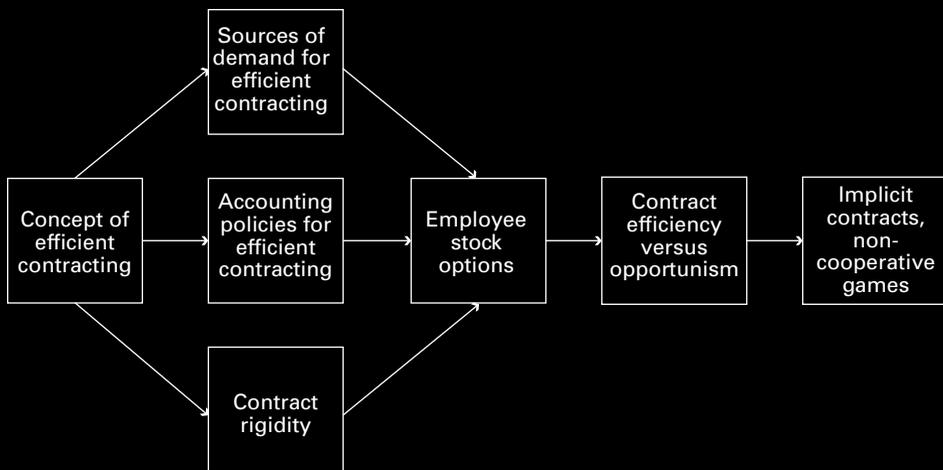


Chapter 8

The Efficient Contracting Approach to Decision Usefulness

Figure 8.1 Organization of Chapter 8



8.1 OVERVIEW

You may have noticed that there has been little reference to corporate management to this point. Yet, in Section 1.4 we suggested that aiding in efficient corporate governance, including efficient contracting and responsible manager performance, was an important role for financial reporting. This role contrasts with the decision usefulness approach of helping investors predict future firm performance that was the subject of Chapters 3 to 7. This chapter begins our study of financial reporting from management's perspective. As we shall see, issues of efficient contracting loom large.

Efficient contracting theory takes the view that firms¹ organize themselves in the most efficient manner, so as to maximize their prospects for survival.² Some firms are more decentralized than others, some firms conduct activities inside while other firms contract out the same activities, some firms finance more with debt than others, etc. The most efficient form of corporate governance for a particular firm depends on factors such

as its legal and institutional environment, its technology, and the degree of competition in its industry.

Efficient contracting is a significant component of efficient corporate governance. Indeed, a firm can be largely defined by the contracts it enters into. To enhance corporate governance, these contracts must be efficient. That is, they must optimally balance contract benefits and costs.³ Ultimately, the objective of the theory is to understand and predict managerial accounting policy choice in different circumstances and across different firms, and how financial accounting can contribute to contract efficiency.

The reason that financial accounting contributes to efficient contracting, hence to corporate governance, is that important contracts usually depend on accounting variables. For example, management compensation contracts typically depend on reported earnings, and debt contracts usually contain accounting-based covenants. As a result, managers have a crucial interest in accounting policies that affect compensation and covenant values. Note that, unlike efficient markets theory, this manager interest arises independently of whether different accounting policies affect cash flows.

The theory assumes that managers, like investors, are rational. Consequently, given that important contracts depend on accounting variables, managers may be tempted to bias or otherwise manage reported earnings and working capital valuations if they perceive this to be for their own benefit. This creates a demand for accounting policies to control such tendencies.

Controlling these tendencies is the efficient contracting and stewardship role of financial reporting. As explained in Sections 1.4 and 1.10, this book argues that motivation of responsible manager performance, that is, providing information to evaluate manager stewardship, is an equally important financial accounting role as providing useful information to investors.

Evaluating stewardship affects the role of the income statement. According to contract theory, its role includes protecting debtholders and shareholders from opportunistic manager behaviour. Also, net income plays a **confirmatory role**—it can confirm, or disconfirm, announcements made by management during the year, such as earnings forecasts. This *ex post* checking up on information released by management motivates truthful announcements. Consistent with the fundamental problem (Section 1.10), we will see that some accounting policies recommended by contract theory differ from the investor-informing policies we have considered in previous chapters.

Efficient contracting theory helps accountants to understand why reporting on stewardship is important, and to appreciate the boundaries of legitimate management concern about accounting policy choice. This understanding is particularly important due to the extensive interaction between managers and accountants.

Management is an important constituency of financial accounting. However, as noted in Section 3.8, its role in financial reporting is largely “outside” the Conceptual Framework.⁴ Thus, management’s interests must be incorporated into accounting standards through due process or, equivalently, through a process of **conflict resolution**. In this chapter, we begin our study of how this conflict works out.

Figure 8.1 outlines the organization of this chapter.

8.2 WHAT IS EFFICIENT CONTRACTING THEORY?

Efficient contracting theory studies the role of financial accounting information in moderating information asymmetry between contracting parties, thereby contributing to efficient contracting and stewardship and efficient corporate governance.

Information asymmetry arises in contracting since management possesses inside information about the state of the firm, and may not necessarily share this with other contracting parties or, if they do share, may distort or exaggerate the information. Also, management's effort in operating the firm is not directly observable by outsiders. In both cases, outside contracting parties look to accounting information to help protect themselves from exploitation.

Recall from Section 1.2 that we defined corporate governance as those policies that align the firm's activities with the interests of its investors and society. Efficient contracting is an important component of this alignment. Firms enter into many contracts, such as with customers, suppliers, management, other employees, and lenders.⁵ For good corporate governance, these contracts should be **efficient**. That is, they must attain an optimal tradeoff between the benefits and costs of contracting. For example, a firm may benefit from lower borrowing costs if it incurs costs to reassure lenders, such as pledging specific assets as security, or accepting a covenant to limit further borrowing which would water down the security of existing lenders.

Contracting is relevant to financial accounting since important contracts depend on accounting variables. Thus, debt contracts may contain covenants, such as maintaining a specified level of working capital, not exceeding a specified debt–equity ratio, or maintaining an agreed times interest earned ratio. Also, bonuses paid under managerial compensation contracts typically depend on net income, both directly and indirectly through the effect of reported earnings on share price.

The theory assumes that managers, like investors, are rational. As a result, managers cannot be assumed necessarily to maximize firm profits and, more generally, act in the best interests of investors. Rather, they will do so only if they perceive such behaviour to be in their own interests. Consequently, the interests of managers, lenders, and shareholders **conflict**. Efficient contracting theory studies how this conflict is resolved. In particular, it predicts how managers will react to new accounting standards, it helps us to understand why managers often object to new standards, and, through better understanding, it enables us to appreciate how efficient contract design can help to align the interests of managers with those of lenders and shareholders.

In addition to formal contracts such as those just discussed, the theory also envisages **implicit contracts**, which arise from continuing business relationships. For example, if a firm builds and maintains a reputation for high quality financial reporting, it generates the trust of customers, creditors, and investors that it will continue to operate with integrity. As a result, it may be able to charge higher product prices, and enjoy lower borrowing costs and cost of capital.

Finally, the theory believes in markets. It asserts that, ideally, demands for financial accounting information should be met by market forces, with the role of standard setting

being to provide general principles within which accounting practices can develop based on laws of supply and demand. Several information sources, in addition to the financial statements proper, are available to supply market information demands. For example, demand for future-oriented information can be met by management forecasts, analysts' forecasts and reports, superior MD&A, and notes to the financial statements. These information sources take some of the pressure off the financial statements proper to supply future-oriented information such as fair value accounting. Also, the financial statements play a confirmatory role by *ex post* checking up on the accuracy of forecasts, and forward-looking statements in MD&A.

8.3 SOURCES OF EFFICIENT CONTRACTING DEMAND FOR FINANCIAL ACCOUNTING INFORMATION

8.3.1 Lenders

Debt contracts are an important source of financing for most firms. While the ultimate security for lenders, like shareholders, is the firm's future performance, two aspects of debt contracts should be noted. First, it is management that has the best information about the state of the firm. Lenders are concerned about this information asymmetry because management may not share their information with them and, indeed, may choose accounting policies to hide performance that threatens lender interests. Lenders thus demand protection against this possibility.

Second, lenders face **payoff asymmetry**. Like equity investors, they stand to lose if the firm performs poorly. However, unlike equity investors, their gains are limited if the firm performs well. Consequently, lenders are crucially concerned about protecting themselves on the downside, that is, protection against financial distress. For this reason, they demand financial accounting policies that help prevent financial distress and provide an "early warning system" if distress threatens.⁶

8.3.2 Shareholders

An efficient contracting source of demand for accounting policies also arises from shareholders (and boards of directors operating on shareholders' behalf—see Note 1), to protect themselves from exploitation by management. To some extent, exploitation is controlled by basing manager compensation on some measure of manager performance, such as net income. Also, the confirmatory role of financial statements helps to prevent managers from overstating their inside information during the year, which could result in share price overvaluation by the market. However, since managers are assumed to act in their own interest, and since information asymmetry prevents shareholders from directly observing managers' efforts in running the firm (a moral hazard problem), managers may shirk on effort and cover up overstatements and lower profits through opportunistic behaviour such as overvaluation of assets and managing earnings upward. This creates a

demand for financial accounting policies that encourage responsible manager efforts and limit opportunistic manager actions.

We now consider what accounting policies meet these lender and shareholder demands.

8.4 ACCOUNTING POLICIES FOR EFFICIENT CONTRACTING

8.4.1 Reliability

Payoff asymmetry shifts lenders' relevance–reliability tradeoffs toward greater concern for reliability relative to equity investors. That is, since lenders do not directly share in increases in firm value, they are less interested in good news future-oriented information, such as unrealized increases in fair values. However, they are very interested in bad news future-oriented information, since this may indicate that the firm is heading into financial distress. Thus, they demand reliable financial statement information that protects against opportunistic manager accounting policies that hide declines in value and overstate firm performance. Overstated performance reduces the protection provided by debt covenants.

To be reliable, accounting information for efficient contracting should be based on *realized* market transactions (i.e., transactions that have actually occurred), and be *verifiable* by third parties. Unrealized increases in fair value, for example, are regarded as unreliable since they are subject to error and possible manager bias, and may be difficult to verify. In Section 7.2.2, we pointed out that fair value accounting has a stewardship interpretation, since we can regard it as charging the manager with the opportunity cost of net assets used in the business. Stewardship is then evaluated by the manager's ability to earn a return on this opportunity cost. However, we also stated that this argument assumes that fair values can be determined with reasonable reliability. Thus, contract theory supports fair value only when this value can be determined reliably (e.g., Level 1 and perhaps Level 2 of the fair value hierarchy—the theory does not support Level 3).

Note that this increased concern for reliability implies that the best financial statements to inform lenders and protect against manager opportunism are not the same as the best ones to inform equity investors (who may find unrealized gains to be decision useful). This implication conflicts with the Conceptual Framework, which states that financial statements should provide useful information to investors *and* report on how efficiently and effectively management has used the firm's financial resources (see Section 3.7.1). The Framework implies that the same general purpose financial statements are useful for reporting to investors and reporting on manager stewardship.

In this regard, O'Brien (2009) questions the dropping of the term "reliable" from the Conceptual Framework in favour of representational faithfulness. Recall, from Section 3.7.1, that representationally faithful information should be complete, free from material error, and neutral (i.e., without bias). In particular, O'Brien questions dropping verifiability (a component of earlier FASB definitions of reliability) in the definition of

representational faithfulness, and downgrading verifiability from a “fundamental” to an “enhancing” information characteristic. The standard setters’ rationale for this, according to O’Brien, is to facilitate fair value accounting where, as is apparent from our discussion of Level 2 and 3 fair values in Section 7.2, verifiability can be problematic.

8.4.2 Conservatism

Payoff asymmetry also creates a demand for conditional conservatism (Section 6.11), that is, for impairment tests. Lenders’ demand for information about unrealized losses is greater than their demand for information about unrealized gains, since unrealized gains are believed to be less useful than unrealized losses in predicting financial distress.

While it is apparent from Chapter 7 that accounting standards contain numerous impairment tests, these tests are likely motivated by legal liability arising from the savings and loan debacle described in Section 6.11. A rationale for this legal liability is demonstrated in Section 6.12. There, conditions were shown under which risk averse investors who use financial statement information for consumption planning benefit from conditional conservatism, which also benefits accountants and auditors through reduced likelihood of their being sued.

However, the efficient contracting rationale for conditional conservatism extends beyond legal liability. As mentioned, it provides an early warning system of impending financial distress. Also, conditional conservatism, by creating a systematic understatement of net asset value, provides lenders with a lower bound on net assets to help them evaluate their loan security.

Evidence that lenders are a major source of demand for conditional conservative accounting is provided by Ball, Robin, and Sadka (2008). Based on a sample of 22 countries, these researchers report evidence that several measures of a country’s financial reporting quality, including conditional conservatism, were higher the greater the size of that country’s debt market. No such relationship was found for the size of a country’s equity market. The authors claim that this result is consistent with the efficient contracting role of financial reporting since it supports an argument that it is the demand of lenders, not equity holders, that is a major driver of conditional conservatism.

Tan (2013) examined firms’ accounting practices *after* a debt covenant violation. He points out that lenders then have significantly greater bargaining power over management (for an example of such power, see Theory in Practice 9.2 re Can West Global). Tan argues that lenders will use this power to force management to adopt increased (conditional) conservatism to further protect their interests. Based on a large sample of U.S. firms that reported a debt covenant violation during the period 1996–2007, he finds a significant increase in conservatism during and after the quarter of violation, consistent with his argument. Tan conducts additional tests that reject two alternative explanations for the lower net income that results from increased conservatism, namely reversal of earlier accruals made by management in an attempt to avoid covenant violation, and large writeoffs made by new management (covenant violations are often followed by replacement of management)

to “clear the decks” of mistakes made by old management. Tan’s findings thus support the lender demand for conservatism predicted by contract theory.

Conditional conservatism is also demanded by equity holders for stewardship purposes, since it is then more difficult for managers, who may wish to enhance their reputations and compensation, to include unrealized income-increasing gains in earnings and to cover up overstatements, such as optimistic forecasts, made during the year. Also, recording unrealized losses may motivate early manager action to correct operating policies that have led to such losses and, if not, alerting Boards of Directors to take timely steps to correct management’s lack of action. Thus, in addition to its role in warning lenders, conditional conservatism also provides an early warning system of losing operating and investment policies.

Ramalingegowda and Yu (2012) (RY) studied the demand for conditional conservatism by institutional shareholders. Using the Basu measure of conservatism (Section 6.11), they found that reported earnings of firms with large dedicated institutional investors (institutions with large share holdings in the firm, long-term investment horizon, and independent of management) exhibited greater conservatism as the percentage ownership of these institutions increased, consistent with a demand for early warning of possible financial distress and protection from manager opportunism. No such relationship was found for other institutional investors using shorter-term investment strategies. Presumably, these shorter-term investors were less interested in firms’ longer-term performance.

RY also report that their findings are concentrated in firms with high information asymmetry and growth potential. Since large, powerful institutions have some ability to demand inside information from management, direct monitoring of management stewardship provides an alternative to conservatism in providing early warning of losing manager policies. However, firms with high information asymmetry and rapid growth are particularly hard to monitor in this manner. This latter result suggests that conditional conservatism provides an effective corporate governance vehicle to help protect against manager opportunism when direct monitoring is most difficult.

Chen, Chen, Lobo, and Wang (2010) studied the demand for conditional conservatism by borrowers in China. They point out that state-owned enterprises have lower default risk than non-state-owned enterprises, due to their government support. Using several measures of conservatism, they report that non-state-owned enterprises exhibit greater accounting conservatism than state-owned enterprises, consistent with greater lender concern about downside risk when the borrower is not state-owned. They also report that firms borrowing from non-state-owned banks exhibit greater conservatism than borrowers from state-owned banks. The reason, according to the authors, is that state-owned banks are less diligent in monitoring default risk on their loans; hence, borrowing firms respond with less conservatism.

Ball and Shivakumar (2006), in a study covering the period 1987–2003, find that the ability of earnings to predict future cash flows increases substantially for years in which the firm is performing poorly, compared to years of good performance. This suggests that accounting practice has moved toward increasing recognition of unrealized losses while

avoiding recognition of unrealized gains. Their findings provide evidence of increasing conditional conservatism, consistent with the increasing number of impairment tests described in Chapter 7.

The extent to which lenders demand unconditional conservatism is less clear in efficient contracting theory. Arguably, valuing assets at less than expected value (and valuing liabilities at more) helps to retain assets in the business for the protection of lenders. Unconditional conservatism also benefits lenders to the extent that the fair value of some assets that are accounted for under unconditional conservatism, such as R&D, would fall in value or disappear if the firm becomes financially distressed, and hence provide little loan security. However, inconsistent with these arguments, Ball, Robin, and Sadka (2008), whose findings on conditional conservatism were outlined above, find no association between the size of a country's debt market and their measures of that country's unconditional conservatism.

8.5 CONTRACT RIGIDITY

Contracts, by their nature, can be hard to change. That is, contracts are **rigid**. Also, many contracts, such as debt contracts, are long term. If long-term contracts depend on accounting variables, it is likely that accounting standards will change during the life of the contract. Such changes can adversely affect covenant values, increasing the likelihood of violation. For example, new standards for revenue recognition or early recognition of credit losses can reduce reported earnings, and hence increase the debt–equity ratio and reduce the times interest earned covenant ratio. Also, standards that increase earnings volatility, such as fair valuation of held-for-trading securities or undesignated derivatives, increase the probability of future covenant violation, even if they do not result in covenant violation currently. While it is possible that a contract could be renegotiated following an accounting standard change, such a process would be long and costly—lenders would be giving up the additional protection afforded by the original covenants, which are now more likely to be violated, and they would likely demand something in return such as a higher interest rate. Also, for public debt, agreement would be required from all, or a significant majority of, creditors.

Another possibility is to incorporate provisions into the contract itself to deal with unexpected events. However, as a practical matter, it is effectively impossible to anticipate all future events that can affect covenant values, particularly new accounting standards.

Yet another possibility is to “freeze” the accounting policies used to calculate covenant values at those in effect at the time the contract is signed. However, this would incur the cost and inconvenience of keeping track of the effect on the financial statements of all standard changes during the life of the contract.

Arguably, a more efficient way to deal with changes in GAAP is to allow the manager some *flexibility in accounting policy choice*, so that he/she can adapt to unexpected circumstances. Usually, the set of accounting policies from which the manager can choose is those allowed under GAAP. For example, suppose that a new accounting standard, such as

expensing of ESOs, lowers reported the net income of a healthy, going concern firm to the point where possible violation of debt covenants is of concern. It may be less costly for management to increase reported net income by adjusting accruals, such as allowances for doubtful accounts, revenue recognition policy, amortization method, or length of useful life of capital assets, than to renegotiate the debt contract or suffer the costs of technical violation. If so, the manager's accounting policy changes are consistent with efficient contracting.

However, giving management discretion to choose from a set of accounting policies opens up the possibility of opportunistic behaviour. That is, given the available set, rational managers may choose accounting policies from the set for their own purposes, thereby reducing contract efficiency. For example, rather than being a healthy, going concern, suppose that the firm in the previous paragraph is approaching financial distress, and the new accounting standard will lead to violation of debt covenants. To avoid violation, and the resulting effects on compensation and reputation, the manager chooses the same income-increasing accounting policy changes. This action is opportunistic, since it hides the firm's financial distress from investors. While such policies may benefit the manager in the short run, they can harm lenders and shareholders. Theory in Practice 8.1 illustrates this type of opportunism.

Theory in Practice 8.1

To illustrate how serious consequences can arise from compensation contracts, consider Fannie Mae, established by the U.S. federal government in 1938, and converted to a public company in 1968. Its mandate is to facilitate home ownership by providing financing to mortgage lenders, including purchasing home mortgages from these institutions. Fannie Mae is one of the largest U.S. corporations in terms of assets. Its stability is essential to the U.S. housing market.

In 2004, the Office of Federal Housing Enterprise Oversight (OFHEO, now part of the Federal Housing Finance Agency) issued a report highly critical of Fannie Mae. OFHEO was an office of the U.S. government created to oversee the operations of Fannie Mae and a related organization (Freddie Mac). One concern was about the amortization of discount and premium on Fannie Mae's large mortgage portfolio, going back to 1998. In that year, falling interest rates led to a large volume of mortgage repayments,

as homeowners scrambled to refinance at lower rates. This created a need for Fannie Mae to accelerate amortization of discount and premium on these mortgages. For 1998, according to OFHEO, extra amortization expense of \$400 million was required. However, Fannie Mae only recorded \$200 million in that year, deferring the rest to 1999. This deferral did not affect operating cash flows. Nevertheless, the volatility of earnings was reduced and, of particular concern to OFHEO, management bonuses would not have been paid if the 1998 net income of Fannie Mae was reduced any further.

Another concern was with Fannie Mae's accounting for hedges. Fannie Mae claimed to account for these at fair value under SFAS 133 (now ASC 815) and, by the end of 2003, had about \$12.2 billion of unrealized hedging losses accumulated in other comprehensive income. However, according to the OFHEO report, Fannie Mae did not properly designate its hedges and did not evaluate

Cont . . .

Theory in Practice 8.1 (Continued)

their effectiveness. Consequently, it did not qualify for the benefits of hedge accounting under SFAS 133 (recall, from Section 7.9.2, that one of these benefits is that unrealized gains and losses on hedging instruments are included in other comprehensive income rather than in net income). As a result, Fannie Mae's net income was overstated over several years. Furthermore, transfer of this amount back against net income threatened the adequacy of Fannie Mae's regulatory capital.

OFHEO obtained an agreement from Fannie Mae's board of directors to, among other things, bring its accounting into conformity with GAAP. In February 2006, a report commissioned by the board termed the company's accounting system at the time grossly inadequate, and accused the then-CFO of failing to provide adequate oversight of the system. The report also noted flawed accounting practices, including a drive to show smooth earnings growth and to report earnings that met analysts' forecasts. The SEC also weighed in, announcing that Fannie Mae should revise its earnings. Later, it fined the company \$400 million for fraudulent accounting.

In December 2004, the board dismissed its CEO and CFO, and announced a review of their bonus and severance payments. Fannie Mae's auditor was also dismissed. In December 2006, OFHEO revealed plans to sue Fannie Mae's former CEO and CFO to recover excess compensation, and Fannie Mae launched a \$2 billion lawsuit against its former auditor.

Additional Fannie Mae reporting problems arose out of the 2007–2008 securities market meltdowns. In December 2011, the SEC launched civil lawsuits against three of its senior executives, including its CEO, for understating Fannie Mae's exposure to subprime mortgage loans. For example, in a 2007 public disclosure, the company reported that only 0.2%, approximately \$4.8 billion, of its total holdings of single-family mortgages were subprime, omitting \$43.4 billion of loans specifically targeted at borrowers with weaker credit histories. In addition, the company understated its exposure to reduced documentation loans. Recall, from Section 1.3, that lax mortgage lending practices bore much of the blame for the collapse of the asset-backed securities market. The result, according to the SEC, was to seriously mislead investors. Consistent with this misleading, Fannie Mae's share price had increased by more than 20% in the year prior to the meltdown.

During this period, the three executives received substantial and increasing incentive plan bonuses, which were tied to company and personal performance. In retrospect, their subprime understatements contributed substantially to reported performance, and thus to bonuses.

In 2008, Fannie Mae reported a loss of \$2.3 billion, mainly due to losses on its higher risk assets. In the same year, the U.S. government took control of the company. The three senior officers were dismissed in 2008–2009.

Given contract rigidity, the firm faces a corporate governance tradeoff. The optimal set of accounting policies for the firm represents a compromise. On the one hand, tightly prescribing accounting policies beforehand will minimize opportunistic accounting policy choices by managers, but incur costs of lack of accounting flexibility to meet changing circumstances, such as new accounting standards that affect debt covenants and compensation. On the other hand, allowing the manager to choose from a broad array of

accounting policies will reduce costs of contract rigidity but expose the firm to the costs of opportunistic manager behaviour.

Regardless of the amount of accounting policy choice available, it should be apparent that changes in accounting standards matter to the manager. If the manager has no flexibility, a new accounting standard that, say, reduces net income may result in the manager changing operating policies, such as cutting R&D or reducing maintenance. If the manager has flexibility, he/she may instead (or in addition) change accounting policies, such as lengthening the expected life of capital assets, or changing the timing of revenue recognition, so as to increase reported net income. In other cases, if a new standard, say, increases earnings volatility, the manager may compensate by increasing hedging activity. When managers change accounting policies and/or change operating decisions in response to a change in accounting standards, we say that the standard change creates **economic consequences**.

Economic consequences could be consistent with efficient contracting if they are the lowest-cost way to avoid costs of technical default on debt covenants when the economic state of the firm does not warrant default, or of preventing a competent manager from leaving the firm due to lower earnings-based compensation. However, economic consequences could also be opportunistic if their effect is to postpone investor awareness of financial distress, or if they are attempts by a poorly performing manager to preserve reputation and compensation. Distinguishing between these two possibilities is an important component of efficient contracting research. Some of this research is reviewed in Section 8.8.

Note that under efficient securities market theory described in Section 4.3, accounting standard changes do not have economic consequences if they are fully disclosed and do not have cash flow effects. Such changes should not matter to managers since an efficient market will see through the financial statement effects and not reward or penalize the firm, or its manager, for any changes in reported earnings that result. However, once we take efficient contracting into account, managers do care about accounting standard changes, cash flow effects or not, and, as just discussed, may change their accounting policies and/or operating actions to compensate. Thus, efficient contracting helps to explain what any accountant knows—accounting policies do matter to managers.

The study by Dichev and Skinner (2002) (DS) supports this argument that accounting policies matter. They studied a large sample of private⁷ lending agreements, concentrating on agreements with covenants based on maintenance of a specified current ratio or a specified amount of net worth.

For each sample firm, DS calculated the *covenant slack* for each quarter during which the loan is outstanding. For example, for the current ratio, the covenant slack for a loan's first quarter is the difference between the firm's actual current ratio at the end of that quarter and the current ratio the firm is required to maintain under the lending agreement. This calculation was repeated for each sample firm for all quarters, for both current ratio and net worth covenants. To avoid covenant violation, managers will want to maintain zero or positive slack.

DS found in their sample that the number of quarters with zero or slightly positive slack is significantly greater than would be expected if firms were not managing their covenant ratios. Also, the number of quarters where slack is slightly negative is significantly less than expected. These results are consistent with economic consequence arguments since they suggest that managers choose accounting policies to maintain their covenant ratios so as to meet or exceed the levels required.

DS also found that this tendency to maintain zero or positive slack is particularly strong for quarters leading up to and including a *first* covenant violation. They pointed out that the costs of an initial violation are higher than for subsequent violations, since the lender will quickly take action to protect its interests, and much of the damage to manager and firm reputation occurs when a violation first occurs. Thus managers work particularly hard to manage covenant ratios so as to avoid an initial violation. This finding also supports the assumption that managers are rational—we would expect managers to work harder when the costs of failure are higher.

8.6 EMPLOYEE STOCK OPTIONS

We now examine an area where management concern about accounting policy was particularly apparent. This is the accounting for stock options issued to management and, in some cases, to other employees, giving them the right to buy company stock over some time period. We will refer to these options as **ESOs**.

Until about 2005, accounting for ESOs in the United States and elsewhere was based on the 1972 Opinion 25 of the Accounting Principles Board (APB 25). This standard required firms issuing fixed⁸ ESOs to record an expense equal to the difference between the market value of the shares on the date the option was granted to the employee (the **grant date**) and the exercise, or strike, price of the option. This difference is called the **intrinsic value** of the option. Most firms granting ESOs set the exercise price equal to the grant date market value, so that the intrinsic value was zero. As a result, no expense for ESO compensation was recorded. For example, if the underlying share has a market value of \$10 on the grant date, setting the exercise price at \$10 triggered no expense recognition, whereas setting the exercise price at \$8 would trigger an expense of \$2 per ESO granted.

In the years following issuance of APB 25, this basis of accounting became widely recognized as inadequate. Even if there is no intrinsic value, an option has a fair value on the grant date, since the price of the underlying share may rise over the term to expiry (the **expiry date**) of the option. Failure to record an expense understates the firm's compensation cost and overstates its net income. Furthermore, a lack of earnings comparability across firms results, since different firms have different proportions of options in their total compensation packages. These problems worsened as a result of a dramatic increase in the use of ESO compensation since 1972, particularly for small, start-up, high-tech firms. These firms particularly liked the non-cash-requiring aspect of ESOs and their motivational impact on the workforce, as well as the higher reported profits that result compared to other forms of compensation.

Also during this period, executive compensation came under political scrutiny, due to the high amounts of compensation that top executives received. Firms were motivated to award seemingly excessive amounts of ESO compensation since such compensation was “free.” Charging the fair value of ESOs to expense would, some felt, help investors to see the real cost to the firm of this component of compensation.

One of the reasons why the APB had not required fair value accounting for ESOs was the difficulty of establishing this value. This situation changed somewhat with the advent of the Black-Scholes option pricing formula. However, several aspects of ESOs are not captured by Black-Scholes. For example, their model assumes that options can be freely traded, whereas ESOs are likely non-transferrable and cannot be exercised until the **vesting date**, which is typically one or more years after they are granted. Also, if the employee leaves the firm prior to vesting the options are forfeited or, if exercised, there may be restrictions on the employee’s ability to sell the acquired shares. In addition, the Black-Scholes formula assumes that the option cannot be exercised prior to expiry (a European option), whereas ESOs are an American option (can be exercised prior to expiry). Nevertheless, it was felt by many that Black-Scholes provided a reasonable basis for estimation of ESO fair value.

Consequently, in June 1993, the FASB issued an exposure draft of a proposed new standard. The exposure draft proposed that firms record compensation expense based on the fair value at the grant date (also called the *ex ante* value) of ESOs issued during the period. Fair value could be determined by Black-Scholes or other option pricing formula, with adjustment for the possibility of employee retirement prior to vesting and for the possibility of early exercise. Early exercise was dealt with by using the *expected* time to exercise, based, for example, on past experience, rather than the time to expiry, in the Black-Scholes formula.

The exposure draft attracted extreme opposition from business, which soon extended into the U.S. Congress. Concerns were expressed about the economic consequences of the lower reported profits that would result. These claimed consequences included lower share prices, higher cost of capital, a shortage of managerial talent, and inadequate manager and employee motivation. This would particularly disadvantage small start-up companies that, as mentioned, were heavy options users. To preserve their bottom lines, firms would be forced to reduce ESO usage, with negative effects on cash flows, motivation, and innovation. This, it was claimed, would threaten the competitive position of American industry. Business was also concerned that the draft proposal was politically motivated. If so, opponents of the proposal would feel justified in attacking it with every means at their disposal.

Another series of questions related to the ability of Black-Scholes to accurately and reliably measure ESO fair value. To see these concerns, we first need to consider just what the ESO costs are to the firm, since, unlike most costs, ESOs do not require a cash outlay. Essentially, the cost is borne by the firm’s existing shareholders through dilution of their proportionate interests in the firm. Thus, if an ESO is exercised at a price of, say, \$10 when the market value of the share is \$30, the *ex post* cost to the firm and its shareholders

is \$20. This \$20 is called the *ex post* cost since it is only after an ESO is exercised that its actual cost is known. We can also think of the \$20 as an opportunity cost, since by admitting the new shareholder at \$10, the firm forgoes the opportunity to issue the share at the market price of \$30. That is, the \$20 opportunity cost measures the dilution of the existing shareholders' interests.

The fair value of the ESO at the grant date, hence the *ex ante* cost to the firm, is the expected present value of the *ex post* cost.⁹ Recognizing this cost as an expense increases relevance, since current shareholders will receive a less-than-proportionate share of future dividends. That is, future dividends per share will be reduced to the extent dividends are diluted over a larger number of shares. The reduction in earnings from expensing ESOs anticipates these lower dividends, thereby helping investors to better predict future cash flows from their investments.

But, this ESO expense is very difficult to measure reliably. As mentioned, the employee may exercise the option at any time after vesting up to expiry. The *ex post* cost to the firm will then depend on the difference between the market value of the share and the exercise price at that time. In order to know the fair value of the ESO it is necessary to know the employee's optimal exercise strategy.

This strategy was modelled by Huddart (1994). As Huddart pointed out, determining the employee's strategy requires knowledge of the process generating the firm's future stock price, the employee's wealth and utility function (in particular the degree of risk aversion), whether the employee holds or sells the acquired shares (many firms require senior officers to hold large amounts of company stock) and, if sold, what investment alternatives are available. Matters are further complicated if the firm pays dividends on its shares and if the motivational impact of the ESO affects share price.

By making some simplifying assumptions (including no dividends, no motivational impact), Huddart showed that the Black-Scholes formula, assuming ESOs are held to expiry date, does indeed overstate the fair value of an ESO at the grant date. To see why, we first note three option characteristics:

1. The expected return from holding an option exceeds the expected return on the underlying share. This is because the option cannot be worth less than zero, but the share price can fall below the option's exercise price. As a result, a risk-neutral employee would not normally exercise an ESO before maturity.
2. The "upside potential" of an American option (its propensity to increase in value) increases with the time to maturity. The longer the time, the greater the probability that during this interval the underlying share price will take off, making the option more valuable. Early exercise sacrifices some of this upside potential.
3. If an option is "deep in the money," that is, if the value of the underlying share greatly exceeds the exercise price, the set of possible payoffs from holding the option and their probabilities closely resembles the set of payoffs and probabilities from holding the underlying share. This is because for a deep in the money option the probability of the share price falling below the exercise price is low. Then, every realization

of share price induces a similar realization in the option value. As a result, if the employee is required to hold the shares acquired, he or she might as well hold the option to maturity. The payoffs are the same and, due to the time value of money, paying the exercise price at expiry dominates paying it sooner.

The question then is, are there circumstances where the employee *will* exercise the option early? Huddart identifies two. First, if the ESO is only slightly in the money (substantial risk of zero payoff), the time to maturity is short (little sacrifice of upside potential), and the employee is required to hold the shares acquired, risk aversion can trigger early exercise. Since there is substantial risk of zero return, a risk-averse employee (who trades off risk and return) may feel that the reduction in risk from exercising the option now rather than continuing to hold it outweighs the lower expected return from holding the share.

The second circumstance occurs when the ESO is deep in the money, the time to expiry is short, and the employee can either hold the acquired share or sell it and invest the proceeds in a riskless asset. If the employee is sufficiently risk-averse, the riskless asset is preferred to the share. Because the option is deep in the money, the payoffs and their probabilities are similar for the share and ESO. Thus the employee is indifferent to holding the ESO or the share. Since holding the riskless asset is preferred to holding the share, it is also preferred to holding the option. Then, the employee will exercise the option, sell the share, and buy the riskless asset.

In a follow-up empirical study to test the early exercise predictions, Huddart and Lang (1996) examined the ESO exercise patterns of the employees of eight large U.S. corporations over a 10-year period. They found that early exercise was common, consistent with Huddart's risk aversion assumption. They also found that the variables that explained empirically the early exercises, such as time to expiration and extent to which the ESO was in the money, were "broadly consistent" with the predictions of the model.

The significance of early exercise is that the fair value of ESOs at grant date is less than the value determined by Black-Scholes, which, as mentioned, assumes the option is held to expiry. This is particularly apparent for the first early exercise scenario outlined above. If the ESO is barely in the money, the *ex post* cost of the option to the employer (share price less exercise price) is low. While the cost savings from the second circumstance are less, the cost to the employer is still less than Black-Scholes, as Huddart shows.

Subsequent research tended to confirm the tendency of Black-Scholes to overstate *ex post* ESO cost. Hall and Murphy (2002), using a different approach than Huddart, also demonstrated a substantial probability of early exercise, and showed that this significantly reduces the firm's ESO cost below Black-Scholes. Their analysis also suggested considerable variability in employees' exercise decisions.

Early exercise, presumably, is the reason the 1993 FASB exposure draft proposed using expected time to exercise, rather than expiry date, in the Black-Scholes formula.

However, as Huddart pointed out, use of expected time to exercise reduces the overstatement of ESO cost, but does not eliminate it, as also demonstrated by Hemmer,

Matsunaga, and Shevlin (1994) (HMS).¹⁰ In an empirical study, Marquardt (2002) examined the accuracy of the Black-Scholes formula based on expected time to exercise. In a sample of 966 option grants by 57 large U.S. companies over the period 1963–1984, she found that Black-Scholes tended to produce positively biased estimates of *ex post* ESO cost, consistent with the analyses of Huddart and HMS. She also found that the accuracy of this estimated cost varied widely for different firms.

We conclude that ESO fair value estimates may be unreliable, due both to upward bias and possible error and bias in estimating the timing of employees' early exercise decisions in the face of wide variability of these decisions. Furthermore, other Black-Scholes model inputs, such as the share variability parameter, create additional reliability problems.

As one can imagine, theory and evidence suggesting that the exposure draft, if implemented, may not produce accurate estimates of ESO expense would be seized upon by critics, particularly if the estimates tended to be too high. As a result, in December 1994 the FASB announced that it was dropping the exposure draft, on the grounds that it did not have sufficient support. Instead, the FASB turned to supplementary disclosure. In SFAS 123, issued in 1995, it urged firms to use the fair value approach suggested in the exposure draft, but allowed the APB 25 intrinsic value approach provided the firm gave supplementary disclosure of ESO expense, determined by amortizing over their vesting periods the fair value of awarded ESOs based on expected time to exercise.

In the early 2000s, however, financial reporting scandals such as Enron and WorldCom led to increasing criticism of APB 25. In retrospect, it seems that manipulations of stock price by these and other companies were often driven by senior executives' tactics to increase the values of their ESOs.

Of course, such opportunistic behaviour to increase ESO value may be anticipated when the manager's remuneration contract is being negotiated, in which case the firm will price-protect itself by lowering the manager's formal remuneration by the expected amount of opportunism. That is, given competition in the labour market for managers, managers will be willing to work for a lower compensation from the company if they can augment their utility by means of opportunistic behaviour. As a result, given the remuneration contract, managers have an incentive to adopt opportunistic tactics to the extent they can do so.

One of these tactics was **pump and dump**, whereby managers would take actions to increase share value shortly before exercising options, then sell the shares (sometimes in a manner to disguise the transaction) before share price fell back and, presumably, invest the proceeds in less risky securities.

Bartov and Mohanram (2004) tested a sample of 1,218 U.S. companies with large ESO exercises by senior executives, during the period 1992–2001. They found a significant decrease in average abnormal share price and earnings in the two years following such exercises, relative to a control sample of similar firms with no large ESO exercises. They also show evidence of abnormally large income-increasing accruals in the two years prior to exercise. The authors concluded that the senior managers in their test sample were aware of deteriorating profitability, and pumped up earnings and share price to delay the

market's awareness of the deterioration. They then exercised their ESOs and, presumably, dumped the acquired shares immediately so as to maximize their cash proceeds. The lower earnings and share prices in the two years following exercise were driven by the reversal of the prior accruals and the market's belated awareness of the declining profitability.

Another tactic was reported by Aboody and Kasznik (2000) (AK), who studied the information release practices of CEOs around ESO grant dates. They reported evidence that CEOs of firms with scheduled grant dates (so that CEOs knew when the ESO award was coming)¹¹ used tactics (e.g., early announcement of bad news but not of good news) to lower share price, and thus ESO exercise price, leading up to award date. They also reported tactics to manage earnings upward after awards (e.g., influencing analysts' earnings forecasts).

Subsequently, Baker, Collins, and Reitenga (2009) investigated managers' discretion over accruals as a way to manage earnings (hence share price and ESO exercise price), downward during quarters when ESO awards were granted. They studied a large sample of U.S. firms over the period 1992–2003, reporting that when ESOs were a high proportion of CEO compensation (thus a high incentive to lower reported earnings during these quarters) or when the firm performed poorly in the prior quarter (thus an incentive to accrue large impairment test and other writedowns so as to relieve future quarters of fixed costs), CEOs, on average, did use accruals to manage grant-period reported earnings downward. However, this practice was observed only when ESO grant dates were unscheduled and thus could not be anticipated by investors. From this, the authors concluded that when investors *could* anticipate ESO grants they would realize managers' incentives and thus would tend to ignore lower reported earnings, in which case there was no point for managers to manage accruals. Note that this conclusion supports securities market efficiency and managers' acceptance of efficiency.

It also appears that some managers manipulated the ESO award date itself. This was investigated by Yermack (1997), who reported evidence that managers pressured compensation committees to grant unscheduled ESOs shortly before good earnings news (a tactic called **spring loading**). This gives the CEO a low exercise price and subsequent benefit as the share price rises in response to the GN.

Yet another tactic was **late timing**, an extreme case of award date manipulation. Late timing is the backdating of ESO awards to a date when the share price was lower than at the actual ESO grant date. This conferred an immediate benefit on the recipient, since, in effect, the ESO was in the money on the actual grant date; that is, intrinsic value was positive. While awarding ESOs that are in the money is not in itself illegal, backdating of ESO awards without full disclosure does violate GAAP. This is because, under APB 25, in effect when much of the late timing took place, an expense had to be recognized for ESOs awarded with positive intrinsic value. Late timing disguised this expense recognition. Discovery of late timing thus leads to restatement of prior years' earnings. If ESOs were expensed, earnings would still be overstated since, holding the share price constant, a decrease in the exercise price increases ESO fair value. The resulting increase in ESO expense would not be recognized under backdating. Other parameter inputs to Black-Scholes (Section 7.9.1) may also change. Lack of disclosure of the late timing also subjects those involved to liability under

securities laws. SEC and company board investigations of late timing have led to a number of CEO and CFO firings and resignations, as illustrated by Theory in Practice 8.2.

The widespread abuse of late timing eroded investor confidence in management. Bernile and Jarrell (2009) investigated a sample of 129 firms identified as having engaged in backdating. They documented large negative abnormal stock returns for these firms in the days surrounding the backdating news. The authors argue that the firms' (as opposed to firm managers') various cash costs of being caught are relatively low, and presented evidence arguing that the declines in share value were instead due to increased estimation risk, as investors perceived managers as having behaved opportunistically.

Theory in Practice 8.2

On July 20, 2006, the SEC announced criminal and civil charges for securities fraud against the former CEO, vice-president human resources, and CFO of Brocade Communications Systems, Inc., a California-based developer of networking data storage products.

These were the first charges resulting from SEC investigations of numerous companies for late timing of ESO awards. The defendants, it was alleged, backdated employee ESO awards to a time when the company's share price was lower (\$24.20) than at the real date of the award (\$36.56), thereby conferring an immediate benefit on the recipients by lowering the exercise price. In effect, the ESOs were issued in the money. Under APB 25, in effect at the time, an expense should have been recorded for in the money options, but this was disguised by the backdating.

In 2005, possibly in anticipation of forthcoming SEC charges, Brocade issued revised financial statements for the period 1999–2004 inclusive to correct for the APB 25 earnings overstatements. It increased compensation expense and decreased reported earnings by a total of \$285 million. In July 2006, the company issued a statement indicating that the executives involved were no longer with the company and reporting a provision of \$7 million for settlement of its own liability resulting from the actions of its former executives. In May 2007, the financial media

reported that Brocade agreed to pay a \$7 million penalty to settle the SEC charges. In June 2008, Brocade agreed to pay \$160 million to settle a shareholder class-action lawsuit arising from the backdating.

In August 2007, the former Brocade CEO was found guilty by a jury in San Francisco on conspiracy and fraud charges for misleading investors. He was sentenced to 21 months in prison and ordered to pay a fine of \$15 million. However, the verdict was later thrown out on appeal, on grounds that the prosecution had incorrectly told the jury that Brocade's finance department was unaware of the backdating. The court noted, however, that the prosecution's case was "relatively strong" and ordered a new trial. On retrial, the CEO was again convicted, sentenced to 18 months in prison, and fined \$15 million.

More generally, Efendi, Files, Ouyang, and Swanson (2013) identify 141 firms with initial news of backdating during 2005 and 2006. After controlling for other factors, such as firm performance, that also affect executive turnover, they report a significant positive relationship between backdating and CEO and CFO turnover, with the likelihood of a forced turnover twice as high as for a sample of control firms with no news of backdating. These executives were also significantly less likely to be hired in comparable positions with another firm.

The common theme of all these tactics is to increase the probability that ESOs will be deep in the money. This increases the likelihood of early exercise since, according to Huddart's analysis, deep in the money ESOs are more likely to be exercised early.

Obviously, managers would be unlikely to admit voluntarily to the behaviours just described. Nevertheless, if ESOs had to be expensed, their usage as a compensation device would decrease, thereby reducing the scope for manipulating ESO values for their own benefit. This undoubtedly added fuel to managers' economic consequences arguments against ESO expensing.

The combined effect of the above-described abuses, plus improved ability of accountants to model complexities such as early exercise,¹² enabled standard setters to overcome management opposition. SFAS 123R (2004), effective in 2005 (now ASC 718-10-30), requires expensing of *ex ante* ESO cost, as does IFRS 2 (2005) of the IASB.¹³ These standards were implemented despite the raising by many managers of economic consequences and reliability concerns similar to those expressed over the 1993 exposure draft.

Indeed, management concern about ESO expensing does seem to have created some economic consequences. Choudhary (2011) compared the valuation of ESOs before and after SFAS 123R. For a sample of U.S. firms, he reports a significant downward bias in the average share return variability parameter input into the Black-Scholes model¹⁴ (see Section 7.9.1) post-123R, relative to this input pre-123R. He finds that the effect of lowering the variability parameter was to lower ESO fair value by about 7%, thus lowering ESO expense and increasing reported net income on average by 3.2% for his sample. Choudhary also reports some evidence that firms with an incentive to manage earnings upward biased the variability parameter even more. These results suggest that managers reacted to concerns about lower reported earnings by managing ESO expense downward.

Another economic consequence, as expected, was to greatly reduce the use of ESOs as a compensation device. For example, *The Economist* (2006) quoted an investment banker's estimate that the fair value of options granted by the top 500 U.S. firms fell from US\$104 billion in 2000 to \$30 billion in 2005. Consistent with this, Choudhary reports an average grant for his sample of 4.64 million ESOs before SFAS 123R, falling to 2.86 million ESOs after.

While, in this case, the standard setters ultimately "won," we may conclude that the accounting for ESOs is a prime illustration of management's interest in accounting policy, an interest that greatly complicates the setting of accounting standards. The intensity of management's objections to ESO expensing is particularly noteworthy given that the accounting policy for ESOs does not directly affect operating cash flows.

8.7 DISCUSSION AND SUMMARY OF ESO EXPENSING

The question then is: Why did management object to ESO expensing? Did they really believe that the result would be lower share prices, higher cost of capital, a shortage of managerial talent, and inadequate manager and employee motivation, as they claimed? One possibility that could explain this belief is that management did not accept securities

market efficiency, believing that investors would react negatively to lower reported earnings regardless of the reason.

Other possibilities, though, arise from contracts. Lower reported earnings would increase the likelihood of debt covenant violation. Also, management compensation could decrease to the extent the compensation contract depended on reported earnings.

A further source of reduced compensation would arise as firms decreased ESO usage in compensation contracts. This would reduce a manager's ability to increase ESO value through opportunistic actions described above such as pump and dump, late timing, etc. In retrospect, it seems that compensation contracting was not very efficient, since it led to such tactics. This lack of efficiency is also borne out by the Enron, WorldCom, and 2007–2008 market meltdown disasters outlined in Chapter 1, where, as mentioned, suspicions arose that management's adoption of risky, even illegal, tactics to report high earnings was driven by a desire to increase ESO values. In Chapter 10, we will discuss some of the changes in manager compensation practices that have arisen in an attempt to increase contracting efficiency. For now, the important point to realize is that efficient contracting theory provides an explanation as to why accounting policy choice matters to managers.

Finally, note that management's concern about accounting policies does not contradict efficient securities market theory. Even if securities markets are efficient, and managers believe this, management concerns about the effects of accounting policies on contracts remain.

8.8 DISTINGUISHING EFFICIENCY AND OPPORTUNISM IN CONTRACTING

Despite the clear existence of opportunism illustrated by Theory in Practice 8.1 and 8.2, there is considerable empirical evidence of efficient contracting. Can it be that the various examples of opportunism outlined above are “the exceptions that prove the rule?” In this section, we consider some of the empirical studies that both support and question efficient contracting.

Mian and Smith (1990) provided a seminal study of efficient contracting. They examined the accounting policy choice of whether to consolidate a subsidiary company. They argue that the greater the interdependence between parent and subsidiary the more efficient it is (that is, the lower the contracting costs) to prepare consolidated financial statements. The reason is that the greater the interdependence the more desirable it is to evaluate the *joint* results of parent and subsidiary operations. Consolidated financial statements provide a basis for joint evaluation. Also, it is more efficient to monitor manager performance by use of consolidated financial statement-based performance measures than by performance measures based on separate parent and subsidiary financial statements when interdependence is high. Thus, Mian and Smith predicted that the greater the integration between parent and subsidiary, the more likely the parent will prepare consolidated statements. This argument can be extended to predict that if consolidated financial statements are prepared for internal monitoring of manager performance, it is

less costly to also prepare consolidated statements for external reporting. Mian and Smith presented empirical evidence consistent with these predictions.

Dechow (1994) investigated whether managers use accruals opportunistically or efficiently. She argued that if accruals are largely the result of opportunistic manipulation of reported earnings, the market will reject them in favour of cash flows, in which case cash flows should be more highly associated with share returns than net income. Alternatively, if accruals reflect efficient contracting, net income should be more highly associated with share returns than cash flows. Her empirical tests found net income to be more highly associated with returns than cash flows.

Dechow also argued that when accruals are relatively large (as, for example, in rapidly growing firms), net income should be even more highly associated with share returns, relative to cash flows, than when the firm is in a steady state (in which case cash flows and net income will be equal). Her empirical tests found this to be the case, adding further support to efficient contracting.

Bharath, Sunder, and Sunder (2008) investigated the effect of accounting quality on interest rates charged in public and private (i.e., banks) lending markets. They measured a firm's accounting quality by the magnitude of its operating accruals, on grounds that the higher accruals are, the greater will be the likelihood of opportunistic management manipulation of net income. They found that interest rates were significantly lower in public and private debt markets for firms with low accruals (i.e., high quality accounting), particularly in the public debt market. This is consistent with efficient contracting since it appears that lenders react favourably to accounting quality by rewarding the high quality firm with lower interest rates. The authors also found that firms with lower quality reporting tended to borrow from banks (i.e., a private debt market) while high quality firms tended to borrow in public markets. In effect, for high accounting quality firms, it is more efficient to borrow via public debt contracts, and vice versa for low accounting quality firms.¹⁵

Recall, from Section 8.4, that conditional conservatism is an important contributor to efficient debt contracting. This argument was tested by Wittenberg-Moerman (2008). She examined a large sample of borrowing firms in the U.S. syndicated loan market during the period 1998–2003, predicting that conditional conservatism reduces information asymmetry for persons buying and selling loans in that market, due to its early warning system characteristic, which reduces the likelihood that management will exploit its inside information to hide or delay the release of bad news.

Wittenberg-Moerman measured information asymmetry by the bid–ask spread (Chapter 1, Note 22) in the loan market. Sellers of loans (askers) possess inside information about the quality and future prospects of their loans on sale. However, buyers who do not possess this information will bid less than the asking price, one reason being fear that the seller may misrepresent loan quality. The greater the buyers' concerns, the wider the spread, other things being equal. As mentioned, these concerns, hence the spread, should be reduced to the extent that the financial statements of the borrowing firm exhibit conditional conservatism.

The extent of this conservatism was measured using the method of Basu (1997) described in Section 6.11. Wittenberg-Moerman found that, as expected, conditional conservatism and bid–ask spread were negatively associated. She did not find an association when firms recognized unrealized gains. These results are consistent with the efficient contracting prediction that lenders demand conditional conservatism.

It should be noted, though, that questions about conservative accounting in debt contracts are raised by Gigler, Kanodia, Sapra, and Venugopalan (2009). They point out that while conservative accounting may lower interest rates on debt, it carries a cost, since, by its nature, conservatism increases the likelihood of covenant violation when not warranted by the economic state of the firm. They demonstrate conditions under which this cost exceeds the benefits, in which case conservative accounting decreases contract efficiency.

In Section 8.2, we pointed out the importance of contract efficiency to corporate governance. **Income escalator clauses** are an interesting example of how clever contract design may improve efficiency. An income escalator clause increases the covenant level of net worth that the firm is required to maintain by a percentage of net income (e.g., 50%). Beatty, Weber, and Yu (2008), report empirical evidence that firms with income escalator clauses in their debt covenants are more likely to choose conservative accounting policies. The reason, presumably, is that conservative accounting lowers reported net income, hence lowers the increase in the covenant net worth requirement. Since conservative accounting benefits lenders through asset retention and early warning of distress, the encouragement of conservatism created by income escalator clauses thus increases debtholder confidence, enabling a lower interest rate.

Many firms experience financial statement restatements, class-action lawsuits, and SEC investigations, which may suggest manager opportunistic behaviour. Armstrong, Jagolinzer, and Larcker (2010) (AJL) studied this issue. They examined a large sample of firms over 2001–2005 and, for each sample firm, estimated its CEO's temptation to behave opportunistically by his/her "portfolio delta," that is, by the change in value of his/her holdings of company stock and options following a \$1 change in the company's share price. Higher portfolio delta suggests that the manager has more to gain from opportunistic behaviour designed to increase the share price.

For each sample firm, AJL also identified another sample firm with similar size, complexity, leverage, and corporate governance characteristics, but with a differing CEO portfolio delta. This creates pairs of firms where firms in each pair have similar contracting environments but different portfolio deltas, hence different management temptations to behave opportunistically.

The question then is: Do firms with high portfolio delta CEOs exhibit more opportunistic CEO behaviour than similar firms with lower CEO portfolio deltas? That is, do high portfolio delta firms experience more restatements, lawsuits, or SEC investigations? AJL find no evidence of this. As they point out, this failure to find evidence suggests that firms are able to align CEO and shareholder interests, thereby supporting efficient contracting. That is, managers' holdings of company stock do not seem, by themselves, to lead to opportunistic behaviour.

Nevertheless, while the AJL study suggests that, on average, opportunistic manager behaviour is not driven by their holdings of company stock and options, the existence of restatements, lawsuits, and SEC investigations does suggest that such behaviour exists. Thus, it could be driven by other motivations. In this regard, Dechow and Shakespeare (2009) report on a procedure that numerous firms use to manage their financial statements. The procedure is to securitize assets (Section 1.3), such as accounts receivable. Such transactions may be accounted for as secured borrowings. That is, the firm retains the securitized assets on its books and records a liability for the amount of cash received. However, under U.S. standards in effect at the time, firms could treat the securitization as a sale, thereby removing the assets off-balance sheet, if certain conditions were met. For example, the buyer must not have recourse to the firm if losses are incurred on the securitized assets. The sale treatment is preferred by many firms since debt–equity ratios are improved.

To increase the buyer's confidence in the quality of the securitized assets, the firm typically retains a portion of them, usually of lower quality. This retained portion is valued at fair value. Since there is no market value for these retained assets by definition, firms have considerable flexibility in their valuation.

These sales-treatment securitizations can result in a gain or loss. For example, a gain will result if the proceeds of sale plus the fair value assigned to the retained assets exceeds the book value of the securitized assets.

For a sample of 195 observations over the period 1987–2005, Dechow and Shakespeare examined the financial statement effects of sales-treatment securitizations. They found that a gain was generated for 171 of these 195 observations, of which 35 enabled the firm to report positive net income, rather than a loss, for the quarter. They also found that debt–equity ratios increased by an average of 42% over what they would have been had these securitizations been accounted for as secured borrowings.

Dechow and Shakespeare also examined the timing of these securitizations. They found that a significant percentage of the 35 firms that avoided reporting a loss entered into their securitization transactions during the last five days of the quarter. This suggests that managers, learning of an impending loss quarter, entered into sufficient profitable securitization transactions to enable a positive quarterly profit to be reported.

While at least some of these off-balance sheet securitizations could result from efficient contracting (i.e., a low-cost way to increase debt to equity, thereby avoiding covenant violation when the firm is not in a financially distressed state), the high proportion of them that avoided a loss, particularly in the last quarter, suggests opportunistic behaviour.

Further evidence of opportunistic behaviour is provided by Hope and Thomas (2008). They examined a sample of multinational firms that reported under SFAS 131.¹⁶ This standard, effective in 1997, required firms to report supplementary information about their various domestic and foreign operations in a manner consistent with how it organizes its segment performance reporting internally. Prior to SFAS 131, firms were required to report sales, earnings, and total assets by geographic area. Under SFAS 131, disclosure

of earnings by geographic area was made voluntary. Total foreign sales and earnings have to be disclosed, however.

Hope and Thomas report that for those sample firms that did not disclose earnings by geographic area post-SFAS 131, total foreign sales increased but total foreign earnings decreased on average, relative to the period prior to SFAS 131, and relative to the post-SFAS 131 domestic earnings of those same firms. The share prices of these firms also fell, as investors became aware of lower foreign profitability. Once full disclosure of foreign earnings by geographic area was relaxed, it seems that managers may have exploited the reduced ability of investors to monitor their performance by increasing foreign sales at the expense of profits.

The authors attribute these results to “empire building,” a form of moral hazard under which managers opportunistically increase firm size (higher foreign sales). Such behaviour is motivated by the increased reputation and compensation that accrues to managers of large, growing firms.

We conclude that both efficient contracting and opportunism exist in the real world of accounting. This puts accountants and auditors on notice that while the borderline between these two types of behaviour is imprecise, some manager accounting policy choice, even if within GAAP, may be opportunistic. This represents a failure of corporate governance. If managers cannot be dissuaded from such policy choices, the onus is on the accountant for full disclosure so that investors are not misled. Otherwise, the firm faces the likelihood of financial statement restatements, lawsuits, and possible securities commission investigation, all of which damage the reputations of the accountant as well as management.

8.9 SUMMARY OF EFFICIENT CONTRACTING FOR DEBT AND STEWARDSHIP

Efficient contracting theory studies the role of financial accounting information in moderating information asymmetry between contracting parties. It predicts that reporting to lenders and reporting on manager stewardship are important sources of demand for financial accounting information as a protection against managers’ inside information advantage and possible shirking. At its most general level, the theory asserts that accounting policy choice is part of the firm’s overall need to attain efficient contracting and corporate governance. To attain efficient contracting, financial information should be reliable and (conditionally) conservative.

A significant implication of efficient contracting theory is that accounting policies have economic consequences. That is, they matter to managers. To the extent that managers have flexibility to choose accounting policies, they may change these policies to offset the effect of new accounting standards on debt and compensation contracts. Lacking sufficient policy flexibility, they may change operating policies.

Firms face a tradeoff in the accounting policy flexibility granted to managers. Too little flexibility leads to contract inefficiency when accounting standards change. Too

much flexibility opens up the possibility of manager opportunism. A reasonable compromise is to allow managers to choose accounting policies within GAAP.

Contract theory has led to a rich body of empirical literature. Some studies suggest manager opportunism. Others suggest efficient contracting. Accountants should be alert to the possibility of manager opportunism, since they are usually caught up in the lawsuits that follow.

8.10 IMPLICIT CONTRACTS

8.10.1 Definition and Empirical Evidence

In many situations, firms can realize the benefits of efficient contracting without actually entering into a formal contract. For example, a firm may consistently report smooth, growing profits, and/or build and maintain a reputation for a transparent information environment (i.e., high quality financial reporting). Consistent profitability, particularly if accompanied by a transparent information environment, creates the *trust* of customers, suppliers, and investors, who reward the firm with higher product prices, better terms for purchases, and lower cost of debt and equity capital than they would to firms with lower quality reporting. Such trust-based relationships are called **implicit contracts**. When a firm's past behaviour creates a valid expectation of outside parties that the firm will continue to behave with integrity, the implicit contract is also called a **constructive obligation**.

An early investigation of implicit contracting was conducted by Bowen, DuCharme, and Shores (1995) (BDS). They argued that firm reputation can be bolstered by high reported profits, which increase stakeholders' confidence that the manager will continue to meet contractual obligations. For example, they predicted that firms with relatively high cost of goods sold and notes payable (used as proxies for high continuing involvement with suppliers and short-term creditors, respectively) would be more likely to choose FIFO inventory and straight-line amortization accounting policies than LIFO¹⁷ and accelerated amortization policies. FIFO and straight-line amortization are regarded as income-increasing since they tend to produce higher reported earnings over time than their LIFO and accelerated amortization counterparts.¹⁸

Based on a large sample of U.S. firms over the period 1981–1993, BDS found that firms with a high level of continuing involvement with stakeholders were more likely to choose FIFO and straight-line amortization policies than firms with lower levels of continuing involvement, consistent with their prediction. Graham, Harvey, and Rajgopal (2005), in a post-Enron survey of chief financial officers of U.S. public companies, support BDS' findings. They report that managers ranked relations with other stakeholders as an important reason to meet earnings targets.

More recently, the importance of implicit contracts was highlighted during the events leading up to the 2007–2008 market meltdowns (Section 1.3). As a way to credit-enhance securitizations, sponsoring firms often protected ABS purchasers against

losses, even without a formal contractual commitment to do so. In this regard, Niu and Richardson (2006) report evidence that the market valued a firm's shares as if the proceeds from off balance sheet ABSs issued by the firm were liabilities (see Chapter 1, Note 20) rather than sales. A major reason for this finding, they argue, is the prevalence of implicit guarantees under which issuing firms feel they have an obligation to "bail out" investors in securitized assets that lose value, thereby enhancing their reputations.

8.10.2 A Single-Period Non-Cooperative Game

Further consideration of implicit contracting, however, quickly involves us in the theory of **non-cooperative games**. A non-cooperative game models the competitive interaction of two or more rational players when there is no formal contract between them. In our context, we can think of the interaction between a firm manager and a potential investor as a non-cooperative game.

The essence of this interaction is that the investor is concerned about the manager's information advantage. The manager may exploit this advantage by not revealing all the information that the investor desires. The investor looks to the firm's financial statements to reduce this source of information asymmetry. However, the manager may behave opportunistically by, for example, omitting certain liabilities from the balance sheet, choosing accounting policies so as to manage reported profits, or recording excessive discretionary accruals. The investor, being aware of these possibilities, will take them into account when making an investment decision. The manager, in turn, will be aware of possible investor reaction when preparing the financial statements. Cooperative game theory provides a formal framework for studying this conflict situation and for predicting the decisions the parties will make.

We model this situation as a non-cooperative game since it is difficult to envisage a binding contract between manager and investor about what specific information is to be supplied. Such an agreement could be very costly, since similar contracts would have to be negotiated with all potential investors. But different investors have varied decision problems and hence different information needs, so that many different contracts would be needed. Even if such binding agreements were made, they would be difficult and costly to enforce, because each user would need to conduct, or hire, an audit investigation of the firm to monitor management compliance with the contract. In other contexts, binding agreements may be illegal, as when an oligopolistic industry enters into an agreement in restraint of trade.

To illustrate this implicit contract game between the manager and the investor, consider Example 8.1.

Example 8.1 **Manager–Investor Relations as a Non-Cooperative Game**

We assume the manager has two strategies, one of which must be chosen (see Table 8.1). We will call one of these "opportunistic" (O), which we can think of as engaging in one or more of the financial statement management devices outlined above. The other strategy

is to choose “honest” (H), which we can think of as generating investor trust by maintaining a transparent information environment. The investor also has two strategies—to buy shares in the firm or to refuse to buy, denoted by B and R, respectively.

Table 8.1 Utility Payoffs in a Non-Cooperative Game

		Manager	
		HONEST (H)	OPPORTUNISTIC (O)
Investor	BUY (B)	60, 40	20, 80
	REFUSE TO BUY (R)	35, 20	35, 30

The numbers in Table 8.1 represent the utility payoffs to the investor and manager respectively for each possible strategy combination. Thus, if the manager chooses H and the investor B, the investor receives a utility of 60 and the manager receives 40, and so on for the other three pairs of numbers in the table. You should analyze the relationship between the payoffs to make sure they appear reasonable. For example, if the investor chooses B, a higher utility is attained by the investor when the manager is honest (60) than when the manager behaves opportunistically (20). Similarly, if the investor refuses to buy, the manager would prefer to choose O (if the manager behaves opportunistically, less money and effort is put into maintaining a transparent information environment).

It is important to emphasize the assumption in this example that each party has *complete information*. Thus, the investor knows the rules of the game, the strategies available to the manager, and the manager’s payoffs, and vice versa. Common knowledge is also assumed, that is, each party knows that the other party has complete information, etc. Game theory can be extended to relax these assumptions, but this is beyond our scope. This completeness of information does not extend to choice of strategy, however. Each player in this example chooses his/her strategy without knowing the strategy choice of the other in this game but nevertheless anticipating that the other player is also behaving strategically.

What *strategy pair* will be chosen? The term means simply a statement of the strategy chosen by each player. Thus, BH is a strategy pair whereby the investor buys (B) and the manager is honest (H). Review Table 8.1 and make your own prediction before reading on.

We can rule out the RH and BO strategy pairs easily. If the manager were to choose H, the investor would reason that it would be better to choose B, because it yields a utility of 60 as opposed to one of 35 from R. Thus, RH would be unlikely to happen. Similarly, if the manager were to choose O, the investor would reason that it would be better to choose R, so BO would be unlikely.

Now consider the BH pair. If the investor were to choose B, the manager would then prefer O. Thus, it seems BH must be ruled out also. The only strategy pair not subject to this problem is RO. If the manager were to choose O, the investor would prefer R. Similarly, if the investor were to choose R, the manager would prefer O. RO is the only strategy pair such that *given* the strategy choice of the other player, each player is content with his or her strategy. Such a strategy pair is called a **Nash equilibrium**. Thus, RO is the predicted outcome of the game.

However, RO is not a completely satisfactory outcome of the game in Example 8.1. Notice that *both parties would be better off* if BH were chosen rather than RO. The strategy pair BH is called the **cooperative solution**. In our context, this is the efficient contracting outcome. But, as we have argued, if the investor were to choose B rather than R, he or she knows that the rational manager would then prefer O and the investor would end up with 20 rather than the 35 from choosing R. Consequently, the investor would not choose B. The Nash equilibrium outcome RO in this game is unfortunate, because it means, at least for payoff values assumed, that the market for the firm's securities would not work very well—no one would buy them.

It is interesting to speculate what might happen next. Perhaps the parties would get together and enter into a binding agreement to choose BH after all. However, each party would have to be convinced the agreement was in fact binding on the other and could be enforced. This could be difficult in a single-period contract.

Another approach would be to think of the game in a *long-run* perspective. If this game was repeated into infinity, or at least for an unknown number of periods, the investor and manager would realize that it was in their joint interest to always choose the cooperative solution (B, H) since, looking ahead, the payoff sequence of (60, 40) thus created gives the largest possible payoff for each (see Chapter 1, Note 23 re folk theorem). If the game continues for a known, finite number of periods, however, the game may or may not collapse to the Nash equilibrium. We will explore this possibility in the next section.

Even if we confine attention to the single-period game model of Example 8.1, it is not hard to see how it relates to the accounting and auditing scandals and resulting declines in stock markets in Canada and the United States in the early 2000s, and to the financial distress suffered by many financial institutions during 2007–2008. In Table 8.1, if we start with the players at the cooperative solution BH, certain managers, such as those at Enron and WorldCom, and many financial institutions (see Sections 1.2 and 1.3), moved to an opportunistic strategy O. They felt that the immediate payoff by departing from the cooperative solution outweighed the longer-run costs of investor and regulator reaction. This short-run strategy generated high payoffs for them. For example, the distortions and excessive risk taking they incorporated into their operations increased reported earnings and moved debt off-balance sheet. The resulting increase in share prices generated huge profits for them from bonuses and ESOs. When the market became aware of the financial statement distortions, investors immediately punished management by moving to R, and share price fell precipitously. However, management had already realized their bonuses and ESO profits.

Management appeared to have ignored, at its peril, another way to maintain the cooperative solution. This is for central authority, such as government, the courts, and standard setters, to attempt to restore investor confidence in financial reporting by changing the payoffs of the game through new regulations and/or increased penalties for distortion. The threat is credible to the extent that the regulations and penalties are enforced. In our example, an increase in penalties may lower the manager's payoffs for BO and RO to, say, zero. Then it can be verified that BH would be a Nash equilibrium.

In this regard, we have already mentioned the Sarbanes-Oxley Act in Section 1.2, which increased the cost of distortion for the manager. In addition, the Public Company Accounting Oversight Board in the United States and the Canadian Public Accountability Board were created (Section 1.2). These boards consist of prominent persons independent of the accounting and auditing profession whose role is to enforce tougher rules on auditors. Hopefully, any Enron- and WorldCom-style financial statement distortions will be deterred. To the extent these bodies succeed in their mission, the manager's payoff under strategy BO will be reduced to the point where the Nash equilibrium becomes BH. In effect, the change in payoffs increases investor confidence that the manager will not distort, with the result that the investors resume buying.

Note the essential difference between single-person decision theory and game theory approaches. In our earlier decision theory Example 3.1, Bill Cautious assessed probabilities of what would happen—he ended up with a 0.77 probability of the high payoff, and so on. The assumption in decision theory is that the high or low payoffs are generated by some random mechanism called nature. Thus, a decision theory problem is sometimes called a game against nature, because some impartial force (nature) is assumed to generate the high or low payoffs with the probabilities as given. While we gave considerable attention to how investors might assess these probabilities and revise them as new information is obtained, we made an implicit assumption throughout Example 3.1 that the particular decision chosen by the investor would not affect what these probabilities were. That is, nature does not “think.”

This assumption is fine for many decision problems. Indeed, as we outlined in Chapters 3, 4, and 5, much progress has been made in understanding the decision needs of users through study of the decision theory approach. However, the approach breaks down when the payoffs are generated by the actions of a thinking opponent rather than by nature. In Example 8.1, the manager will reason that if the investor buys, his/her best act is to act opportunistically, and the investor knows this. Thus, it is not correct for the investor to assign probabilities to the manager's action choice when the manager's action is not chosen probabilistically. Similarly, it would not be correct for the manager to assign probabilities to the investor's action.¹⁹ Such behaviour, by either or both decision-makers, would be unlikely to lead to good decisions in the conflict situation.

While Example 8.1 spans only one period, we can use it to derive an important conclusion. Recall that in Chapter 3 we developed a considerable body of theory to enable us to understand the information needs of investors, and we suggested that major professional accounting standard-setting bodies have adopted the decision usefulness approach that follows from the theory. However, we did not consider management's role in accounting policy choice. That is, we did not consider whether firm management would be *willing* to adopt policies such as full disclosure and fair values proposed by standard setters. Example 8.1 suggests that managers are unwilling to sit idly by and adopt whatever accounting policies are suggested by the standard setters (representing the interests of investors). The efficient contracting assumption that managers are rational, leading to the possibility of opportunistic behaviour, makes it clear that management has *its own* interests at stake in

accounting policy choice and cannot be assumed to necessarily adopt accounting policies solely on the ethical grounds that they will be useful to shareholders and other investors. This is shown in Example 8.1 by the utility of the manager being lower under H than under O. That is, the interests of the investor and manager constituencies may *conflict*.

Thus, any accounting body concerned about implementing a new standard must be concerned with the resulting payoffs to *both* investors and management. Only by ensuring that the payoffs to management are such that management will accept the new policy can a smooth implementation be assured.

Of course, any accountant with practical experience in choosing a firm's accounting policies will know about management's interest in and concern about these policies, without having to be convinced by a game theory example. Nevertheless, better understanding of this conflict situation by standard setters will result in more realistic accounting standard choices, which should help to avoid economic consequence disputes, such as those surrounding ESO expensing discussed in Section 8.6.

8.10.3 A Trust-Based Multi-Period Game*

As our discussion above of working out from under the unfortunate Nash equilibrium solution in Example 8.1 suggests, it is difficult to draw longer-run conclusions from a single-period game. In this section, we present a multi-period extension of the Example 8.1 game.

Recall from the previous section that if the single-period game is repeated for an indefinite number of periods (i.e., infinite horizon), the cooperative solution can be attained. If the game is repeated for a known, finite number of periods, a **trigger strategy** may also attain the cooperative solution if sufficient penalties can be credibly applied for any deviation. To illustrate, suppose that each player threatens that if the other player deviates from the cooperative solution, he/she will switch strategy the next time the game is played. Thus the deviating player will be punished by receiving only the non-cooperative Nash equilibrium payoff for the remainder of the game. This threat is credible because the Nash equilibrium is an equilibrium. For this to work, however, the players must not have too high a discount rate. For example, if the investor buys, the value to the manager of an immediate payoff of \$80 may exceed the present value of the \$10 reduction in each future period (i.e., $\$40 - \30) when the investor punishes the manager by switching to R.

The various government interventions following financial reporting disasters, outlined in the previous section, can be thought of in a trigger strategy context. The prospect of such interventions will hopefully deter short-run, opportunistic manager actions, even in a finite period context. However, since managers are adept at working around new rules, it seems that, for some managers at least, the prospect of immediate gain exceeded the expected present value of future penalties. This reminds us of the point made centuries ago by Hobbes (Section 1.5) that force and fear will not work because no set of rules can anticipate all human interaction, and that people must recognize that it is in

*This section can be omitted without loss of continuity.

their joint interests to cooperate. In this spirit, we now introduce a somewhat different approach, by introducing a measure of trust between the players.

Example 8.2 A Trust-Based Multi-Period Game²⁰

Suppose that the game given in Table 8.1 is to be repeated for five periods. To simplify, assume that the players are risk neutral, and there is no discounting. Also assume that the play is sequential—in each period of the game the investor moves first. In period 1, the investor decides whether to invest (B) or not invest (R). The manager then decides whether to play honest (H) or opportunistic (O). In subsequent periods, the investor's decision is whether to hold the investment (B) or to sell it (R). The manager's decision continues to be H or O. If, in any period, the investor sells or the manager behaves opportunistically, the game ends. Otherwise, the game continues to the next play.

Figure 8.2 is a decision tree outlining the structure of the game. The bottom node represents the investor's first play, node 3 her second play, etc. Similarly, the second node represents the manager's first play, node 4 his second play, etc.

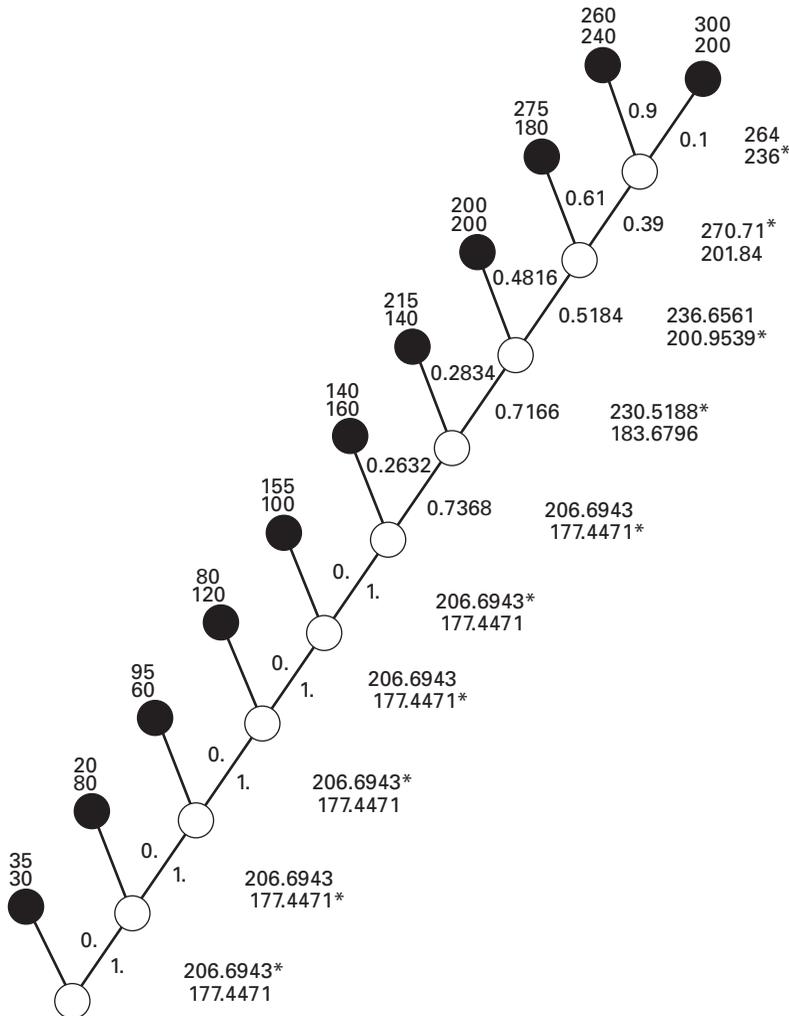
The payoffs to each player if the game ends are shown by the dark nodes, with the top number being the investor's payoff. Payoffs are easily calculated from Table 8.1. For example, if the investor plays R in period 1, the players receive the Nash equilibrium payoffs of the single-period game. If the game continues to the manager's decision in period 5 and the manager plays O, the investor receives 260 ($4 \times 60 + 20$) and the manager 240 ($4 \times 40 + 80$). If he plays H, payoffs are 300 and 200, respectively. Intermediate payoffs are calculated similarly.

To begin, consider period 5.²¹ If the game were to continue to the manager's play in period 5, the payoff-maximizing manager will choose O, since the payoff of 240 exceeds the payoff of 200 from choosing H. But, anticipating this, the investor will choose R at the second last node, receiving payoff of 275 rather than 260. Thus, if the game proceeds to period 5, the investor will end the game. However, the game will not proceed to period 5 because in period 4 the manager, realizing that if he plays H the investor will end the game at the first of period 5, will instead choose O, receiving payoff of 200 rather than the 180 he would receive if he played H. Again, however, the investor at the fourth-from last node will anticipate this, and play R, ending the game at the beginning of period 4. This thinking continues into period 3, 2, etc., and the game unravels to the first node, where the investor ends the game and the players receive the Nash equilibrium payoffs of the single-period game of Example 8.1.

This result seems counter intuitive, however. Notice, reading from the dark nodes, that as the game continues the investor receives an additional payoff of 60 if she ends the game at her *next* play. Similarly, the manager receives an additional 40 if he ends the game at his *next* play. One might expect the players to realize this potential and continue playing, providing each has some trust that the other player will continue at his/her next turn.

To introduce some trust into this game, assume that, at each play, each player believes, correctly, that the other will continue with probability $p = \min(1, 0.5 + .01T)$ in the next play of the game, where T is the difference in that next play between that

Figure 8.2 A Trust-Based Multi-Period Game



player's expected payoff from continuing and the payoff from ending the game. Note that if $T \geq 50$, the player will continue with probability 1. If $T \leq -50$, the player will end the game for sure. Thus, a player's probability of continuing is greater the more the expected payoff from continuing exceeds the payoff from ending the game—higher T implies more trust that the other player will continue. Nevertheless, trust is not complete since the complement of p measures the player's temptation to end the game. This temptation increases the lower is T , that is, as the excess payoff for continuing the game decreases.

Given this degree of trust, the investor believes the probability the manager plays H on his last play of the game is:

$$p = 0.5 + .01(200 - 240) = 0.10$$

This probability, and its complement for O, are shown on the top branches of Figure 8.2. The expected payoff of each player at the time the manager makes his 5th period decision is thus:

$$\text{Investor } 0.10 \times 300 + 0.90 \times 260 = 264$$

$$\text{Manager } 0.10 \times 200 + 0.90 \times 240 = 236$$

For the investor's last play, the manager believes the investor's probability of playing B is:

$$p = 0.5 + .01(264 - 275) = 0.39$$

This yields expected payoffs of:

$$\text{Investor } 0.39 \times 264 + 0.61 \times 275 = 270.71$$

$$\text{Manager } 0.39 \times 236 + 0.61 \times 180 = 201.84$$

These expected payoffs are entered opposite the related light-coloured nodes on Figure 8.2, with an asterisk denoting the expected payoff of the player whose turn it is at that node. Working down the tree, when it is the investor's decision in period 3 (node 5), the probability she chooses B is

$$p = 0.5 + .01(206.69 - 155) = 1.0169 > 1$$

Thus the investor will choose B with probability 1. Then, p remains at 1 for both players for all earlier nodes, yielding expected payoff of 206.69 and 177.45, respectively, for investor and manager at the beginning of the game.

Notice that, given the trust assumed, the game proceeds with probability 1 for the first five plays. After that, the game may end with the probabilities given. For example, for the 6th play, the manager chooses D with probability 0.2632. Thus, with probability 0.7368, the game continues to the next play, and so on.

Trust is particularly important in the last play of the game. In this play, the manager would be better off to choose O, for a payoff of 240 rather than the expected payoff of 236 from playing according to the probabilities given. If the investor feels the manager will play O for sure, she will choose R for a payoff of 275 rather than 260 from continuing. The game will unravel. For this not to happen, the investor must trust that the manager will in fact choose his final act with the probabilities shown. The manager may choose D due to a fear of legal liability if O is chosen,²² and/or a desire to maintain a reputation. Also, many executive compensation plans require that the manager hold company stock for some time after retirement. For example, the Royal Bank compensation plan reviewed in Section 10.3 requires the CEO and CFO to hold company stock for two years after retirement. Even a very small probability that the manager (0.1 in this example) will do so is sufficient to prevent unravelling.

The question then is: how is trust maintained? One source of trust is a belief by the investor that the manager will be held liable for opportunism (see Note 22). However, fear of liability does not always deter cheating. Can accounting help to maintain investor trust? The answer is yes to the extent that GAAP, full disclosure, and an ethical audit profession prevent opportunism.

Nevertheless, it is quite possible for trust to be lost, at any point in the game. A major reporting failure by the manager of another firm could cause the investor to lose trust.

Arguably, revelation of accounting fraud by Enron and WorldCom (Section 1.2) caused investors to lose trust in all firms' financial reporting, thereby triggering the 2001 U.S. recession. From the manager's perspective, he may lose trust because of concern that the investor is likely to sell for portfolio reasons, or is unduly influenced by analyst forecasts, or is a noise trader.

Furthermore, if we replace trust with "bubble" or "bandwagon effect" in the model, we see that these forces could also motivate the players to proceed up the tree. Again, an event such as financial reporting failure could cause the bubble to burst, with the players heading for the nearest left node.

We conclude that, from an accounting perspective, the role of high quality financial reporting to maintain investor trust in managers is crucial. The example reinforces our argument (Section 4.7) that high quality reporting is essential to enable the investor trust that firms need if they are to raise investment capital.

8.10.4 Summary of Implicit Contracting

Non-cooperative game theory enables us to model the conflict situation that often exists between different constituencies of financial statement users. Even a very simple game-theoretic model shows that an accounting standard-setting body that fails to consider the interests of all constituencies affected by accounting policy choice is in danger of making policy recommendations that are difficult to implement.

8.11 SUMMARY OF EFFICIENT CONTRACTING

Efficient contracting raises two important questions for the Conceptual Framework. First, should the Framework give greater recognition to verifiability, such as moving it from an enhancing characteristic of financial statements to a component of representational faithfulness? As O'Brien argues (see Section 8.4.1), this would strengthen the role of reliability in the Framework, thus reducing investors' concern that managers may opportunistically manage earnings so as to avoid violation of debt covenants and to increase their reputation and compensation.

Second, to what extent should financial statements provide an early warning system to alert debtholders to possible firm financial distress? Conditional conservatism provides such an early warning system by recognizing unrealized losses. In fairness, accounting standards do recognize many unrealized losses through impairment tests. However, the motivation is likely due to a concern about legal liability rather than to an acceptance of contract theory.

Empirical research has reported evidence of both efficient contracting and opportunistic manager behaviour. While it is important for accountants to be aware of the possibility of manager opportunism, evidence of efficient contracting suggests that it is possible to align managers' interests with those of investors. We now turn to a consideration of how this alignment may be achieved.

Questions and Problems

1. Debt contracts may contain covenants, such as maintaining a specified level of working capital, not exceeding a specified debt–equity ratio, or maintaining an agreed times interest earned ratio. Explain how these covenants help to generate the lenders’ trust that is necessary if the firm is to borrow at reasonable cost. Do these covenants give lenders complete trust that their interest and principal will be paid? Explain.
2. Lenders are primarily concerned about poor firm performance, since this increases the likelihood that they will not receive their interest and principal. How do lenders benefit if the firm performs well? If lenders benefit when the firm does well, why are they primarily concerned about downside risk? Which accounting policies do lenders want to protect against downside risk? Explain how these policies decrease downside risk.
3. In his article “The Impact of Accounting Regulation on the Stock Market: The Case of Oil and Gas Companies,” Lev (1979) examined the daily returns on a portfolio of oil and gas companies’ common shares affected by the exposure draft of SFAS 19. This standard required firms to use the successful efforts method of accounting for the costs of oil and gas exploration. Under successful efforts, costs of drilling unsuccessful wells are written off when the well is determined to be unsuccessful. An alternative policy is full cost accounting, under which the costs of unsuccessful wells are capitalized into the costs of successful wells. For firms with an active exploration policy, successful efforts reports lower net income than full cost, and also increases earnings volatility. Under the proposed standard, firms that were using the full cost method would be required to switch to the successful efforts method. The new standard became effective in December 1977.

SFAS 19 was objected to particularly strongly by small oil and gas firms, especially if they were actively exploring, who argued that successful efforts accounting would reduce their ability to raise capital, with consequent effects on oil and gas exploration and on the level of competition in the industry.

Lev found that there was an average decline of 4.5% in the share prices of firms that would have to switch to the successful efforts method, during a three-day period following the release of the exposure draft (July 18, 1977). This study is one of the few that have detected a securities market reaction to an accounting policy change that would have no direct impact on cash flows.

Required

- a. Why did Lev examine share returns around the date of the exposure draft (July 18, 1977) rather than the date SFAS 19 was issued (December 5, 1977)?
 - b. Use contract theory and efficient securities market theory to explain why the stock market reacted as it did to the exposure draft of SFAS 19.
 - c. Suppose that, pursuant to the theory and evidence described in Section 6.2, securities markets are not efficient. What reaction to SFAS 19 would you then expect? Explain.
4. Use contracting theory to explain why firms (i.e., Boards of Directors acting on shareholders’ behalf) would prefer to allow managers a set of accounting policies (e.g., GAAP) from which to choose, rather than completely prescribe accounting policy choice so that managers have no flexibility to choose policies .

Use contracting theory to explain why managers may also prefer to have a choice of accounting policies.

5. A new accounting standard requires a firm to accrue major new liabilities for employee pensions and benefits. As a result, its debt–equity ratio rises to the point where technical violation of covenants in its borrowing agreements is threatened. Management knows that renegotiation of these covenants would be difficult and costly.

Suggest some accounting policy choices that could reduce the likelihood of technical violation. Ideally, any changes in policies should not violate GAAP, not affect the firm’s real operations, and not reduce cash flows. Justify your suggestions.

6. Use contract theory to explain how conditionally conservative accounting can contribute to efficient contracting. Consider both debt and managerial compensation contracts.
7. *The Globe and Mail* (November 6, 2002, p. B1), reported “New accounting rules sow confusion about oil earnings.” This refers to changes in Canadian accounting standards that required firms with monetary items denominated in a foreign currency to include, and disclose, gains and losses from translating these items into Canadian dollars in the current period’s income statement. Previously, such gains and losses could be deferred and amortized over the life of the monetary item.

Many Canadian oil companies have long-term debt denominated in U.S. dollars. Under the new standard, fluctuations in the value of the Canadian dollar relative to the U.S. dollar increased the volatility of the reported earnings of Canadian oil companies. For example, according to the *Globe* article, EnCana Corp. reported an after-tax loss of \$145 million on its foreign currency-denominated debt for its third quarter, 2002, reducing its reported earnings by about 40%. This loss followed a foreign currency conversion gain of approximately the same amount in its second quarter. The article went on to quote the managing director of the research of a Calgary investment firm as saying that earnings are “going up and down like a toilet seat.”

Required

- a. In a follow-up article in the *Globe* on November 8, 2002 (“Accounting rule change burns big oil,” p. B2), Deborah Yedlin reported the president and CEO of EnCana Corp. as commenting that the new accounting rules could deter companies from being able to lock in financing at the current low interest rates.

Evaluate this comment from the standpoint of efficient securities market theory.

- b. Evaluate the comment in part a from the standpoint of contract theory.
8. Following the 1990 Iraqi invasion of Kuwait, the price of crude oil soared, as did retail gasoline prices. This led the major U.S. oil companies to try to hold down their reported earnings.

The oil companies were anxious to avoid a repeat of an earlier episode when crude oil and gasoline prices peaked during the 1970s, and earnings soared. At that time, the public outrage was so great that the U.S. Congress imposed an excess profits tax, taxing back several billion dollars of excess profits. Warnings of similar taxes were repeated in 1990.

To limit their 1990 profits, the major oil companies did exercise some price restraint to keep prices at the pump from rising as much as they otherwise would. They also engaged in a number of accounting practices, such as increased provisions for future environmental costs, increased maintenance, and large provisions for legal liabilities.

Required

- a. What pricing and accounting policy choices are predicted by contract theory, in response to increasing crude oil prices? Explain.
 - b. For a U.S. company (see Note 17), what inventory accounting policy would be most effective in holding down profits? Explain.
 - c. Obviously, the major U.S. oil companies were concerned about political backlash. Do you think a strategy of holding down reported profits by means of accounting policy choice is effective in avoiding a backlash? Explain why or why not.
9. Many companies issue large numbers of stock options to executives and other employees. These companies frequently buy back some of their shares on the open market. For example, Microsoft Corp., which was a major issuer of ESOs, bought back over \$20 billion of its shares over a five-year period up to 2003. In February 2005 ConocoPhillips, a large oil company based in Houston, Texas, announced a \$1 billion buyback program over the next two years. ConocoPhillips was also a major ESO issuer.

Required

- a. Why would firms with large ESO plans buy back their stock? Explain.
 - b. Normally, companies that buy back their shares do so over time, to avoid the increased demand bidding up share price, thus raising the cost of buying them back. As the shares are bought back, the company then records the reduction in outstanding shares and the cash payment. However, according to an article in *The Globe and Mail* (January 31, 2006, p. B13), "Watch out for the loophole: buybacks have hidden costs," (reproduced from *The Wall Street Journal*), many companies have engaged in "accelerated share repurchase." Under this tactic, firms recorded their *total planned* buyback all at once at their shares' current market price, even though they had not yet bought back the shares. This maximized the increase in current earnings per share. Would you, as a potential investor in firms using this tactic, be concerned? Why or why not?
10. For U.S. public corporations, SFAS 123R required expensing of ESOs. However, the exposure draft of this standard met considerable opposition, mostly from large technology companies. These companies formed an anti-expense lobby group, the International Employee Stock Options Coalition, to fight the proposal. As a result, several bills were introduced in the U.S. Congress to override or modify the FASB proposal. Suggested modifications included expensing only ESOs for the firm's top five executives, and setting share price variability to zero in the Black-Scholes formula.

The FASB's stand was strengthened, however, because numerous companies, including General Motors Corp., Microsoft Corp., and Exxon Mobil Corp., had already decided, voluntarily, to expense their ESOs. Also many firms reduced their ESO awards. For example, the Bank of Montreal reduced options issued as compensation by two-thirds, replacing them with increased cash bonuses and stock awards.

In October 2004, the FASB announced it was delaying implementation of its proposal for six months, to June 15, 2005. However, except for the implementation delay, it did not back down on this standard.

Required

- a. Evaluate the relevance and reliability of Black-Scholes as a measure of the fair value of ESOs. Use the three components of representational faithfulness outlined in Section 3.7.1 in your answer.
 - b. Some critics of the proposed standard claim that the cost of ESOs is zero. Why? Explain to these critics why their claim is incorrect.
 - c. Why are managers of some firms strongly opposed to expensing ESOs?
 - d. Why would a firm voluntarily adopt expensing ESOs?
- 11.** On October 25, 2002, *The Globe and Mail* (p. B2) reported “Former Big Bear head denies manipulation.” The article describes accusations against the former CEO of Big Bear Exploration Ltd. in a hearing before the Alberta Securities Commission. The accusations are that the former CEO fed the market gloomy news about Blue Range Resources Corp., a newly acquired subsidiary of Big Bear, in order to drive down Big Bear’s stock price and benefit personally from a subsequent rebound in stock price when Blue Range sprang back from some financial difficulties that were revealed shortly after it was acquired by Big Bear.
- Big Bear’s former CEO strenuously denied these charges, which had not been proven at the time of the article.

Required

- a. Assuming that the Big Bear CEO’s compensation contract included regular grants of ESOs, are these accusations consistent with the findings of Aboody and Kasznik (2000)? Explain why or why not.
 - b. If, as a result of a rebound at Blue Range, Big Bear’s CEO’s options became deep in the money, what is the likely effect on the CEO’s exercise decision?
- 12.** Years prior to the 2007 meltdown in the market for asset-backed securities saw a significant increase in “covenant-lite” debt, under which debt contracts had few if any debt covenants. For example, a firm may issue such debt to finance a planned takeover. One estimate is that, in 2007, covenant-lite debt accounted for 35% of all debt issued in the United States.
- Typically this debt was bought by financial institutions, such as banks. A bank would then combine this loan with other similar loans and slice the total up into tranches of similar credit quality. It would then sell these tranches to investors on a secondary loan market. The purchaser would receive his/her share of the interest and principal payments paid by the firms whose debt is in that tranche. Thus, the investor could buy interest-bearing debt with the level of default risk he/she desires, and pay accordingly. The effect, it was felt at the time, was to disperse credit risk through the economy. It was expected that even for a covenant-lite tranche of low quality there will be no more than a few defaulting firms, so that any credit losses are spread over all the investors in that tranche.
- Furthermore, it was possible to increase the credit quality of a tranche by buying credit default swaps (CDSs). These are derivative instruments under which the issuer of the CDS, for a fee, agrees to compensate tranche investors for credit losses incurred by that tranche. If CDSs are bought to protect, say, 25% of the underlying debt in the tranche, the effect is to increase the credit quality of the tranche significantly. This further dispersed credit risk, since now at least part of the risk was borne by the CDS issuers.

Required

- a. If you were an investor in interest-bearing securities, would you be willing to invest a substantial amount of your capital in tranches secured by covenant-lite debt? Explain why or why not. Consider both your evaluation of expected return and risk in your decision.
 - b. Concerns are sometimes expressed that issuing covenant-lite debt creates a moral hazard problem for the firms issuing such debt. What is the problem?
 - c. The ability to increase the credit quality of high-risk debt by means of CDSs seems almost “magical.” However, based on experience from the 2007–2008 market meltdowns (Section 1.3), the increase in credit quality was not as great as expected. Why?
13. Beatty, Weber, and Yu (2008) (Section 8.8) analyzed a sample of U.S. firms with debt covenants that required the firm to maintain a specified level of net worth. Almost two-thirds of these covenants contained income escalators, whereby the required level of net worth to be maintained increased by a specified percentage (e.g., 50%) of positive net income. If net income was negative, the required level did not decrease.

The authors’ findings included the following:

- Firms with high information asymmetry between the firm and its lenders (i.e., high estimation risk) were more likely to include income escalator clauses in their net worth covenants. The higher the information asymmetry, the greater are lenders’ concerns that firm managers may behave opportunistically by, for example, paying excessive dividends and/or managing earnings upward to cover up or delay solvency concerns. Lender concerns can be measured by the spread between bid and ask price when bonds are traded (a higher spread suggests greater lender concerns), by the firm’s credit rating, and by the magnitude of its accruals (high accruals suggest a volatile operating environment, which can lead to increased probability of covenant violation). All of these concerns increase with information asymmetry.
- Income escalator clauses and conservative accounting (including both conditional and unconditional conservatism) were positively associated. That is, firms with income escalator clauses in their net worth covenants were more likely to adopt conservative accounting policies. This finding was after allowing for other reasons for conservative accounting such as investor demand and concern about litigation (Sections 6.11 and 6.12). This finding is of interest because it implies that conservative accounting alone is not sufficient for efficient debt contracting. Rather, a combination of conservative accounting and sophisticated debt covenants may further increase contracting efficiency.

Required

- a. Why do debt contracts often contain covenants requiring maintenance of a specified level of net worth?
- b. Managers of firms with higher information asymmetry between the firm and its lenders have greater opportunities to opportunistically manage earnings upward. Why would such firms include income escalator clauses in their debt covenants?
- c. Explain why income escalator clauses and conservative accounting work together to benefit investors. Give two examples of conservative accounting policies in your answer.

14. In the United States, SFAS 123 required firms to report employee stock option (ESO) expense either in its financial statements proper or in a financial statement note (Section 8.6). Many firms based their expense estimates on the Black-Scholes option pricing formula (Section 7.9.1). However, many of these firms included a management disavowal of the reliability of the ESO expense calculation in their financial statements.

Blacconiere, Frederickson, Johnson, and Lewis (2011) (BFJL) studied these reliability disavowals. Their interest was in whether the disavowals were informative about reliability or whether they indicated opportunistic behaviour by the managers involved. Informative disavowals would bring to investors' attention that management really believed ESO expense was unreliable. Opportunistic disavowals were not necessarily indicative of low reliability, but rather designed to benefit the manager. For example, the manager may wish to reduce political backlash to high ESO compensation by calling the value of that compensation into doubt.

Required

- a. What are the problems of using the Black-Scholes option pricing model to estimate ESO expense?
 - b. Does a finding that management disavowals are informative, that is, are associated with high unreliability of ESO estimates, mean that reporting ESO expense is not decision useful for investors? Explain.
 - c. The authors found that firms with high implied share price variability were more likely to disavow than firms with low implied share price variability. The implied variability of share price applies to firms with *traded* stock options outstanding (i.e., options not issued as ESOs). Given the market price of the traded options, and estimates of the other inputs into the Black-Scholes formula (Section 7.9.1), the formula can be solved for the variability of share price implied by the model. This variability estimate is often regarded as a superior input to Black-Scholes than past share price variability for valuing ESOs since it is more forward looking. Does this finding suggest that management disavowals of reliability are informative or opportunistic? Explain.
 - d. Under SFAS 123, firms are required to disclose the values they use for the various inputs to the Black-Scholes formula, including the input for share price variability. For each firm in their sample, the authors compared this variability input with the firm's actual share price variability over a five-year period following the disavowal. They found that, on average, management's share price variability input exceeded actual variability following the disavowal. Does this finding suggest that management disavowals of reliability are informative or opportunistic? Explain.
15. Beatty, Liao, and Weber (2012) investigate **delegated monitoring** of public debt issues, under which holders of public debt delegate monitoring of the borrower's financial performance to a specialist, such as a bank. This tactic is common, particularly when a firm has several classes of debt outstanding. When there are several debt classes, holders of a class may leave it to holders of another class to monitor financial performance. If all debtholders feel this way, insufficient monitoring will be carried out. Alternatively, if holders of all debt classes do their own monitoring, total

monitoring costs will be high. By hiring a monitoring specialist, these problems are reduced.

Knowing that its debt holders may delegate monitoring, the firm may include a **cross acceleration** covenant in its debt contracts. This is to overcome a problem that arises with multiple debt classes when some classes have greater security than others. For example, one class may have higher priority to receive debt repayments than another should the firm go into liquidation. Consequently, if the firm enters financial distress, the debt holders with priority may force liquidation even though the firm has a higher expected value if it continues operating. Cross acceleration relieves this problem because all debt classes are treated equally should debt repayments be accelerated because the firm has entered financial distress.

While, cross acceleration may treat all classes of debt equally, another problem remains—namely, inappropriate liquidation. To see why, note that most delegated monitors are banks, and it is likely that the bank has also loaned money to the firm in question. If so, and if the firm approaches financial distress, the bank may trigger liquidation to protect its own position, even though the firm's value as a going concern exceeds its liquidating value. This is of particular concern to debt holders if their debt is longer-term than the firm's bank debt.

Consequently, the firm faces a cost–benefit tradeoff when considering inclusion of a cross acceleration covenant in its debt contracts. Its borrowing costs will be reduced to the extent that debt investors feel more secure because of cross acceleration, but will be increased to the extent that investors are concerned about inappropriate liquidation.

Delegated monitoring and cross acceleration are of interest to accounting since, as mentioned, most delegated monitors are banks, which have usually loaned money to the borrowing firm. As the authors point out, bank lending agreements usually contain accounting-based covenants, and the bank will base a decision to demand accelerated repayment, with resulting likelihood of forced liquidation, on these.

BLW study 1,670 public debt issues from 515 firms over the period 1994–2007. They report that 62% of their sample contained cross acceleration provisions. In their study of these contracts, the authors report several findings, including:

- i. Cross acceleration is less likely to the extent that the expected going concern value of the borrowing firm exceeds its expected liquidation value. The authors measure expected going concern value by the market value of total assets. They measure expected liquidation value by a proportion of the value of accounts receivable, inventory; property, plant and equipment; and cash.
- ii. Cross acceleration is more likely as the number of covenants in the bank's lending contract increases.
- iii. Cross acceleration is more likely as information asymmetry between the firm and investors increases. Information asymmetry is based on the discretionary accrual models of Dechow and Dichev (2002) (Section 5.4.1) and Jones (1991) (Section 11.3), with higher discretionary accruals implying lower earnings quality.
- iv. The authors also find that interest rates paid by firms with a cross acceleration covenant in their lending agreements are higher on average the greater the level of discretionary accruals.

Required

Explain the likely reasons for each of the findings reported above.

16. The controversy over expensing of ESOs can be analyzed as a non-cooperative game. Let the two players be the standard setter and the large, powerful corporations that wish to prevent expensing. Each player faces two strategies. The “cooperate” strategy happens when one player accedes to the demands of the other, or, at least, expresses a willingness to compromise. (For example, one suggested compromise was to expense only ESOs granted to senior officers, with those granted to all other employees reported only as supplementary information. Another was to delay an expensing decision to give time to work out a compromise.) The “strong” strategy involves a player sticking to his/her own preferred policy and attempting to win support from business and government.

Hypothetical payoffs for each player are summarized in the following table.

		Standard setter	
		Cooperate	Strong
Corporations	Cooperate	30, 30	8, 40
	Strong	20, 10	12, 15

In each box, the first number represents the corporations’ payoff and the second number the standard setter’s payoff. Consider the lower left payoffs. Here, the corporations play strong; that is, they vigorously oppose expensing and proceed to gather support for their position from business and government. The standard setter backs down, as the FASB did in 1994, and allows all ESO expense to continue to be reported in the financial statement notes. The corporations’ payoff is 20 in this case, because it is seen as the dominant player. However, because this strategy erodes their relationship with the standard setter, generates political controversy, and alienates other constituencies who feel that standard setting should be done in the private sector, its payoff is less than the 30 it would receive if both players had cooperated to reach a compromise solution. The standard setter receives a very low payoff of 10, because it is perceived as capitulating to the corporations’ demands. If the corporations cooperate, however, and formulate a compromise, with payoffs of 30 each, the standard setter may seize on this as an expression of weakness and force through its preferred expensing option. Then, the standard setter’s payoff is 40, since it is seen as the dominant player, and the corporations suffer an embarrassing defeat with payoff of only 8. If both parties play strong, no agreement is possible and the question of ESO expensing has to be settled by another authority, such as government. Here, both parties lose, with low payoffs as shown in the lower right of the table.

Required

- a. Given the payoffs as shown, which strategy pair do you predict the players will choose?

- b. Is this strategy pair a Nash equilibrium? Explain.
 - c. Both parties would be better off if they cooperated. Explain why this strategy pair is unlikely to be chosen in a single play of the game.
17. The shareholders of X Ltd. will vote at the forthcoming annual meeting on a proposal to establish a bonus plan for X Ltd. management, based on firm earnings. Proponents of the plan argue that management will work harder under a bonus plan and that future cash flows will thereby increase. However, a dissident shareholder group argues that there is little point in granting a bonus plan, because management will bias or otherwise manage earnings to increase their bonus, rather than working harder.

Upon investigation, you estimate that if the bonus plan is granted, expected future cash flows will be \$150 if management does not manage earnings, and \$140 if it does, *before* management remuneration in each case (cash flows are lower in the latter case because, rather than working harder, management uses earnings management to disguise shirking). Management remuneration, including the bonus, would be \$50 if it does not manage earnings and \$60 if it does. Assume that cash flows not paid as management remuneration will go to the shareholders. If the bonus plan is not granted, expected cash flows will be \$140 before management remuneration if management does not manage earnings and \$100 if it does. Management remuneration would be \$30 in either case, with the balance of cash flows going to the shareholders.

Required

- a. Prepare a payoff table for the above game between shareholders and management.
 - b. Which strategy pair will be chosen? That is, identify a Nash equilibrium for the game. Assume both players are risk neutral.
 - c. What is the main advantage of a game theory approach to modelling the management’s decision whether to manage earnings, rather than modelling it as a single-person decision theory problem of the manager?
18. The following table depicts a non-cooperative game between an investor in a firm’s shares and the firm’s auditor.

		Auditor	
		Work for investor	Work for manager
Investor	Invest	5, 4	2, 6
	Do not invest	3, 1	3, 3

The investor has two strategies: invest or not invest. The auditor can choose to work for the investor by ensuring that the firm’s financial statements are free of opportunistic earnings management, or to work for the manager by allowing opportunistic earnings management, which may mislead the investor but benefit the manager.

The number pairs in the table represent the utility payoff to the investor and auditor, respectively, for each strategy combination. The rationale for these payoffs is as follows:

- Invest, work for investor: The investor receives high-quality information (generating utility of 5), but the auditor incurs high audit costs (generating utility of 4) due to time spent arguing with the manager and possible loss of audit engagement.
- Invest, work for manager: The investor receives low-quality information (utility of 2), but the auditor's costs are lower (utility of 6).
- Do not invest, work for investor: The investor buys lower-yielding securities (utility of 3). The firm's cost of capital rises due to lower demand for its shares. As a result, its earnings fall. Auditor incurs high audit costs, and absorbs lower audit fee due to lower firm earnings (utility of 1).
- Do not invest, work for manager: The investor buys lower-yielding securities. The auditor's audit costs are lower due to less arguing with manager but audit fee is still low due to lower firm earnings (utility of 3).

Required

- a. Identify the Nash equilibrium of this game and explain why this is the predicted outcome of the game.
 - b. Identify the cooperative solution. Explain why it is unlikely to be attained in a single play of this game.
 - c. Outline three possible ways that the cooperative solution may be attained.
19. A problem with many games is that they can have multiple Nash equilibria. This makes it difficult to predict the outcome of the game.

As an illustration of a non-cooperative game with multiple equilibria, consider the following payoff table. The first number in each payoff pair is the payoff to country 2:

		Country 1	
		Keep	Violate
Country 2	Keep	100, 100	50, 200
	Violate	200, 50	50, 50

Required

- a. Identify three Nash equilibria of this game.
- b. Suppose that this game will be repeated a known, finite number of times. Suppose that the current equilibrium is in the lower left portion of the table. Describe an action by country 1 that would cause a shift to a new equilibrium.
- c. Suppose that the game will be repeated an indefinite (i.e., infinite) number of times. What equilibrium would you then predict? Explain.

Notes

1. In the following discussion it will be helpful to distinguish between the firm and its manager. We can think of the firm as represented by the board of directors.
2. This is the “economic Darwinism” argument of Alchian (1950).
3. While the two concepts are related, contract efficiency should not be confused with securities market efficiency.
4. The Framework does recognize the importance of stewardship—it states that the financial reporting objective is to help investors in resource-providing decisions *and* assess whether management has made efficient and effective use of the firm’s resources. However, this does not recognize the fundamental problem (Section 1.10) that the best income measure to inform investors is not necessarily the same as the best measure to motivate manager performance. Most accounting standards are devoted to the information needs of investors, not to the special needs of stewardship evaluation.
5. Efficient contracting theory, also referred to as **positive accounting theory**, refers to the firm as a “**nexus of contracts.**” See Watts and Zimmerman (1986), page 196.
6. Important firm customers and suppliers have similar concerns. See Hui, Klasa, and Yeung (2012).
7. Private lending agreements are loans that are not publicly traded, in contrast to public lending agreements where investors can buy or sell bonds and other credit instruments on the market. The private lending agreements studied by Dichev and Skinner consist of loans made by U.S. banks to large corporations. They report that such loans are the main form of private lending.
8. A fixed ESO plan is one where the number of shares and the exercise price are known at the grant date. This contrasts with a variable plan, under which the number of shares the employee may acquire and/or the price to be paid are not determinable until some time after the grant date.
9. This assumes that the number of shares to be issued by means of options is not large enough to affect the market price of the firm’s shares.
10. Concavity is the source of the overstatement. To see this, note first that the Black-Scholes value of an option is increasing in time to expiry, since the longer the time to expiry, the greater the probability that share price will take off. Also, recall that under APB 25, most ESOs were issued with exercise price equal to underlying share price at the grant date. When exercise price and grant date share price are equal, the Black-Scholes value may be an increasing, *concave* function of time to expiry, as argued by HMS. If so, the option value increases at a decreasing rate. The significance of concavity is that if an employee exercises his/her ESOs *before* expected time to exercise (note that expected time to exercise is an average across employees), the reduction in *ex post* cost to the firm is greater than the increase in cost if an employee exercises a similar time *after* expected time to exercise. That is, use of expected time to exercise in Black-Scholes upwardly biases ESO cost relative to *ex post* cost. When this upward bias is put together with the considerable variability of employees’ exercise decisions, the bias can be significant. Using a procedure suggested by HMS to approximate the effects of this concavity, Marquardt (2002) finds the tendency of Black-Scholes to bias ESO cost is reduced.
11. AK’s argument assumes that investors do not know the scheduled date. If they did, they could discount the CEO’s information release to adjust for manager biases. AK argue that there is considerable uncertainty that a firm will maintain its scheduled ESO grant dates, and whether or not it does is not known by the market until after the fact. Also, it would take several years before the market could identify that the firm was, in fact, adhering to a fixed schedule. AK present evidence in support of their argument.
12. Instead of using the Black-Scholes model with expected exercise date, more elaborate versions of the binomial model illustrated in Figure 7.2 can incorporate the various early exercise possibilities directly into the model.

13. As discussed earlier, *ex ante* ESO cost is an estimate, based on an option pricing model applied at grant date. *Ex post* ESO cost is the actual cost, being the difference between the share price and exercise price at exercise date. SFAS 123R and IFRS2 do not require subsequent adjustment of ESO expense for any difference between *ex ante* and *ex post* cost.
14. Choudhary reports that 96% of the firms in his sample used the Black-Scholes model to measure ESO fair value.
15. The reason, according to the authors, is that banks can demand inside information, and tailor loan conditions such as maturity, collateral, and interest rate to the borrower's particular circumstances. They also have greater flexibility than bondholders to revise loan terms should the borrower enter financial distress. It is more difficult for public lenders to obtain and process inside information, and to change the terms of the debt contract. Consequently, the borrowing firm's accounting quality is the main variable that public lenders have in monitoring the safety of their investment.
16. SFAS 131 is discussed further in Section 12.10. This standard is now included in ASC 280-10.
17. LIFO inventory method uses the cost of the most recently acquired inventory as cost of sales, as opposed to FIFO, which uses the cost of the earliest inventory as cost of sales. On a rising market, LIFO produces a lower net income than FIFO. LIFO is allowed under FASB standards (ASC 330-10-30-9), but not under IASB standards (IAS 2).
18. This assumes that stakeholders do not unwind the earnings management. BDS argue that it is not cost effective for them to do so since it is difficult to isolate effects on reported income of continuing use of, for example, LIFO inventory or accelerated amortization, particularly since many stakeholders have limited ability to process information and may not have enough at stake to warrant careful evaluation of reported earnings.
19. The discussion here assumes only pure strategies, that is, strategies where one act is chosen with probability 1. It is possible to have mixed-strategy solutions, where players randomize between acts over which they are indifferent. Then, this statement would need modification.
20. This example is based on a discussion in Friedman (1986), pp. 139–141. Friedman's discussion is, in turn, based on a model proposed by R.W. Rosenthal (1981).
21. The process of analyzing the game from the final play to the first is called **backwards induction**. It captures the forward-looking behaviour of rational players as they determine their first move.
22. Jeffrey Skilling, CEO of Enron, resigned in August 2001, prior to the disclosure of serious financial irregularities (Section 1.2). Nevertheless, he was subsequently found guilty of criminal behaviour, and was sentenced to a 24-year, 4-month prison term. In June 2010, the Supreme Court vacated part of Skilling's conviction and transferred the case back to the lower court for resentencing. During April 2011, a three-judge 5th Circuit Court panel ruled that the verdict would have been the same despite the legal issues being discussed, and Skilling's conviction was confirmed, however the court ruled Skilling should be resented. Skilling appealed this new decision to the Supreme Court, but the appeal was denied. In 2013 the United States Department of Justice reached a deal with Skilling resulting in 10 years being cut from his sentence.