



**FINANCIAL
ACCOUNTING
THEORY**
Seventh Edition

William R. Scott

FINANCIAL ACCOUNTING THEORY

Seventh Edition

William R. Scott
University of Waterloo

PEARSON

Toronto

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Preface

This book began as a series of lesson notes for a financial accounting theory course of the Certified General Accountants' Association of Canada (CGA). The lesson notes grew out of a conviction that we have learned a great deal about the role of financial accounting and reporting in our society from securities markets and information economics-based research conducted over many years, and that financial accounting theory comes into its own when we formally recognize the information asymmetries that pervade business relationships.

The challenge was to organize this large body of research into a unifying framework and to explain it in such a manner that professionally oriented students would both understand and accept it as relevant to the financial accounting environment and ultimately to their own professional careers.

This book seems to have achieved its goals. In addition to being part of the CGA program of professional studies for a number of years, it has been extensively used in financial accounting theory courses at the University of Waterloo, Queen's University, and numerous other universities, both at the senior undergraduate and professional master's levels. I am encouraged by the fact that, by and large, students comprehend the material and, indeed, are likely to object if the instructor follows it too closely in class. This frees up class time to expand coverage of areas of interest to individual instructors and/or to motivate particular topics by means of articles from the financial press and professional and academic literature.

Despite its theoretical orientation, the book does not ignore the institutional structure of financial accounting and standard setting. It features considerable coverage of financial accounting standards. Many important standards, such as fair value accounting, financial instruments, reserve recognition accounting, management discussion and analysis, employee stock options, impairment tests, hedge accounting, derecognition, consolidation, and comprehensive income, are described and critically evaluated. The structure of standard-setting bodies is also described, and the role of structure in helping to engineer the consent necessary for a successful standard is evaluated. While the text discussion concentrates on relating standards to the theoretical framework of the book, the coverage provides students with exposure to the contents of the standards themselves.

I have also used this material in Ph.D. seminars. Here, I concentrate on the research articles that underlie the text discussion. Nevertheless, the students appreciate the framework of the book as a way of putting specific research papers into perspective. Indeed, the book proceeds in large part by selecting important research papers for description and commentary, and provides extensive references to other research papers underlying the text discussion. Assignment of the research papers themselves could be especially useful for instructors who wish to dig into methodological issues that, with some exceptions, are downplayed in the book itself.

This edition continues to orient the coverage of accounting standards to those of the International Accounting Standards Board (IASB). As in previous editions, some coverage of major U.S. accounting standards is also included.

I have retained the outline of the events leading up to the 2007–2008 securities market meltdowns, since these events have raised significant questions about the validity of many economic models, and continue to have significant accounting implications. Ramifications of these events are interwoven throughout the book. For example, one outcome of the meltdowns is severe criticisms of the efficient market hypothesis. Nevertheless, I continue to maintain that investors are, on average, rational and that securities markets, while not fully (semi-strong) efficient, are sufficiently close to efficiency (except during periods of bubble and subsequent liquidity pricing) that the implications of the theory continue to be relevant to financial reporting. Critical evaluation of these various criticisms and arguments is given. Nevertheless, I have moved from Chapter 3 to the Instructor's Manual the lengthy outline of the diversified portfolio investment decision that was included in previous editions, replacing it with a much abbreviated discussion.

The Conceptual Framework retains its role as an important component of this book. As it is further developed, this framework will be an important aspect of the financial accounting environment. Its relationships to the theory developed here are critically evaluated. While extensive discussion of alternate theories of investor behaviour is retained, this book continues to regard the theory of rational investors as important to helping accountants prepare useful financial statement information.

The book continues to maintain that motivating responsible manager behaviour and improving the working of managerial labour markets is an equally important role for financial reporting in a markets-oriented economy as for enabling good investment decisions and improving the working of securities markets.

I have updated references and discussion of recent research articles, revised the exposition as a result of comments received and experience in teaching from earlier editions, and added new problem material. I also continue to suggest optional sections for those who do not wish to delve too deeply into certain topics.

Summary of Major Changes

Below is a comprehensive list of major changes made to the seventh edition of *Financial Accounting Theory*:

- Thorough review of recent academic accounting research, with updated explanations and discussion of important papers added throughout the text. The text represents the current state of academic accounting theory as published in major research journals up to about mid-2013.
- Increased attention to contract theory (replacing positive accounting theory), with Chapter 8 rewritten to fully explain the roles of reliability and conservatism of accounting information in securing efficient corporate governance, borrowing, and stewardship.
- Extensive discussion and evaluation of criticisms of securities market efficiency and investor rationality following the 2007–2008 securities market meltdowns. Much accounting research relies on these concepts. The important assumptions of rational expectations, common knowledge, and market liquidity that underlie market

efficiency theory are explained and discussed. The text concludes that relaxation of these assumptions is needed if accountants are to better understand the working of securities markets and the information needs of investors. The text also concludes that accounting-related securities anomalies, typically claimed to result from investor non-rationality, can also be consistent with investor rationality once these assumptions are relaxed. Theoretical and empirical papers supporting these conclusions are outlined (Chapters 4 and 6).

- New and proposed accounting standards, including for financial instruments, derecognition, consolidation, leases, and loan loss provisioning, are described and evaluated. Discussion of the Conceptual Framework is updated throughout the book.
- Discussion of standards convergence and the possibility of U.S. adoption of International Accounting Standards is updated to take recent developments into account (Chapter 13).
- Recent research using sophisticated computer software to evaluate the information content of the written and spoken word is explained and evaluated. The text includes coverage of research papers using this methodology to study the informativeness of Management Discussion and Analysis (Chapter 3) and of executive conference calls (Chapter 11).
- New problem material is added throughout the text, including numerical problems of present value accounting, decision theory, and agency. Other new problems are based on embedded value, earnout contracts, outside directors, bail-in bonds, delegated monitoring, ESO repricing, and Sarbanes-Oxley Act. Discussions and problem materials derived from recent accounting scandals (Groupon, Olympus Corp., and Satyam Computer Services) are also added.
- Discussion of whether information risk is diversifiable, and thus of the extent to which firms benefit from superior accounting disclosure, is updated in the light of recent research (Chapter 12).
- The lengthy explanation of portfolio theory, included in all previous editions, is moved to the Instructor's Manual, replaced by a much shorter explanation of portfolio diversification (Chapter 3).
- Discussion and illustration of Management Discussion and Analysis (Chapter 3) and of Reserve Recognition Accounting (Chapter 2) are updated.

SUPPLEMENTS

Instructor's Solutions Manual

The Instructor's Solutions Manual includes suggested solutions to all the end-of-chapter Questions and Problems. It also offers learning objectives for each chapter and suggests teaching approaches that could be used. In addition, it comments on other issues for consideration, suggests supplementary references, and contains some additional problem

material taken from previous text editions. The Instructor's Manual is available in print format and also available for downloading from a password-protected section of Pearson Education Canada's online catalogue (www.pearsoned.ca/highered). Navigate to your book's catalogue page to view a list of supplements that are available. See your local sales representative for details and access.

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I thank the large number of researchers whose work underlies this book. As previously mentioned, numerous research papers are described and referenced. However, there are many other worthy papers that I have not referenced. This implies no disrespect or lack of appreciation for the contributions of these authors to financial accounting theory. Rather, it has been simply impossible to include them all, both for reasons of space and the boundaries of my own knowledge.

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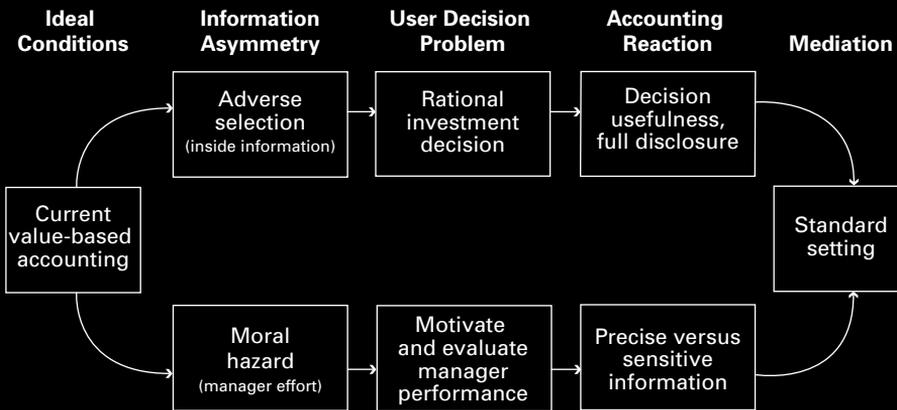
Finally, I thank my wife and family, who, in many ways, have been involved in the learning process leading to this book.

William Scott

Chapter 1

Introduction

Figure 1.1 Organization of the Book



1.1 THE OBJECTIVE OF THIS BOOK

This book is about accounting, not about how to account. It argues that accounting students, having been exposed to the methodology and practice of accounting, need to examine the broader implications of financial accounting for the fair and efficient working of our economy. Our objective is to give the reader a critical awareness of the current financial accounting and reporting environment, taking into account the diverse interests of both external users and management.

1.2 SOME HISTORICAL PERSPECTIVE

Accounting has a long history. Our perspective begins with the double entry bookkeeping system. The first complete description of this system appeared in 1494, authored by Luca Paciolo, an Italian monk/mathematician.¹ Paciolo did not invent this system—it had

developed over a long period of time. Segments that developed first included, for example, the collection of an account receivable. “Both sides” of such a transaction were easy to see, since cash and accounts receivable have a physical and/or legal existence, and the increase in cash was equal to the decrease in accounts receivable. The recording of other types of transactions, such as the sale of goods or the incurring of expenses, however, took longer to develop. In the case of a sale, it was obvious that cash or accounts receivable increased, and that goods on hand decreased. But, what about the difference between the selling price and the cost of the goods sold? There is no physical or legal representation of the profit on the sale. For the double entry system to handle transactions such as this, it was necessary to create *abstract* concepts of income and capital. By Paciolo’s time, these concepts had developed, and a complete double entry system, quite similar to the one in use today, was in place. The abstract nature of this system, including the properties of capital as the accumulation of income and income as the rate of change of capital,² attracted the attention of mathematicians of the time. The “method of Venice,” as Paciolo’s system was called, was frequently included in mathematics texts in subsequent years.

Following 1494, the double entry system spread throughout Europe. It was in Europe that another sequence of important accounting developments took place. The Dutch East India Company was established in 1602. It was the first company to issue shares with limited liability for all its shareholders. Shares were transferable, and could be traded on the Amsterdam Stock Exchange, also established in 1602. In subsequent years, the concept of a joint stock company, with permanent existence, limited liability, and shares traded on a stock exchange, became an important form of business organization.

Obviously, investors needed financial information about the firms whose shares they were trading. Thus began a long transition for financial accounting, from a system enabling a merchant to control his/her own operations to a system to inform investors who were not involved in the day-to-day operations of the firm. It was in the joint interests of the firm and investors that financial information provided by the firm was trustworthy, thereby laying the groundwork for the development of an auditing profession and government regulation.

In this regard, the English 1844 Companies Act was notable. It was in this Act that the concept of providing an audited balance sheet to shareholders first appeared in the law, although this requirement was dropped in subsequent years³ and not reinstated until the early 1900s. During the interval, voluntary provision of information was common, but its effectiveness was hampered by a lack of accounting principles. This was demonstrated, for example, in the controversy over whether amortization of capital assets had to be deducted in determining income available for dividends (the English courts ruled it did not).

In the twentieth century, major developments in financial accounting shifted to the United States, which was growing rapidly in economic power. The introduction of a corporate income tax in the United States in 1909 provided a major impetus to income measurement and, as noted by Hatfield (1927, p. 140), was influential in persuading business managers to accept amortization as a deduction from income.

Nevertheless, accounting in the United States continued to be relatively unregulated, with financial reporting and auditing largely voluntary. However, the stock market crash of 1929 and resulting Great Depression led to major changes by the U.S. government. The most noteworthy was the creation of the Securities and Exchange Commission (SEC) by the Securities Act of 1934, with a focus on protecting investors by means of a disclosure-based structure. The Act regulates dealing in the securities of firms that meet certain size tests and whose securities are traded in more than one state. As part of its mandate, the SEC has the responsibility to ensure that investors are supplied with adequate information.

Merino and Neimark (MN; 1982) examined the conditions leading up to the creation of the SEC. In the process, they reported on some of the securities market practices of the 1920s and prior. Apparently, voluntary disclosure was widespread, as also noted by Benston (1973). However, MN claimed that such disclosure was motivated by big business's desire to avoid disclosure regulations that would reduce its monopoly power.

Regulations to enforce disclosure would reduce monopoly power by better enabling potential entrants to identify high-profit industries. Presumably, if voluntary disclosure was adequate, the government would not feel that regulated disclosure was necessary. Thus, informing investors was not the main motivation for disclosure. Instead, investors were "protected" by a "two-tiered" market structure whereby prices were set by knowledgeable insiders, subject to a self-imposed "moral regulation" to control misleading reporting. Unfortunately, moral regulation was not always effective, and MN referred to numerous instances of manipulative financial reporting and other abuses, which were widely believed to be major contributing factors to the 1929 crash.

The 1934 securities legislation, then, can be regarded as a movement away from an avoidance-of-regulation rationale for disclosure toward one supplying better-quality information to investors as a way to control manipulative financial practices.⁴

One of the practices of the 1920s that received criticism was the frequent appraisal and/or overstatement of capital assets, the values of which came crashing down in 1929.⁵ A major lesson learned by accountants as a result of the Great Depression was that values are fleeting. The outcome was a strengthening of the historical cost basis of accounting. This basis received its highest expression in the famous Paton and Littleton (1940) monograph *An Introduction to Corporate Accounting Standards*. This document elegantly and persuasively set forth the case for historical cost accounting, based on the concept of the firm as a going concern. This concept justifies important attributes of historical cost accounting, such as waiting to recognize revenue until objective evidence of realization is available, the use of accruals to match realized revenues and the costs of earning those revenues, and the deferral of unrealized gains and losses on the balance sheet until the time comes to match them with revenues. As a result, the income statement shows the current "installment" of the firm's earning power. The income statement replaced the balance sheet as the primary focus of financial reporting.

It is sometimes claimed that the Paton and Littleton monograph was too persuasive, in that it shut out exploration of alternative bases of accounting. However, alternative

valuation bases have become more common over the years, to the point where we now have a **mixed measurement system**. Historical cost is still the primary basis of accounting for important asset and liability classes, such as capital assets, inventories, and long-term debt. However, if assets are impaired, they are frequently written down to a lower value. Impairment tests (also called ceiling tests) for capital assets and the lower-of-cost-or-market rule for inventories are examples. Under International Accounting Standards Board (IASB) standards, capital assets can sometimes be written up over cost if their value has increased. Generally speaking, standard setters have moved steadily toward current value alternatives to historical cost accounting over the past number of years.

There are two main current value alternatives to historical cost for assets and liabilities. One is **value-in-use**, such as discounted present value of future cash flows. The other is **fair value**, also called **exit price** or **opportunity cost**, the amount that would be received or paid should the firm dispose of the asset or liability. These valuation bases will be discussed in Chapter 7. When we do not need to distinguish between them, we shall refer to valuations that depart from historical cost as **current values**.

While the historical cost lesson learned by accountants from the Great Depression may be in the process of being forgotten by standard setters, another lesson remains: how to survive in a disclosure-regulated environment. In the United States, for example, the SEC has the power to establish the accounting standards and procedures used by firms under its jurisdiction. If the SEC chose to use this power, the prestige and influence of the accounting profession would be greatly eroded, possibly to the point where financial reporting becomes a process of “manual thumbing,” with little basis for professional judgment and little influence on the setting of accounting standards. However, the SEC usually chose to delegate most standard setting to the profession.⁶ To retain this delegated authority, however, the accounting profession had to retain the SEC’s confidence that it was doing a satisfactory job of creating and maintaining a financial reporting environment that protects and informs investors and encourages **well-working capital markets**—where, by “well-working,” we mean markets on which the market values of assets and liabilities equal, or reasonably approximate, their real underlying fundamental values.

Thus began the search for basic accounting concepts, those underlying truths on which the practice of accounting is, or should be, based. This was seen as a way to convince regulators that private sector standard setting bodies were capable of high quality accounting standards. Also, identification of concepts, it was felt, would improve practice by reducing inconsistencies in the choice of accounting policies across firms and enable the accounting for new reporting challenges⁷ to be deduced from basic principles rather than developing in an ad hoc and inconsistent way. Despite great effort, however, accountants never did agree on a set of accounting concepts.^{8,9}

As a result of the lack of concepts, accounting theory and research up to the late 1960s consisted largely of *a priori* reasoning as to which accounting concepts and practices were “best.” For example, should the effects of changing prices and inflation on financial statements be taken into account, and, if so, how? This debate can be traced back at least as far as the 1920s. Some accountants argued that the current values of specific assets and

liabilities held by the firm should be recognized, with the resulting unrealized holding gains and losses included in net income.¹⁰ Other accountants argued that inflation-induced changes in the purchasing power of money should be recognized. During a period of inflation, the firm suffers a purchasing power loss on monetary assets such as cash and accounts receivable, since the amounts of goods and services that can be obtained when they are collected and spent is less than the amounts that could have been obtained when they were created. Conversely, the firm enjoys a purchasing power gain on monetary liabilities such as accounts payable and long-term debt. Separate reporting of these gains and losses would better reflect real firm performance, it was argued. Still other accountants argued that the effects of *both* specific and inflation-induced changes in prices should be taken into account. Others, however, often including firm management, resisted these suggestions. One argument, based in part on experience from the Great Depression, was that measurement of inflation was problematic, and current values were very volatile, so that taking them into account would not necessarily improve the measurement of the firm's (and the manager's) performance.

Nevertheless, standard setters in numerous countries did require some disclosures of the effects of changing prices. For example, in the United States, Financial Accounting Standards Board Statement of Financial Accounting Standards No. 33 (1979) required supplementary disclosure of the effects on earnings of specific and general price level changes for property, plant and equipment, and inventories. This standard was subsequently withdrawn. However, this withdrawal was due more to a reduction of its cost effectiveness as inflation declined in later years than to the debate having been settled.

The basic problem with debates such as how to account for changing prices was that there was little theoretical basis for choosing among the various alternatives, particularly since, as mentioned, accountants were unable to agree on a set of basic accounting concepts.

During this period, however, major developments were taking place in other disciplines. In particular, a theory of rational decision making under uncertainty developed as a branch of statistics. This theory prescribes how individuals may revise their beliefs upon receipt of new information. The theory of efficient securities markets developed in economics and finance, with major implications for the role of information in capital markets. Another development was the Possibility Theorem of Arrow (1963), which demonstrated that, in general, it is not possible to combine differing preferences of individual members of society into a social preference ordering that satisfies reasonable conditions. This implies that there is no such thing as perfect or true accounting concepts, since, for example, investors will prefer different accounting concepts than will managers. Arrow's theorem demonstrates that no set of concepts will be fully satisfactory to both parties. Instead, concepts must be hammered out strategically through negotiation and compromise to the point where both parties are willing to accept them even though they are not perfectly satisfactory to either side. The difficulties that accountants have had in agreeing on basic concepts are thus not surprising. Without a complete set of basic concepts, accounting standards, which, ideally, are derived from the concepts, are subject to the same challenges.

These theories, which began to show up in accounting theory in the latter half of the 1960s, generated the concept of **decision useful** (in place of true) financial statement information. This view of the role of financial reporting first appeared in the American Accounting Association (AAA)¹¹ monograph *A Statement of Basic Accounting Theory*, in 1966. The joint **Conceptual Framework** of the IASB and the Financial Accounting Standards Board (FASB; 2010), which is the most recent statement of basic accounting concepts, is based on decision usefulness. That is, it states that the objective of financial statements is to provide information to assist investors to make investment decisions. Henceforth, we will usually refer to this document as the Conceptual Framework, or, if the context is clear, the Framework. It is discussed in Section 3.7.

Equally important was the development of the economics of imperfect information, based on a theory of rational decision making. The theory recognizes that some individuals have an information advantage over others. This led to the development of the theory of agency, which has greatly increased our understanding of the legitimate interests of business management in financial reporting and standard setting.

These theories suggest that the answer to which way, if any, to account for changing prices outlined above will be found in the extent to which they lead to good investment decisions. Furthermore, any resolution will have to take the concerns of management into account.

In Canada, the development of financial accounting and reporting has proceeded differently, although the end result is basically similar to that just described. Financial reporting requirements in Canada were laid down in federal and provincial corporations acts, along the lines of the English corporations acts referred to above. The ultimate power to regulate financial reporting rests with the legislatures concerned. However, in 1946, the Committee on Accounting and Auditing Research, now the Accounting Standards Board (AcSB) of the Canadian Institute of Chartered Accountants (CICA), began to issue bulletins on financial accounting issues. These were intended to guide Canadian accountants as to best practices, and did not have force of law. In 1968, these were formalized into the *CICA Handbook*. At first, adherence to these provisions was voluntary but, given their prestigious source, they were difficult to ignore. Over time, the *Handbook* gained recognition as the authoritative statement of Generally Accepted Accounting Principles (GAAP) in Canada. Ultimately, provincial securities commissions and the corporations acts formally recognized this authority. For example, in 1975, for federally regulated companies, the Canada Business Corporations Act required adherence to the *CICA Handbook* to satisfy reporting requirements under the Act. The end result, then, is similar to that in the United States and many other countries, in that the body with ultimate authority to set accounting standards has delegated this function to a private professional body.¹²

Subsequently, several notable events had a major impact on financial accounting and reporting. One such set of events followed from the stock market boom in the late 1990s and its collapse in the early 2000s. During the collapse, share prices of many firms, especially those in the “hi-tech” industry, fell precipitously. For example, while the share

price of General Electric Corp., a large U.S. conglomerate firm, fell from a high of about US\$55 in August 2000 to a low of about US\$21 in October 2002, that of telecommunications firm Nortel Networks fell from a high of about US\$82 to a low of 44 cents over the same period.

A contributing factor to the market collapse was the revelation of numerous financial reporting irregularities. Frequently, these involved revenue recognition, which has long been a problem in accounting theory and practice. In a study of 492 U.S. corporations that reported restatements of prior years' incomes during 1995–1999, Palmrose and Scholz (2004) report that revenue restatements were the single most common type of restatement in their sample. In part, this problem is due to the vagueness and generality of revenue recognition criteria. For example, under International Accounting Standard 18 (IAS 18),¹³ revenue from the sale of goods can be recognized when the significant risks and rewards of ownership have been transferred to the buyer, the seller loses control over the items, the revenue and related costs can be measured reliably,¹⁴ and collection is reasonably assured. Revenue from services is recognized as the work progresses. Revenue recognition criteria in the United States are broadly consistent with the above, although, at present, they differ somewhat across industries. Revenue can be recognized when it is “realized or realizable” and earned, where earned means the firm has done what it has to do to be entitled to the revenues.¹⁵

During the boom of the late 1990s, many firms, especially newly established ones with little or no history of profits, attempted to impress investors and enhance their stock prices by reporting a rapidly growing stream of revenue. Subsequently, when the boom collapsed, much recognized revenue proved to be premature and had to be reversed.

Theory in Practice 1.1

In July 2002, Qwest Communications International Inc., a large provider of Internet-based communications services, announced that it was under investigation by the SEC. Its share price immediately fell by 32%. In February 2003, the SEC announced fraud charges against several senior Qwest executives, alleging that they had inflated revenues during 2000 and 2001 in order to meet revenue and earnings projections.

One tactic used was to separate long-term sales of equipment and services into two components. Full revenue was immediately recognized on the equipment component despite the obligation to honour the service component over an extended period. A related tactic was to price

services at cost, putting all profit into the equipment component, which, as just mentioned, was immediately recognized as revenue despite a continuing obligation to protect the customer from risk of obsolescence on the equipment “sold.” Yet another tactic was to recognize revenue from the sale of fibre-optic cable despite an ability of the purchaser to exchange the cable at a later date. In retrospect, Qwest’s revenue recognition practices were premature, to say the least.

In June 2004, the SEC announced settlements with some of the officers charged. One officer, for example, repaid \$200,000 of “ill-gotten gains,” plus a penalty of \$150,000, and agreed to “cease and desist” from any future violations.

Numerous other, even more serious, failures of financial reporting also came to light. Two of these are particularly notable. Enron Corp. was a large U.S. corporation with initial interests in natural gas distribution. Following substantial deregulation of the natural gas market in the United States during the 1980s, Enron successfully expanded its operations to become an intermediary between natural gas producers and users, thereby enabling them to manage their exposures to fluctuating natural gas prices. For example, it offered long-term fixed-price contracts to public utilities and natural gas producers. Subsequently, Enron extended this business model to a variety of other trading activities, including steel, natural gas, electricity, and weather futures. Its stock market performance was dramatic, rising from US\$20 in early 1998 to a high of about US\$90 per share in September, 2000. To finance this rapid expansion, and support its share price, Enron needed both large amounts of capital and steadily increasing earnings. Meeting these needs was complicated by the fact that its forays into new markets were not always profitable, creating a temptation to disguise losses.¹⁶

In the face of these challenges, Enron resorted to devious tactics. One tactic was to create various special purpose entities (SPEs). These were limited partnerships formed for specific purposes, and effectively controlled by senior Enron officers. These SPEs were financed largely by Enron's contributions of its own common stock, in return for notes receivable from the SPE. The SPE could then borrow money using the Enron stock as security, and use the borrowed cash to repay its note payable to Enron. In this manner, much of Enron's debt did not appear on its balance sheet—it appeared on the books of the SPEs instead.

In addition, Enron received fees for management and other services supplied to its SPEs, and also investment income. This investment income is particularly worthy of note. By applying current value accounting to its holdings of Enron stock, the SPE included increases in the value of this stock in its income. As an owner of the SPE, Enron included its share of the SPE's income in its own earnings. In effect, Enron was able to include increases in the value of its own stock in its reported earnings! In 2006, financial media, reporting on a five-and-a-half-year jail sentence of Enron's chief accounting officer for his part in the Enron fraud, revealed that \$85 million of Enron's 2000 reported operating earnings of \$979 million came from this source.

Of course, if the SPEs had been consolidated with Enron's financial statements, as they should have been, the effects of these tactics would disappear. The SPE debt would then have shown on Enron's consolidated balance sheet, fees billed would have been offset against the corresponding expense recorded by the SPE, and Enron's investment in its SPEs would have been deducted from its shareholders' equity.

However, the SPEs were not consolidated, seemingly with the agreement of Enron's auditor. But, in late 2001, Enron announced that it would now consolidate, apparently in response to an inquiry from the SEC. This resulted in an increase in its reported debt of some \$628 million, a decrease in its shareholders' equity of \$1.1 billion, and large reductions in previously reported earnings. Investors quickly lost all confidence in the company. Its share price fell to almost zero, and it filed for bankruptcy protection in 2001.

A second major abuse involved WorldCom Inc., a large U.S. telecommunications carrier. During the years 1999 to 2002, the company overstated its earnings by about \$11 billion. Almost \$4 billion of this amount arose from capitalization of network maintenance and other costs that should have been charged to expense as incurred—a tactic that overstated both reported earnings and operating cash flow. Another \$3.3 billion of overstatement arose from reductions in the allowance for doubtful accounts. Again, when these abuses came to light, investor confidence collapsed and WorldCom applied for bankruptcy protection in 2002.

These, and numerous other, reporting abuses took place regardless of the fact that the financial statements of the companies involved were audited and certified as being in accordance with GAAP. As a result, public confidence in financial reporting and the working of capital markets was severely shaken.

One result of the reduction of public confidence was increased regulation. The most notable example is the Sarbanes-Oxley Act, passed by the U.S. Congress in 2002. This wide-ranging Act was designed to restore confidence by reducing the probability of accounting horror stories such as those just described. The Act did this by tightening the audit function and improving **corporate governance**, where by corporate governance we mean those policies that align the firm's activities with the interests of its investors and society. For example, creation of an audit committee of the Board of Directors is a corporate governance policy to tighten the audit function by improving communication between the Board and the firm's auditor, particularly where the auditor has concerns about the manager's operation of the firm's accounting and reporting system.

To improve corporate governance, a major provision of Sarbanes-Oxley was to create the Public Company Accounting Oversight Board (PCAOB). This agency has the power to set auditing standards and to inspect and discipline auditors of public companies. The Act also restricts several of the non-audit services offered by auditing firms to their clients, such as information systems and valuation services. Furthermore, the auditor now reports to the audit committee of the client's board of directors, rather than to management. The audit committee must be composed of directors independent of company management. In Canada, the Canadian Public Accountability Board (CPAB), created in 2003 by federal legislation, has a similar role.

Other provisions of Sarbanes-Oxley include a requirement that firms' financial reports shall include "all material correcting adjustments" and disclose all material off-balance-sheet loans and other relations with "unconsolidated entities." Furthermore, the Chief Executive Officer (CEO) and Chief Financial Officer (CFO) must certify that the financial statements present fairly the company's results of operations and financial position. The Act required these two officers, and an independent auditor, to certify the proper operation of the company's internal controls over financial reporting, with deficiencies, and their remediation, publicly reported. (These requirements were relaxed somewhat in 2007.) Similar regulations are in place in Canada, except that officers' certification of internal controls need not be attested to by an independent auditor.

Accounting standard setters also moved to restore public confidence. One move was to tighten the rules surrounding SPEs, so that it was more difficult to avoid their consolidation with the financial statements of the parent entity.

1.3 THE 2007–2008 MARKET MELTDOWNS

Despite these new regulations and standards, however, the use of SPEs did not decline, particularly by financial institutions, where they were frequently called **structured investment vehicles** (SIVs). These vehicles were often created by lenders such as banks, mortgage companies, and other financial institutions to securitize their holdings of mortgages, credit card balances, auto loans, and other financial assets. That is, the institution would transfer large pools of these assets to the SIVs it sponsors. The SIV would pool them into **asset-backed securities** (ABSs)¹⁷—that is, into tranches of similar credit quality. Thus, a particular ABS would be a tranche of, say, residential mortgages of high quality, another ABS would be of lower quality, etc., down to “subprime” mortgages of lowest quality. These various ABS tranches would then be resold to investors¹⁸ or, particularly for the lowest quality tranche, retained by the SIV and its sponsor to help convince investors that the firm stood behind the investments it sold. As mortgagors made payments, cash flowed to the SIV and on to the tranche holders, after deduction of various fees. Holders of higher-quality (i.e., lower-risk) tranches received a lower return than holders of lower-quality tranches, since they were less subject to defaults by the original mortgage borrowers.

ABSs were highly popular with investors, including many financial institutions, since they offered higher returns than, say, bonds, and were viewed (wrongly, as it turned out) as no riskier than bonds even though the return was higher. In part, this perception of ABS safety was fuelled by a belief that house prices, the ultimate security underlying mortgages, would continue to rise. Perceived safety was also enhanced because of the apparent diversification of **credit risk**, where credit risk is the risk that a party to a financial contract, such as a mortgage, will be unable to meet its financial obligations. This diversification was created by the spreading of credit risk across the large underlying pool of mortgages or other financial assets that backed up ABSs—while some mortgages may go bad, it was felt that these would be a small proportion of the mortgages in the pool. Perceived safety was also reinforced by high-quality ratings from investment rating agencies. Furthermore, investors could customize their investments by buying tranches of the particular risk and return that they desired.

ABSs were frequently further securitized as **collateralized debt obligations** (CDOs), which consisted of tranches of similar quality ABS tranches, a procedure that further increased diversification. Unlike ABSs, CDOs tended to be arranged and sold privately, and often consisted of riskier mortgages or other assets. Henceforth, when it is not necessary to distinguish them, we will refer to these securities collectively as ABSs. To finance the assets purchased from its sponsor, SIVs borrowed money, often by issuing **asset-backed commercial paper** (ABCP).¹⁹ ABCP paid higher interest rates than treasury bills and,

like the underlying ABSs, typically received high ratings from investment rating agencies. Thus ABCP was popular with companies and other investors who wanted to invest surplus cash for a short term.

Alternatively, SIVs could retain ABSs rather than sell them on to investors. Since the ABSs generated higher returns than the cost of funds borrowed to acquire them, SIVs became “money machines.”

Of course, since it resulted in high leverage, financing holdings of ABSs with borrowed money was a risky strategy for SIVs. The underlying reason is that borrowing and lending were “out of sync.” That is, ABSs were long-term investments whereas ABCP borrowings were short term. Despite rising house prices and the inherent diversification of ABSs, some credit losses could still occur, reducing the safety of ABCP and affecting the SIV’s ability to roll over maturing ABCP. Consequently, some form of **credit enhancement** of ABSs was often necessary if the SIV was to be able to borrow at a low interest rate. One way to accomplish this was the “**liquidity put**,” under which the sponsor agreed to buy back the SIV’s asset-backed securities should the market for them collapse. Other enhancements included retention of the lowest-quality tranche by the sponsoring institution, as mentioned above, and various explicit and implicit guarantees to reimburse purchasers for losses.

Also, SIVs could hedge their risk by purchasing **credit default swaps** (CDSs) from some intermediary, such as an insurance company. These were derivative financial instruments that would reimburse the SIV for all or part of credit losses on its ABSs. To obtain this insurance, the CDS purchaser paid a fee (called the spread) to the CDS issuer. The belief that credit losses on the underlying ABSs were protected further increased the confidence of lenders that ABSs and ABCP were low risk.

Note that if an SIV was consolidated into the financial statements of its sponsor, the high SIV leverage would show up on the sponsor’s consolidated balance sheet. Despite the apparent safety of ABSs, sponsors would be penalized by the market if their leverage became sufficiently high. This was particularly so for financial institutions, many of which are subject to capital adequacy regulations. Consequently, firms that sponsored SIVs had an incentive to avoid consolidation of their SIVs into their own financial statements. Then, leverage could be further exploited by remaining off-balance sheet.²⁰

However, as mentioned, standard setters had moved to tighten up the rules for consolidation of off-balance sheet vehicles. In the United States, FASB Interpretation No. 46(R) (FIN 46; 2003) expanded requirements for consolidation of a particular form of SIVs, called **variable interest entities** (VIEs), and required additional supplementary disclosures by firms with significant interests in VIEs.²¹ Variable interests are ownership interests that absorb the expected losses and gains of the VIE—that is, they bear the risks. As noted above, VIEs are thinly capitalized, so that they need to borrow money in order to operate.

Under FIN 46, the primary beneficiary of the VIE (e.g., a bank or other financial institution) must consolidate its financial statements with the VIEs it sponsors. A primary beneficiary was the entity that absorbed a majority of the VIE’s expected losses and

received a majority of its expected gains. Thus, the primary beneficiary did not need to actually control the VIE (the usual criterion for consolidation) in order for consolidation to be required. It was felt that by mandating consolidation when a sponsor's exposure to their VIEs' risks and returns was significant (thereby bringing VIE assets and liabilities onto their sponsors' balance sheets), the financial reporting for financial institutions, particularly with respect to their overall solvency and capital adequacy, would be improved.

Nevertheless, many sponsors avoided consolidation by creating **expected loss notes** (ELNs). These were securities sold by sponsors to an outside party, under which that party contracted to absorb a majority of a VIE's expected losses and receive a majority of expected net returns. Thus, the holder of the ELN became the primary beneficiary under FIN 46, and consolidation would be with the financial statements of the ELN holder, not with the sponsor. Freed from consolidation, the sponsor could then exploit off-balance sheet VIE leverage as much as it wanted. Typically, the balance of net returns would go to the sponsor. In addition, sponsors would receive fees for various services rendered to VIEs.

Beginning in 2007, this whole structure came crashing down. It had become increasingly apparent that because of lax lending practices to stoke the demand for more and more ABSs to feed leverage profits, many of the mortgages underlying ABSs were unlikely to be repaid—it seems that when mortgage lenders knew that the mortgages they originated would be securitized and sold, they were less careful about evaluating borrowers' credit quality than they would be if they had intended to retain the mortgages. As a result, a major advantage of ABSs from an investor's perspective (diversification of credit risk across many similar assets) turned out to be their greatest weakness: *asset-backed securities lacked transparency*. That is, investors did not know what they contained. This was particularly so for CDOs, which tended not to be publicly traded. As concern about mortgage defaults and housing prices increased, investors were unable to (or neglected to) determine how many mortgages associated with a specific ABS were likely to go bad. Valuing ABSs was particularly difficult due to their complexity. As a result, valuation models based on well-working underlying market variables, which have been used for years to value securities such as options, were not available for ABSs. Instead, valuations were based on projected interest rates and historical default rates. These estimates did not anticipate the high default rates that began to appear.

The rational reaction to growing suspicion about the value of a security is to lower the price offered, or not to buy at all, leading to further declines in market value. The risk of a continuing decline in demand due to skeptical investors' lack of buying is called **liquidity risk**.²² Note that liquidity risk can result in a market value less than value-in-use. To illustrate the effects of liquidity risk, financial media reported in July 2007 that two mutual funds of Bear Stearns (at the time, a large U.S. investment bank) were suffering severe losses on their large holdings of ABSs. This was followed in August 2007 with a suspension by BNP Paribas, a large France-based bank, of subscriptions to and redemptions of several of its investment funds, on grounds that market values of their holdings of ABSs were impossible to determine. Other U.S. and European financial institutions reported similar problems. In effect, the market for these securities collapsed.

There was another major contributing factor to the market collapse, however. Above, we mentioned that SIVs could purchase CDSs to insure any losses suffered on their ABSs. If so, why did investors lose confidence? The answer lies in **counterparty risk**. As mentioned, many SIVs purchased CDSs to reduce the credit risk of their ABSs. However, as concern about mortgage defaults grew, concern also grew that CDS issuers (i.e., counterparties) would not be able to meet their obligations.

Counterparty risk was greatly enhanced due to a significant CDS feature—it was not necessary for the purchaser of a CDS to own the underlying assets secured by that CDS. Anyone could buy and sell a so-called “naked” CDS that protected against losses on specific reference ABSs by reimbursing for declines in their value. Such a CDS would protect an investor who had no insurable interest in that ABS but wanted to hedge against the possibility of, say, a downturn in the housing market. If the housing market was to deteriorate, the value of ABSs based on that market would also decline. A CDS that pays off if an ABS declines in value would thus increase in value. Thus, in addition to their role in providing insurance, naked CDSs became a vehicle for speculators, since any event that lowered the value of ABS securities would raise the value of CDSs written on those securities.

The demand for CDSs became very high, and their issuance quickly spread from insurance companies to other financial institutions, attracted by the spread that they generated. Indeed, CDSs were often packaged into **synthetic CDOs**—that is, tranches of CDSs, for sale to investors and speculators. As a result, the face value of CDSs written on specific asset-backed securities could be many times their value (estimates ranged as high as five times). Also, like CDOs, CDSs and synthetic CDOs were not traded on an organized exchange, or even settled through clearing houses, where regulations would be in place to standardize, publicize, and protect the integrity of trade transactions. Instead, CDOs were bought and sold privately. These huge amounts of private trading of CDOs and CDSs, combined with the off-balance sheet nature of many VIEs, became part of what was known as the **shadow banking system**. A consequence of shadow banking was that it was difficult to know how many CDSs were outstanding against specific ABSs, except that if a reference ABS was to decline in value, insurance payouts could be huge. For example, the solvency, credit rating, and share price of American International Group, Inc. (AIG), a major U.S. issuer of CDSs, rapidly declined as it became apparent that it was unable to meet its obligations. One reason for this decline was AIG’s obligation to post collateral as security to the holders of ABSs it had insured if their market value fell, an obligation that quickly reached \$85 billion. In 2008, AIG had to be rescued by the U.S. government to prevent a complete collapse of the financial system. In sum, counterparty risk was a major contributing factor to the ABS market collapse.

Since asset-backed securities often secured ABCP, the ABCP market also was threatened with collapse. Thus SIVs faced several problems simultaneously. They were unable to roll over maturing ABCP from the proceeds of issue of fresh ABCP (no one would buy them due to the collapse of the ABS market), their holdings of ABSs themselves were difficult or impossible to value or sell, and the ability of CDS issuers such as AIG to

reimburse losses was doubtful. In the face of this market collapse and severe counterparty risk, SIVs faced either insolvency or the necessity for their sponsors to buy back their impaired assets. For example, the *Financial Times* (November 19, 2008) reported that Citigroup returned the last \$17.4 billion of assets of its sponsored SIVs to its balance sheet, recording a writedown of \$1.1 billion in the process.

These buybacks had severe consequences, however. Paying for them lowered sponsors' solvency and required writedowns of the "toxic" assets thus acquired. These writedowns were in addition to writedowns of CDSs, and of asset-backed securities held directly by the sponsors. Further writedowns were frequently required as the fair value of these assets continued to deteriorate. Many sponsors failed, raised additional capital at distressed prices, or were rescued by governments, resulting in a major contraction of the financial system. The resulting security market collapse spread to the real economy, leading to worldwide recession, including drastic falls in share prices.

The underlying causes of these catastrophic events, which are rooted in both wealth inequality and global imbalances in consumption, trade, and foreign exchange markets, will be debated by economists and politicians for years. However, blame for the initial collapse of the market for asset-backed securities is usually laid at the feet of lax mortgage lending practices and inadequate regulation. The lack of transparency of the complex financial instruments created by the finance and investment communities was also at fault. Of greater significance for accountants, however, was sponsors' failure to adequately control the risks of excessive leverage in the quest for leverage profits. Firm managers were encouraged/enabled to take on excessive risk since, as described above, financial accounting standards allowed sponsor firms to avoid SIV consolidation, resulting in large amounts of off-balance sheet leverage. Accountants and auditors who allowed this avoidance were arguably meeting the letter of FIN 46 while avoiding its intent.

Another result of the meltdown was severe criticism of fair value accounting, since accounting standards required fair valuation for many financial instruments. Much of this criticism came from financial institutions. They claimed that the requirement to write down the carrying values of financial instruments as fair values fell created huge losses that threatened their capital adequacy ratios and eroded investor confidence. Writedowns were further criticized because inactive markets often meant that fair values had to be estimated by other means. For example, fair value of asset-backed securities could be estimated from the spreads charged by CDS issuers. Since these spreads became very high as underlying ABS values fell, the resulting fair value estimates reflected **liquidity pricing** in the market. Liquidity pricing is an outcome of liquidity risk (see Note 22), under which market value is less than the value-in-use that the institutions felt they would eventually realize if they held these assets to maturity.

Management's concerns about excessive writedowns had some validity. As mentioned above, ABSs lacked transparency. Since investors could not separate the good from the bad, all such securities became suspect. Returning to historical cost accounting, or at least allowing institutions to value these assets using their own internal estimates (i.e., value-in-use), it was claimed, would eliminate these excess writedowns. Of course, allowing firms to use their own internal valuations creates the possibility of manager bias.

Accounting standard setters attempted to hold their ground in the face of these criticisms of fair value. However, faced with threats that governments would step in to override fair value accounting, they did relax some requirements. For example, in October 2008, the IASB and FASB issued similar guidance on how to determine fair value when markets are inactive (i.e., melted down, in terms of our terminology). The guidance was that when market values did not exist and could not be reliably inferred from values of similar items, firms could determine fair value based on value-in-use.

Subsequently, the IASB and FASB embarked on a major reworking of fair value accounting standards, as well as standards on derecognition, consolidation, and revenue recognition. Some of these standards are described in Chapter 7.

Collectively, the events described above raise fundamental questions about the extent of regulation in a markets-based economy. It seems that relatively unregulated capital markets (e.g., the shadow banking system) are subject to catastrophic market failure. This came as a shock to many economists and politicians. The prevailing theory was that markets would always properly price assets, so that regulation could be confined to maintaining an orderly marketplace. Furthermore, it was felt that, in addition to imposing a costly bureaucracy, regulators were inferior to markets in determining what market price should be, and that the consequences of failures by regulators could prove more costly to society than some of the excesses of unfettered markets. These theories, based on underlying economic models of rational investor behaviour and asset pricing, have come under intense criticism following their failure to predict the market meltdowns. Some of these criticisms, and possible responses to them, are discussed later in this book. Market failures have in the past typically led to increased regulation. The question then is, how and to what extent should regulation be increased as a result of this most recent failure? This question is heightened by the globalization of capital markets, which causes the effects of such failures to quickly spread worldwide.

Responses to this most recent failure are still being debated by regulators, economists, and politicians. One response is to require financial institutions to hold increased capital reserves. Of more direct interest in this book is a flurry of new or expanded accounting and disclosure standards. Some of these are outlined in Section 7.5. Another response is to limit or modify the managerial compensation practices of financial institutions, since suspicion arose that existing compensation practices, including large amounts of stock options, contributed to the meltdowns by encouraging managers to indulge in excessive off-balance sheet leverage. This leverage increased the profits, and share prices, of sponsoring institutions but also increased their risk. Yet, for whatever reason, the market had not fully appreciated this risk, bidding up share prices of financial institutions and thus increasing the value of executive stock options. To the extent that stock-based compensation practices encouraged short-run, risk-taking behaviour, they had the opposite effect to their intended purpose, which was to align manager and shareholder interests by encouraging managers' longer-run decision horizons.

Nevertheless, the extent to which additional regulations are desirable is not obvious, since, as mentioned, regulation is costly and also subject to failure. Furthermore, alternative mechanisms to help inhibit market failure, such as the legal system, are available.

In sum, four points relevant to accountants stand out from the events just described. First, financial reporting must be transparent, so that investors can properly value assets and liabilities, and the firms that possess them. With respect to complex financial assets and liabilities, transparency includes full reporting of models used to determine value, disclosure of any repurchase obligations, and explanations of risk exposures and risk-management strategies, including use of credit default swaps. Second, fair value accounting, being based on market value or estimates thereof, may understate value-in-use when markets collapse due to liquidity pricing that results from a severe decline in investor confidence. This leads to management, and even government, objections. It also creates a need for research into the causes of liquidity pricing and how financial reporting may help to control it. Third, off-balance sheet activities should be fully reported, even if not consolidated, since they can encourage excessive risk taking by management. Finally, since accounting standards are a form of regulation, substantial changes to existing standards, including increased disclosures of manager compensation, have taken place.

1.4 EFFICIENT CONTRACTING

Standard setters apparently feel that fair value accounting is the best way to implement the decision usefulness concept that, as described in Section 1.2, developed during the 1960s. For example, we mentioned in Section 1.3 that many financial instruments are valued at fair value. However, the severe criticisms of fair value accounting arising from the security market meltdowns have strengthened an alternative view of financial reporting, namely the **efficient contracting** approach to financial reporting. Efficient contracting argues that the **contracts** that firms enter into (e.g., debt contracts and managerial compensation contracts) create a primary source of demand for accounting information. The role of accounting information is viewed as one of helping to maximize contract efficiency or, more generally, to aid in efficient corporate governance.

Debt and compensation contracts are discussed in later chapters. For now, it is sufficient to note that these contracts usually depend on accounting variables, such as net income. The role of financial reporting for debt and compensation contract purposes is to generate *trust*. Trust is needed if lenders are to be willing to lend to the firm and if shareholders (represented by Boards of Directors) are to be willing to delegate managerial responsibilities to managers. An efficient contract generates this trust at lowest cost. Thus covenants in debt contracts under which, for example, the borrowing firm will not pay dividends if its working capital falls below a specified level, increase lender trust in the security of their loans.

Basing manager compensation on net income increases investor trust by helping to align manager and shareholder interests. That is, net income can be used as a measure of manager performance. Alignment of manager and shareholder interests is the **stewardship** role of financial reporting, one of the oldest concepts in accounting.

Efficient contracting leads to some major accounting policy differences from the measurement approach (i.e., current value accounting) of financial reporting envisaged by standard setters, since trust is compromised to the extent that managers are able to

Theory in Practice 1.2

Serious consequences that can result from lack of conservatism are illustrated by New Century Financial Corp. Formed in 1995, New Century became the second-largest sub-prime mortgage lender in the United States. Its lending was in large part based on automated credit granting programs, and reflected a belief that house prices would continue to rise. Many of these mortgages were securitized and transferred to investors. New Century accounted for these transfers as sales, thereby derecognizing them from its balance sheet. Gross profit was then the difference between the sales revenue received from investors and the cost of the mortgages transferred. Of course, reported earnings should allow for credit losses, since New Century committed to buy back mortgages that became troubled within up to a year after transfer.

In addition, New Century would retain some mortgages for itself (called retained interests), from which it would receive future cash flows. Also, the transfer agreements included the right to service the mortgages, for which New Century charged a fee. The retained interests and servicing rights assets were valued at current value, based on their discounted expected future cash flows. Thus, revenue from retained interests was recognized when the decision to retain was made, and servicing revenue was recognized at the time of mortgage transfer. These policies required numerous estimates and management judgments, especially for retained interests (since a secondary market for these assets did not exist). These policies contrasted with a more conservative policy of recognizing revenues as cash flows from retained interests were received and servicing responsibilities rendered.

The company's share price increased dramatically, to a high of US\$64 in 2004. Its reported net income reached \$1.4 billion in 2005.

However, through error or design, New Century seriously underestimated the extent of its mortgage buybacks and resulting credit losses. Of \$40 billion of mortgages granted in the first three

quarters of 2006, it provided only \$13.9 million for repurchases. As the number of subprime mortgages in default increased greatly in the fourth quarter of 2006, investor concerns about New Century rose. In particular, the company failed to write down its retained interests as the value of the underlying mortgages decreased. These concerns added to concerns about early revenue recognition from retained interests and servicing. New Century, which was highly levered, was soon unable to borrow money to finance buybacks. In March 2007, it announced that it would no longer accept new mortgage applications. Its shares lost 90% of their value, and the company was delisted from the New York Stock Exchange. In 2007, it filed for bankruptcy protection.

New Century's auditor (KPMG) was drawn into the lawsuits that followed. In 2009, financial media reported a lawsuit of \$1 billion, claiming that the auditor had allowed the serious understatement of provisions for buybacks. KPMG denied that it was responsible, claiming that the provisions were deemed adequate at the time, and blaming New Century's failure on the market meltdowns of 2007–2008. Later in 2009 the SEC filed civil fraud charges against three former executives of New Century, seeking damages and return of bonuses. Several other lawsuits followed. In 2010, financial media reported final settlement of a class action lawsuit that included a payment of over \$65 million by former company officers and directors, and a payment of \$44.75 million by auditor KPMG.

Subsequently, other financial institutions also settled claims for sub-standard mortgage lending. For example, in 2012, Citigroup was fined \$158 million for certifying low quality mortgages as eligible for U.S. government mortgage insurance. The fine was to compensate the government for the insurance payouts it had to make when these mortgages went into default. Bank of America was fined \$1 billion for similar offences.

manipulate the values of accounting variables used in contracts. One difference is an increased emphasis, relative to current value accounting, on **reliability** of accounting information. Reliability of accounting information benefits lenders by increasing their trust that the firm manager will not take actions that harm their interests (e.g., disguising deteriorating earnings). Reliability also benefits compensation contracting by increasing shareholders' trust that managers cannot cover up poor performance by opportunistically manipulating reported net income and balance sheet values.

The second major difference from the measurement approach is the role of **conservatism** in financial reporting. Under conservatism, unrealized losses from declines in value are recognized when they take place, but gains from increases in value are not recognized until they are realized. Accounting standards include numerous instances of conservatism, such as lower-of-cost-or-market for inventories, and impairment tests for capital assets and many financial instruments.

While both standard setters and adherents to the efficient contracting view recognize that some conservatism is desirable, they differ in the reasons why. Arguably, the standard setters' view is that conservatism reduces the probability of lawsuits that invariably result when firms report major unexpected losses. The contracting view is that conservatism is a vehicle to improve contract efficiency by providing investors, particularly debt investors, with an "early warning system" of financial distress. It also serves a stewardship role by preventing managers from overstating their performance and compensation by recognizing unrealized gains.

In this book, we view the decision useful and efficient contracting roles of financial reporting as equally important. While, as just mentioned, standard setters do see a role for conservatism, they would point out that fair value accounting is, in effect, conservative when fair values fall, but can also serve a useful investor-informing role when fair values rise. Contract theory adherents, however, are more concerned about low reliability of many fair value increases. While they are willing to accept possible low reliability of conservative accounting in order to attain the benefits of contract efficiency and good corporate governance, they argue that low reliability of unrealized fair value gains works against conservatism, contract efficiency, and governance. How to best combine these two important but conflicting roles is a fundamental problem for financial accounting theory. We discuss this problem further in Section 1.10.

1.5 A NOTE ON ETHICAL BEHAVIOUR

The collapse of Enron and WorldCom and subsequent collapse of public confidence, as well as the more recent market meltdowns, raise questions about how to restore and maintain public confidence in financial reporting. One response is increased regulation, including new accounting standards, as just discussed. However, ethical behaviour by accountants and auditors is also required, since numerous accountants designed, were involved in, or at least knew about the various reporting irregularities. Also, the financial

statements of the firms involved were certified by their auditors as being in accordance with GAAP. It seems that conforming to GAAP is not sufficient to prevent financial reporting failures.

By ethical behaviour, we mean that accountants and auditors should “do the right thing.” In our context, this means that accountants must behave with integrity and independence in putting the public interest ahead of the employer’s and client’s interests, should these conflict.

It is important to realize that there is a social dimension to integrity and independence. That is, a society depends on shared beliefs and common values. This notion goes back to Thomas Hobbes, a seventeenth-century philosopher and author of *Leviathan*. Hobbes argued that if people acted solely as selfish individuals, society would collapse to the point where force, or the threat of force, would prevail—there would be no cooperative behaviour. He also argued that rules, regulations, and the courts were not enough to restore cooperative behaviour, since no set of rules could possibly anticipate all human interaction. What is needed, in addition, is that people must recognize that it is in their joint interests to cooperate.

The force of Hobbes’s arguments can be seen, for example, in the Enron and WorldCom disasters. We have a set of rules governing financial reporting (e.g., GAAP). However, GAAP was not followed and/or was bent so as to conform to its letter but not its intent. Cooperative behaviour broke down because certain individuals behaved in a manner that broke the rules—they did not behave with integrity and independence. This was good for them, at least in the short run, but bad for society. Hobbes’s prediction is that increased regulation will not suffice to prevent a repetition of these reporting disasters. What is also needed is ethical behaviour.

Note, however, that there is a time dimension to ethical behaviour. An accountant can act in his/her own self-interest and still behave ethically. This is accomplished by taking a broader view of the consequences of one’s actions. For example, suppose that an accountant is instructed to understate a firm’s environmental liabilities. In the short run, doing so will benefit the accountant through job retention, promotion, and higher compensation. In the longer run, though, future generations will suffer through increased pollution, shareholders will suffer from reduced share price when the extent of environmental liability becomes known, and investors as a whole will suffer when reduced public confidence in financial reporting lowers the prices of all shares. The accountant will suffer through dismissal, professional discipline or expulsion, and reduced compensation due to reduced stature of all accountants. By taking account of these longer-run costs, the accountant is motivated to behave ethically. In effect, in the longer run, self-interested behaviour and ethical behaviour merge.²³

In this book, we will often cast our discussion in terms of full disclosure,²⁴ usefulness of financial statements, cooperative behaviour, and reputation, all of which benefit society. However, in acting so as to meet these desirable characteristics of financial reporting, the accountant is, in effect, acting ethically.

1.6 RULES-BASED VERSUS PRINCIPLES-BASED ACCOUNTING STANDARDS

These longer-run considerations lead directly to the question of rules-based versus principles-based accounting standards. Rules-based standards attempt to lay down detailed rules for how to account. An alternative to detailed rules, however, is for accounting standards to lay down general principles only, and rely on auditor professional judgement to ensure that application of the standards is not misleading. For example, in Section 1.3 we described FASB Interpretation No. 46 (FIN 46). This standard imposed rules for consolidation of variable interest entities, following the abuse by Enron of earlier rules. However, the new rules were in turn circumvented by many financial institutions through the creation of expected loss notes. A principles-based standard for consolidation would require that consolidation be required when failure to do so would be misleading. Thus, if the accountant/auditor felt that excessive financial leverage was otherwise being disguised, he/she would insist on consolidation or, at least, clear supplementary disclosure.

It is often stated that IASB standards are more principles-based than those of the United States.²⁵ However, Ball (2009) argues that U.S. financial reporting is inherently principles-based, in the sense that the U.S. justice system punishes misleading financial statement reporting even if the financial statements are technically in accordance with GAAP.²⁶ Ball attributes the rules-based nature of U.S. financial reporting to its high degree of regulation and possible punishment, which produces a “rule-checking” mentality.

Undoubtedly, punishment is a powerful deterrent to fraud. But, the events described in Sections 1.2 and 1.3 demonstrate that the prospect of punishment is not always effective. Furthermore, the serious impacts of the 2007–2008 market meltdowns raise the question of whether the world can afford to wait until the wheels of justice grind to their conclusion. It would be preferable to prevent misleading reporting in the first place.

Principles-based standards are seen as a way to accomplish this, since detailed rules do not seem to work. Of course, professional accounting bodies already encourage principled behaviour, through codes of professional conduct, discipline committees, and the process of standard setting. However, Ball points out that such rules have been widely ignored. Nevertheless, the SEC, in “Study Pursuant to Section 108(d) of the Sarbanes-Oxley Act ... (2003),” recommends that the FASB adopt a principles-based approach to accounting standards. The SEC study is in broad agreement with the FASB’s own 2002 “Proposal for a Principles-based Approach to U.S. Standard-setting.” Furthermore, a stated goal of the Conceptual Framework introduced in Section 1.2 is to create a foundation for principles-based standards. Without such a foundation, it is unclear just what principles are to be upheld.

It thus seems that the world is moving toward principles-based standards. Yet, even with a strong conceptual framework, such standards will face pressures from managers, and even governments, to bend financial reporting to their wishes. To resist such pressures, auditors and accountants will have to adopt the longer-term view of their responsibilities advocated in Section 1.5.

1.7 THE COMPLEXITY OF INFORMATION IN FINANCIAL ACCOUNTING AND REPORTING

It should now be apparent that the environment of accounting is both very complex and very challenging. It is complex because the product of accounting is information—a powerful and important commodity. The main reason for this complexity is the absence of perfect or true accounting concepts and standards, as discussed in Section 1.2. As a result, individuals will not be unanimous in their reaction to even the same information. For example, a sophisticated investor may prefer the valuation of certain firm assets and liabilities at value-in-use on grounds that this will help to predict future firm performance. Debt investors, such as bondholders, may prefer conservative accounting on grounds that understating assets and earnings protects lenders' interests by making it more difficult for managers to reduce their security by, for example, paying excessive dividends to shareholders. Others may prefer historical cost accounting, perhaps because they feel that current value information is unreliable, or simply because they are used to historical cost information. Furthermore, managers, who will have to report the current values, might react quite negatively. Management typically objects to inclusion of unrealized gains and losses resulting from changes in asset and liability values in net income, arguing that these items introduce excessive volatility into earnings, do not reflect their performance, and should not be included when evaluating the results of their efforts. These arguments may be somewhat self-serving, since part of management's job is to anticipate changes in values and take steps to protect the firm from adverse effects of these changes. For example, management may hedge against increases in prices of raw materials and changes in interest rates. Nevertheless, managements' objections remain, and accountants quickly get caught up in whether reported net income should fulfill a primary role of reporting useful information to equity investors or to debt investors, or to report information that motivates responsible manager performance.

Another reason for the complexity of information is that it does more than affect individual decisions. In affecting decisions it also affects the working of markets, such as securities markets and managerial labour markets. It is important to the efficiency and fairness of the economy itself that these markets work well.

The challenge for financial accountants, then, is to survive and prosper in a complex environment characterized by conflicting preferences of different groups with an interest in financial reporting. This book argues that the prospects for survival and prosperity will be enhanced if accountants have a critical awareness of the impact of financial reporting on investors, managers, and the economy. The alternative to awareness is simply to accept the reporting environment as given. However, this is a very short-term strategy, since environments are constantly changing and evolving.

1.8 THE ROLE OF ACCOUNTING RESEARCH

A book about accounting theory must inevitably draw on accounting research, much of which is contained in academic journals. There are two complementary ways that we can view the role of research. The first is to consider its effects on accounting practice. For

example, the essence of the decision usefulness approach that underlies the Conceptual Framework is that investors should be supplied with information to help them make good investment decisions. One has only to compare the current annual report of a public company with a similar report issued in the 1960s and prior to see the tremendous increase in disclosure over the 40 years or so since decision usefulness formally became an important concept in accounting theory.

Yet, this increase in disclosure did not “just happen.” It, as outlined in Section 1.2, is based on fundamental research into the theory of investor decision making and the theory of capital markets, which have guided the accountant in what information is useful. Furthermore, as we will see, the theory has been subjected to extensive empirical testing, which has established that, on average, investors use financial accounting information much as the theory predicts.

Independently of whether it affects current practice, however, there is a second important view of the role of research. This is to improve our *understanding* of the accounting environment, which we argued above should not be taken for granted. For example, fundamental research into models of conflict resolution, in particular agency theory models, has improved our understanding of managers’ interests in financial reporting, of the role of executive compensation plans in motivating and controlling management’s operation of the firm, and of the ways in which such plans use accounting information. This in turn leads to an improved understanding of managers’ interests in accounting policy choice and why they may want to bias or otherwise manipulate reported net income, or, at least, to have some ability to manage the “bottom line.” Research such as this enables us to better understand corporate governance issues such as the boundaries of management’s legitimate role in financial reporting. It also helps us understand why the accountant is frequently caught between the interests of investors and managers.

In this book, we use both of the above views. Our approach to research is twofold. In some cases, we choose important research papers, describe them intuitively, and explain how they fit into our overall framework of financial accounting theory and practice. In other cases, we briefly refer to research papers on which our discussion is based. The interested reader can refer to the papers to pursue the discussion in greater depth if desired.

1.9 THE IMPORTANCE OF INFORMATION ASYMMETRY

This book is based on information economics. This is a unifying theme that formally recognizes that some parties to business transactions may have an information advantage over others or may take actions that are unobservable to others. When this happens, the economy is said to be characterized by information asymmetry. We shall consider two major types of information asymmetry.

The first is **adverse selection**. For our purposes, adverse selection occurs because some persons, such as firm managers and other insiders, will have better information about the

current condition and future prospects of the firm than outside investors. There are various ways that managers and other insiders can exploit their information advantage at the expense of outsiders. For example, managers may behave opportunistically by biasing or otherwise managing the information released to investors, perhaps to increase the value of stock options they hold. They may delay or selectively release information early to selected investors or analysts, enabling insiders, including themselves, to benefit at the expense of ordinary investors. Such tactics are *adverse* (hence the term) to the interests of ordinary investors, since it reduces their ability to make good investment decisions. Then, investors' concerns about the possibility of biased information release and favouritism will make them wary of buying firms' securities, with the result that capital markets will not function as well as they should. We can then think of financial accounting and reporting as a mechanism to control adverse selection by timely and credible conversion of inside information into outside information.

***Adverse selection** is a type of information asymmetry whereby one or more parties to a business transaction, or potential transaction, have an information advantage over other parties.*

The second type of information asymmetry is **moral hazard**, which arises when one party to a contractual relationship takes actions that are unobservable to the other contracting parties. Moral hazard exists in many situations. A medical doctor may give a patient a cursory examination. A trustee for a bond issue may shirk his/her duties, to the disadvantage of the bondholders. In our context, moral hazard occurs because of the separation of ownership and control that characterizes most large business entities. It is effectively impossible for shareholders and lenders to observe directly the extent and quality of top manager effort on their behalf. Then, the manager may be tempted to shirk on effort, blaming any deterioration of firm performance on factors beyond his/her control, or biasing reported earnings to cover up. Obviously, if this happens, there are serious implications both for the contracting parties and for the efficient working of the economy. We can then view accounting net income as a measure of managerial performance. This helps to control moral hazard in two complementary ways. First, net income can serve as an input into executive compensation contracts to motivate manager performance. Second, net income can inform the managerial labour market, so that a manager who shirks will suffer a decline in income, reputation, and personal market value in the longer run.

***Moral hazard** is a type of information asymmetry whereby one or more parties to a contract can observe their actions in fulfillment of the contract but other parties cannot.*

Note that both adverse selection and moral hazard result from information asymmetry. The difference is that adverse selection involves inside information about matters affecting future firm performance and resulting security returns. Moral hazard involves manager effort—the manager knows how hard he/she is working but investors do not.

1.10 THE FUNDAMENTAL PROBLEM OF FINANCIAL ACCOUNTING THEORY

Given the absence of perfect or true accounting concepts, it turns out that the most useful measure of net income to inform investors—that is, to control adverse selection—need not be the same as the best measure to measure and motivate manager stewardship—that is, to control moral hazard. This was recognized by Gjesdal (1981). Investors' interests are best served by information that enables better investment decisions and better-operating capital markets. Providing it is reasonably reliable, current value accounting fulfils this role, since it provides up-to-date information about assets and liabilities, hence of future firm performance, and reduces the ability of insiders to take advantage of changes in asset and liability values.

Managers' legitimate interests are best served by information that is highly informative about their performance in running the firm, since this enables efficient compensation contracts and better working of managerial labour markets. Fair value accounting can improve reporting on stewardship since, ultimately, the manager is responsible for everything, including current value gains and losses. If the manager cannot earn an acceptable return on the fair value of net assets, these assets (or the manager) should be disposed of.

However, current value accounting can also interfere with reporting on stewardship. Current values are very volatile in their impact on reported earnings, and can even increase earnings volatility beyond the real volatility faced by the firm. Also, unless market values are readily available, current values may be more subject to bias and manipulation by the manager than historical cost-based information. If so, as noted in Section 1.4, contract efficiency is decreased. Both excess volatility and contract efficiency effects reduce the informativeness of earnings about manager stewardship. Thus, from a managerial perspective, a less volatile and more conservative income measure, such as one based on historical cost, or at least a measure that excludes certain unrealized gains, may better fulfil a role of motivating and evaluating managers.

Given that there is only one bottom line, the fundamental problem of financial accounting theory is how to design and implement concepts and standards that best combine the investor-informing and manager performance-evaluating roles for accounting information. In future, we will refer to combining these two roles of financial reporting as the **fundamental problem**.

Some policies require tradeoffs between these roles. For example, as described in Section 1.4, the investor-informing role of financial reporting (i.e., the measurement approach) puts less emphasis on reliability and conservatism than the manager performance-evaluating role envisaged by contract theory. Other policies, such as expanded disclosure, may facilitate both roles. In this regard, a 2008 IASB discussion paper, "*Preliminary Views on Financial Presentation*," proposed to dichotomize the balance sheet, income statement, and statement of cash flows into separate components for operating, financing, investing, and tax activities. One purpose is to improve investor decision making. However, separate

Theory in Practice 1.3

As a result of the September 11, 2001, terrorist attacks in the United States, numerous companies incurred substantial costs. For example, airlines were unable to fly for two days, and air traffic declined substantially for some time afterward.

The resulting reductions in revenue and profits could hardly be regarded as management's responsibility. Consequently, manager performance would best be measured by earnings *excluding* the costs of these catastrophic events. Yet, from the standpoint of investors who are interested primarily in *future* firm cash flows, earnings *including* these events have greater relevance.

In a 2001 news release, the FASB decided against allowing costs resulting from the attacks to be reported in a separate section of earnings. The FASB had originally considered allowing at least some costs to be reported separately, but came to the conclusion that it would be impos-

sible to reliably separate direct costs resulting from the attack (e.g., airlines' losses of revenue during the two-day shutdown) from operating costs, some of which would be reduced and some which were fixed. Also, some of these costs would be recovered through insurance and government assistance. Consequently, the FASB concluded that all costs resulting from September 11 be included in income from continuing operations, with any government assistance reported as a separate line item.

Thus, separate reporting of earnings best suited to evaluation of manager performance and best suited to investors foundered on concerns about reliability. Nevertheless, from a conceptual standpoint, these events illustrate the fundamental problem. Management performance and prospects for future firm performance are not necessarily best measured by the same net income number.

subtotals for operations and other important manager activities may also improve the reporting on stewardship, assuming responsible allocation by managers into the respective activity components.

Other comprehensive income (OCI) is another approach to reconciling the two roles. A statement of OCI was originally created in the United States by FASB's Statement of Financial Accounting Standards 130 (SFAS 130; 1997), now included in Accounting Standards Codification (ASC) 220-10-45.²⁷As mentioned earlier, standard setters have moved increasingly to current value accounting. However, we noted in Section 1.7 that management typically objects to inclusion in net income of unrealized gains and losses resulting from current value accounting. We can view OCI as a compromise to secure manager acceptance of current value standards, since it excludes these gains and losses from net income. Thus OCI includes unrealized current value gains and losses resulting from fair value accounting for securities, foreign currency translation adjustments, changes in some pension expense components, and several other items. As these gains and losses are realized or amortized, they are generally transferred to net income. The sum of net income and other comprehensive income is called **comprehensive income**.

Internationally, IAS 1 imposed a statement of other comprehensive income in 2009. It requires that other comprehensive income be included below net income in a single statement of comprehensive income, or immediately following net income if net income is shown as a separate statement. FASB standards now contain a similar requirement.

The extent to which modifications to the financial statement format will resolve the fundamental problem remains to be seen.

1.11 REGULATION AS A REACTION TO THE FUNDAMENTAL PROBLEM

There are two more basic reactions to the fundamental problem. One is, in effect, to ask, “What problem?” That is, why not keep regulation to the minimum needed to provide a stable environment for trade, resolution of disputes, and punishment for wrongdoing? Then, let market forces determine how much and what kinds of information firms should produce. We can think of investors and other financial statement users as demanders of information and of managers as suppliers. Just as in markets for apples and automobiles, the forces of demand and supply can determine the quantity produced.

This view argues, in effect, that market forces can sufficiently control the adverse selection and moral hazard problems so that investors are protected, and managerial labour markets and securities markets will work reasonably well. Indeed, as we shall see, there is a surprising number of ways for managers to credibly supply information. Furthermore, investors as a group are surprisingly sophisticated in ferreting out the implications of information for future firm performance. Consequently, according to this view, unregulated market prices reasonably reflect firm and manager value.

The second reaction is to turn to regulation to protect investors, on the grounds that information is such a complex and important commodity that market forces alone fail to adequately control the problems of moral hazard and adverse selection. This leads directly to the role of standard setting, which is viewed in this book as a form of regulation that lays down generally accepted accounting concepts and standards.

Of course, consistent with the theorem of Arrow (Section 1.2) and the arguments of Hobbes (Section 1.5), we cannot expect regulation to completely protect investors. Consequently, the rigorous determination of the right amount of regulation is an extremely complex issue of social choice. At the present time, we simply do not know which of the above two reactions to the fundamental problem is on the right track. Certainly, we witness lots of regulation in accounting, and there appears to be no slowing down in the rate at which new standards are coming on line. Consequently, it may seem that society is resolving the question of extent of regulation for us.

Yet, past years witnessed substantial deregulation of major industries such as transportation, telecommunications, financial services, and electric power generation, where deregulation was once thought unthinkable. The reason it is important to question the extent of regulation in accounting is that regulation has a cost—a fact often ignored by

standard setters. Again, the answer to the question of whether the benefits of regulation outweigh the costs is not known. However, we shall pursue this issue later in the book.

1.12 THE ORGANIZATION OF THIS BOOK

Figure 1.1 at the beginning of this chapter summarizes how this book operationalizes the framework for the study of financial accounting theory outlined above. There are four main components of the figure, which we outline in turn.

1.12.1 Ideal Conditions

Before considering the problems introduced into accounting by information asymmetry, it is worthwhile to consider what accounting would be like under ideal conditions. This is depicted by the leftmost box of Figure 1.1. By ideal conditions we mean an economy where firms' future cash flows and their probabilities are known. Also, the economy has perfect and complete markets or, equivalently, a lack of information asymmetry and other barriers to fair and efficient working of markets. Such conditions are also called "first best." Then, asset and liability valuation is on the basis of expected present values of future cash flows (i.e., value-in-use). Arbitrage ensures that present values and market values are equal. Investors and managers would have no scope for disagreement over the role of financial reporting and no incentives to call for regulation. Under such conditions, there would be no fundamental problem.

Unfortunately, or perhaps fortunately, ideal conditions do not prevail in practice. Nevertheless, they provide a useful benchmark against which more realistic "second best" accounting conditions can be compared. For example, we will see that there are numerous instances of the actual use of current value-based accounting techniques in financial reporting. Reserve recognition accounting for oil and gas companies is an example. Furthermore, fair value accounting is required for many financial instruments. A study of accounting under ideal conditions is useful not only because practice is moving to increased use of current values, but, more importantly, it helps us to see what the real problems and challenges of current value accounting are when the ideal conditions that it requires do not hold.

1.12.2 Adverse Selection

The top three boxes of Figure 1.1 represent the second component of the framework. This introduces the adverse selection problem. As discussed in Section 1.9, this is the problem of communication from the firm to outside investors. Here, the accounting role is to provide a "level playing field" through full disclosure of useful and cost-effective information to investors and other financial statement users.

To understand how financial accounting can help to control the adverse selection problem, it is desirable to have an appreciation of how investors make decisions. This is

because knowledge of investor decision processes is essential if the accountant is to know what information they need. The study of investment decision making is a large topic, since investors undoubtedly make decisions in a variety of ways, ranging from intuition, to “hot tips,” to random occurrences such as a sudden need for cash, to sophisticated computer-based models.

The approach we will take in most of this book is to assume that investors are rational on average; that is, the average investor makes decisions so as to maximize his/her expected utility, or satisfaction, from wealth. This theory of rational investment decision has been widely studied. In making the rationality assumption we do not imply that all investors make decisions this way. Indeed, there is increasing recognition that many investors do not behave rationally in the sense of maximizing their expected utility of wealth. We do claim, however, that the theory captures the average behaviour of those investors who want to make informed investment decisions, and this claim is backed up by substantial empirical evidence.

The reporting of information that is useful to rational investors is called the decision usefulness approach. As suggested in Section 1.2, this approach underlies the pronouncements (in particular, the Conceptual Framework) of major standard setting bodies.

1.12.3 Moral Hazard

The bottom three boxes of Figure 1.1 represent the third component of the book. Here, the information asymmetry problem is moral hazard, arising from the unobservability of the manager’s effort in running the firm. That is, the manager’s decision problem is to decide on how much effort to devote to running the firm on behalf of the shareholders. Since effort is unobservable, the manager may be tempted to shirk on effort. However, since net income reflects manager performance, it operates as an indirect measure of the manager’s effort decision. Consequently, the user decision problem is how to design financial reporting to motivate and evaluate manager performance. To be informative about performance, net income should be a precise and sensitive measure of this performance.

1.12.4 Standard Setting

We can now see the source of the fundamental problem more clearly. Current values of assets and liabilities are potentially of greater interest to equity investors than their historical costs since, if markets work reasonably well, current values provide the best available indication of future firm performance and investment returns. However, managers may feel that unrealized gains and losses from adjusting the carrying values of assets and liabilities to current value do not reflect *their own* performance. Accounting standard setters quickly get caught up in mediation between the conflicting preferences of investors and managers. This is depicted by the rightmost box in Figure 1.1.

1.12.5 The Process of Standard Setting

We have pointed out that, in practice, the setting of accounting concepts and standards requires negotiation and compromise. Also, their application must be enforced. We now give a brief description of the structure of accounting standard-setting bodies, to show how these requirements are operationalized.

The International Accounting Standards Board (IASB) The IASB was established in 2001, assuming standard setting responsibility from a predecessor body, the International Accounting Standards Committee. This earlier body was created in 1973 by agreement between accountancy bodies in Australia, Canada, France, Germany, Japan, Mexico, the Netherlands, the United Kingdom and Ireland, and the United States.

The IASB is supported financially by an oversight body, the International Financial Reporting Standards Foundation (IFRS Foundation). As a result, the IASB itself is independent from professional accounting bodies and business organizations in countries that have adopted IASB standards.

The basic objective of the IASB is to develop a single set of high-quality, understandable, and enforceable global accounting standards, now called International Financial Reporting Standards (IFRS). These standards are developed by a board of 16 individuals, most of whom serve on a full-time basis. They must possess technical skills and suitable international business and market experience, and are chosen to represent different world regions.

A majority of 10 of 16 votes is required to pass new standards, a requirement called **super-majority voting**. Super-majority voting decreases the possibility of approval of a standard that is only marginally acceptable to the Board, and also tends to produce a process of negotiation and compromise in the creation of a new standard. Dissenting members will be in a stronger position than they would be if only a simple majority was required and thus are less likely to feel that their views and concerns have been ignored.

In designing standards, the IASB follows **due process**. This includes: broad consultation with interested parties before admitting a topic to the Board's agenda; an investor outreach program; discussion papers, which normally precede exposure drafts of new standards; and assessment of the likely effects of new standards. In 2013, an Accounting Standards Advisory Forum was established, consisting of national standard setting bodies and other bodies with an interest in standard setting, to provide technical advice and feedback.

These various procedures enable interested parties, including management, to react and comment. Public hearings and field tests may also take place. Comments are analyzed and a revised standard is prepared. A statement of basis for conclusions is issued to explain the standard. Representation of diverse constituencies and regions on the Board and super-majority voting also contribute to due process. Post-implementation reviews of new standards are also carried out. Note that following due process is consistent with a need for compromise and negotiation in setting accounting standards.

Many countries, including Canada in 2011, have adopted IASB standards, as has the European Union in 2005. Other adopters include Australia, Israel, Mexico, Russia, South Korea, and many countries in South America and Southeast Asia. Other countries, such as United States, China, Japan, and India, are considering, or are in process of, adoption.

The Financial Accounting Standards Board (FASB) The FASB was established in 1973 to assume from earlier bodies the role of standard setting in the United States. Similar to the IASB, the FASB is supported financially by an oversight body, the Financial Accounting Foundation (FAF).

The FASB's mission is to establish and improve standards of financial accounting and reporting for the guidance and education of the public. To accomplish this, it develops accounting concepts, strives to improve the usefulness of financial reporting, keeps standards current to reflect changes in the business and economic environment, addresses financial reporting deficiencies, improves the understanding of the nature and purpose of information contained in financial reports, and promotes international convergence of accounting standards.

The FASB consists of seven board members, appointed for a maximum of two five-year terms. Collectively, they must have knowledge and experience in investing, accounting, finance, business, education and research; and a concern for investors, other financial statement users, and the public interest. Unlike the IASB, a simple majority vote is required to pass a new standard.

The FASB, like the IASB, is independent of other business and professional organizations. For example, the FASB is distinct from the American Institute of Certified Public Accountants (AICPA), the major American professional accounting body. While the AICPA is one of the sponsoring bodies and endorses FASB standards, many other bodies are also involved in sponsoring the FASB.

In 2002, the FASB established a User Advisory Council. This is a group of over 40 investment professionals that assists the FASB in raising awareness of how investors, analysts, and rating agencies use financial information and how to better design accounting standards to meet their needs.

In setting and updating accounting and reporting concepts and standards, the FASB, like the IASB, places heavy emphasis on due process. Procedures for initiating and adopting new standards are broadly similar to those of the IASB outlined above. Also, the IASB and FASB have been working since 2002 to converge their standards, with substantial progress to date. Convergence is considered further in Section 13.7.1.

The Canadian Accounting Standards Board (AcSB) The AcSB is the Canadian accounting standard setting body. It is authorized by the Board of Governors of the Canadian Institute of Chartered Accountants to publish reports "on its own responsibility," in order to give it a measure of independence from the CICA itself and reduce the possibility of interference in its deliberations. This organizational structure differs from that of the IASB and FASB, which, as mentioned, are independent of related professional organizations.

The AcSB consists of a maximum of nine members, chosen to represent diverse constituencies. Unlike the IASB and FASB, members, with the exception of the Chairperson, serve on a voluntary basis. For publicly accountable enterprises, the *CICA Handbook* now primarily contains IASB standards. To pass a new standard, a super-majority of two-thirds of Board members voting in favour is required.

With its adoption of IASB accounting standards in 2011, the activities of the AcSB have changed somewhat. The Board gives increased attention to special problems of financial reporting for non-publicly accountable enterprises (which do not necessarily report under the same GAAP as publicly traded firms) and to not-for-profit enterprises. Also, the Board will continue to take part in the setting of international standards, through IASB representation and contributions to the development of concepts and new IFRSs.

Securities Commissions If standard setting bodies are to achieve their objectives, financial statements must adhere to GAAP. Adherence to GAAP is accomplished in a variety of ways. Ethical behaviour by managers and accountants is obviously desirable. Also, as we shall see, securities markets and managerial labour markets are important contributors to responsible reporting. When these motivations fail, enforcement takes over. Discipline committees of professional accounting bodies play an important enforcement role, as does the prospect of legal liability for reporting failures.

From our perspective, securities commissions are one of the most important enforcers of accounting standards. Notable among these is the SEC in the United States. Its creation, and its delegation of standard setting to the FASB, were outlined in Section 1.2. However, the SEC also fulfils an important enforcement role, by investigating firms and managers for failures to adhere to GAAP and prosecuting and penalizing them if appropriate. The SEC's reach extends to many Canadian and other foreign firms whose shares are traded in the United States. We shall see several examples of the SEC's enforcement activities in this book.

The SEC also issues accounting standards, mainly for disclosures outside of the financial statements. These include management discussion and analysis, and disclosures of management compensation, which will be discussed in later chapters.

In Canada, securities regulation is a provincial jurisdiction. Consequently, Canada does not at present have a national securities regulator. However, the provincial and territorial securities regulators have created the Canadian Securities Administrators (CSA), a forum to coordinate and harmonize Canadian capital markets regulation. Its mission includes the protection of investors, securing the proper working of capital markets, and reducing risk. One of its regulations is National Instrument NI 52-109, imposing management disclosures of internal control effectiveness similar to those of the Sarbanes-Oxley Act in the United States. Of the provincial securities commissions, the most important is the Ontario Securities Commission (OSC).

The International Organization of Securities Commissions (IOSCO) represents the world's securities regulators, including Canadian regulators and the SEC. It recommends to its members that they use IASB standards, although individual member countries may require reconciliation of IASB standards with their own GAAP. For example, foreign

firms that wish to trade their securities in the United States must meet SEC requirements. These include filing financial statements with the SEC either in accordance with IASB GAAP or with U.S. GAAP.²⁸

Unlike domestic securities commissions, the IOSCO, hence the IASB, do not have authority to enforce IASB standards. Enforcement is up to the authorities in the respective jurisdictions that adopt these standards.²⁹ Consequently, analysis of financial statements from foreign jurisdictions should include careful awareness of local customs and business practices, and the legal and other institutional characteristics of those jurisdictions. Research shows that even in the presence of the same set of accounting standards (i.e., IASB standards), the quality of financial reporting varies across countries. Some of this research is discussed in Chapter 13.

1.13 RELEVANCE OF FINANCIAL ACCOUNTING THEORY TO ACCOUNTING PRACTICE

The framework just described provides a way of organizing our study of financial accounting theory. However, this book also recognizes an obligation to convince you that the theory is relevant to accounting practice. This is accomplished in two main ways. First, the various theories and research underlying financial accounting are described and explained in plain language, and their relevance is demonstrated by means of numerous references to accounting practice. For example, Chapter 3 describes how investors may make rational investment decisions, and then goes on to demonstrate that this decision theory underlies the Conceptual Framework. Theory in Practice vignettes, which illustrate the theories more explicitly, are scattered throughout the book. Also, the book contains numerous instances where accounting standards are described and critically evaluated. In addition to enabling you to learn some of the contents of these standards, you can better understand and apply them when you have a grounding in the underlying reasoning on which they are based. The second approach to demonstrating relevance is through assignment problems. A concentrated attempt has been made to select relevant problem material to illustrate, motivate, and extend the concepts.

Recent years have been challenging, even exciting, times for financial accounting theory. We have learned a tremendous amount about the important role of financial accounting in our economy from the information economics research outlined above. If this book enables you to better understand and appreciate this role, it will have attained its objective.

Notes

1. For some information about Paciolo, a translation of his bookkeeping treatise, and a copy of an Italian version, see *Paciolo on Accounting*, by R. Gene Brown and Kenneth S. Johnston (1963).
2. Readers with a mathematical background will recognize these relationships as related to the fundamental theorem of calculus.

3. The dropping of these requirements did not mean that firms should not supply information to shareholders, but that the amount and nature of the information supplied was a matter between the firm and its shareholders. In effect, it was felt that market forces, rather than a legal requirement, were sufficient to motivate information production.
4. Actually, MN posed a much deeper question. Widespread share ownership had long been seen as a way of reconciling increasingly large and powerful corporations with the popular belief in individualism, property rights, and democracy, whereby the “little guy” could take part in the corporate governance process. With the 1929 crash and subsequent revelation of manipulative abuses, a new approach was required that would both restore public confidence in securities markets and be acceptable to powerful corporate interest groups. MN suggest that the creation of the SEC was an embodiment of such a new approach.
5. As an example of one longstanding practice, Montgomery (1912, pp. 191–192) criticized the practice of many firms of valuing capital assets on the basis of appraisals, often using the recorded gains as a source of dividends. A related practice was **watered stock**, under which assets were valued at the par value of stock issued to acquire the assets, when the value of the acquired assets was much lower. For a critical discussion of watered stock, see Hatfield (1927, pp. 208–209). Another practice was the creation of **secret reserves**, under which assets were undervalued and/or liabilities overstated. Then, losses were charged against the reserves (that is, charged against the asset or liability account) rather than to expense, typically without any disclosure to investors. Hatfield (pp. 319–323) also discusses this practice.
Perhaps surprisingly, however, May (1943, pp. 53–58) discusses the effects of accounting abuses leading up to the 1929 crash, and argues “inadequate or misleading reports played but a relatively unimportant part in causing the catastrophic losses that were sustained.”
6. This is not to say that the SEC stands aloof from accounting standards. If it perceives that standards as set by the profession are straying too far from what it wants, the SEC can bring considerable pressure to bear short of taking over the process. In this regard, see Note 7. The SEC reaffirmed its delegation of standard-setting to the FASB in 2003.
7. The controversy over the investment tax credit in the United States provides an excellent example. The 1962 Revenue Act provided firms with a credit against taxes payable of 7% of current investment in capital assets. The controversy was whether to account for the credit as a reduction in current income tax expense or to bring all or part of it into income over the life of the capital assets to which the credit applied. The Accounting Principles Board (the predecessor body to the FASB) issued APB2, requiring the latter alternative. The SEC, however, objected and issued its own standard, allowing greater flexibility in accounting for the credit. The Accounting Principles Board backed down and issued APB4 in 1964 allowing either alternative. The basic problem, as seen by the standard setters, was the lack of a set of basic accounting concepts from which the correct accounting for the credit could be deduced.
8. For a detailed description of the search for basic accounting concepts in the United States from the inception of the SEC to the 1990s, see Storey and Storey (1998).
9. Subsequently, the search for concepts changed to a search for a conceptual framework. This framework is introduced below, and discussed more fully in Section 3.2.
10. IASB standards use the term “profit or loss” rather than “net income.” In this book, we will use “net income” or, if the context is clear, “earnings.”
11. The American Accounting Association is comprised of academic accountants. It does not have standard setting authority as does the FASB. Nevertheless, professional accountants later picked up on the decision usefulness concept. See American Institute of Certified Public Accountants Study Group on the *Objectives of Financial Statements* (1973), also called the Trueblood Committee Report.

12. The Canada Business Corporations Act in effect confers power on the AcSB to set accounting standards. This is somewhat different from the United States, where the SEC, not the FASB, has ultimate power (see Notes 6 and 7). However, the two situations are similar in that it is the elected governments that have ultimate power over accounting standards. In Canada, this became evident in the “PIP Grant” controversy of 1982. Several large Canadian oil companies disagreed with the deferred recognition of these grants as laid down in the *CICA Handbook*, demanding immediate recognition of the grants in earnings instead. They took their case to the government, which agreed with them. The government threatened legislation to override the provisions of the *Handbook*. The AcSB held its ground and the government eventually backed down. Nevertheless, it was clear where the ultimate power over accounting standards lay. For a detailed account of this controversy, see Crandall (1983).
13. IASB standards are called International Financial Reporting Standards (IFRS), beginning with IFRS 1 (2003). Standards issued prior to that time were called International Accounting Standards (IAS), and, unless replaced, still retain their original titles and authority.
14. In this book, we will often use the word “reliable” in an intuitive sense. That is, reliable information is information that financial statement users can trust. This is the sense in which it is used in this chapter. However, standard setters envisage reliability as a more complex concept. According to the Conceptual Framework, financial statement information should “faithfully represent” what it is intended to represent. That is, there should be a correspondence between the accounting valuation or description of an item and the real item the information represents. The Framework rejects the term *reliability*, explaining that reliability means different things to different people, and the term *faithful representation* reduces ambiguity. In this book, we will usually use the term *reliability* as meaning faithful representation, because the term is shorter and because of its familiarity from past usage. Further discussion of reliability is given in Sections 2.2 and 3.7.1.
15. The IASB and FASB are currently engaged in a joint revenue recognition project, intended to simplify and unify the recognition of revenue. In 2011, the project issued an exposure draft that would require firms to separate distinct performance obligations in contracts with customers (e.g., a machine sold along with a maintenance agreement would contain two such obligations). The total revenue expected from a contract is then allocated to its distinct performance obligations. Revenue is generally recognized when, or as, the customer attains control over the contracted good or service. If the expected cost of meeting a performance obligation greater than one year exceeds its expected revenue, the contract is deemed “onerous,” and an expense and associated liability are recognized. The proposed standard also requires extensive supplementary disclosures, such as the assumptions and judgments made in determining expected revenues, when the customer attains control, and when a contract is onerous.
16. For further discussion of Enron’s business model, see Healy and Palepu (2003).
17. Asset-backed securities can be backed by several asset types such as mortgages (**mortgage-backed securities**), commercial real estate, credit card debt, student loans, and other receivables.
18. Proceeds of tranche sales could be flowed back to the sponsor to enable it to buy still more mortgages and other financial assets for securitization.
19. SIVs that issued ABCP were called “conduits.”
20. This incentive would be reduced to the extent that the market looked through the lack of consolidation and valued the sponsor and its VIEs as one entity. Landsman, Peasnell, and Shakespeare (2008) report evidence that the market did do this. Also, Niu and Richardson (2006) examined the relationship between off-balance sheet financing and the market’s evaluation of firm risk. They found that more off-balance sheet financing was associated with higher risk. Both of these studies suggest that, at least to some extent, investors add back off-balance sheet financing to the firm’s balance sheet even without consolidation. Despite these findings, avoiding consolidation would be of crucial importance to financial institutions facing capital adequacy regulations.

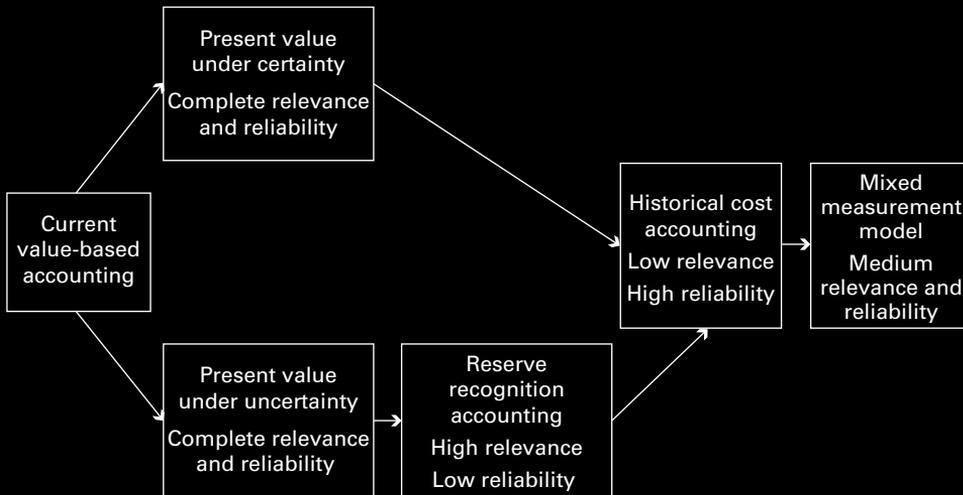
21. In Canada, Accounting Guideline 15, “Consolidation of Variable Interest Entities” (2004), was similar to FIN 46. Consolidation under IASB standards was governed by Standing Interpretations Committee Interpretation 12, (SIC 12) “Consolidation-Special Purpose Entities” (1998). Since the market meltdown of asset-backed securities originated in the United States, we concentrate on FIN 46 here.
22. The **liquidity** of a security is the extent to which investors can quickly and at reasonable cost buy or sell any quantity of that security without affecting its market price. A **liquid market** is a market composed of liquid securities. The liquidity of a market is a matter of degree.
 Liquidity is a composite of market **depth**—the quantity of a security that investors can buy or sell without affecting its market price—and the **bid–ask spread**—the contemporaneous difference between the buying price and selling price of the security. Both of these components are measures of information asymmetry. The greater that investor concern is about their information disadvantage, the more likely they are to leave the market or, if they stay, the less they are willing to pay relative to the ask price.
 Liquidity risk is thus the risk that market depth and/or bid–ask spread change, thereby changing costs to buy or sell. Certainly, this risk materialized on the downside during the market meltdowns. When this happens, the market is said to be in a state of **liquidity pricing**.
23. This argument derives from the **folk theorem** of game theory. In its simplest form, this theorem states that for a non-cooperative game that is repeated indefinitely, without discounting of future payoffs, a cooperative solution can be attained if the players adopt a rational strategy. In our context, the rational strategy is for the accountant to forgo a short-term gain resulting, say, from bending or violating GAAP to please the client. The accountant will forgo the short-term gain if the strategy of the other players (investors, standard setters, lawmakers, courts) is to sufficiently punish the accountant for deviating from the cooperative strategy. That is, in this broader perspective, the accountant’s payoffs are higher if he/she acts cooperatively.
 The folk theorem originated in the 1960s. It is so named because it is not known who established it first. Subsequently, game theorists have strengthened the theorem, for example by deriving conditions under which the theorem can be extended to finite periods, and with some discounting. See Friedman (1986), pp. 103–104. See also Robert Aumann’s 2005 Nobel Prize Lecture (http://nobelprize.org/nobel_prizes/economics/laureates/2005/aumann-lecture.html).
 It should be noted, however, that while the folk theorem can produce ethical behaviour, the two mindsets are different. Ethical behaviour is driven by a desire to do the right thing. Folk theorem is driven by a rational calculation by the players that if they deviate from the cooperative solution they will be sufficiently punished.
24. By full disclosure, we do not mean that the financial statements should disclose “everything.” This could be very costly, for example, if disclosure revealed valuable information to competitors and/or generated uncertainty about how different individuals or groups might react. Rather, by full disclosure we mean disclosure that does not create a wrong impression. Wrong impressions can be created by, for example, hiding information, delaying its release, biasing valuations, or using overly complex and ambiguous wording.
25. Indeed, the constitution of the IASB commits this body to principles-based standards. While IASB and FASB standards often seem similar, FASB standards are typically accompanied by a mass of detailed underlying rules and guidance, unlike IASB standards.
26. This argument is based on the 1969 court case *U.S. v. Simon*, under which the auditors of Continental Vending Machine Corporation were charged with certifying financial statements that they knew were false. As Ball describes, Continental’s balance sheet included an uncollectible account receivable from an affiliated company. Some disclosure was provided in the financial statement notes, and the auditor argued that the financial statements were thus in accordance with GAAP. However, the disclosure was ambiguous. The courts ruled that technical accordance with GAAP was not sufficient to relieve the auditor of liability if the financial statements did not fairly represent financial position.

27. FASB accounting standards are now included in the *Accounting Standards Codification* (ASC; 2009). When we refer to a FASB standard as originally introduced, we denote it by its original title, as is the case here. When we refer to a FASB standard as it currently exists, we will give its ASC reference. Sometimes, we give both.
28. In Canada, IASB-based financial statements of foreign firms are accepted without the need to reconcile to Canadian GAAP, under National Instrument 52-107 (2004) of the CSA. For Canadian firms with shares traded in the United States, the Multi-jurisdictional Disclosure System allows them to file SEC reports using the documents they file in Canada, and vice versa. Canadian firms taking advantage of the Multi-jurisdictional Disclosure System must meet the requirements of the Sarbanes-Oxley Act.
29. However, through its 2002 Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information, IOSCO facilitates consultation, cooperation, and the exchange of information for the consistent enforcement of securities regulations.

Chapter 2

Accounting Under Ideal Conditions

Figure 2.1 Organization of Chapter 2



2.1 OVERVIEW

We begin our study of financial accounting theory by considering the present value model. This model provides the utmost in relevant information to financial statement users. In this context, we define *relevant information* as information about the firm's future economic prospects—that is, its dividends, cash flows, and profitability.

Our concern is with the conditions under which relevant financial statements will also be reliable, where reliable information faithfully represents the firm's financial position and results of operations. We will also explore the conditions under which market values of assets and liabilities can serve as indirect measures of present value. This will be the case under ideal conditions (to be defined later). If conditions are not ideal (which is usually the case), fundamental problems are created for asset valuation and income measurement.

Figure 2.1 outlines the organization of this chapter.

2.2 THE PRESENT VALUE MODEL UNDER CERTAINTY

The present value model is widely used in economics and finance and has had considerable impact on accounting over the years. We first consider a simple version of the model under conditions of certainty. By “certainty” we mean that the future cash flows of the firm and the interest rate in the economy are publicly known with certainty. We denote these as **ideal conditions**.

Example 2.1

Illustration of the Present Value Model Under Certainty

Consider P.V. Ltd., a one-asset firm with no liabilities. Assume that the asset will generate end-of-year cash flows of \$150 each year for two years and then will have zero value. Assume also that the interest rate in the economy is 10%. Then, at time 0 (the beginning of the first year of the asset’s life), the present value of the firm’s future cash flows, denoted by PA_0 , is

$$PA_0 = \frac{\$150}{1.10} + \frac{\$150}{1.10^2} = \$136.36 + \$123.97 = \$260.33$$

We can then prepare a present value opening balance sheet as follows:

P.V. Ltd.			
Balance Sheet			
Time 0			
Capital asset, at present value	<u>\$260.33</u>	Shareholders’ equity	<u>\$260.33</u>

The firm’s income statement for year 1 is

P.V. Ltd.	
Income Statement	
For Year 1	
Accretion of discount	<u>\$26.03</u>

Since future net revenues are capitalized into asset value, net income is simply interest on the opening asset value, just as income from a savings account is interest on the opening account balance.¹ Thus, net income for the year is equal to $PA_0 \times 10\% = \$260.33 \times 10\% = \26.03 . This amount is called **accretion of discount**. The term arises because the stream of cash receipts is one year closer at the end of the year than it was at the beginning.²

At the end of year 1, the present value of the remaining cash flows from the firm's asset is

$$PA_1 = \frac{\$150}{1.10} = \$136.36$$

Then, the end-of-year-1 balance sheet is

P.V. Ltd.			
Balance Sheet			
End of Year 1			
Financial Asset		Shareholders' Equity	
Cash	\$150.00	Opening value	\$260.33
Capital asset, at present value	<u>136.36</u>	Net income	<u>26.03</u>
	<u>\$286.36</u>		<u>\$286.36</u>

This assumes that the firm pays no dividend. A dividend can be easily incorporated by reducing cash and shareholders' equity by the amount of the dividend.

Note the following points about Example 2.1:

1. The net book value of the capital asset at any year-end is equal to its present value, or value-in-use (see the discussion of value in use in Section 1.2), where value-in-use is here determined as the present value of the future cash flows from that asset, discounted at 10%.
2. The \$26.03 accretion of discount is also referred to as *ex ante*, or expected net income, since, at time 0, the firm expects to earn \$26.03. Of course, since all conditions are known with certainty, the expected net income will equal the *ex post*, or realized net income.
3. **Relevant** financial statement information gives information to investors about the firm's future economic prospects. The information in Example 2.1 is entirely relevant. To see this, note first that, fundamentally, economic prospects are defined by the firm's stream of future dividends—it is dividends that provide a payoff to investors, the present value of which serves to establish firm value.

Then, it might seem that the firm's dividend policy will affect its value, since the timing of dividends will affect their present value. However, under ideal conditions, this is not the case, due to **dividend irrelevancy**.

To see why dividend policy does not matter under ideal conditions, note that as long as investors can invest any dividends they receive at the *same rate* of return as the firm earns on cash flows *not* paid in dividends, the present value of an investor's

overall interest in the firm is independent of the timing of dividends. This holds in our example since there is only one interest rate in the economy. In effect, the firm's cash flows establish the size of the "pot" that is ultimately available to investors, and it does not matter if this pot is distributed sooner or later. If it is distributed during the current year, investors can earn 10% on the distributions. If it is distributed in a subsequent year, the firm earns 10% on amounts not distributed, but this accrues to investors through an increase in the value of their investment. The present value to the investor is the same either way.

Under dividend irrelevancy, cash flows are just as relevant as dividends, because cash flows establish the firm's dividend-paying ability. As a result, the financial statements under Example 2.1 are entirely relevant.

4. As an accountant, you might be wondering why the firm's net income seems to play no role in firm valuation. This is quite true—it doesn't, under ideal conditions. The reason is that future cash flows are known and hence can be discounted to provide balance sheet valuations. Net income is then perfectly predictable, being simply accretion of discount as pointed out above. In effect, under ideal conditions, the balance sheet contains all the relevant information and the income statement contains none.³ Even though net income is "true and correct," it conveys no information because investors can always figure it out by multiplying the opening balance sheet value by the interest rate. To put this another way, there is no information in the current net income that helps investors predict future economic prospects of the firm. These are already known to investors, and capitalized into asset valuation, by assumption. This is an important point, and we shall return to it later. For now, suffice it to say that when ideal conditions do not hold, the income statement assumes a much more significant role.
5. **Reliable** financial statement information faithfully represents what it is intended to represent (see Chapter 1, Note 14). For example, the balance sheet valuation of capital assets and resulting amortization would not be reliable if operating expenses are capitalized, as in the case of WorldCom described in Section 1.2. Nor would the valuation of long-term debt be reliable if some debt is off balance sheet, as it was in the case of many financial institutions leading up to the 2007–2008 market meltdowns described in Section 1.3.

The information in Example 2.1 is entirely reliable, since we have assumed that future cash flows and the interest rate are known with certainty. Then, balance sheet valuations faithfully represent the real underlying assets and liabilities of the firm. Any attempt by management to hide assets and liabilities, or bias inputs into the present value calculations, and any calculation errors, would be immediately discovered since the various inputs are publicly known.

6. Under the ideal conditions of future cash flows known with certainty and the economy's risk-free interest rate given, the present value of an asset or liability will equal its market value. In terms of the different versions of current value accounting

outlined in Section 1.2, value in use and fair value (exit value) are equal. To see this, consider the following argument: Given an interest rate of 10%, no one would be willing to pay more than \$260.33 for P.V.'s asset at time 0—if they did, they would be earning less than 10%. Also, the owners of the asset would not sell it for less than \$260.33—if offered less than \$260.33, they would be better off to retain it and earn 10%. If they needed the money they could borrow at 10% against the asset as security. Thus, the only possible equilibrium market price is \$260.33. This argument is a simple example of the principle of **arbitrage**. If market prices for identical goods and services are such that it is possible to make a profit by simply buying in one market and selling in another, these are called arbitrage profits. However, it seems reasonable to expect that, if future cash flows and the risk-free rate are publicly known, the scramble of self-interested individuals to make these quick profits would eliminate any price discrepancies.⁴

7. As P.V. Ltd. owns only one asset and has no liabilities, the firm's market value would also be \$260.33 at time 0, being the sum of the financial assets⁵ and the present value of future cash receipts from the capital asset. Thus, the total market value of P.V.'s shares outstanding would be \$260.33. In more general terms, if a firm has more than one asset, the market value of the firm would be the sum of the value of its financial assets plus the present value of the joint future receipts from its capital assets, including intangibles, less the present value of any liabilities. At points in time after time 0, the firm's market value continues to equal the sum of its financial assets plus capital assets, net of liabilities. Note, however, that dividend policy affects the amount of financial assets. To the extent that the firm does not pay out all of its profits in dividends, its market value will include the return on reinvested assets. Question 1, at the end of this chapter, illustrates this point. See also the discussion of dividend irrelevancy above.

2.2.1 Summary

The purpose of Example 2.1 is to demonstrate that under the ideal conditions of future cash flows known with certainty and a given interest rate in the economy, it is possible to prepare completely relevant and reliable financial statements. The process of arbitrage ensures that the market value of an asset equals the present value of its future cash flows. The market value of the firm is then the value of its net financial assets plus the value of its capital assets (less other liabilities).

2.3 THE PRESENT VALUE MODEL UNDER UNCERTAINTY

It is instructive to extend the present value model to the presence of uncertainty. With one major exception, the concepts carry over from Example 2.1.

Example 2.2

Illustration of the Present Value Model Under Uncertainty

Let us continue Example 2.1, taking into account that the economy can be in a “bad” state or a “good” state during each year. If it is in the bad state, end-of-year cash flows will be \$100 for the year. If it is in the good state, however, end-of-year cash flows will be \$200 for the year.

Assume that during each year the bad state and the good state each occur with probability 0.5. Our assumption that state probabilities are the same each year implies that the state realizations are independent. That is, the state realization in year 1 does not affect the probabilities⁶ of state realization in year 2.

Uncertain future events that affect firm performance, such as the state of the economy, are called **states of nature**, or **states** for short. Thus, the states in this example are for each year:

State 1 Economy is bad (low firm performance of \$100).

State 2 Economy is good (high firm performance of \$200).

Note that no one can control which of the states is realized—this is why they are called states of *nature*. Other examples of states that affect cash flows are weather, government policies, strikes by suppliers, equipment breakdowns, etc. In any realistic situation there will be a large number of possible states. However, our two-state example is sufficient to convey the idea—states of nature are a conceptual device to model those uncertain, uncontrollable future events whose realizations affect the cash flows of the firm.

While at time 0 no one knows which state will occur, we assume that the set of possible states is publicly known and complete. That is, every possible event that can affect cash flows is known to everyone, and everyone knows that everyone knows.⁷ Thus, while no one knows for sure which state will occur, it is known that whatever state does happen must be an element of the set. Furthermore, we assume that the state realization is publicly observable—everyone will know which state actually happens. Finally, we assume that the state probabilities are **objective** and publicly known. That is, everyone has the same state probabilities. By objective we mean that if we imagine a long-run sequence of repetitions of our two-period economy, the bad state will occur with relative frequency 0.5 (or whatever other state probability we were to assume). Think by analogy of rolling a pair of fair dice. We know that the probability of a seven, say, is $1/6$, and that if we were to roll the dice a large number of times a seven would appear with relative frequency $1/6$. Thus, $1/6$ is an objective probability of rolling seven, just as 0.5 is an objective probability that the economy is in a good state this period and that firm performance will thus be high. Note that an implication of objective probabilities here is that any particular outcome tells us nothing about what the state probabilities are—these are already known by assumption. Thus, the probability of a seven on the next roll of the dice remains at $1/6$, just as the probability of the good state remains at 0.5 in this example, regardless of the state realization this period.

These assumptions extend the concept of ideal conditions, also called “first-best” conditions, to take uncertainty into account. To summarize,⁸

Ideal conditions under uncertainty are characterized by (1) a given, fixed interest rate at which the firm’s future cash flows are discounted, (2) a complete and publicly known set of states of nature, (3) state probabilities objective and publicly known, and (4) state realization publicly observable.

Another way to think about ideal conditions is that they are similar to conditions of certainty except that future cash flows are known *conditionally* on the states of nature. That is, *if* state 1 happens, then firm performance will be low, with cash flows of \$100, etc. We will assume that P.V. Ltd.’s future cash flows are discounted at 10%.

Be sure you realize that while investors know the set of possible states of nature and their probabilities, they do not know which state will actually occur (or has already occurred, such as the state of the economy, but this is not known until period end). The risk arising from not knowing which state of nature will happen is called **estimation risk**. More generally, estimation risk arises when a decision maker is uncertain about the values of underlying parameters affecting his/her decision, such as, in this example, the state of the economy.

Given these ideal conditions, we can now calculate the **expected present value** of P.V.’s future cash flows at time 0:

$$\begin{aligned}
 PA_0 &= 0.5 \left(\frac{\$100}{1.10} + \frac{\$200}{1.10} \right) + 0.5 \left(\frac{\$100}{1.10^2} + \frac{\$200}{1.10^2} \right) \\
 &= (0.5 \times \$272.73) + (0.5 \times \$247.93) \\
 &= \$136.36 + \$123.97 \\
 &= \$260.33
 \end{aligned}$$

We can then prepare P.V.’s opening balance sheet as follows:

P.V. Ltd.			
Balance Sheet			
Time 0			
Capital asset, at expected present value	<u>\$260.33</u>	Shareholders’ equity	<u>\$260.33</u>

It is worthwhile to ask whether the time 0 market value of the asset, and hence of the firm, would be \$260.33, as per the balance sheet. It is tempting to answer yes, since this is the firm’s expected value given dividend irrelevance. But uncertainty introduces an additional consideration not present in the certainty model of Section 2.2. This is that investors may be averse to risk. While the *expected* value of the firm is \$260.33 at time 0, it is shown below that the expected value of the firm at the *end* of year 1 will be \$236.36 or \$336.36, depending on whether the bad state or the good state happens in that year. Ask yourself whether you would be indifferent between having \$260.33 in

your pocket or a 50/50 gamble of \$236.36 or \$336.36. The present value of the 50/50 gamble is

$$\begin{aligned}
 PA_0 &= 0.5 \times \frac{\$236.36}{1.10} + 0.5 \times \frac{\$336.36}{1.10} \\
 &= (0.5 \times \$214.87) + (0.5 \times \$305.78) \\
 &= \$107.44 + \$152.89 \\
 &= \$260.33
 \end{aligned}$$

the same as the sure thing. But, most people would prefer the sure thing, because it is less risky. Then, the market value of the firm will be less than \$260.33, since to the extent that investors are collectively risk averse they will value the risky firm at less than its present value. In this chapter, we will ignore this complication by assuming that investors are risk neutral. That is, they are indifferent between the sure thing and the 50/50 gamble above. Then, the firm's market value will be \$260.33 at time 0. This assumption of risk-neutral investors will be relaxed later, since accountants have a role to play in informing investors about the firm's riskiness as well as its expected value. The concept of a risk-averse investor is introduced in Section 3.4 and the impact of risk on firm valuation is shown in Section 4.5. For now, suffice it to say that the expected value of future cash flows or, more generally, future firm performance, is relevant for investors irrespective of their attitudes to risk.

Given risk-neutral valuation, the arbitrage principle will ensure that the market value of the firm's asset, and of the firm itself, is \$260.33. The arbitrage principle would still hold if investors were averse to risk but the market value would be driven to an amount less than \$260.33.

To return to the example, accretion of discount is now based on *expected* net income for year 1, calculated as $0.10 \times \$260.33 = \26.03 .

The major difference between the uncertainty and certainty cases is that *expected net income and realized net income need not be the same under uncertainty*. To analyze this further, assume that the year 1 state realization is a bad economy. Thus *realized* cash flows in year 1 are \$100, whereas *expected* cash flows were $0.5 \times 100 + 0.5 \times 200 = \150 . Realized net income is then the sum of expected net income plus the difference between expected and actual cash flows, as per the following income statement:

The negative \$50 of unexpected cash flows results in a \$50 "shock" to earnings for the year. The negative \$50 earnings shock is called **abnormal earnings**, or, equivalently,

P.V. Ltd.			
Income Statement			
(bad economy)			
Year 1			
Accretion of discount ($0.10 \times \$260.33$)			\$26.03
Less: Abnormal earnings, as a result of bad-state realization:			
Expected cash flows ($0.5 \times \$100 + 0.5 \times \200)	\$150.00		
Actual cash flows	<u>100.00</u>		<u>50.00</u>
Net loss			<u>\$23.97</u>

unexpected earnings, since it reduces expected earnings of \$26.03 to a loss of \$23.97. Under uncertainty, net income consists of *expected* net income plus or minus abnormal earnings for the year.⁹

Now, at the end of year 1, the expected present value of the remaining cash flows from the asset is

$$PA_1 = 0.5 \left(\frac{\$100}{1.10} + \frac{\$200}{1.10} \right) = \$136.36$$

The year-end balance sheet is as follows:

P.V. Ltd.			
Balance Sheet (bad economy) End of Year 1			
Financial Asset		Shareholders' Equity	
Cash	\$100.00	Opening value	\$260.33
Capital Asset		Net loss	<u>23.97</u>
End of year value	<u>136.36</u>		
	<u>\$236.36</u>		<u>\$236.36</u>

Again, arbitrage ensures that the market value of the asset is \$136.36 and of the firm is \$236.36 at time 1. We continue the assumption that the firm pays no dividend. Ideal conditions ensure that it makes no difference whether the firm pays a dividend or not, as in the certainty case. In other words, dividend irrelevancy continues to hold. Question 4 pursues this point.

It should be noted that in our example abnormal earnings do not **persist**. That is, their effect dissipates completely in the year in which they occur. In general, this need not be the case. For example, if the bad-state realization was due to, say, a market meltdown that affected economic activity, the abnormal effect on earnings may persist for several periods. We ignore this possibility here to keep the example simple. However, we will return to the concept of persistence in Chapters 5 and 6.

Now, let's consider the accounting if the state realization is a good economy. The year 1 income statement is as follows:

P.V. Ltd.	
Income Statement (good economy) Year 1	
Accretion of discount	\$26.03
Add: Abnormal earnings, as a result of good-state realization (\$200 – \$150)	<u>50.00</u>
Net income	<u>\$76.03</u>

The abnormal earnings of \$50 is the difference between actual and expected cash flows for year 1, and these abnormal earnings increase expected earnings of \$26.03 up to a profit of \$76.03.

At the end of year 1, the present value of the remaining cash flows is still \$136.36. The year-end balance sheet is as follows:

P.V. Ltd.			
Balance Sheet			
(good economy)			
End of Year 1			
Financial Asset		Shareholders' Equity	
Cash	\$200.00	Opening value	\$260.33
Capital Asset		Net income	<u>76.03</u>
End of year value	<u>136.36</u>		
	<u><u>\$336.36</u></u>		<u><u>\$336.36</u></u>

Again, arbitrage ensures that the firm's market value at time 1 will be \$336.36, given risk-neutral investors.

Note the following points about Example 2.2:

1. It continues to be the case that financial statement information is both completely relevant and completely reliable. Relevance holds because balance sheet values are based on expected future cash flows, and dividend irrelevancy holds. Reliability holds because ideal conditions ensure that present value calculations faithfully represent the firm's expected future cash flows.

Note that financial statement reliability and **volatility** are different concepts. While present value calculations are reliable under ideal conditions, net income and balance sheet values are volatile since end-of-period present values depend on which state is realized. This volatility is demonstrated by abnormal earnings in our example, where net income varied from $-\$23.97$ to $+\$76.03$ under bad and good economy realizations respectively, leading to the ending firm value of $\$236.36$ or $\$336.36$. Thus, the investor bears risk even when the financial statements are completely reliable.¹⁰

2. Like the certainty case, there are still two ways of calculating balance sheet current values: We can calculate expected present values directly or we can use market values. Under ideal conditions, arbitrage forces the two ways to yield identical results. Thus, as in Example 2.1, value in use and fair value are equal.
3. Despite the fact that expected and realized net income need not be equal, the income statement still has no information content when abnormal earnings do not persist. Investors have sufficient information to calculate for themselves what realized net

income will be, once they know the current year's state realization. This calculation is programmable and no accounting policy decisions are needed. We can now say that net income is predictable *conditional on* the state of nature.

4. At the risk of getting ahead of ourselves, let us see how the income statement can have information content. For this, we need only relax the assumption that state probabilities are objective. This puts us into the realm of **subjective probabilities**, which are formally introduced in Chapter 3. Then, investors no longer have “ready-made” state probabilities available to them for purposes of calculating expected future firm performance. Rather, they must assess these probabilities themselves, using whatever information is available. There is no longer any guarantee that in a long-run sequence of repetitions of the two-period economy, the bad and good states will occur with the same relative frequencies as the probabilities assigned by the investor. The reason, of course, is that individuals are limited in their knowledge and forecasting ability. Note that if state probabilities are subjective, so are the resulting expected values. That is, the value of the firm is also subjective.

Subjective probabilities are a more reasonable assumption than objective probabilities, because the future performance of a business entity is much more complex and difficult to predict than a simple roll of fair dice. Since investors know that their predictions are subject to error, they will be alert for information sources that enable them to revise their probability assessments. The income statement is one such source. When state probabilities are subjective, the income statement can provide information about what these probabilities are. For example, observing a net income of \$76.03 this year in Example 2.2 may cause you to increase your probability of the good state in future years. This would increase your expectation of future firm cash flows and profitability.

If this argument is unclear to you, return to the analogy of rolling dice, but now assume that you do not know whether the dice are fair. What is your probability of rolling a seven? Obviously, this probability is no longer objective, and you must assess it on the basis of whatever information and prior experience you have. However, rolling the dice (analogous to observing the income statement) provides information, and after a few rolls you should have a better idea whether their true state is fair or not fair. For example, if you rolled five times and a seven came up each time, you would probably want to increase from $1/6$ your subjective probability of rolling a seven. Just as improved knowledge of the true state of the dice will help you to predict future rolls, improved knowledge of the true state of the firm will help you to predict future firm performance and investment returns. In Chapter 3 we will show how investors can use financial statement information to revise their subjective probabilities of future firm performance.

2.3.1 Summary

The purpose of Example 2.2 is to extend the present value model to formally incorporate uncertainty, using the concepts of states of nature and objective probabilities. The definition of ideal conditions must be extended to include a complete and publicly known set

of states of nature, with future cash flows known *conditionally* on state realization. Also, ideal conditions now specify objective state probabilities and publicly observable state realization. The logic of the present value model under certainty then carries over, except that market values are based on *expected* cash flows, assuming investors are risk neutral.

The major difference between the certainty and uncertainty cases is that *expected* and *realized* net income need no longer be the same under uncertainty, and the difference is called abnormal earnings. Nevertheless, financial statements based on expected present values continue to be both relevant and reliable. They are relevant because they are based on expected future cash flows. They are reliable because financial statement values faithfully represent these expected future cash flows and, in each case, management omission, error, and bias are not possible. All of these conclusions are independent of the firm's dividend policy, since dividend irrelevancy continues to hold.

2.4 EXAMPLES OF PRESENT VALUE ACCOUNTING

2.4.1 Embedded Value

By now, you probably want to point out that the real world is *not* characterized by ideal conditions. This is quite true. As an example of some of the complexities of present value accounting when ideal conditions do not hold, consider Theory in Practice 2.1.

Theory in Practice 2.1

Some insurance companies voluntarily report **embedded value** as supplementary information. This is a form of present value accounting that values the company's insurance business in force at discounted present value of policy amounts to be collected, net of costs (i.e., value in use). These costs consist of income taxes, and a charge for the capital the company is required to hold as a reserve for policy commitments. The discount rate to compute present value is based on a risk-free rate plus a risk premium. Embedded value does not include the present value of expected future business. Thus it is not a full current valuation of the business. Nevertheless, by providing an estimate of the present value of business actually in force, it does provide highly relevant information.

Since insurance policies typically extend well into the future, embedded value requires many

assumptions, including for discount rates, investment conditions, and life expectancies. Many of these assumptions are based on actuarial calculations.

The table below is adapted from the embedded value information of Manulife Financial Corporation, a large Canada-based multinational provider of insurance and related financial services. Manulife's common shareholders' equity as per its December 31, 2011, balance sheet was \$22,402 million. Its financial statements are prepared in accordance with IASB GAAP. The market value of a Manulife common share was \$11.20 on January 3, 2012, rising to \$13.96 in late March, 2012, and then falling off. Manulife's new business of \$1,086 million is down from 2010, when new business was \$1,841 million. The question then is, why is Manulife's share price less than its embedded value?

Serafeim (2011) studied a worldwide sample of 350 insurance companies over the period 1991–2009, of which 93 disclosed embedded value. He reported a lower bid–ask spread (see Chapter 1, Note 22) for shares of firms reporting embedded value information than for firms that did not report this information. This implies greater investor confidence in the overall quality of these firms' financial reporting (i.e., less information asymmetry between the firm and investors). However, this result held only for

firms for which an outside auditor or consultant certified the calculations, and was particularly strong for firms that belonged to the CFO Forum, an insurance industry group with objectives that include promotion of transparent reporting. There is no mention in Manulife's annual report that its embedded value information is certified by an outside party, or of CFO membership. Thus, investor concern about reliability could at least partially explain Manulife's lower share price.

Manulife Financial Corporation	
Annual Report, 2011	
Embedded Value	
Embedded value, January 1, 2011 (millions)	\$39,303
Interest on embedded value (i.e., accretion of discount)	2,808
Net present value of new business during the year	1,086
Experience variances and other changes in actuarial assumptions	(5,041)
Discount rate changes	(2,416)
Favourable changes in exchange rates	1,171
Dividends and other capital movements	<u>(846)</u>
Embedded value, December 31, 2011	<u>\$36,065</u>
Embedded value per share	<u>\$ 20.02</u>

2.4.2 Reserve Recognition Accounting

To further illustrate present value accounting, we now consider **reserve recognition accounting** (RRA) for oil and gas companies. RRA is of interest because it provides sufficient information to prepare a present value-based income statement, for comparison with the statement in Example 2.2.

Reserve recognition accounting requires supplemental disclosure of present value, discounted at 10%, of a firm's proved oil and gas reserves (called the **standardized measure**), plus a statement explaining changes in the standardized measure during the year.

At present, IASB standards do not include disclosure requirements for oil and gas reserves. In Canada, CSA National Instrument (NI) 51-101 requires extensive supplementary reserves disclosure. However, these requirements do not include reserve recognition accounting. Consequently, we turn to the United States' reserve recognition standard

ASC 932.¹¹ As mentioned, this standard provides sufficient information to enable calculation of a present value-based income statement, as well as an asset value.

The intent of ASC 932, presumably, is to provide investors with more relevant information about future cash flows than that contained in conventional historical cost-based financial statements. Oil and gas companies, it can be argued, particularly need to give this type of supplementary disclosure because the historical cost of oil and gas properties may bear little relationship to their value.

It can hardly be said that oil and gas companies operate under conditions of certainty. Consequently, we consider ASC 932 in relation to our present value model under uncertainty, which was illustrated in Example 2.2. Consider first Table 2.1, from the 2012 SEC Annual Information Form 40-F of Husky Energy Inc., a large Canada-based multinational corporation with operations in Canada, the United States, China, Indonesia, and Greenland. Its shares are traded on the Toronto Stock Exchange. Note that the undiscounted future net cash flows are shown, and also the present value of these cash flows, discounted at 10%. When estimating future cash flows, ASC 932 requires that the present value calculations use average oil and gas prices during the past year (as opposed to prices expected to be in effect when the reserves are lifted and sold). ASC 932 does not require disclosure of states of nature and their probabilities, only the end results of the expectation calculation.

Standardized Measure of Discounted Future Net Cash Flows Relating to Proved Oil and Gas Reserves (unaudited)

Husky gives the following information to accompany its standardized measure: “The following information has been developed utilizing procedures prescribed by FASB

Table 2.1 Husky Energy Inc. Standardized Measure of Discounted Future Net Cash Flows Relating to Proved Oil and Gas Reserves

Standardized Measure (unaudited) (\$ millions)	Canada ⁽¹⁾			International ⁽¹⁾			Total ⁽¹⁾		
	2012	2011	2010	2012	2011	2010	2012	2011	2010
Future Cash Inflows	43,058	50,824	40,840	5,850	1,510	1,582	48,908	52,334	42,422
Future Production Costs	15,803	18,342	14,682	1,099	503	576	16,902	18,845	15,258
Future Development Costs	8,138	7,932	7,605	1,293	161	182	9,431	8,093	7,787
Future Income Taxes	4,724	6,286	4,752	670	282	255	5,394	6,568	5,007
Future Net Cash Flows	14,393	18,264	13,801	2,788	564	570	17,181	18,828	14,371
Annual 10% Discount Factor	5,747	8,217	6,010	724	199	216	6,471	8,416	6,226
Standardized Measure of Discounted Future Net Cash Flows	8,646	10,047	7,791	2,064	365	354	10,710	10,412	8,145

⁽¹⁾ The schedules above are calculated using year average prices and year-end costs, statutory income tax rates and existing proved oil and gas reserves for 2010, 2011 and 2012. The value of exploration properties and probable reserves, future exploration costs, future change in oil and gas prices and in production and development costs are excluded.

Source: Reprinted by permission of Husky Energy Inc.

Accounting Standards Codification 932, “Extractive Activities—Oil and Gas” and based on crude oil and natural gas reserve and production volumes estimated by the Company’s reserves evaluation staff. It may be useful for certain comparison purposes, but should not be solely relied upon in evaluating Husky or its performance. Further, information contained in the following table should not be considered as representative of realistic assessments of future cash flows, nor should the standardized measure of discounted future net cash flows be viewed as representative of the current value of Husky’s reserves.

The future cash flows presented below are based on average sales prices and cost rates, and statutory income tax rates in existence as of the date of the projections. It is expected that material revisions to some estimates of crude oil and natural gas reserves may occur in the future, development and production of the reserves may occur in periods other than those assumed, and actual prices realized and costs incurred may vary significantly from those used.

Management does not rely upon the following information in making investment and operating decisions. Such decisions are based upon a wide range of factors, including estimates of probable as well as proved reserves, and varying price and cost assumptions considered more representative of a range of possible economic conditions that may be anticipated.”

This disclosure seems to conform fairly well to our theoretical Example 2.2. The \$10,710 million total present value is the amount that would appear on Husky’s December 31, 2012, present value-based balance sheet for the asset “proved oil and gas reserves” if one was prepared on this basis. It corresponds to the \$136.36 valuation of the capital asset at time 1 in Example 2.2. It should be noted, however, that the 10% discount rate used by Husky is not the single known rate in the economy. Rather, this rate is mandated by ASC 932, presumably for comparability across firms. Also, as mentioned, the figures apply only to proved reserves and not all of Husky’s reserve assets.

Table 2.2 gives changes in the standardized measure. To understand this statement of changes, we prepare in Table 2.3 an income statement in the same format as the income statement for P.V. Ltd. in Example 2.2.

Check each of the numbers in Table 2.3 from the original Husky statements in Tables 2.1 and 2.2.¹²

The changes in estimates of (\$4,556) million in Table 2.3 should be considered carefully. Note, in particular, that there are a number of changes, including revisions of quantities, prices, timing, and costs, as well as related income taxes. Note also that the amounts are quite material, netting out to over four times expected net income. The number and magnitude of these changes are the main differences between our Example 2.2, which assumed ideal conditions, and the “real world” environment in which Husky operates.

Note that the accretion of discount is not 10% of beginning-of-year present value, as it was in Example 2.2. ASC 932 does not require disclosure of how this amount is calculated. Its failure to agree with its theoretical counterpart derives from the various changes to estimates during the year, which impact the calculations. Nevertheless, the concept of accretion of discount as expected net income for the year remains.

Table 2.2 Husky Energy Inc. Changes in Standardized Measure of Discounted Future Net Cash Flows Relating to Proved Oil and Gas Reserves

(\$ millions)	Canada ⁽¹⁾			International ⁽¹⁾			Total ⁽¹⁾		
	2012	2011	2010	2012	2011	2010	2012	2011	2010
Present Value at January 1	10,047	7,791	6,522	365	354	270	10,412	8,145	6,792
Sales and Transfers, net of Production Costs	(3,538)	(4,239)	(3,129)	(235)	(216)	(227)	(3,773)	(4,455)	(3,356)
Net Change in Sales and Transfer Prices, net of Development and Production Costs	(1,353)	3,281	2,982	(15)	266	99	(1,368)	3,547	3,081
Development Cost Incurred that Reduced Future Development Costs	3,093	2,500	2,697	733	7	6	3,826	2,507	2,703
Changes in Estimated Future Development Costs	(2,234)	(1,921)	(2,639)	(1,551)	26	(1)	(3,785)	(1,895)	(2,640)
Extensions, Discoveries and Improved Recovery, net of Related Costs	937	1,601	1,235	2,774	10	169	3,711	1,611	1,404
Revisions of Quantity Estimates	(460)	156	(68)	426	(47)	43	(34)	109	(25)
Accretion of Discount	1,194	908	911	(101)	55	39	1,093	963	950
Sale of Reserves in Place	(12)	(28)	(4)	—	(59)	—	(12)	(87)	(4)
Purchase of Reserves in Place	9	1,096	247	—	—	—	9	1,096	247
Changes in Timing of Future Net Cash Flows and Other	320	(358)	(579)	(4)	(20)	—	316	(378)	(579)
Net Change in Income Taxes	643	(740)	(384)	(328)	(11)	(44)	315	(751)	(428)
Net Increase (Decrease)	(1,401)	2,256	1,269	1,699	11	84	298	2,267	1,353
Present Value at December 31	8,646	10,047	7,791	2,064	365	354	10,710	10,412	8,145

⁽¹⁾ The schedules above are calculated using year-end average prices and year-end costs, statutory income tax rates and existing proved oil and gas reserves for 2010, 2011, and 2012. The value of exploration properties and probable reserves, future exploration costs, future changes in oil and gas prices, and production and development costs are excluded.

Source: Reprinted by permission of Husky Energy Inc.

In sum, the procedures used by Husky to account for the results of its oil and gas operations under RRA seem to conform to the theoretical present value model under uncertainty, except that it is necessary to make material changes to previous estimates.

2.4.3 Critique of RRA

ASC 932 contains several provisions to mitigate reliability concerns. As mentioned, only proved reserves are included, average oil and gas price for the year is used rather than prices expected when the reserves are lifted and sold, and the interest rate is specified as 10%. However, these provisions reduce relevance, since the extent to which the resulting

Table 2.3 Husky Energy Inc. Income Statement for 2012 from Proved Oil and Gas Reserves (millions of dollars)

Expected net income—accretion of discount		\$1,093
<i>Abnormal earnings</i>		
Net present value of additional reserves added during year		3,711
Unexpected items—changes in estimates		
Net changes in sales and transfer prices, net of production and development costs	\$(1,368)	
Revisions of quantity estimates	(34)	
Changes in timing of net future cash flows	316	
Changes in estimated future development costs	(3,785)	
Net changes in income taxes	315	(4,556)
Net income from proved oil and gas reserves		<u>\$ 248</u>

Source: Reprinted by permission of Husky Energy Inc.

present value predicts future cash flows and their risk is reduced. Thus, while RRA is more relevant than historical costs of proved reserves, it is by no means completely relevant.

Nevertheless, reliability concerns remain.¹³ RRA is not a complete representation since it applies only to proved reserves. The concept of proved reserves is itself a matter of judgment, since “proved” essentially means “reasonable certainty” of recovery under current economic, operating, and regulatory conditions. Due to the imprecision of the proved reserves concept, RRA estimates are also subject to bias (see Theory in Practice 2.2 below). Also, estimates are subject to error, as evidenced by the substantial adjustments to previous estimates in Table 2.3 above. Thus, the extent to which the present value calculations faithfully represent actual reserves is open to question.

Consistent with these relevance and reliability considerations, oil company managers, in particular, tend to regard RRA with reservation and suspicion. As an example, Husky’s management states (see Table 2.1) that its RRA information should not be solely relied on when evaluating Husky or its performance, is not a realistic measure of future cash flows and the value of the company’s reserves, and is not relied upon for internal decision making. Also, the reader is warned that substantial changes to some estimates may be made in future.

One might ask why Husky reports under ASC 932, a U.S. standard. However, since the company has investors residing in the United States, it is subject to SEC requirements. Also, many other multinational oil companies report RRA information, and Husky likely wants to appeal to a broader spectrum of investors than those in North America. The company also reports considerable additional reserves information (not reproduced).

While it is clear that management is cautious about RRA, this does not necessarily mean that it does not provide useful information to investors. As mentioned, RRA is more relevant than historical cost information and steps are taken to mitigate reliability

Table 2.4 Husky Energy Inc. Results of Operations for Producing Activities⁽¹⁾ (unaudited)

(\$ millions)	Year Ended December 31, 2011		
	Canada	International	Total
Revenues, net of Royalties	5,367	264	5,631
Production and Operating Expenses	1,798	31	1,829
Depreciation, Depletion, Amortization, & Impairment	2,093	11	2,104
Exploration & Evaluation Expenses	305	45	350
Earnings Before Taxes	1,170	177	1,347
Income Taxes	339	51	391
Results of Operations	831	126	956

⁽¹⁾ The costs in this schedule exclude corporate overhead, interest expense and other operating costs, which are not directly related to producing activities.

Source: Reprinted by permission of Husky Energy Inc.

concerns, so it has the potential to be useful. To see the potential for usefulness, compare the present value-based 2012 net income from Table 2.3 with Husky's historical cost-based earnings from oil and gas¹⁴ in Table 2.4.

Comparison of net income under the two bases is complicated by the fact that the present value calculations relate only to proved reserves. However, let us take the \$956 million profit from operations for 2012 in Table 2.4 as the historical cost analogue of the \$248 million present value-based 2012 net income in Table 2.3. Since oil- and gas-production revenue recorded under historical cost accounting obviously originates from proved reserves, and since corporate overhead, interest expense, and other operating costs are excluded from both RRA and the operating results in Table 2.4 (see Note 1 to table), the two measures should be reasonably comparable.

We see that the present value-based earnings are \$708 million lower than their historical cost-based counterpart. What accounts for the difference? The difference can be explained in terms of revenue and cost recognition. Valuation of proved reserves at present value implies revenue recognition as reserves are proved, thus explaining the \$3,711 million increase in RRA net income from additional reserves proved in the year. Under historical cost accounting, revenues are not recognized until reserves are lifted and sold.

Also, gains and losses resulting from changes in estimates enter into RRA net income as these estimates change. For example, as can be seen from Table 2.3, the increase in estimated future development costs of \$3,785 million works against the \$3,711 million reserve quantity increase in its effect on RRA net income. These, and the other items in Table 2.2, are not included in historical cost-based earnings. In effect, under RRA, revenues, gains, and losses are recorded "sooner" than under historical cost accounting. Thus, RRA does provide some relevant information.

The difference between the two income measures can also be explained by different bases of asset valuation. Under RRA, oil and gas assets are valued at expected present value (i.e., value in use), not at historical cost. If proved reserves were valued on Husky's balance sheet at present value of \$10,710 million, this value would be \$708 million lower than a comparable historical cost value. The balance sheet would still balance, since the lower RRA asset valuation will equal the lower RRA retained earnings. In effect, asset valuation and revenue recognition are two sides of the same coin.

If RRA does convey useful information to investors, we should observe some share price reaction to the release of RRA information. Empirical evidence on the usefulness of RRA is reviewed in Chapter 5. For now, suffice it to say that evidence of usefulness is mixed, at best.

Given questions about usefulness, questions about relevance and reliability, and management's concerns, what is the basic problem of RRA? The basic problem is that Husky does not operate under the ideal conditions of Examples 2.1 and 2.2. Consider the difficulties that Husky's managers and accountants face in applying ideal conditions. First, interest rates in the economy are not fixed, although ASC 932 deals with this by requiring a fixed, given rate of 10% for the discounting. Second, the set of states of nature affecting the amounts, prices, and timing of future production is much larger than the simple two-state set of Example 2.2, due to the complex environment in which oil and gas companies operate. ASC 932 reduces some of this complexity by requiring that reserves be valued at the average oil and gas market price for the year. However, proved reserve quantity states, and the timing of their extraction, are still needed to arrive at the standardized measure.

Theory in Practice 2.2

The reliability issues surrounding reserve estimates are illustrated by the case of Royal Dutch Shell. Long a respected company, Shell's reputation suffered a severe blow when, in January 2004, it reduced its "proved" reserves by 20%, reclassifying them as "probable." This was followed by several smaller reductions. Apparently, the company had been overstating its proved reserves as far back as 1997 to disguise falling behind its competitors in replacing its reserves. Such overstatements were enabled by relatively vague SEC rules at the time (which Shell purported to follow) that required reasonable certainty of recovery to classify reserves as proved. Also, the reserve quantities were unaudited.

This scandal resulted in the dismissals of Shell's chairman and head of exploration and development and a preliminary fine by the SEC of US\$150 million, and led to a major drop in Shell's share price as investors revised downward their probabilities of Shell's future performance. The relevance of Shell's reserve information was overwhelmed by low reliability introduced by manager bias.

In 2008, Shell announced an agreement to distribute approximately \$80 million to U.S. investors in settlement of their claims for damages, plus an additional \$120 million to be distributed through the SEC. In 2009, it agreed to pay US\$389 million to non-U.S. investors.

A third problem is more fundamental. Objective state probabilities of proved reserve amounts and timing are not available. Consequently, subjective state probabilities need to be assessed by Husky's engineers and accountants, with the result that the standardized measure is itself a subjective estimate. In effect, it is difficult to apply present value accounting when the ideal conditions it requires do not hold.

Because of these difficulties in applying ideal conditions, the reliability of RRA information is compromised. It is not that estimates of expected future cash flows cannot be made. After all, RRA is on line. Rather, lacking objective probabilities, the complex environment in which oil companies operate renders it effectively impossible to prepare estimates that are completely accurate and unaffected by subsequent events. Thus, consistent with Husky management's reservations, these estimates become subject to errors and possible bias that threaten reliability to the point where the benefit of increased relevance is also threatened. The important point is that, without ideal conditions, complete relevance and reliability are no longer jointly attainable. One must be traded off against the other.

2.4.4 Summary of RRA

RRA represents a valiant attempt to convey relevant information to investors. On the surface, the present value information conforms quite closely to the theoretical present value model under uncertainty. If one digs deeper, however, serious problems of estimation are revealed. This is because oil and gas companies do not operate under the ideal conditions assumed by the theoretical model. As a result, reserve information loses reliability, as evidenced by the need for substantial annual revisions and possible bias, as it gains relevance. It seems necessary to trade off these two desirable information qualities.

2.5 HISTORICAL COST ACCOUNTING REVISITED

2.5.1 Comparison of Different Measurement Bases

To this point, we have mainly considered ideal conditions, which lead to a present value (i.e., value in use) version of current value accounting. But, as we outlined in Section 1.2, present-day accounting practice can be described as a mixed measurement model. While, over the past number of years, standard setters have introduced numerous current value-based standards, current value accounting runs into volatility and reliability issues, as our discussions of embedded value and RRA in Section 2.4 demonstrate. These issues raise questions about the extent to which current value accounting will replace historical cost. Consequently, we now consider these two measurement bases in relation to important accounting concepts.

Relevance Versus Reliability Relevance and reliability are important characteristics of accounting information. As we concluded in the previous section, it is

necessary to trade them off. However, different measurement bases imply different tradeoffs. Historical cost accounting is relatively reliable since the cost of an asset or liability to a firm is usually a verifiable number that is less subject to errors of estimation and bias than are present value calculations. However, historical costs may be low in relevance. While cost may equal current value at date of acquisition, this equality will soon be lost as current values change over time. Consequently, the relevance of current value accounting generally exceeds that of historical cost. But the need for estimates when conditions are not ideal opens current value accounting up to problems of reliability.

Revenue Recognition As discussed in Section 1.2, the timing of revenue recognition is controversial. We can also characterize accounting measurement bases in terms of revenue recognition. Recall that for each basis of asset and liability measurement there is an associated basis of revenue recognition. In Section 2.4.3, we demonstrated this for RRA. Valuing proved reserves at current value (i.e., the standardized measure) implies revenue recognition as reserves are proved, since future expected revenues are capitalized into the proved reserves valuation. More generally, current valuation of assets and liabilities implies revenue recognition as changes in current value occur. Under historical cost, valuation of inventories at cost and accounts receivable at selling price implies revenue recognition as inventory is sold. Thus current value accounting implies earlier revenue recognition than under historical cost.

Recognition Lag This same ordering of measurement bases appears in the concept of recognition lag, which is the extent to which the timing of revenue recognition lags behind changes in real economic value. Current value accounting has little recognition lag, since changes in economic value are recognized as they occur. Historical cost accounting has greater recognition lag. As just pointed out, revenue is not recognized until increases in inventory value are validated, usually through realization as sales. As a result, revenue recognition under historical cost lags increases in the economic value of inventory.

Matching of Costs and Revenues Finally, we consider the matching of costs and revenues. As already pointed out, matching is primarily associated with historical cost accounting, since net income under historical cost accounting is a result of the matching of realized revenues with the costs of earning them. This is accomplished through accruals. As you know, common examples of accruals include accounts receivable and payable, allowance for bad debts, amortization, provisions for warranty costs, etc. In all cases, these accruals “smooth out” cash flows so as to allocate cash flows over the periods to which they relate. There is little matching under current value accounting, since, as mentioned, net income is then an explanation of how current values of assets and liabilities have changed during the period. Matching is not required for this since value changes in assets and liabilities are driven by market forces and the firm’s response to these forces.

It is important to note that while historical cost matching is reasonably reliable, it is not completely so. To see this, consider the amortization of capital assets. The matching principle requires deduction of amortization of capital assets from revenue for the period to arrive at net income. Yet, the principle does not state how much amortization should be accrued except for a vague indication that it should be systematic and rational. For example, under IAS 16, amortization should be charged systematically over the asset's useful life and reflect the pattern of benefit consumption. However, since useful life and pattern of benefit consumption are largely subjective estimates, there is no unique way to match costs and revenues.¹⁵

As a result of this vagueness, the door is open to a variety of amortization methods, such as straight-line, declining-balance, and so on. This complicates the comparability of profitability across firms, because the investor must ascertain the amortization methods firms are using before making comparisons. Vagueness also reduces reliability, since firm managers have room to manage their reported profitability through choice of amortization method and useful life, or through changes to these policies.

2.5.2 Conclusion

Characterizations of measurement bases in terms of relevance and reliability, revenue recognition, recognition lag, and matching are basically similar, and we shall use them interchangeably in this book. Thus, to say that historical cost accounting is low in relevance but reasonably reliable also is to say that the accountant waits until objective evidence is available before recognizing revenue, that historical cost lags in recognizing changes in asset and liability values, and that historical cost is a process of matching. Historical cost and current value accounting adopt different tradeoffs between these characteristics.

2.6 THE NON-EXISTENCE OF TRUE NET INCOME

To prepare a complete set of financial statements on a current value basis, it is necessary to value *all* of the firm's assets and liabilities this way, with net income explaining the change in the firm's current value during the period (before capital transactions such as dividends). Yet, we saw with RRA that severe problems arise when we try to apply a present value approach to even a single type of asset. These problems would be compounded if the approach were incorporated into the financial statements proper¹⁶ and extended to all other assets and liabilities.

This leads to an important and interesting conclusion, namely that under the real-world conditions in which accounting operates, *net income does not exist as a well-defined economic construct*. As evidence, simply consider Husky's RRA net income of \$248 million in Table 2.3. How can we take this as well-defined, or "true," income when we know that next year there will be another flock of unanticipated changes to the estimates that underlie the 2012 income calculation?

A basic problem is the lack of objective state probabilities. With objective probabilities, present values of assets and liabilities correctly reflect the uncertainty facing the firm, since present values then take into account all possible future events and their probabilities. In this case, accounting information is completely relevant as well as completely reliable, and true economic income exists.

The equality of present values and market values under ideal conditions suggests an indirect approach to true economic income—base the income calculation on changes in market values rather than present values. However, this approach runs into the problem that market values need not exist for all firm assets and liabilities, a condition known as **incomplete markets**. For example, while there may be a market price for a barrel of crude oil, what is the market value of an oil company’s reserves? In the face of uncertainties over quantities, prices, and lifting costs, an attempt to establish their market value runs into the same estimation problems as RRA. As a result, a ready market value is not available. If market values are not available for all firm assets and liabilities, an income measure based on changes in market values is not possible. Beaver and Demski (1979) give formal arguments to show that income is not well defined when markets are incomplete.¹⁷

You may be bothered by the claim that true net income does not exist. Should we devote our careers to measuring something that doesn’t exist? However, we should be glad of the impossibility of ideal conditions. If they existed, no one would need accountants! As discussed in Examples 2.1 and 2.2, net income has no information content when conditions are ideal. The present value calculations and related income measurement could then be programmed in advance. All that is needed is the set of states, their probabilities, and knowledge of which state is realized, and accountants would not be needed for this. Thus, we can say of income measurement, “If we can solve it, we don’t need it.”

This lack of a theoretically correct concept of income is what makes accounting both frustrating and fascinating at the same time. It is frustrating because of the difficulty of agreeing on accounting policies. Different users will typically want different tradeoffs between relevance and reliability. As a result, there are often several ways of accounting for the same thing. It is fascinating because the lack of a well-defined concept of net income means that a great deal of *judgment* must go into the process of asset valuation and income measurement. It is judgment that makes accounting valuable and, indeed, provides the very basis of a profession.

2.7 CONCLUSION TO ACCOUNTING UNDER IDEAL CONDITIONS

Instead of dwelling on questions of existence of net income, accountants have turned their efforts to making financial statements more useful. We now proceed to study decision usefulness.

Questions and Problems

1. Prepare the income statement for year 2 and the balance sheet at the end of year 2 for P.V. Ltd. in Example 2.1 under the assumption that P.V. Ltd. pays no dividends.
2. Show that an owner of P.V. Ltd. in Example 2.1 would not care whether P.V. Ltd. paid any dividend at the end of year 1. State precisely why this is the case.
3. Explain why expected net income is also called “accretion of discount.”
4. Show that an owner of P.V. Ltd. in Example 2.2 would not care whether P.V. Ltd. paid any dividend at the end of year 1. Assume that the good-economy state was realized in year 1.
5. Two well-known models of firm value are the dividend discount model and the discounted cash flow model. Under ideal conditions, each model gives the same result.
In Example 2.2, assume that P.V. Ltd. pays no dividends over its life, until a liquidating dividend is paid at the end of year 2 consisting of its cash on hand at that time.

Required

Verify that the market value of P.V. Ltd. at time 0 based on the expected present value of its future dividend equals \$260.33, equal to P.V.'s market value based on expected future cash flows.

6. A simple example of the difference between ideal and non-ideal conditions is the rolling of a die.

Required

- a. Calculate the expected value of a single roll of a fair die.
 - b. Now suppose that you are unsure whether the die is fair. How would you then calculate the expected value of a single roll?
 - c. Continuing part **b**, now roll the die four times. You obtain 6, 4, 1, 3. Does this information affect your belief that the die is fair? Explain.
7. Explain why, under ideal conditions, there is no need to make estimates when calculating expected present value.
 8. Explain why estimates are required to calculate expected present value when conditions are not ideal. (CGA-Canada)
 9. Do you think that the market value of an oil and gas firm will be affected when RRA information is presented in addition to historical cost-based earnings from oil- and gas-producing activities? Explain why or why not.
 10. Explain why, under non-ideal conditions, it is necessary to trade off relevance and reliability when estimating future cash flows. Define relevance and reliability as part of your answer.
 11. Why do you think oil company managers express severe reservations about RRA?
 12. The text discussion of RRA is primarily in terms of the relevance and reliability of the asset valuation of oil and gas reserves. RRA can also be evaluated in terms of the criteria for revenue recognition. Under IAS 18, revenue from the sale of goods is recognized when the significant risks and rewards of ownership have been transferred to the buyer, the

seller loses control over the items, the revenue and related costs can be measured reliably, and collection is reasonably assured.

Required

- a. At what point in their operating cycle do most industrial and retail firms regard revenue as having been earned (i.e., realized)? Use the IAS 18 revenue recognition criteria above to explain why.
 - b. Suppose that X Ltd. is an oil and gas producer. X Ltd. uses RRA on its books and prepares its financial statements on this basis. When (i.e., at what point in the operating cycle) is revenue recognized under RRA? Does this point meet the criteria for revenue recognition for sale of goods as given in IAS 18? Explain why or why not.
- 13.** Inventory is another asset for which there is a variety of ways to account under historical cost accounting, including first-in, first-out; last-in, first-out; average cost; etc.

Required

- a. How would inventory manufactured but not yet sold be accounted for under ideal conditions? In your answer, consider both balance sheet and revenue recognition approaches.
 - b. Give reasons why inventory is usually accounted for on a historical cost basis. Is accounting on this basis completely reliable? Why?
- 14.** A retail firm has just made a sale. However, it values its account receivable at the cost of the merchandise sold, rather than at the amount owing from the customer. What basis of revenue recognition does this practice imply? Under what conditions might a retail firm value accounts receivable this way?
- 15.** Sure Corp. operates under ideal conditions of certainty. It acquired its sole asset on January 1, 2015. The asset will yield \$600 cash at the end of each year from 2015 to 2017, inclusive, after which it will have no market value and no disposal costs. The interest rate in the economy is 6%. Purchase of the asset was financed by the issuance of common shares. Sure Corp. will pay a dividend of \$50 at the end of 2015 and 2016.

Required

- a. Prepare a balance sheet for Sure Corp. at the end of 2015 and an income statement for the year ended December 31, 2015.
- b. Prepare a balance sheet for Sure Corp. as at the end of 2016 and an income statement for the year ended December 31, 2016.
- c. Under ideal conditions, what is the relationship between present value (i.e., value in use) and market value (i.e., fair value)? Why? Under the real conditions in which accountants operate, to what extent do market values provide a way to implement fair value accounting? Explain.
- d. Under real conditions, present value calculations tend to be of low reliability. Why? Does this mean that present value-based accounting for assets and liabilities is not decision useful? Explain.

Note: In the following two problems, the capital asset is financed in part by means of interest-bearing bonds. This is not illustrated in the text.

- 16.** P Ltd. operates under ideal conditions of certainty. It has just bought a capital asset for \$3,100, which will generate \$1,210 cash flow at the end of one year and \$2,000 at the end of the second year. At that time, the asset will be useless in operations and P Ltd. plans to go out of business. The asset will have a known salvage value of \$420 at the end of the second year. The interest rate in the economy is constant at 10% per annum.

P Ltd. finances the asset by issuing \$605 par value of 12% coupon bonds to yield 10%. Interest is payable at the end of the first and second years, at which time the bonds mature. The balance of the cost of the asset is financed by the issuance of common shares.

Required

- a.** Prepare the present value-based balance sheet at the end of the first year and an income statement for the year. P Ltd. plans to pay no dividends in this year.
 - b.** Give two reasons why ideal conditions are unlikely to hold.
 - c.** If ideal conditions do not hold, but present value-based financial statements are prepared anyway, is net income likely to be the same as you calculated in part **a**? Explain why or why not.
- 17.** North Ltd. plans to manufacture cross-country skiing equipment. Its cash flows are highly dependent on the winter weather. North operates under ideal conditions of uncertainty. On August 1, 2015, the beginning of its first year in business, North acquires equipment to be used in its operations. The equipment will last two years, at which time its salvage value will be zero. The company finances the equipment by means of a \$500 bank loan at 3% interest, with the balance financed by issuing common shares.
- North's annual net cash flows will be \$900 if the weather is snowy and \$300 if it is not snowy. Assume that cash flows are received at year-end. In each year, the objective probability that the weather is snowy is 0.7 and 0.3 that it is not snowy. The interest rate in the economy is 3% in both years.
- North Ltd. will pay a dividend of \$50 at the end of each year of operation.

Required

- a.** In the 2015–2016 skiing season, the weather is snowy. Prepare a balance sheet at July 31, 2016, the end of North Ltd.'s first year of operations, and an income statement for the year.
 - b.** What timing of revenue recognition is implicit in the income statement you have prepared in part **a**? When ideal conditions do not hold, is this timing of revenue recognition relevant? Is it reliable? Explain.
 - c.** Assume that North Ltd. paid the present value you calculated in part **a** for its equipment. Calculate North's net income for the year ended July 31, 2016, on a historical cost basis, assuming that equipment is amortized on a straight line basis. Under the more realistic assumption that ideal conditions do not hold, which measure of net income—present value basis or historical cost basis—is most relevant? Which is most reliable? Why?
- 18.** Electro Ltd. has just commenced operations under ideal conditions of uncertainty. Its cash flows will depend crucially on the state of the economy. On January 1, 2015, the company

acquired plant and equipment that will last two years, with zero salvage value. Electro financed the plant and equipment purchase by issuing common shares.

In 2015, net cash flows will be \$900 if the state of the economy is good and \$600 if it is poor. In 2016, cash flows will rise to \$1,200 if the economy is good and remain at \$600 if it is bad. Cash flows are received at year-end. In each year, the probability that the economy is good is 0.6. The interest rate in the economy is 3% in both years.

Electro pays a dividend of \$60 at the end of 2016.

Required

- a. How much did Electro Ltd. pay for its plant and equipment on January 1, 2015?
 - b. In 2015, the economy is good. Prepare a balance sheet at the end of 2015 and an income statement for 2015.
 - c. In North America, most property, plant, and equipment is accounted for under historical cost accounting, rather than at current value as above? Suggest why.
19. QC Ltd. operates under ideal conditions of uncertainty. On January 1, 2015, it purchased a capital asset that will last for two full years and then will be retired with zero salvage. The purchase price was financed with an issue of common stock. QC Ltd. plans to pay no dividends until after the end of 2016. The interest rate in the economy is 6%.

QC Ltd. is certain that net cash flow from its only asset will be \$100 in 2015. However, net cash flow in 2016 is uncertain. Net cash flows in 2016 will be \$200 (the high state) with objective probability 0.60 and \$50 (the low state) with objective probability 0.40. All cash flows are received at their respective year-ends. At the end of year 2 it becomes known that the high state is realized.

Required

- a. How much did QC Ltd. pay for its capital asset at the beginning of 2015? Show calculations.
- b. Prepare, in good form, an income statement for QC Ltd. for the *second* year of operations—that is, 2016.
- c. Prepare, in good form, a balance sheet for QC Ltd. at the end of 2016 (before any dividend payments).

Note: In the following problem, state probabilities are not independent over time. Part **b** requires calculations not illustrated in the text.

20. Conditional Ltd. operates under ideal conditions of uncertainty. It has just purchased a new machine, at a cost of \$3,575.10, paid for entirely from the proceeds of a stock issue. The interest rate in the economy is 8%. The machine is expected to last for two years, after which time it will have zero salvage value.

The new machine is an experimental model, and its suitability for use in Conditional's operations is not completely known. Conditional assesses a 0.75 probability that there will be a major machine failure during the first year of operation, and a 0.25 probability that the machine will operate as planned. If there is a major failure, cash flow for the year will be \$1,000. If the machine operates as planned, cash flow will be \$3,000 for the year. If there is no major failure in the first year, the probability of a major failure in the second year, and resulting cash flows of \$1,000, falls to 0.60. If there is no major failure in the

second year, cash flows for that year will again be \$3,000. However, if there is a major failure in the first year, the lessons learned from correcting it will result in only a 0.10 probability of failure in the second year.

It turns out that there is no major failure in the first year.

Required

- a. Verify that the cost of \$3,575.10 for the machine is correct.
- b. Prepare an income statement for year 1.
- c. Prepare a balance sheet at the end of the first year.

Note: The next problem contains calculations not illustrated in the text.

21. On January 1, 2015, ABC Ltd. started its business by purchasing a productive oil well. The proved oil reserves from the well are expected to generate \$7,000 cash flow at the end of 2015, \$6,000 at the end of 2016, and \$5,000 at the end of 2017. Net sales is gross revenues less production costs. Net sales equals cash flows. On January 1, 2018, the oil well is expected to be dry, with no environmental liabilities. The management of ABC Ltd. wishes to prepare financial statements on a present value basis with an interest rate of 10%. The following information is known about the well at the end of 2015.

- Actual cash flows in 2015 amounted to \$6,500—that is, \$500 less than expected.
- Changes in estimates: Due to improved recovery (of oil from the well), end of year cash flows for 2016 and 2017 are estimated to be \$6,500 and \$6,000 respectively.

Required

- a. Prepare the income statement of ABC Ltd. for 2015 from its proved oil reserves.
 - b. Managements of some firms have expressed serious concerns about the reliability of present value information for oil and gas companies. Outline two of these concerns.
- 22.** The following supplemental RRA information is taken from the 2015 annual report of HL Oil & Gas Ltd.

HL Oil & Gas Ltd.	
Statement of Changes in Standardized Measure	
Year Ended December 31, 2015	
Present value, January 1, 2015	\$6,500
Sales of oil and gas, net of production costs	(2,000)
Changes in prices of oil and gas, net of changes in production costs	1,200
Extensions and discoveries of proved reserves, net	1,500
Accretion of discount	700
Revisions to quantity estimates	<u>(200)</u>
Present value, December 31, 2015	<u><u>\$7,700</u></u>

Required

- a. Prepare an income statement for 2015 on an RRA basis.
 - b. Use the concepts of relevance and reliability to explain why the standardized measure is not applied to unproved reserves in RRA.
 - c. Explain why present value calculations for oil and gas reserves lay down a mandatory 10% discount rate. What is an advantage and disadvantage to requiring all firms to use a common discount rate?
23. The following RRA information is taken from the December 31, 2015, annual report of FX Energy, Inc.

FX Energy, Inc.	
Changes in the Standardized Measure of Discounted Future Cash Flows	
Year Ended December 31, 2015	
(\$ thousands)	
Present value at January 1, 2015	\$5,460
Sales of oil produced, net of production costs	(1,172)
Net changes in prices and production costs	(159)
Extensions and discoveries, net of future costs	2,511
Changes in estimated future development costs	(53)
Revisions in previous quantity estimates	(31)
Accretion of discount	546
Changes in rates of production and other	<u>116</u>
Present value at December 31, 2011	<u>\$7,218</u>

Required

- a. Prepare an RRA income statement for FX Energy for 2015.
- b. FX Energy reports elsewhere in its annual report an (historical cost-based) operating loss from exploration and production for 2015 of \$5,245. While this amount may exclude certain administrative cost allocations, take this operating loss as a reasonable historical cost-based analogue of the RRA income you calculated in part a. Explain why RRA income for 2015 is different from the \$5,245 loss under historical cost.
- c. The standardized measure is applied only to proved reserves under RRA, using average oil and gas prices for the year. Explain why.
- d. RRA mandates a discount rate of 10% for the RRA present value calculations, rather than allowing each firm to choose its own rate. Why? Can you see any disadvantages to mandating a common discount rate?

Note: The item “extensions and discoveries, net of future costs” represents additional reserves proved during the year. The item “changes in rates of production and other” represents changes in timing of extraction relative to the timing that was expected at the beginning of 2015.

24. The following RRA information is taken from the 2015 annual report of Moonglo Energy Inc.

Balance of proved reserves: beginning of year	\$1,070
Sales, net of production costs	(456)
Sales of reserves in place	(4)
Accretion of discount	125
Extensions and discoveries, net of related costs	162
Development costs incurred in year	629
Changes in estimates	<u>134</u>
Balance of proved reserves: end of year	<u>\$1,660</u>

Required

- a. Prepare 2015 income statements for Moonglo on an RRA basis.
 - b. Moonglo reports a profit on its 2015 oil and gas operations, on a historical cost basis, of \$173. Explain (in words only) why this profit differs from the RRA income you calculated in part a.
 - c. Which income number (RRA or historical cost basis) is more relevant? Which is more reliable? Explain why.
25. Revenue recognition is a major accounting challenge. Most industrial and retail firms recognize revenue as earned at the point of sale. More generally, according to IAS 18, revenue from the sale of goods should be recognized when the significant risks and rewards of ownership have been transferred to the buyer, the seller loses control over the items, the revenue and related costs can be measured reliably, and collection is reasonably assured. Revenue from services and long-term contracts can be recognized as the work progresses.

It is often not clear just when these general criteria are met. For example, revenue recognition at point of sale may be a reasonable tradeoff between relevance and reliability in most cases. However, relevance is increased (and reliability decreased) if revenue is recognized earlier than point of sale.

Furthermore, revenue recognition policy may be used by firms to impress investors. For example, firms with no earnings history (e.g., startup firms) and firms that are incurring significant losses or declines in earnings have an incentive to record revenue as early as possible, so as to improve, at least temporarily, the appearance of their financial statements.

Consider the case of Lucent Technologies Inc. (now called Alcatel-Lucent). In December 2000, Lucent restated its revenue for its fiscal year ended September 30, 2000, reducing the amounts (in millions) originally reported as follows:

The vendor financing component of the restatement represents previously unrecorded credits granted by Lucent to customers, to help them finance purchases of Lucent products. That is, the customer sales were originally recorded gross, rather than net, of the credits. The distribution partners' component represents product

Vendor financing	\$199
Partial shipments	28
Distribution partners	<u>452</u>
Total	<u>\$679</u>

shipped to firms with which Lucent did not deal at arm's length, but which was not resold by these firms at year-end. These firms included certain distributors in which Lucent had an ownership interest. The practice of overshipping to distributors is called "stuffing the channels."

In its 2000 annual report, Lucent reported net income of \$1,219 million, compared to \$4,789 million for 1999 and \$1,065 million for 1998.

Despite these December, 2000 adjustments, on May 17, 2004, the SEC announced charges against Lucent and several of its officers for overstating revenues by \$1,148 million in 2000 in order to meet sales targets. The company's share price fell by 5.5% on that day. Tactics used, the SEC claimed, included the granting of improper credits to customers to encourage them to buy company products, and invoicing sales to customers that were subject to renegotiation in subsequent periods.

Subsequently, Lucent paid a fine of \$25 million for "lack of cooperation." In addition, the company, and some of the executives charged, settled the allegations by paying penalties, without admitting or denying guilt.¹⁸

Required

- a. What is the most relevant point of revenue recognition? The most reliable? Explain. In your answer, consider manufacturing firms, oil and gas exploration firms, retail firms, and firms with long-term contracts.
 - b. Explain whether or not you feel that Lucent's original recognition of the \$679 million of items listed above as revenue was consistent with revenue recognition criteria? While Lucent was a U.S. company, assume that U.S. revenue recognition criteria are similar to the IASB criteria given in the question. In your answer, consider the tradeoff between relevance and reliability.
 - c. What additional revenue recognition questions arise when the vendor has an ownership interest in the customer?
26. Refer to the revenue recognition practices of Qwest Communications outlined in Theory in Practice 1.1.

Required

- a. Use the concept of relevance to argue that firms should record revenue as earned as early as possible in their operating cycles. Was Qwest's revenue recognition policy relevant? Explain.
- b. Use the concept of reliability to argue that firms should wait until the significant risks and rewards of ownership are transferred to the buyer, and there is reasonable assurance of collection, before recording revenue. Was Qwest's revenue recognition policy reliable? Explain.
- c. When is revenue recognized under ideal conditions? Why?

27. Refer to Theory in Practice 2.1 relating to the embedded value of Manulife Financial's common shares.

Required

- a. Prepare an income statement for Manulife on an embedded value basis for 2011. Use a format similar to the format used in Table 2.3.
 - b. Serafeim (2011) reported lower information asymmetry for insurance companies that report embedded value, compared with companies that do not report this information. However, this lower information asymmetry held only for firms that employed an outside auditor to review the calculations and was particularly strong for firms that also belonged to the CFO forum. Why would information asymmetry be lower for such firms?
 - c. Suggest reasons why Manulife's common share market value (\$11.20) is so much less than its embedded value per share (\$20.02).
28. National Instrument 51-101 of the Canadian Securities Administrators, effective September 30, 2003, lays down disclosure requirements for Canadian oil and gas firms. These requirements include:
- Proved reserve quantities, defined as reserves that can be estimated with a high degree of certainty (operationalized as at least 90% probability) to be recoverable
 - Probable reserve quantities, defined as additional reserves such that there is at least a 50% probability that the amounts actually recovered will exceed the sum of estimated proved and probable reserves
 - Future net revenues from proved reserves and changes therein, discounted at 10% and undiscounted, using
 - i. year-end prices and costs
 - ii. forecasted prices and costs
 - Future net revenues from probable reserves, discounted at 5%, 10%, 15%, and 20%, and undiscounted, using forecasted prices and costs
- In addition, reserves data must be verified by an independent qualified reserves evaluator or auditor and reviewed by the board of directors.

Required

- a. Evaluate the relevance of National Instrument 51-101 disclosures in comparison to those of RRA. In your answer, include consideration of whether or not discounting expected future receipts at various rates (rather than at 10% as per RRA) adds to relevance.
- b. Evaluate the reliability of National Instrument 51-101 disclosures in comparison to those of RRA.
- c. In their National Instrument 51-101 disclosures, firms include a disclaimer to the effect that estimated future net revenues contained in their disclosures do not necessarily represent the fair market value of the company's reserves. They also claim that there is no assurance that the forecast price and cost assumptions contained in the disclosures will be attained, and that variances could be material. Give reasons why the companies give these disclaimers.

29. “A theoretically correct measure of income does not exist in the real world in which accountants must operate.”

Required

- a. What is meant by the phrase “a theoretically correct measure of income”?
- b. Why does a theoretically correct measure of income not exist in the real world?
- c. Outline the different tradeoffs between relevance and reliability under historical cost accounting and current value accounting. Consider both situations where reasonably well-working market values exist (see definition of well-working markets in Section 1.2) and do not exist.

Notes

1. Net income for year 1 can also be calculated in a more familiar format as:

Cash flow (i.e., sales)	\$150.00
Amortization expense	<u>123.97</u>
Net income	<u><u>\$ 26.03</u></u>

Amortization expense is calculated as $\$260.33 - \$136.36 = \$123.97$; that is, it equals the decline in the present value of the future receipts from the asset over the year. This way of calculating amortization differs from the way that accountants usually calculate it. Nevertheless, it is the appropriate approach under the ideal conditions of this example—namely, future cash flows known with certainty and a fixed risk-free interest rate.

We view this approach to measuring income under ideal conditions as less instructive than the accretion of discount approach illustrated in the example. It creates the impression that revenue is recognized as sales are made. However, since future net revenues are capitalized into asset value, as explained in the example, revenue is, in effect, recognized when assets are acquired. Calculating amortization on a present value basis forces net income to be the same under either format.

2. Yet another way to calculate income, familiar from introductory accounting, is to calculate the change in balance sheet net assets for the year, adjusted for capital transactions. In this example, we have:

$$\text{Net income} = \$286.36 - \$260.33 - \$0 = \$26.03$$

where capital transactions during the period are zero. Thus, knowing the present values of all assets and liabilities at the beginning and end of the period enables one to calculate present value-based net income.

- 3. This argument can be turned around. We could argue that if the firm’s future income statements were known with certainty, in conjunction with the interest rate, then they would contain all relevant information and the balance sheet could be easily deduced. In effect, each statement contains all the information needed for the other. We view the balance sheet as more fundamental under ideal conditions, however.
- 4. As another example of arbitrage, assume a share of ABC Ltd. is selling in Toronto for \$10, and the same share is selling in New York for \$10.50 (in Canadian dollars). Ignoring commissions, ABC shares could be purchased on the Toronto market for \$10 and sold in New York for \$10.50, for a profit of \$0.50 per share. However, share price will quickly rise in Toronto because of greater demand, and will just as quickly fall in New York because of greater supply. This change in the supply/demand relationship will bring the market prices into equality in the two markets.

5. Here, the only financial item is cash. Generally, financial assets are assets whose values are fixed in terms of money, such as accounts receivable and investments with a fixed face value, such as bonds. Certain other assets, such as investments in shares, are also regarded as financial assets if a ready market value is available. Financial liabilities, such as accounts payable, bank loans, and bonds issued, are defined similarly.
6. The independence assumption is not crucial to the example. With slight added complexity we could allow for conditional probabilities, where the probability of state realization in year 2 depends on the state realization in year 1. For example, if the good state happened in year 1, this might increase the probability that the good state would also happen in year 2. See Problem 20. The important point for ideal conditions to hold, however, is that if probabilities will change over time, the pattern of changes is publicly known.
7. This is an example of **common knowledge**. That is, everyone knows the set of states of nature, everyone knows that everyone knows, everyone knows that everyone knows that everyone knows, etc. This assumption is often made in economic and accounting models. Further discussion of common knowledge is given in Sections 4.5.2 and 6.5.2.
8. Somewhat weaker conditions than these would be sufficient to give a first-best economy. Our purpose here, however, is only to give a set of conditions sufficient to ensure that net income is well defined and without information content.
9. We can also calculate net income as

Cash flow (sales)	\$100.00
Amortization expense ($\$260.33 - \136.36)	<u>123.97</u>
Net loss	<u>\$ 23.97</u>

See Note 1 for reasons why we prefer the net income format used in the example. Calculating amortization on an *expected* present value basis forces net income to be the same under either format.

10. Of course, if investors are risk neutral, this risk will not matter to them. However, under more realistic conditions, which we will introduce later, risk does matter. Note that the firm can use hedging to reduce this volatility.
11. A more precise reference is ASC 932-235-50. The IASB is currently considering new guidelines for extractive industries. Given the unsettled state of these standards, we proceed in terms of the U.S. standard here.
12. As is the case in Examples 2.1 and 2.2, we can also prepare an income statement in a more conventional format:

Cash flow from operations (sales in year = $3,773 + 12 - 9$)	\$3,776
Development costs incurred in year	(3,826)
Amortization "expense" (increase in present value of proved reserves during the year) ($10,710 - 10,412$)	<u>298</u>
Net income from proved oil and gas reserves	<u>\$ 248</u>

The \$3,826 of development costs incurred during the year is not a change in estimates. It represents the expenditure of some of the development costs allowed for in the beginning-of-year present value.

The selection of items from the statement of changes may seem arbitrary. Notice however, that with the exception of amortization, all the items of the above income statement involve cash flows. In the income statement in the body of the text, none of the items are cash flows.

See also Notes 1 and 8.

13. Note that these changes in estimates contain two components. One component derives from state realization. As illustrated in Example 2.2, state realization introduces volatility into earnings. The second component derives from changes in estimates of cash flow amounts. Under ideal conditions, there are no such errors of estimation. Since ASC 932 does not require disclosure of the states of nature affecting its future cash flow estimates, and which states actually happened, we cannot separate changes in estimates into these two components. The significance of such a separation is that while state realizations generate volatility, they do not reduce reliability. Consequently, attributing all changes in estimates to errors, as we do in our discussion, tends to understate RRA reliability.
14. ASC 392 also requires the reporting of historical cost-based results of operations for oil- and gas-producing activities.
15. For an extensive discussion of the balance sheet versus income statement approaches, and the inability of the income statement approach to resolve the question of how to match costs and revenues, see Storey and Storey (1998).
16. Strictly speaking, the term “financial statements” includes the notes to the statements. When we refer to disclosure within the financial statements themselves, we will use the term “financial statements proper.” Thus, if a firm values an asset at current value in its accounts and reports the resulting number on the balance sheet, it reports current value in the financial statements proper. If it discloses current value only in a note, this would be reported in the financial statements but not in the financial statements proper.
17. For a counterargument, see Ohlson (1987).
18. The significance of not admitting or denying guilt is that, while guilty penalties are paid to the government, third parties who may wish to recover damages must prove guilt. Not admitting or denying guilt reduces the expected amount of any such lawsuits.