						
Operating Assets						
Operating Cash	20.3	14.8	15.8	14.7	13.5	14.4
Accounts Receivable	50.6	44.3	41.8	34.2	23.4	29.9
Inventories	2.7	2.5	2.1	2.0	2.4	3.4
Prepaid Exp. and Other Curr. Assets	94.5	74.1	85.8	159.6	123.7	20.4
Current Tax Prepaid	0.5	0.0	0.0	1.6	0.0	0.0
Total Operating Current Assets	**168.6**	**135.7**	**145.5**	**212.0**	**163.0**	**68.1**
Property, Plant, and Equipment	4933.7	4314.2	3644.8	3582.1	2901.5	2533.0
Other Operating Assets	46.8	46.8	46.8	46.8	46.8	46.8
Total Operating Assets	**5149.1**	**4496.7**	**3837.1**	**3841.0**	**3111.3**	**2647.9**
Operating Liabilities						
Accounts Payable	150.8	154.0	132.7	129.3	127.2	79.3
Tax Payable	0.0	2.6	0.4	0.0	20.8	15.2
Other Current Operating Liabilities	1224.3	1086.5	905.8	919.3	807.1	570.6
Total Current Operating Liabilities	1375.1	1243.1	1038.9	1048.6	955.2	665.1
Deferred Tax	267.7	199.6	155.5	148.1	151.0	127.3
Provisions	89.6	102.9	72.0	42.8	28.7	16.7
Other Operating Liabilities	126.6	136.6	106.5	102.0	112.2	46.1
Total Operating Liabilities	**1859.0**	**1682.2**	**1372.9**	**1341.5**	**1247.1**	**855.2**
Net Operating Assets	**3290.1**	**2814.5**	**2464.2**	**2499.5**	**1864.2**	**1792.7**
Net Financial Assets						
Cash Equivalents	2008.0	1463.1	1567.4	1456.1	1333.0	1424.6
Available for Sale Financial Assets	114.0	116.2	93.2	311.5	406.1	0.0
Derivative Financial Instruments	274.0	69.0	-1.5	-207.2	-62.0	-89.7
Interest Receivable	4.9	6.5	5.2	10.0	9.0	9.1
Restricted Cash	42.9	67.8	291.6	292.4	258.8	204.0
Financial Assets: Cash > 3 months	869.4	1267.7	403.4	406.3	592.8	328.9
Current Portion of Long term Debt	-336.7	-265.5	-202.9	-366.8	-178.9	-153.3
Long Term Debt	-2465.6	-2129.2	-1607.7	-1489.4	-1441.9	-1408.6
Capital Leases	-847.1	-561.5	-587.8	-410.3	-241.3	-115.8
	-336.2	**34.1**	**-39.1**	**2.7**	**675.6**	**199.2**
Common Stockholders' Equity	**2953.9**	**2848.6**	**2425.1**	**2502.2**	**2539.8**	**1992.0**

You can find the reformulated balance sheet statements of Ryanair for the years 2006–2011, which gives the classification of typical items found in the balance sheet of any company. A derivation of these reformulated balance sheet statements can be found in a spreadsheet available on the VLE.

Stylised statement of cash flows

The statement of cash flows shows how the firm generates and uses cash. The IFRS/GAAP statement of cash flows classifies cash flows into three sections (see Figure 3.5): cash flows from operating activities (cash generated from selling goods/services minus cash used to pay the cost of inputs and operations), cash flows used in investing activities (cash paid for capital expenditure and cash spent in buying assets less cash received from selling assets) and cash flows from financing activities (cash raised from or paid to the firm's claimants – debt-holders and shareholders). The total cash flows from these sections provide the change in cash and cash equivalents (note that this amount has to be equal to the difference in the cash balance between the ending and beginning balance sheet). The difference between cash flows from operations and cash flows used in investment activities provides a sort of measure of free cash flow (FCF), the cash flow associated to operating activities.

Firms use two formats for the statement of cash flows: the direct method and the indirect method. The key difference between the two formats is the way in which they represent cash flow from operations. Under the direct method, cash from operations is calculated by subtracting from the list of the separate sources of operating cash inflows (e.g. cash from sales, cash from rents, cash from interest) the list of sources of operating cash outflows (e.g. cash paid to suppliers, cash paid to employees, cash paid for interest, cash paid for income taxes). The direct method is used by only a small number of firms in practice. Under the indirect method, cash from operations is calculated as the net income including changes in net working capital items (i.e. accounts receivable, inventories and accounts payable) plus adjustments for non-cash revenues and expenses (such as depreciation, amortisation and deferred income taxes).

	Cash flow from operating activities
–	Cash flow used in investing activities
+	Cash flow from financing activities
=	Change in cash and cash equivalents

Figure 3.5: IFRS/GAAP statement of cash flows.

The IFRS/GAAP statement of cash flows seems to distinguish between the flows from operating activities and from financing activities. However, it somehow confuses the two categories. Here we analyse a number of deficiencies.

- Change in cash and cash equivalents. The IFRS/GAAP statement of cash flows aims at explaining the change in cash and cash equivalents. Change in operating cash (as defined in the section 'Accounting relations on the form of stylised financial statements' below) should be included in cash investment (and thus concurs with the formation of free cash flow), whereas the change in cash equivalents is an investment of excess cash in financial assets (and thus has to be included in the debt financing section).
- Net cash interest and tax on net interest. The IFRS/GAAP reported cash flow from operations includes cash interest payments and receipts

for financing activities (this happens because in the calculation of cash flows from operations the starting line is net income and not operating income). However, they should be included in the financing flows. Analogously the reported cash flow from operations include all tax cash flows (also the ones paid on financing activities, such as interest income and expense). Tax cash flows related to financing activities should be separated. The reported cash flow from operations has to be corrected accordingly.

- Transactions in financial assets. The IFRS/GAAP reported cash flow from investing includes investments and disinvestments in financial assets (such as short-term marketable securities and long-term debt securities). However, these investments should be included in the financing section because they represent a disposition of free cash flow (and not a reduction of free cash flow). Similarly, the disinvestments of financial assets should be classified as financing flows rather than investing flows: they satisfy a free cash flow shortfall, they do not create it. Therefore the reported cash flow from investing has to be corrected accordingly.

Overall, how do we calculate the components of FCF (cash flows from operations and cash investments in operations) starting from the IFRS/GAAP statement of cash flow? For the calculation of cash flow from operations, the IFRS/GAAP reported cash flow from operations has to be corrected as regards net cash interest and tax on net interest. Formally, this can be written as:

$$\text{Cash flow from operations} = \text{Reported cash flow from operations} + \text{After-tax net interest payments} \quad (3.3)$$

As for the calculation of cash investments in operations, the IFRS/GAAP reported cash flow from investing has to be corrected as regards transactions in financial assets, as shown below:

$$\text{Cash investments in operations} = \text{Reported cash flow from investing} - \text{Net investment in interest-bearing instruments} \quad (3.4)$$

A summary of the adjustments of the IFRS/GAAP statement of cash flow – necessary because some operating and financing cash flows are misclassified – is shown in Figure 3.6.

	GAAP reported cash from operating activities
+	Net cash interest outflow (after tax)
–	GAAP reported cash used in investing activities
+	Purchase of financial assets
–	Sale of financial assets
–	Increase in operating cash
=	Free cash flow

	GAAP reported cash from financing activities
+	Net cash interest outflow (after tax)
+	Purchase of financial assets
–	Sale of financial assets
+	Increase in cash equivalents
=	Financing cash flow

Figure 3.6: Adjusting GAAP statement of cash flows.

Activity 3.7

Go back to the statement of cash flows of Ryanair downloaded for Activity 3.2. Prepare the reformulated statement of cash flows for the years 2006–2011. Keep your answer – it will be needed in Chapter 8.

The above adjustments are quite complex. Nevertheless, the analyst can produce a reformulated statement (without adjusting the GAAP statement of cash flows) by recalling all the cash flows to/from product and input markets on the one hand, and capital markets on the other hand. On the operating side, the cash flows involved in the purchase of operating assets to produce goods for sales are cash investments. The cash inflows from selling products and services less cash outflows from paying wages, rents, invoices and so on are the so-called cash flow from operations. On the financing side, the cash flows to and from the debt-holders (summarised in the net debt financing flow) relate to the payment/receipt of interests and the repayments of principal to/from the firm for the cash lent to/borrowed from these creditors. The cash flows to and from the shareholders (summarised in the net cash flow to shareholders) involve the payment of dividends and repurchases of stocks in exchange of the contribution to the firm from the shareholders.

The cash flows associated to operating activities are cash from operations and cash investments in operations. By comparing these operating flows, the analyst gets a measure known as free cash flow (FCF). The FCF then equals the cash paid for financing activities, which is given as the sum of the net cash flows paid to debt-holders (or issuers) and shareholders. Figure 3.7 summarises the four flows and represents a typical reformulated statement of cash flows.

	Cash flow from operations
–	Cash investments in operations
=	Free cash flow from operating activities
	Cash paid to debt-holders and issuers
+	Cash paid to shareholders
=	Cash paid for financing activities

Figure 3.7: Reformulated statement of cash flows.

Note that the value of FCF can be obtained in a more straightforward way from the reformulated balance sheet and reformulated income statement (without the need to produce a full reformulated statement of cash flows), as we will explain in the section 'Business profitability and free cash flows' in Chapter 5 (p.67).

Accounting relations governing the stylised financial statements

Accounting relations indicate how the financial statements and their components relate to each other, and also what drives each component. The understanding of these relations is essential because they provide a structure for fundamental analysis, which is the object of this guide, and can be simply defined as a method based on analysing information on the firm, and forecasting payoffs to get an intrinsic value based on those forecasts. As one of the tasks of fundamental analysis is to correct for

the missing values in the financial statements, the full comprehension of accounting relations is essential.

Note that in the following sections we will mainly refer to accounting relations that govern reformulated financial statements, but when required we will also recall relations related to the GAAP statements.

Accounting relations on the form of stylised financial statements

Accounting relations that govern how different components relate to each other are said to govern the form of financial statements. Under the framework of a stylised balance sheet, the main balance sheet equation relates the net stocks for operating and financing activities to each other. In particular, common shareholders' equity can be seen as an investment in net operating assets and net financial assets. Formally this can be written as:

Common shareholders' equity = Net operating assets + Net financial assets

$$CSE = NOA + NFA \tag{3.5}$$

where net operating assets (NOA) is the difference between operating assets (OA) and operating liabilities (OL); and net financial assets (NFA) is the difference between financial assets (FA) and financial obligations (FO).

However, the investment in net financial assets can be negative. When net financial assets is negative (and it is named net financial obligations), equation (3.5) becomes:

Common shareholders' equity = Net operating assets + Net financial obligations

$$CSE = NOA + NFO \tag{3.6}$$

Note that the last two relations restate the well-known balance-sheet equation used for GAAP balance sheets, which indicates that shareholders' equity is the residual claim on the assets after subtracting liability claims. This implies that shareholders' equity is always equal to the difference between assets and liabilities, or rather:

$$\text{Common shareholders' equity} = \text{Assets} - \text{Liabilities} \tag{3.7}$$

With reference to the stylised statement of cash flows, the well-known cash-conservation equation (or the sources and uses of cash equation) relates the four cash-flow components to each other by stating that the sources of cash must be equal to its uses. Formally this can be expressed as follows:

Cash from operations – Cash investments in operations = Net dividends to shareholders + Net payments to debt-holders and issuers

$$C - I = d + F \tag{3.8}$$

The left-hand side ($C - I$) represents the free cash flow (FCF). The right-hand side ($d + F$) represents the net cash flows paid to debt-holders (or issuers) and shareholders. If operations generate more cash than is used in investments, the free cash flows (FCF) is positive and it is used either to buy bonds (F) or pay dividends (d). If operations produce less cash than needed for new investments, the free cash flows (FCF) is negative and it requires that a firm either issues bonds (negative F) or issues shares (negative d) to satisfy the cash shortfall. In doing so, the firm has to cover any net dividend it wants to pay and any net interest cash flow (i). This can be summarised in the treasurer's rule, which is:

If $C - I - i > d$, the firm has to lend or buy back its own debt;

If $C - I - i < d$, the firm has to borrow or reduce its own debt.

Accounting relations on the drivers of each component of reformulated financial statements

The reformulated statement of cash flows and the reformulated income statement are statements of flows over a period, while the reformulated balance sheet is a statement of the stocks at the end of a period. The flows and the changes in stocks are linked by some accounting relations, which describe what drives, or determines, each component. Below we analyse these relations.

The drivers of free cash flow can either relate to its sources or to its uses

To see how the free cash flow is generated, or rather what are the sources of the free cash flow, we can refer to the following equation:

Sources of free cash flow = Operating income – Change in net operating assets

$$FCF = OI - \Delta NOA \tag{3.9}$$

That is, operations generate operating income, and the free cash flow is the part of operating income remaining after reinvesting some of it in net operating assets. (If the investment in NOA is higher than the operating income, the free cash flow is negative. This implies that an infusion of cash is required.)

Alternatively, by focusing on the disposition of free cash flow, the uses of free cash flow can be formalised in two different ways according to the presence of net financial obligations or net financial assets.

If the firm has net financial obligations, free cash flow can be written as follows:

Uses of free cash flow = Net financial expense – Change in net financial obligations + Net dividends

$$FCF = NFE - \Delta NFO + d \tag{3.10}$$

This implies that the free cash flow is used to pay for the net financial expenses, to reduce net borrowing and to pay net dividends.

If the firm has net financial assets, the free cash flow can be written as follows:

Free cash flow = Change in net financial assets – Net financial income + Net dividends

$$FCF = \Delta NFA - NF + d \tag{3.11}$$

Free cash flow and net financial income increase net financial assets and are also used to pay net dividends.

The drivers of dividends

Dividends, or rather the cash flow paid out to shareholders, can also be explained on the basis of several operating and financial components of the financial statements. If the firm has financial obligations, by reordering the FCF equation (3.10), we identify the following drivers of dividends:

Net dividends = Free cash flow – Net financial expenses + Change in net financial obligations

$$d = FCF - NFE + \Delta NFO \tag{3.12}$$

This means that dividends are generated from free cash flow after paying net interest expenses, but also by increasing borrowing. This accounting relation explains why dividends are not a good indicator of value generation in the short term: the firm can borrow in order to pay out dividends.

Conversely, if the firm has financial assets, by reordering equation (3.11), the drivers of dividends become:

Net dividends = Free cash flow – Change in net financial assets + Net financial income

$$d = \text{FCF} - \Delta\text{NFI} + \text{NFA} \quad (3.13)$$

This relation implies that dividends are paid out of free cash flow and net financial income and by selling financial assets: financial assets are sold to pay dividends if free cash flow is insufficient to pay dividends.

The drivers of net operating assets and net financial obligations

The changes in the balance sheet components can also be explained on the basis of the free cash flow accounting relation. By rearranging equation (3.9) we are able to identify the drivers of net operating assets (at the end of the year). Formally, this can be written as:

Net operating assets (end) = Net operating assets (beginning) + Operating income – Free cash flow

$$\text{NOA}_t = \text{NOA}_{t-1} + \text{OI}_t - \text{FCF}_t \quad (3.14)$$

The value added from operations (represented by operating income) increases the net operating assets, whereas the free cash flow reduces net operating assets as cash is taken from operations and invested in net financial assets.

Activity 3.8

Correspondingly identify the drivers of net financial obligations by rearranging equation (3.10).

Activity 3.9

Go to the SEC website (www.sec.gov) and download the financial statements of Microsoft Corp. for the years 2010 and 2011 (go to 'EDGAR FILERS', then to 'FILINGS (EDGAR)', and to 'Search for company filings'). Finally go to 'Companies and other filers' and write down 'Microsoft Corp'. Now produce reformulated balance sheet and income statements.

Overview of chapter

This course provides an economic framework for securities analysis and valuation. This chapter introduced both the analysis framework and the stylised financial statements supporting the analysis.

In the first part of the chapter, we outlined the role played by capital markets in the economy. Capital markets were characterised by asymmetries of information between firms' managers or entrepreneurs and potential investors. These asymmetries of information could lead to distortions in investments by firms as well as to a breakdown in the capital markets. We hence argued that securities analysis and valuation could play an important role in the economy by reducing these asymmetries of information. We then outlined the key steps used in the analysis framework and how they relate to each other.

In the second part of this chapter we showed that misclassification in the financial statements can lead to erroneous financial statement analysis and erroneous valuations. This explains why analysts must reformulate financial statements before proceeding with valuations. Indeed, as we proceed with financial analysis and valuation, we will work with reformulated statements, not published GAAP statements. We have shown

how to produce reformulated financial statements clearly highlighting operating and financing activities (both with regard to stylised statements and to an application to an airline company). In particular, reformulated balance sheets must distinguish between operating and financial assets and liabilities; reformulated income statements have to distinguish operating and financing income; and reformulated cash flow statements isolate free cash flow and make it equal to financing cash flows.

Accounting relations are another important tool for analysts because they basically enable analysts to get at the drivers of the main items in the reformulated financial statements. In particular, we have described the ways in which analysts can use accounting relations to understand how financial statements, and their components, relate to each other, and also what drives each component. This understanding is essential to have a structure for fundamental analysis, as developed in the next chapters.

Key terms

accounting analysis
accounting relations
assets
balance sheet
balance sheet equation
capital leases
cash conservation equation
cash equivalents
cash flow in operating activities
cash flow statement
cash flows from financing activities
cash flows from operations
cash flows used in investing activities
cash investments in operations
common shareholders' equity (CSE)
comprehensive earnings (CE)
direct method
earnings
expenses
financial analysis
financial assets (FA)
financial expenses (FE)
financial obligations (FO)
financial revenue (FR)
financing activities
free cash flow (FCF)
fundamental analysis
General Accepted Accounting Principles (GAAP)
income statement
indirect method
initial public offering (IPO)
International Financial Reporting Standards (IFRS)
investing activities
liabilities
minority interest
net financial assets (NFA)
net financial expense (NFE)
net financial obligations (NFO)
net income (NI)
net operating assets (NOA)
net profit
operating activities
operating assets (OA)
operating cash
operating expenses (OE)
operating income (OI)
operating leases
operating liabilities (OL)
operating revenues (OR)
ordinary shareholders
preferred stocks
profit and loss statement
prospective analysis
revenues
shareholders' equity
statement of cash flows
stylised statements
stockholders' equity
strategy analysis
tax allocation
tax shield
treasurer's rule

A reminder of your learning outcomes

Having completed this chapter, and the Essential readings and activities, you should be able to:

- briefly recall the role of capital markets in the economy
- critically assess the value of securities analysis in capital markets
- articulate the five steps involved in securities analysis and valuation in detail
- fully explain how financial statements are used in securities analysis and valuation
- discuss how financial statements can be reformulated, and prepare reformulated statements with minimal supervision
- clearly identify what assets and liabilities typically fall into operating and financing categories, and effectively explain the reasons for given classifications
- cogently explain the problems associated with the GAAP statement of cash flow, and adequately perform the adjustments needed to identify operating, financing and investing activities
- carefully contrast the direct and indirect calculations of cash flow from operations
- aptly calculate free cash flows from reformulated income statements and balance sheets autonomously
- thoroughly relate different components of the financial statement to each other (under the so-called accounting relations).

Test your knowledge and understanding

1. How can valuation and securities analysis create value in the economy?
2. What are the five steps involved in securities and valuation analysis? How do they relate to each other?
3. What are the main adjustments of the GAAP statement of cash flows needed to separate operating, financing and investing activities? Why are these adjustments needed?
4. By investing in short-term marketable securities to absorb excess cash, the firm reduces its reported cash flow after investing activities prepared according to the GAAP. What is wrong in this picture?
5. Explain the main accounting relations on the drivers of the following components of the reformulated financial statements: free cash flow, dividends and net operating assets.

Chapter 4: Financial analysis: performance evaluation

Introduction

In the previous chapter we introduced the analysis framework used in valuation and securities analysis. In this context, we highlighted the main steps involved: strategy analysis, financial analysis, accounting analysis and prospective analysis. This chapter introduces the tools required to perform a financial analysis and assess the performance of a firm from the point of view of a shareholder. It considers both accounting-based and market-based measures of performance and explains the link between these measures. It explains the limitations of both classes of performance measures. It shows how a firm's stock price obtaining in an efficient market reflects the firm's expected future performance. Determinants of performance, as far as shareholders are concerned, are analysed in the next chapter.

This chapter is organised as follows. We first introduce accounting-based measures of performance. We then cover market-based measures of performance and show how these measures are related to the accounting-based measures. We then show the link between a firm's intrinsic value of equity and the firm's expected future performance.

Aim

The aim of this chapter is to provide tools in order to assess the performance of a firm from the point of view of a shareholder. We will introduce accounting-based measures, such as a firm's return on common equity and abnormal earnings, used to assess performance and provide benchmarks to compare these measures with. We will provide intuition for the use of these accounting-based performance measures and discuss their limitations. We will introduce market-based measures of performance, such as stock return and stock rates of return. We will then explain the link between accounting-based and market-based measures of performance. Finally, we will explain how a firm's stock price obtaining in an efficient market reflects the firm's expected future performance.

Learning outcomes

By the end of this chapter, and having completed the Essential readings and activities, you should be able to:

- soundly assess firm performance from the shareholders' perspective using accounting tools and market-based measures with minimal guidance
- clearly identify the reasons why accounting-based performance measures may differ from market-based performance measures
- keenly identify the limitations of the accounting-based and market-based performance measures
- cogently relate the firm's fundamental value to its firm's expected future performance in detail

- competently analyse the reasons why a firm's fundamental value of equity may differ from its book value of equity.

Essential reading

Penman, S. *Financial statement analysis and security valuation*. (Boston, MA: McGraw-Hill, 2012) fifth edition, Chapter 5.

Further reading

Nissim, D. and S. Penman 'Ratio analysis and equity valuation: from research to practice', *Review of Accounting Studies* 6 2001, pp.109–54.

Palepu, K., V. Bernard and P. Healy *Business analysis and valuation*. (Mason, OH: South-Western College Publishing, 2012) fifth edition, Chapter 5.

Works cited

Hillier, D., M. Grinblatt and S. Titman *Financial markets and corporate strategy*. (Boston, MA: McGraw-Hill, 2008) second edition.

Healy, P., S. Myers, and C. Howe 'R&D accounting and the trade-off between relevance and objectivity', *Journal of Accounting Research* 40 2002, pp.677–710.

Accounting-based measures of performance

This section introduces in turn the following accounting-based measures of a firm's performance as far as a shareholder is concerned: comprehensive earnings (CE), the return on common equity (ROCE), the abnormal return on common equity (AROCE), and abnormal earnings (AE).

Comprehensive earnings

Investing in a firm's shares is a risky proposition. As a reward, shareholders are entitled to earnings. Earnings capture the net economic resources generated by the firm for its shareholders during some period. Earnings furthermore result from the inter-temporal allocation of cash flows (revenue and expenditure).

We will first focus on a measure of earnings, comprehensive earnings, accruing to shareholders.

SFAC (Statement of Financial Accounting Concepts) 6 defines comprehensive earnings as 'the change in common equity...from transactions...from non-owner sources. It includes all changes in common equity during a period except those resulting from investments by common equity owners and distribution to common equity owners.'

More formally, the comprehensive earnings (CE) generated over some period are given by:

$$CE = CSE(EP) - CSE(BP) + d \qquad (4.1)$$

where CSE(EP) and CSE(BP), respectively, denote the common shareholders' equity, a balance sheet item, also referred to as the book value of equity, obtaining at the end and at the beginning of the period; and d denotes the net dividends, that is, the dividends in excess of any proceeds from issues of shares.

Consider a savings account. According to SFAC 6, earnings on your savings account are equal to the change in the savings balance over the period adjusted for any contribution or withdrawal. The concept of comprehensive earnings is hence quite intuitive.

Activity 4.1

On the basis of Ryanair's balance sheets, derive the comprehensive earnings generated in each of the last five financial years in the 2006–2011 period.

Using Ryanair as an example, we derive comprehensive earnings generated in each of the last five financial years in Table 4.1. Ryanair did not pay any cash dividend during this period but did issue shares. Comprehensive earnings were hence lower than the increase in the book value of equity. We also compare comprehensive earnings with net income and do not find any discrepancy.

(€m)	2011	2010	2009	2008	2007	2006
CSE(EP)	2,953.9	2,848.6	2,425.1	2,502.2	2,539.8	1,992.0
CSE(BP)	2,848.6	2,425.1	2,502.2	2,539.8	1,992.0	1,734.5
d	269.3	–118.2	–92.0	428.3	–112.2	49.2
CE	374.6	305.3	–169.1	390.7	435.6	306.7
NI	374.6	305.3	–169.2	390.7	435.6	306.7

Table 4.1: Derivation of comprehensive earnings (CE) at Ryanair.

When evaluating performance, financial analysts tend to distinguish between recurrent and non-recurrent (also referred to as transitory) components of comprehensive earnings, as non-recurrent components of comprehensive earnings reflect one-off events and do not have any implications for future earnings.

In general, comprehensive earnings, as calculated in equation (4.1), are different from the net income reported in an income statement. Any discrepancy between comprehensive earnings and net income comes from dirty-surplus accounting, that is, net economic resources consumed or earned during the period, recognised in common stockholders' equity (CSE, balance sheet) but unrecognised in net income (income statement).

Dirty-surplus accounting components tend to be quite significant in continental Europe. They are less common in countries such as the UK or the USA. Recent international accounting standards are, however, consistent with clean-surplus accounting as they do not introduce discrepancies between comprehensive earnings and net income. But, even in the UK or the USA, there are still accounting standards which are not consistent with clean-surplus accounting. Revaluation gains and losses, for instance, do bypass income in both countries.

Activity 4.2*

Consider R&D Inc., a biotech start-up. This firm:

- incurs expenditure in R&D of $50 at the beginning of its first year of activity
- has an opening book value of equity of $1,000
- generates comprehensive earnings (before any R&D expenses) of $205 in year 1 and $221 in year 2, at the end of which it is liquidated
- pays $155 in cash dividends at the end of the first year.

Calculate the comprehensive earnings generated by R&D Inc. for its shareholders in each year of activity, assuming that the firm expenses research and development as incurred (in the year in which the expenditure is incurred).

(*The solution to this activity can be found at the end of the subject guide.)

Comprehensive earnings can hence be thought of as the payoff accruing to shareholders, as measured by accounting, for holding a firm's shares. However, it would be useful to relate this payoff to the investment that was made. Hence we will introduce in the next section a measure of bottom-line profitability.

Bottom-line profitability

In order to assess bottom-line performance, that is, performance as far as shareholders are concerned, analysts tend to use an accounting-based profitability ratio: the **return on common equity** (ROCE). A firm's ROCE can be defined at the ratio of the shareholders' payoff, as measured by accountants, that is, the stock return, over the shareholders' investment, as measured by accountants, that is, the book value of equity:

$$ROCE = \frac{CE}{CSE\,(BP)} \tag{4.2}$$

Financial analysts sometimes also define ROCE by considering the average of CSE at the beginning of the period (BP) and CSE at the end of the period (EP):

$$ROCE = \frac{CE}{½\left[CSE\,(BP) + CSE\,(EP)\right]} \tag{4.3}$$

ROCE is a comprehensive indicator of a firm's performance because it provides an indication of how well managers are employing the funds invested by the firm's shareholders to generate returns. A natural benchmark for a firm's ROCE is the firm's cost of equity capital. You may think of the firm's cost of equity capital as the opportunity cost of a shareholder or as the rate of return required by a shareholder to compensate them for the investment's risk. In the long run, one would expect the fundamental value (also referred to as intrinsic value) of a firm's equity to be determined by the deviation of the firm's ROCE from its cost of equity capital, also referred to as the **abnormal return on common equity (AROCE)**:

$$\text{AROCE} = \text{ROCE} - r_E \tag{4.4}$$

The cost of equity capital can be estimated either empirically or from an asset pricing model. In the context of securities analysis and valuation, the most widely used asset pricing model is the capital asset pricing model (CAPM). The CAPM states that any security's expected return is equal to the risk-free rate plus a risk premium depending on the security's systematic risk:

$$r_E = r_F + \beta_E\left[E(r_M) - r_F\right] \tag{4.5}$$

where r_F denotes the risk-free rate

β_E denotes the systematic risk of the security

$E(r_M)$ denotes the expected return of the market portfolio.

A thorough analysis of a security's cost of equity capital can be found either in the **FN1024 Principles of banking and finance** subject guide or in Hillier, Grinblatt and Titman (2012) Chapter 5.

Activity 4.3

Estimate the cost of equity of Ryanair. Given that the yield on government bonds of medium-long term (10 years) is 4.25 per cent, the market risk premium is 3 per cent, and Ryanair's equity beta is 0.8 per cent.

On the above data, it follows that Ryanair's cost of equity is r_E = 4.25% + 0.8 * 3% = 7.6%.

When assessing a firm's performance, analysts may also compare the firm's current return on common equity with competitors' performance (cross-sectional analysis) and with the firm's own past performance (time-series analysis). Cross-sectional analysis and time-series analysis are discussed in more detail in the next chapter.

%	2011	2010	2009	2008	2007	2006
Ryanair	13.2%	12.6%	–6.8%	15.4%	21.9%	17.7%
easyJet		13.9%	1.5%	7.2%	15.5%	10.9%
Southwest		14.2%	10.2%	–29.7%	20.2%	2.8%

Table 4.2: ROCE (BP) in the airline industry.

As an example, we derive the return on common equity (ROCE) generated by Ryanair in each of the last financial years for which financial information is available, using the book value of equity as of the beginning of the financial year. As shown in Table 4.2, Ryanair's ROCE exceeds its cost of equity capital by some margin in all years except for 2009. Ryanair also outperformed its rival, easyJet, and the leading US low-cost airline, Southwest, in earlier years (2006, 2007, 2008), but has been trailing behind them more recently.

Activity 4.4*

Calculate the return on common equity for R&D Inc. in each year of activity.

(*The solution to this activity can be found at the end of the subject guide.)

Abnormal earnings

Financial analysts also assess a firm's performance, as far as shareholders are concerned, through abnormal earnings. Abnormal earnings (also referred to as residual earnings) can be defined as the 'actual' comprehensive earnings generated by the firm in excess of the firm's 'normal' (comprehensive) earnings, which can be thought as a charge for the use of equity capital. The firm's normal earnings are the comprehensive earnings required for equity to be earning at the cost of equity capital. More formally, normal earnings are defined as the product of the book value of equity (as of the beginning of the period), and the cost of equity capital. The firm's abnormal earnings can hence be derived as:

$$AE = CE - r_E CSE(BP) \quad (4.6)$$

Activity 4.5*

Calculate the abnormal earnings generated by R&D Inc. in each year of activity assuming that the cost of equity capital is equal to 10 per cent.

(*The solution to this activity can be found at the end of the subject guide.)

Abnormal earnings can also be rewritten as a product of the abnormal return on common equity and the book value of equity as of the beginning of the period:

$$AE = AROCE*CSE(BP) = (ROCE - rE)*CSE(BP) \quad (4.7)$$

Three different situations can occur:

1. AE = 0 ↔ ROCE = r_E The firm shows a 'normal rate of return' on common shareholders' equity. If accounting is unbiased, this

is consistent with the firm not having any source of comparative advantage and operating in a very competitive industry.

2. $AE > 0 \leftrightarrow ROCE > r_E$ If accounting is unbiased, the firm is creating economic value (economic rents) for its shareholders.
3. $AE < 0 \leftrightarrow ROCE < r_E$ If accounting is unbiased, the firm is destroying economic value for its shareholders.

Activity 4.6

The bulk chemical industry is very competitive. Consider a firm in this industry which does not have any comparative advantage. Assuming that the accounting used by this firm is unbiased, what is your best estimate of the firm's future abnormal earnings. Why?

Non-nil abnormal earnings may arise for the following reasons. The firm may be in an attractive industry and its strategic position may enable it to generate returns on common equity in excess of its cost of equity capital at least over the short run. The firm may be at some competitive disadvantage at least in the short run, leading to subnormal abnormal profitability. Alternatively, the firm may be very skilled (or underskilled) in financial engineering and may be able to generate supernormal (subnormal) economic profits. In any event, if accounting is unbiased, positive abnormal earnings capture the economic rent accruing to shareholders generated either in the product markets or in the financial markets. Finally, the accounting used may be biased in the sense that it fails to capture the underlying business reality. If accounting is biased, the firm's comprehensive earnings and book value of equity are likely to be distorted and hence may not reflect any economic value created or destroyed for the firm's shareholders.

Information on percentiles of ROCE, along with percentiles of annual growth in the book value of equity, for NYSE and AMEX firms, as reported by Penman (2012), can be found in Table 4.3. Over the 1963–97 period, the median ROCE is 12.2 per cent, with variations from –21.5 per cent at the fifth percentile to 31 per cent at the 95th percentile. Similarly, the median growth in the book value of equity is 9 per cent, with variations from –18 per cent at the fifth percentile to 50.5 per cent at the 95th percentile. There thus appears to be a strong correlation between performance as measured by ROCE and growth as measured by growth in the book value of equity.

Percentile	ROCE (%)	CSE growth (%)
95	31.0	50.5
90	24.5	33.2
75	17.6	17.3
50	12.2	9.0
25	6.3	2.7
10	–4.8	–6.9
5	–21.5	–18.0

Table 4.3: Percentiles of annual growth.

As an example, Table 4.4 shows the abnormal earnings generated by Ryanair in each of the last financial years for which financial information is available assuming a cost of equity capital r_E equal to 7.6 per cent over the period.

	2011	2010	2009	2008	2007	2006
CE	374.6	305.3	–169.1	390.7	435.6	306.7
CSE(BP)	2,848.6	2,425.1	2,502.2	2,539.8	1,992.0	1,734.5
AE	158.1	121.0	–359.3	197.7	284.2	174.9

Table 4.4: Derivation of abnormal earnings (AE) at Ryanair.

Assuming that accounting is unbiased, Ryanair has therefore been generating economic value for its shareholders in each year over the 2006–2011 period, except for 2009.

Market-based measures of performance

This section introduces the following market-based measures of a firm's performance as far as shareholders are concerned: the stock return (SR), the stock rate of return (SRR), the stock abnormal rate of return (SARR) and the stock abnormal return (SAR).

Stock return

Consider the actual return of a share, SR, experienced in the capital markets over some period. This payoff, also referred to as stock return or market value added, can be defined as the sum of the change in the market value of equity and net dividend paid over the period:

$$\text{SR} = \text{MVE(EP)} - \text{MVE(BP)} + d \tag{4.8}$$

Substituting the net dividend ND from (4.1) into (4.8) leads to:

$$\text{SR} = \text{CE} + \left[\text{MVE(EP)} - \text{CSE(EP)}\right] - \left[\text{MVE(BP)} - \text{CSE(BP)}\right] \tag{4.9}$$

The return on a share, as experienced in the capital markets over some period, is hence equal to comprehensive earnings plus the change in premium of the market value of equity over the book value of equity over the period.

In general, there is no reason for the premium of market over book to remain constant over any period. The payoff to a firm's shareholders, as measured by accounting, comprehensive earnings, hence tends to differ from the one experienced in the capital markets, the stock return.

Activity 4.7*

Calculate the stock return for R&D Inc. in each year of activity assuming that:

- the market value of equity at the beginning of the first year is $1,150
- the market value of equity at the end of the first year is $1,110
- the market value of equity at the end of the second year is $1,221.

(*The solution to this activity can be found at the end of the subject guide.)

Stock rate of return

Consider the actual rate of return, SRR, experienced by a share in the capital markets over some period. This rate of return, also referred to as stock rate of return, can be defined as the ratio of the payoff SR over the market value of equity obtaining at the beginning of the period:

$$SRR = \frac{MVE\,(EP) - MVE\,(BP) + d}{MVE\,(BP)} \tag{4.10}$$

Substituting the net dividend ND from (4.1) into (4.10) leads to:

$$SRR = ROCE\,\frac{CSE(BP)}{MVE(BP)} + \frac{\left[MVE(EP) - CSE(EP)\right] - \left[MVE(BP) - CSE(BP)\right]}{MVE(BP)} \tag{4.11}$$

The stock rate of return experienced in the capital markets, SRR, is hence equal to the rate of return calculated by accountants, ROCE, multiplied by the book-to-market ratio obtaining at the beginning of the period, plus the change in the premium of the market value of equity over the book value of equity over the period deflated by the market value of equity obtaining at the beginning of the period.

In general, the SRR experienced in the capital markets over a period differs from the measure of bottom-line profitability ROCE derived by accountants. The relationship between SRR and ROCE furthermore depends both on the sign of the current premium of market over book and the sign of the change in premium.

Consider a special case in which the current premium of the market value of equity over the book value of equity is nil and there is no change in the premium over the period: MVE(EP) = CSE(EP) = MVE(BP) = CSE(BP). In this case, it follows from (4.11) that the SRR is equal to the ROCE. In contrast, with a constant positive premium, the SRR is strictly lower than the ROCE. Finally, with a premium increasing from zero, the SRR strictly exceeds the ROCE.

Activity 4.8*

Calculate the stock rate of return (SRR) for R&D Inc. in each year of activity.

(*The solution to this activity can be found at the end of the subject guide.)

Stock abnormal rate of return

In the spirit of the AROCE for accounting-based performance measures, we can also consider the abnormal rate of return, SARR, experienced by the share in the capital markets over some period. This abnormal rate of return, also referred to as the **stock abnormal rate of return**, can be defined as:

$$SARR = SRR - r_E \tag{4.12}$$

Intuitively, the stock abnormal rate of return captures the extent to which the actual rate of return experienced by a stock in the capital markets exceeds or falls short of the rate of return required by investors to compensate them for the risk associated with their investment. In general, as the stock rate of return experienced in the capital markets over any period differs from the return on common equity derived by accountants, the stock abnormal rate of return also differs from the abnormal return on common equity.

Activity 4.9*

Calculate the stock abnormal rate of return (SARR) for R&D Inc. in each year of activity.

(*The solution to this activity can be found at the end of the subject guide.)

In the interest of concision, but in an abuse of language, a firm's stock rate of return is also referred to in many textbooks as the stock's return. Similarly, a firm's abnormal stock rate of return is often referred to as the stock's abnormal return. Subsequent chapters in this guide will follow the same approach.

Stock abnormal return

Consider the abnormal return, SAR, experienced by a share in the capital markets over some period. This abnormal return, also referred to as stock abnormal return or abnormal market value added, can be defined as:

$$SAR = SR - r_E MVE(BP) \tag{4.13}$$

Intuitively, the stock abnormal return captures the excess of stock return (or market value added of the firm's equity) over the one required by investors to compensate them for the risk involved with their investment.

Activity 4.10*

Calculate the stock abnormal return (SAR) for R&D Inc. in each year of activity.

(*The solution to this activity can be found at the end of the subject guide.)

Substituting the net dividend ND from (4.1) into (4.13) leads to:

$$SAR = AE + \left[MVE(EP) - CSE(EP)\right] - (1 + r_E)\left[MVE(BP) - CSE(BP)\right] \quad (4.14)$$

The abnormal payoff obtained from investing in any share over some period, as experienced in the capital markets, SAR, is hence related to the abnormal payoff derived by accountants, AE. In general, however, they are different.

Accounting-based versus market-based performance measures

In the previous sections, when assessing the performance of a firm from the point of view of its shareholders, we introduced both market-based and accounting-based performance measures: the stock return and comprehensive earnings, the stock rate of return and return on common equity, the stock abnormal rate of return and abnormal return on common equity, and the stock abnormal return and abnormal earnings. Both types of performance measures are related. Although related, measures of performance as derived by accountants are different from measures of performance as experienced in the capital markets. The main reason for this discrepancy comes from the rules used in order to recognise the net economic resources gained or consumed in any period.

Accountants use very restrictive rules based on the realisation, the matching and the conservatism principles. As explained by Palepu et al. (2012):

> Revenues are economic resources earned during a time period. Revenue recognition is governed by the realization principle which proposes that revenues should be recognized when (a) the firm has provided all, or substantially all, the goods or services to be delivered to the customer and (b) the customer has paid cash or is expected to pay cash with a reasonable degree of certainty.

Similarly:

> Expenses are economic resources used up in a time period. Expense recognition is governed by the matching and the conservatism principles. Under these principles, expenses are (a) costs directly associated with revenues recognized in the same period, or (b) costs associated with benefits that are consumed in this time period, or (c) resources whose future benefits are not reasonably certain.

More intuitively, revenue is only recognised when the firm makes a sale to a customer. Accounting then matches the expenses incurred in gaining revenue against the revenue. Earnings can then be derived as the resulting difference between revenue and expenses.

In efficient markets, stock prices reflect the present value of all net economic resources to be generated in the future for shareholders. In other words, stock prices are anticipatory. As a result of both anticipatory stock prices and the set of restrictive rules used by accountants, stock prices tend

to lead earnings. In other words, the information content from economic transactions and news tends to get impounded in stock prices before it is recognised by accounting. As an example, consider the following release of information by governors of central banks: 'interest rates are bound to increase in Europe in the next financial year'. This event has no impact on the comprehensive earnings (the return on common equity, abnormal return on common equity or abnormal earnings) generated by Ryanair in the current financial year. Higher interest rates in the future will, however, lead to lower demand for travel and a higher cost of equity capital. The present value of the net economic resources generated in the future for Ryanair's shareholders is hence lower after the information release. In efficient markets, the information release will have an adverse effect on Ryanair's stock return (as well as on its stock rate of return, stock abnormal rate of return, or stock abnormal return) over the current financial year.

The fact that stock prices are anticipatory, and hence volatile, implies that market-based measures of performance may, in some instances, be less useful than accounting-based measures of performance. Assessing and rewarding risk-averse managers on the basis of noisy stock prices, which do not capture accurately the consequences of managers' actions, can for instance be sub-optimal. In other situations, when assessing the performance of a portfolio of stocks, market-based measures of performance are more appropriate (as illustrated in Chapters 10 and 11 of this subject guide).

Present value of abnormal earnings

In **FN1024 Principles of Banking and Finance**, it has already been established that the intrinsic value (or fundamental value) of a firm's equity can be calculated as the present value of the firm's expected future net dividends (PVED):

$$VE^*_t = \sum_{i=1}^{i=+\infty} \frac{E_t^*(d_{t+i})}{(1+r_E)^i} \tag{4.15}$$

with VE_t^* denoting the intrinsic value of the firm's equity at date t
$E_t^*(d_{t+i})$ denoting the net dividend expected at date $t+i$ as of date t.

Given (4.15), it can be shown that the intrinsic value of the firm's equity is also equal to the sum of the current book value of equity and the present value of all future expected abnormal earnings (PVAE):

$$VE^*_t = CSE_t + \sum_{i=1}^{i=+\infty} \frac{E_t^*(AE_{t+i})}{(1+r_E)^i} \tag{4.16}$$

In efficient markets, the market value of a firm's equity is equal to the intrinsic value of the firm's equity. According to (4.16), the premium of the market value of equity over the book value of equity is hence equal to the present value of all future expected abnormal earnings. A proof of (4.16) can be found in the Appendix at the end of this chapter.

Let us first consider a special case: a firm without any comparative advantage in a very competitive industry. If accounting is unbiased, future expected abnormal earnings are expected to be nil and, in efficient markets, the market value of such a firm's equity is equal to its book value (nil premium of market over book). Let us then consider a firm with some comparative advantage in a more attractive industry, at least in the

short term. For the latter firm, if accounting is unbiased, future expected abnormal earnings are strictly positive (at least in the short term). In efficient markets, the market value of such a firm's equity hence strictly exceeds its book value (positive premium of market over book). Other things being equal, the stronger the firm's comparative advantage and the longer the time interval over which the firm is able to sustain some comparative advantage, the higher the market value of equity, and hence, the higher the premium of market over book.

Accounting choices, accounting-based performance measures and valuation

Financial statements, such as balance sheet and income statements, are based on accrual accounting as opposed to cash accounting. The accounting-based measures of performance introduced in this chapter are hence not cash-flow based. Assessing a firm's performance on the basis of cash flows would, however, discourage investment in the form of capital expenditure and increases in working capital.

Accounting choices affect the recognition of revenue and expenses in the income statement and, hence, the valuation of assets and liabilities in the balance sheet statement. Accounting-based measures of performance, such as comprehensive earnings, return on common equity and abnormal earnings, are hence affected by accounting choices too.

Healy et al. (2002) illustrate the effect of accounting choices in the context of research and development through a simulation. As summarised by Penman (2012):

> In this experiment, a pharmaceutical firm spends each year a set amount for basic research and development on a number of drugs with a set probability of success. If the research is successful, the firm moves to preclinical testing and clinical trials, again with a set probability of a successful outcome. Successful drugs are launched commercially with estimated revenues, production costs, and marketing costs. All estimates, including the probability of R&D success, are based on experience in the drug industry, lending them a certain realism.

R&D may be accounted for by using the expensing method, the full costing method or the successful efforts method. The expensing method expenses R&D expenditure whenever incurred. The full costing method capitalises R&D expenditure and amortises it straight-line over a period of 10 years following the commercial launch. The successful efforts method capitalises R&D expenditure, writes off R&D expenditure for drugs failing to reach the next stage of development, and amortises R&D for successful drugs over a period of 10 years following the commercial launch.

Average ROCE over many trials in the simulation are provided in Table 4.5. These results were generated for a representative firm starting its R&D programme in year 1 with the first revenue being generated in year 14 after a long development period.

A steady state is reached from year 26. Even in this steady state, the average ROCE generated when using the most conservative accounting method, that is, the expensing method, is nearly twice the average ROCE generated when using the least conservative accounting method.

Year	Expensing method	Full costing method	Successful efforts method
14	–92.3	–3.4	–15.2
20	8.1	10.7	11.0
26	54.8	27.8	39.6
32	54.0	26.4	39.3

Table 4.5: ROCE (%) from a simulated R&D programme.

This experiment calls for caution when using AROCE or AE in order to assess the performance of any firm from the point of view of its shareholders. A meaningful interpretation is only possible if accounting is unbiased. If accounting is biased, it may be possible to remove the bias by making adjustments. Alternatively, one may evaluate performance over a longer period, which tends to attenuate the effects of bias in accounting on reported performance.

Activity 4.11*

Calculate the return on common equity for R&D Inc. in each year of activity assuming that the firm capitalises and amortises research and development expenditure on a straight-line basis (e.g. $25 in each period).

(*The solution to this activity can be found at the end of the subject guide.)

Whereas accounting-based measures of performance are affected by accounting choices, the intrinsic valuation of a firm's equity obtained from the PVAE is not affected by the accounting choices made by analysts. The intuition behind this result is as follows. Given consistent underlying data, both the PVED and PVAE provide the same valuation outcomes. The valuation outcome of the PVED is independent of accounting choices. The valuation outcome of the PVAE is hence also independent of accounting choices.

Activity 4.12*

Calculate the intrinsic value of R&D Inc. using the PVAE using the following scenarios:

1. The firm expenses research and development as incurred (in the year in which the expenditure is incurred).
2. The firm capitalises and amortises research and development expenditure on a straight-line basis (e.g. $25 in each period).

(*The solution to this activity can be found at the end of the subject guide.)

Activity 4.13*

Show that the intrinsic value of the equity of R&D Inc. is the same whether estimated with the PVED or with the PVAE.

(*The solution to this activity can be found at the end of the subject guide.)

Overview of the chapter

This chapter has provided the tools required to assess a firm's performance from the point of view of its shareholders. It introduced accounting-based performance measures, such as the return on common equity (and abnormal return on common equity) as well as abnormal earnings. It has shown how these accounting-based performance measures are affected by the accounting choices made by managers. It provided economic interpretations whenever these performance measures are derived

using unbiased accounting. It introduced market-based measures of performance such as the stock rate of return (and stock abnormal rate of return) as well as the stock abnormal return. It showed how these market-based performance measures are related to and differ from the accounting-based performance measures. Furthermore it has shown how the fundamental value of a firm's equity and hence the market value of the firm's equity in efficient markets reflect the firm's expected future performance as captured by accounting-based measures through the present value of abnormal earnings.

Key terms

abnormal earnings (AE)
abnormal profitability
abnormal ROCE (AROCE)
biased accounting
book value of equity (CSE)
capital asset pricing model (CAPM)
clean-surplus accounting
comprehensive earnings (CE)
cost of equity capital (r_E)
dirty-surplus accounting
economic rent
fundamental value
intrinsic value
net income (NI)
non-recurrent earnings
prices-led earnings
recurrent earnings
residual earnings
return on common equity (ROCE)
stock abnormal rate of return (SARR)
stock abnormal return (SAR)
stock rate of return
stock return (SR)
transitory earnings

A reminder of your learning outcomes

Having completed this chapter, and the Essential readings and activities, you should be able to:

- soundly assess firm performance from the shareholders' perspective using accounting tools and market-based measures with minimal guidance
- clearly identify the reasons why accounting-based performance measures may differ from market-based performance measures
- keenly identify the limitations of the accounting-based and market-based performance measures
- cogently relate the firm's fundamental value to its firm's expected future performance in detail
- competently analyse the reasons why a firm's fundamental value of equity may differ from its book value of equity.

Test your knowledge and understanding

1. How may information bearing upon performance evaluation explain the difference between a firm's market value of equity and book value of equity?
2. How does a firm's stock return differ from its comprehensive earnings?
3. Which benchmark would you use in order to assess how good a firm's return on common equity is? What is the intuition for making this comparison? Discuss any potential problems associated with it.

4. How does a firm's stock rate of return relate to its return on common equity?
5. Construct a two-period numerical example to show that the present value of abnormal earnings yields the same fundamental value for equity regardless of accounting choices.
6. Earnings Management Inc. is a 'darling' of Wall Street analysts. Its current market value of equity is $15m and its book value of equity is $5m. Analysts know that the firm's book value will grow by 10 per cent per year forever for sure. The cost of equity capital is 15 per cent. The firm's return on common equity is believed to stay constant in the future indefinitely. Given these assumptions, what is the market's expectation of the firm's return on common equity?

Appendix

Reconciling the present value of expected dividends (PVED) and the present value of abnormal earnings (PVAE)

Assuming that the PVED holds:

$$VE^*_t = \frac{E(d_{t+i})}{(1+r_E)} + \frac{E(d_{t+2})}{(1+r_E)^2} + \ldots \quad \text{(A1)}$$

Given clean surplus accounting:

$$d_{t+1} = CE_{t+1} + CSE_t - CSE_{t+1} \quad \text{(A2)}$$

$$d_{t+2} = CE_{t+2} + CSE_{t+1} - CSE_{t+2} \quad \text{(A3)}$$

Substituting (A2) and (A3) into (A1) yields:

$$VE^*_t = CSE_t + \frac{E(CE_{t+i}) - r_E CSE_t}{(1+r_E)} + \frac{E(CE_{t+2}) - r_E CSE_{t+1})}{(1+r_E)^2} - \frac{E(CSE_{t+2})}{(1+r_E)^2}$$

Equivalently:

$$VE^*_t = CSE_t + \frac{E(AE_{t+i})}{(1+r_E)} + \frac{E(AE_{t+2})}{(1+r_E)^2} - \frac{E(CSE_{t+2})}{(1+r_E)^2} + \ldots \quad \text{(A4)}$$

As the horizon and the number of dividend terms in (A1) expands, the number of abnormal earnings terms in (A4) increases and the present value of the book value of equity term in (A4) converges towards 0. The PVAE hence obtains.