ACQUISITIONS AND TAKEOVERS

When analyzing investment decisions, we did not consider in any detail the largest investment decisions that most firms make, i.e., their acquisitions of other firms. Boeing's largest investment of the last decade was not a new commercial aircraft but its acquisition of McDonnell Douglas in 1996. At the time of the acquisition, Boeing's managers were optimistic about the merger, claiming that it would create substantial value for the stockholders of both firms. What are the principles that govern acquisitions? Should they be judged differently from other investments?

Firms are acquired for a number of reasons. In the 1960s and 1970s, firms such as Gulf and Western and ITT built themselves into conglomerates by acquiring firms in other lines of business. In the 1980s, corporate giants like Time, Beatrice and RJR Nabisco were acquired by other firms, their own management or wealthy raiders, who saw potential value in restructuring or breaking up these firms. In the 1990s, we saw a wave of consolidation in the media business as telecommunications firms acquired entertainment firms, and entertainment firms acquired cable businesses. Through time, firms have also acquired or merged with other firms to gain the benefits of synergy, in the form of either higher growth, as in the Disney acquisition of Capital Cities, or lower costs.

Acquisitions seem to offer firms a short cut to their strategic objectives, but the process has its costs. In this chapter, we examine the four basic steps in an acquisition, starting with establishing an acquisition motive, continuing with the identification and valuation of a target firm, and following up with structuring and paying for the deal. The final, and often the most difficult, step is making the acquisition work after the deal is consummated.

Background on Acquisitions

When we talk about acquisitions or takeovers, we are talking about a number of different transactions. These transactions can range from one firm merging with another

firm to create a new firm to managers of a firm acquiring the firm from its stockholders and creating a private firm. We begin this section by looking at the different forms taken by acquisitions, continue the section by providing an overview on the acquisition process and conclude by examining the history of the acquisitions in the United States

Classifying Acquisitions

There are several ways in which a firm can be acquired by another firm. In a **merger**, the boards of directors of two firms agree to combine and seek stockholder approval for the combination. In most cases, at least 50% of the shareholders of the target and the bidding firm have to agree to the merger. The target firm ceases to exist and becomes part of the acquiring firm; Digital Computers was absorbed by Compaq after it was acquired in 1997. In a **consolidation**, a new firm is created after the merger, and both the acquiring firm and target firm stockholders receive stock in this firm; Citigroup, for instance, was the firm created after the consolidation of Citicorp and Travelers' Insurance Group.

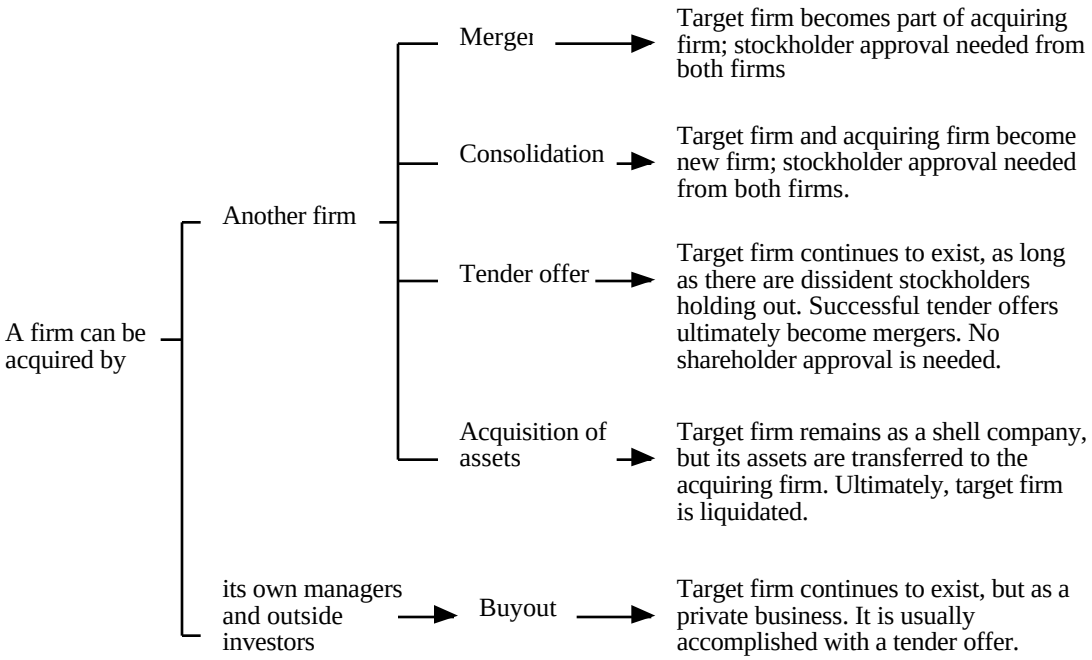
In a **tender offer**, one firm offers to buy the outstanding stock of the other firm at a specific price and communicates this offer in advertisements and mailings to stockholders. By doing so, it bypasses the incumbent management and board of directors of the target firm. Consequently, tender offers are used to carry out hostile takeovers. The acquired firm will continue to exist as long as there are minority stockholders who refuse the tender. From a practical standpoint, however, most tender offers eventually become mergers, if the acquiring firm is successful in gaining control of the target firm.

In a **purchase of assets**, one firm acquires the assets of another, though a formal vote by the shareholders of the firm being acquired is still needed.

There is a one final category of acquisitions that does not fit into any of the four described above. Here, a firm is acquired by its own management or by a group of investors, usually with a tender offer. After this transaction, the acquired firm can cease to exist as a publicly traded firm and become a private business. These acquisitions are called

management buyouts, if managers are involved, and **leveraged buyouts**, if the funds for the tender offer come predominantly from debt. This was the case, for instance, with the leveraged buyouts of firms such as RJR Nabisco in the 1980s. Figure 26.1 summarizes the various transactions and the consequences for the target firm.

Figure 26.1: Classification of Acquisitions



The Process of an Acquisition

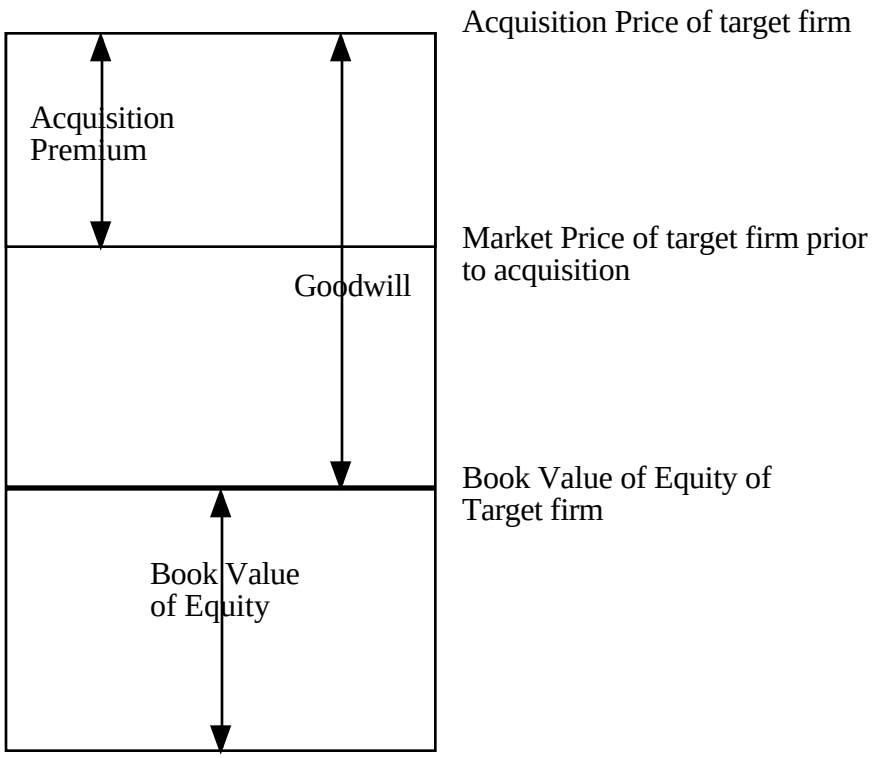
Acquisitions can be friendly or hostile events. In a friendly acquisition, the managers of the target firm welcome the acquisition and, in some cases, seek it out. In a hostile acquisition, the target firm's management does not want to be acquired. The acquiring firm offers a price higher than the target firm's market price prior to the acquisition and invites stockholders in the target firm to tender their shares for the price.

In either friendly or hostile acquisitions, the difference between the acquisition price,and the market price prior to the acquisition is called the **acquisition premium**. The **acquisition price**, in the context of mergers and consolidations, is the price that will be paid by the acquiring firm for each of the target firm's shares. This price is usually based upon negotiations between the acquiring firm and the target firm's managers. In a tender

offer, it is the price at which the acquiring firm receives enough shares to gain control of the target firm. This price may be higher than the initial price offered by the acquirer, if there are other firms bidding for the same target firm or if an insufficient number of stockholders tender at that initial price. For instance, in 1991, AT&T initially offered to buy NCR for $ 80 per share, a premium of $ 25 over the stock price at the time of the offer. AT&T ultimately paid $ 110 per share to complete the acquisition.

There is one final comparison that can be made, and that is between the price paid on the acquisition and the accounting book value of the equity in the firm being acquired. Depending upon how the acquisition is accounted for, this difference will be recorded as goodwill on the acquiring firm's books or not be recorded at all. Figure 26.2 presents the break down of the acquisition price into these component parts.

Figure 26.2: Breaking down the Acquisition Price



A Brief History of Mergers and Acquisitions in the United States

Merger activity in the United States has occurred in waves, with different motives behind each wave. The first wave occurred in the early part of the 20th century, when companies such as U.S. Steel and Standard Oil were created by acquiring firms within an industry with the explicit objective of dominating these industries and creating monopolies. The second wave coincided with the bull market of the 1920s, when firms again embarked on acquisitions as a way of extending their reach into new markets and expanding market share. During this period, firms such as General Foods and Allied Chemical came into being. The third wave occurred in the 1960s and 1970s, when firms such as Gulf and Western focused on acquiring firms in other lines of business, with the intent of diversifying and forming conglomerates. The fourth wave of mergers occurred in the mid 1980s, when firms were acquired primarily for restructuring assets and recapitalization. In some cases, the acquisitions were financed heavily with debt and were initiated by the managers of the firms being acquired. This wave reached its zenith with the acquisition of RJR Nabisco by KKR, but waned toward the end of the decade, as deals became pricier and it became more difficult to find willing lenders. The mergers in the 1990s were in the telecommunications, entertainment and financial services, as firms consolidated to meet new market and technological challenges. Towards the end of the 1990s, the focus of consolidation shifted to the high technology and internet sectors, with firms increasingly using their own stock as currency to finance acquisitions.

Interestingly, merger activity seems to increase in years in which the stock market does well, which is counter to what we would expect if the primary motive for acquisitions were undervaluation. There also seems to be a tendency for mergers to be concentrated in a few sectors; in the early 1980s, many of the mergers involved oil companies, whereas the focus shifted to food and tobacco companies in the latter half of the decade and shifted again to media and financial service firms in the early 1990s.

✒ CT 26.1: Merger waves seem to end with excesses – bidders overpaying for companies and paying a hefty price. The restructuring and buyout wave of the 1980s ended, for instance, after several leveraged buyouts towards the end of the decade failed. Why do merger waves crest?

Empirical Evidence on the Value Effects Of Takeovers

Many researchers have studied the effects of takeovers on the value of both the target and bidder firms. The evidence indicates that the stockholders of target firms are the clear winners in takeovers — they earn significant excess returns[1] not only around the announcement of the acquisitions, but also in the weeks leading up to it. Jensen and Ruback (1983) reviewed 13 studies that look at returns around takeover announcements and reported an average excess return of 30% to target stockholders in successful tender offers and 20% to target stockholders in successful mergers. Jarrell, Brickley, and Netter (1988) reviewed the results of 663 tender offers made between 1962 and 1985 and noted that premiums averaged 19% in the 1960s, 35% in the 1970s and 30% between 1980 and 1985. Many of the studies report an increase in the stock price of the target firm prior to the takeover announcement, suggesting either a very perceptive financial market or leaked information about prospective deals.

Some attempts at takeovers fail, either because the bidding firm withdraws the offer or because the target firm fights it off. Bradley, Desai,and Kim(1983) analyzed the effects of takeover failures on target firm stockholders and found that, while the initial reaction to the announcement of the failure is negative, albeit statistically insignificant, a substantial number of target firms are taken over within 60 days of the first takeover is failing, earning significant excess returns (50% to 66%).

[1] Excess returns represent returns over and above the returns you would have expected an investment to make, after adjusting for risk and market performance.

The effect of takeover announcements on bidder firm stock prices is not as clear cut. Jensen and Ruback report excess returns of 4% for bidding firm stockholders around tender offers and no excess returns around mergers. Jarrell, Brickley and Netter, in their examination of tender offers from 1962 to 1985, note a decline in excess returns to bidding firm stockholders from 4.4% in the 1960s to 2% in the 1970s to -1% in the 1980s. Other studies indicate that approximately half of all bidding firms earn negative excess returns around the announcement of takeovers, suggesting that shareholders are skeptical about the perceived value of the takeover in a significant number of cases.

When an attempt at a takeover fails, Bradley, Desai and Kim (1983) report negative excess returns of 5% to bidding firm stockholders around the announcement of the failure. When the existence of a rival bidder in figured in, the studies indicate significant negative excess returns (of approximately 8%) for bidder firm stockholders who lose out to a rival bidder within 180 trading days of the announcement, and no excess returns when no rival bidder exists.

✒ CT 26.2: The managers of bidding firms whose stock prices go down on acquisitions, often argue that this occurs because stockholders do not have as much information as they do about the target firm's finances and its fit with the bidding firm. How would you respond to the argument?

Steps in an Acquisition

There are four basic and not necessarily sequential steps, in acquiring a target firm. The first is the development of a rationale and a strategy for doing acquisitions, and what and understanding of this strategy requires in terms of resources. The second is the choice of a target for the acquisition and the valuation of the target firm, with premiums for the value of control and any synergy. The third is the determination of how much to pay on the acquisition, how best to raise funds to do it, and whether to use stock or cash. This decision has significant implications for the choice of accounting treatment for the acquisition. The

final step in the acquisition, and perhaps the most challenging one, is to make the acquisition work after the deal is complete.

Developing an Acquisition Strategy

Not all firms that make acquisitions have acquisition strategies, and not all firms that have acquisition strategies stick with them. In this section, we consider a number of different motives for acquisitions and suggest that a coherent acquisition strategy has to be based on one or another of these motives.

Acquire undervalued firms

Firms that are undervalued by financial markets can be targeted for acquisition by those who recognize this mispricing. The acquirer can then gain the difference between the value and the purchase price as surplus. For this strategy to work, however, three basic components need to come together:

1. *A capacity to find firms that trade at less than their true value*: This capacity would require either access to better information than is available to other investors in the market, or a better analytical tools than those used by other market participants.
2. *Access to the funds that will be needed to complete the acquisition*: Knowing a firm is undervalued does not necessarily imply having capital easily available to carry out the acquisition. Access to capital depends upon the size of the acquirer – large firms will have more access to capital markets and internal funds than smaller firms or individuals – and upon the acquirer's track record – a history of success at identifying and acquiring under valued firms will make subsequent acquisitions easier.
3. *Skill in execution*: If the acquirer, in the process of the acquisition, drives the stock price up to and beyond the estimated value, there will be no value gain from the acquisition. To illustrate, assume that the estimated value for a firm is $ 100 million, and that the current market price is $ 75 million. In acquiring this firm, the acquirer

will have to pay a premium. If that premium exceeds 33% of the market price, the price exceeds the estimated value, and the acquisition will not create any value for the acquirer.

While the strategy of buying under valued firms has a great deal of intuitive appeal, it is daunting, especially when acquiring publicly traded firms in reasonably efficient markets, where the premiums paid on market prices can very quickly eliminate the valuation surplus. The odds are better in less efficient markets or when acquiring private businesses.

Diversify to reduce risk

We made a strong argument in chapter 6 that diversification reduces an investor's exposure to firm-specific risk. In fact, the risk and return models that we have used in this book have been built on the presumption that the firm-specific risk will be diversified away and hence will not be rewarded. By buying firms in other businesses and diversifying, acquiring firms' managers believe, they can reduce earnings volatility and risk, and increase potential value.

Although diversification has benefits, it is an open question whether it can be accomplished more efficiently by investors diversifying across traded stocks, or by firms, diversifying by acquiring other firms. If we compare the transactions costs associated with investor diversification with the costs and the premiums paid by firms doing the same, investors in most publicly traded firms can diversify far more cheaply than firms can.

There are two exceptions to this view. The first is in the case of a private firm, where the owner may have all or most of his or her wealth invested in the firm. Here, the argument for diversification becomes stronger, since the owner alone is exposed to all risk. This risk exposure may explain why many family-owned businesses in Asia, for instance, diversified into multiple businesses and became conglomerates. The second, albeit weaker case, is the closely held firm, whose incumbent managers may have the bulk of their wealth invested in the firm. By diversifying through acquisitions, they reduce their exposure to total risk,

though other investors (who presumably are more diversified) may not share their enthusiasm.

Create Operating or Financial Synergy

The third reason to explain the significant premiums paid in most acquisitions is **synergy**. Synergy is the potential additional value from combining two firms. It is probably the most widely used and misused rationale for mergers and acquisitions.

Sources of Operating Synergy

Operating synergies are those synergies that allow firms to increase their operating income, increase growth or both. We would categorize operating synergies into four types:

1. *Economies of scale* that may arise from the merger, allowing the combined firm to become more cost-efficient and profitable.
2. *Greater pricing power* from reduced competition and higher market share, which should result in higher margins and operating income.
3. *Combination of different functional strengths*, as would be the case when a firm with strong marketing skills acquires a firm with a good product line
4. *Higher growth in new or existing markets*, arising from the combination of the two firms. This would be case when a US consumer products firm acquires an emerging market firm, with an established distribution network and brand name recognition, and uses these strengths to increase sales of its products.

Operating synergies can affect margins and growth, and through these the value of the firms involved in the merger or acquisition.

Sources of Financial Synergy

With financial synergies, the payoff can take the form of either higher cash flows or a lower cost of capital (discount rate). Included are the following:

· A combination of a firm with excess cash, or **cash slack**, (and limited project opportunities) and a firm with high-return projects (and limited cash) can yield a payoff

in terms of higher value for the combined firm. The increase in value comes from the projects that were taken with the excess cash that otherwise would not have been taken. This synergy is likely to show up most often when large firms acquire smaller firms, or when publicly traded firms acquire private businesses.

- *Debt capacity* can increase, because when two firms combine, their earnings and cash flows may become more stable and predictable. This, in turn, allows them to borrow more than they could have as individual entities, which creates a tax benefit for the combined firm. This tax benefit can either be shown as higher cash flows, or take the form of a lower cost of capital for the combined firm.
- *Tax benefits* can arise either from the acquisition taking advantage of tax laws or from the use of net operating losses to shelter income. Thus, a profitable firm that acquires a money-losing firm may be able to use the net operating losses of the latter to reduce its tax burden. Alternatively, a firm that is able to increase its depreciation charges after an acquisition will save in taxes, and increase its value.

Clearly, there is potential for synergy in many mergers. The more important issues are whether that synergy can be valued and, if so, how to value it.

Empirical Evidence on Synergy

Synergy is a stated motive in many mergers and acquisitions. Bhide (1993) examined the motives behind 77 acquisitions in 1985 and 1986, and reported that operating synergy was the primary motive in one-third of these takeovers. A number of studies examine whether synergy exists and, if it does, how much it is worth. If synergy is perceived to exist in a takeover, the value of the combined firm should be greater than the sum of the values of the bidding and target firms, operating independently.

$$V(AB) > V(A) + V(B)$$

where

V(AB) = Value of a firm created by combining A and B (Synergy)

V(A) = Value of firm A, operating independently

V(B) = Value of firm B, operating independently

Studies of stock returns around merger announcements generally conclude that the value of the combined firm does increase in most takeovers and that the increase is significant. Bradley, Desai, and Kim (1988) examined a sample of 236 inter-firms tender offers between 1963 and 1984 and reported that the combined value of the target and bidder firms increased 7.48% ($117 million in 1984 dollars), on average, on the announcement of the merger. This result has to be interpreted with caution, however, since the increase in the value of the combined firm after a merger is also consistent with a number of other hypotheses explaining acquisitions, including under valuation and a change in corporate control. It is thus a weak test of the synergy hypothesis.

The existence of synergy generally implies that the combined firm will become more profitable or grow at a faster rate after the merger than will the firms operating separately. A stronger test of synergy is to evaluate whether merged firms improve their performance (profitability and growth) *relative to their competitors*, after takeovers. On this test, as we show later in this chapter, many mergers fail.

☞ *CC 26.1:* Synergy takes a long time to show up. Some argue that the reason most studies find no synergy benefits is that they look at short time periods (five years or less) after mergers. Do you agree with this statement?

Take over poorly managed firms and change management

Some firms are not managed optimally and others often believe they can run them better than the current managers. Acquiring poorly managed firms and removing incumbent management, or at least changing existing management policy or practices, should make these firms more valuable, allowing the acquirer to claim the increase in value. This value increase is often termed the **value of control**.

Prerequisites for Success

While this corporate control story can be used to justify large premiums over the market price, the potential for its success rests on the following:

1. The poor performance of the firm being acquired should be attributable to the incumbent management of the firm, rather than to market or industry factors that are not under management control.
2. The acquisition has to be followed by a change in management practices, and the change has to increase value. As noted in the last chapter, actions that enhance value increase cash flows from existing assets, increase expected growth rates, increase the length of the growth period, or reduce the cost of capital.
3. The market price of the acquisition should reflect the status quo, i.e, the current management of the firm and their poor business practices. If the market price already has the control premium built into it, there is little potential for the acquirer to earn the premium.

In the last two decades, corporate control has been increasingly cited as a reason for hostile acquisitions.

Empirical Evidence on the Value of Control

The strongest support for the existence of a market for corporate control lies in the types of firms that are typically acquired in hostile takeovers. Research indicates that the typical target firm in a hostile takeover has the following characteristics:

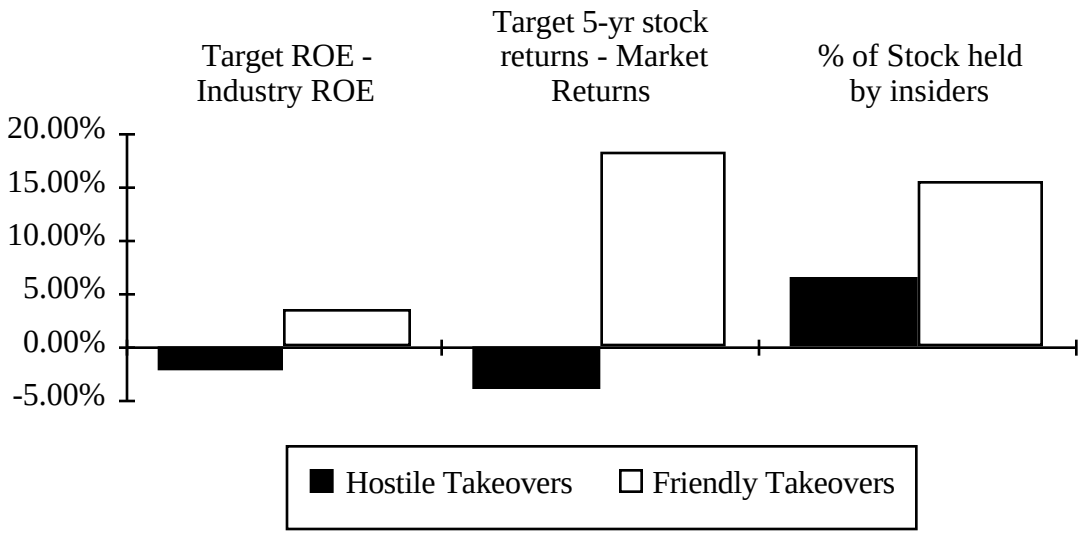
(1) It has under performed other stocks in its industry and the overall market, in terms of returns to its stockholders in the years preceding the takeover.

(2) It has been less profitable than firms in its industry in the years preceding the takeover.

(3) It has a much lower stock holding by insiders than do firms in its peer groups.

In a comparison of target firms in hostile and friendly takeovers, Bhide illustrates their differences. His findings are summarized in Figure 26.3.

Target Characteristics - Hostile vs. Friendly Takeovers



As you can see, target firms in hostile takeovers have earned a 2.2% lower return on equity, on average, than other firms in their industry; they have earned returns for their stockholders which are 4% lower than the market; and \only 6.5% of their stock held by insiders.

There is also evidence that firms make significant changes in the way they operate after hostile takeovers. In his study, Bhide examined the consequences of hostile takeovers and noted the following changes:

1. Many of the hostile takeovers were followed by an increase in debt, which resulted in a downgrading of the debt. The debt was quickly reduced with proceeds from the sale of assets, however.
2. There was no significant change in the amount of capital investment in these firms.
3. Almost 60% of the takeovers were followed by significant divestitures, in which half or more of the firm was divested. The overwhelming majority of the divestitures were units in business areas unrelated to the company's core business (i.e., they constituted reversal of corporate diversification done in earlier time periods).
4. There were significant management changes in 17 of the 19 hostile takeovers, with the replacement of the entire corporate management team in seven of the takeovers.

Thus, contrary to popular view[2], most hostile takeovers are not followed by the acquirer stripping the assets of the target firm and leading it to ruin. Instead, target firms refocus on their core businesses and often improve their operating performance.

Cater to Managerial Self Interest

In most acquisitions, it is the managers of the acquiring firm who decide whether to carry out the acquisition and how much to pay for it, rather than the stockholders of the same firm. Given these circumstances, the motive for some acquisitions may not be stockholder wealth maximization, but managerial self-interest, manifested in any of the following motives for acquisitions:

- *Empire building*: Some top managers interests' seem to lie in making their firms the largest and most dominant firms in their industry or even in the entire market. This objective, rather than diversification, may explain the acquisition strategies of firms like Gulf and Western and ITT[3] in the 1960s and 1970s. Note that both firms had strong-willed CEOs, Charles Bludhorn in the case of Gulf and Western, and Harold Geneen, in the case of the ITT, during their acquisitive periods.
- *Managerial Ego*: It is clear that some acquisitions, especially when there are multiple bidders for the same firm, become tests of machismo[4] for the managers

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[2] Even if it is not the popular view, it is the populist view that has found credence in Hollywood, in movies like *Wall Street, Barbarians at the Gate* and *Other People's Money.*

[3] In a delicious irony, ITT itself became the target of a hostile acquisition bid by Hilton Hotels and responded by shedding what it termed its non-core businesses, i.e., all the businesses it had acquired during its conglomerate period.

involved. Neither side wants to lose the battle, even though winning might cost their stockholders billions of dollars.

- *Compensation and side-benefits*: In some cases, mergers and acquisitions can result in the rewriting of management compensation contracts. If the potential private gains to the managers from the transaction are large, it might blind them to the costs created for their own stockholders.

In a paper titled "The Hubris Hypothesis", Roll (1981) suggests that we might be under estimating how much of the acquisition process and the prices paid can be explained by managerial pride and ego.

Choosing a Target firm and valuing control/synergy

Once a firm has an acquisition motive, there are two key questions that need to be answered. The first relates to how to best identify a potential target firm for an acquisition, given the motives described in the last section. The second is the more concrete question how to value a target firm, again given the different motives that we have outlined in the last section.

Choosing a target firm

Once a firm has identified the reason for its acquisition program, it has to find the appropriate target firm.

- If the motive for acquisitions is under valuation, the target firm must be under valued. How such a firm will be identified depends upon the valuation approach and model used. With relative valuation, an under valued stock is one that trades at a multiple (of earnings, book value or sales) well below that of the rest of the industry,

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[4] An interesting question that is whether these bidding wars will become less likely as more women rise to become CEOs of firms. They might bring in a different perspective on what winning and losing in a merger means.

after controlling for significant differences on fundamentals. Thus, a bank with a price to book value ratio of 1.2 would be an undervalued bank, if other banks have similar fundamentals (return on equity, growth, and risk) but trade at much higher price to book value ratios. In discounted cash flow valuation approaches, an under valued stock is one that trades at a price well below the estimated discounted cash flow value.

- If the motive for acquisitions is diversification, the most likely target firms will be in businesses that are unrelated to and uncorrelated with the business of the acquiring firm. Thus, a cyclical firm should try to acquire counter-cyclical or, at least, non-cyclical firms to get the fullest benefit from diversification.
- If the motive for acquisitions is operating synergy, the typical target firm will vary depending upon the source of the synergy. For economies of scale, the target firm should be in the same business as the acquiring firm. Thus, the acquisition of Security Pacific by Bank of America was motivated by potential cost savings from economies of scale. For functional synergy, the target firm should be strongest in those functional areas where the acquiring firm is weak. For financial synergy, the target firm will be chosen to reflect the likely source of the synergy – a risky firm with limited or no stand-alone capacity for borrowing, if the motive is increased debt capacity, or a firm with significant net operating losses carried forward, if the motive is tax benefits.
- If the motive for the merger is control, the target firm will be a poorly managed firm in an industry where there is potential for excess returns. In addition, its stock holdings will be widely dispersed (making it easier to carry out the hostile acquisition) and the current market price will be based on the presumption that incumbent management will continue to run the firm.
- If the motive is managerial self-interest, the choice of a target firm will reflect managerial interests rather than economic reasons.

In Table 26.1, we summarize the typical target firm, given the motive for the take over.

Table 26.1: Target FirmCharacteristics given Acquisition Motive

If motive is	*then the target firm…*
Undervaluation	trades at a price below the estimated value
Diversification	is in a business different from the acquiring firm's business.
Operating Synergy	has the characteristics that create the operating synergy *Cost Savings*: in same business to create economies of scale. *Higher growth*: with potential to open up new markets or expand existing ones.
Financial Synergy	has the characteristics that create financial synergy *Tax Savings*: provides a tax benefit to acquirer *Debt Capacity*: is unable to borrow money or pay high rates *Cash slack*: has great projects/ no funds
Control	is a badly managed firm whose stock has under performed the market
Manager's Interests	has characteristics that best meet CEO's ego and power needs.

There are two final points worth making here, before we move on to valuation. The first is that firms often choose a target firm and a motive for the acquisition simultaneously, rather than sequentially. That does not change any of the analysis in these sections. The other point is that firms often have more than one motive in an acquisitions, say, control and synergy. If this is the case, the search for a target firm should be guided by the dominant motive.

Valuing the Target Firm

The valuation of an acquisition is not fundamentally different from the valuation of any firm, although the existence of control and synergy premiums introduces some complexity into the valuation process. Given the inter-relationship between synergy and control, the

safest way to value a target firm is in steps, starting with a status quo valuation of the firm, and following up with a value for control and a value for synergy.

a. Status Quo Valuation

We start our valuation of the target firm by estimating the firm value with existing investing, financing and dividend policies. This valuation, which we term the **status quo valuation,** provides a base from which we can estimate control and synergy premiums. All of the basic principles presented in chapter 24 on valuation continue to apply here. In particular, the value of the firm is a function of its cash flows from existing assets, the expected growth in these cash flows during a high growth period, the length of the high growth period, and the firm's cost of capital.

In Practice 26.1: A Status Quo Valuation of Digital

In 1997, Digital Equipment, a leading manufacturer of mainframe computers, was the target of an acquisition bid by Compaq, which was at that time the leading personal computer manufacturer in the world. The acquisition was partly motivated by the belief that Digital was a poorly managed firm and that Compaq would be a much better manager of Digital's assets. In addition, Compaq expected synergies, in the form of both cost savings (from economies of scale) and higher growth (from Compaq selling to Digital's customers).

To analyze the acquisition, we begin with a status quo valuation of Digital. At the time of the acquisition, Digital had the following characteristics:

- Digital had earnings before interest and taxes of $391.38 million in 1997, which translated into a pre-tax operating margin of 3% on revenues of $13,046 million and an after-tax return on capital of 8.51%; the firm had a tax rate of 36%.
- Based upon its beta of 1.15, an after-tax cost of borrowing of 5% and a debt ratio of approximately 10%, the cost of capital for Digital in 1997 was 11.59%. (The treasury bond rate at the time of the analysis was 6%.)

1. Cost of Equity = 6% + 1.15 (5.5%) = 12.33%
2. Cost of Capital = 12.33% (.9) + 5% (.1) = 11.59%

· Digital had capital expenditures[5] of $475 million, depreciation of $ 461 million, and working capital is 15% of revenues.

4. Operating income, net capital expenditures and revenues were expected to grow 6% a year for the next 5 years.
5. After year 5, operating income and revenues were expected to grow 5% a year forever. After year 5, capital expenditures were expected to be 110% of depreciation. The debt ratio remained at 10%, but the after-tax cost of debt dropped to 4% and the beta dropped to 1.

The value of Digital, based upon these inputs, was estimated to be $2,110.41 million.

Year	*FCFF*[6]	*Terminal Value*	*PV at 11.59%*
1	$133.26		$119.42
2	$141.25		$113.43
3	$149.73		$107.75
4	$158.71		$102.35
5	$168.24	$2,717.35	$1,667.47
Terminal Year	$156.25		
		Firm Value =	$2,110.41

Note that the terminal value is computed using the free cash flow to the firm in year 6 and the new cost of capital after year 5:

[5] The reinvestment rate is therefore artificially low when we look at net capital expenditures. This is because R&D expenses are not capitalized.

[6] To estimate FCFF in year 1,

$FCFF_1$ = EBIT (1-t) (1+g)-Net Cap Ex (1+g) – Revenue (g) (WC as % of revenues)

New cost of equity after year 5 = 6% + 1.00 (5.5%) = 11.5%

New cost of capital after year 5 = 11.50%(.9) + 4% (.1) = 10.75%

Terminal value = $156.25/(.1075-.05) = $2,717.35

b. The Value of Corporate Control

Many hostile takeovers are justified on the basis of the existence of a market for corporate control. Investors and firms are willing to pay large premiums over the market price to control the management of firms, especially those that they perceive to be poorly run. This section explores the determinants of the value of corporate control and attempts to value it in the context of an acquisition.

Determinants of the Value of Corporate Control

The value of wresting control of a firm from incumbent management is inversely proportional to the perceived quality of that management and its capacity to maximize firm value. In general, the value of control will be much greater for a poorly managed firm that operates at below optimum capacity than for a well managed firm.

The value of controlling a firm comes from changes made to existing management policy that can increase the firm value. Assets can be acquired or liquidated, the financing mix can be changed and the dividend policy reevaluated, and the firm can be restructured to maximize value. If we can identify the changes that we would make to the target firm, we can value control. The value of control can then be written as:

Value of Control = Value of firm, optimally managed - Value of firm with current management

The value of control is negligible for firms that are operating at or close to their optimal value, since a restructuring will yield little additional value. It can be substantial for firms operating at well below optimal, since a restructuring can lead to a significant increase in value.

= $391.38(1-.36)(1.06) – (475-461)(1.06) - $13,046(.06)(.15) = $133.26 million

In Practice 26.2: The Value of Control at Digital

We said earlier that one of the reasons Digital was targeted by Compaq was that it was viewed as poorly managed. Assuming that Compaq was correct in its perceptions, we valued control at Digital by making the following assumptions:

- Digital will raise its debt ratio to 20%. The beta will increase, but the cost of capital will decrease.

  New Beta = 1.25 (Unlevered Beta = 1.07; Debt/Equity Ratio = 25%)

  Cost of Equity = 6% + 1.25 (5.5%) = 12.88%

  New After-tax Cost of Debt = 5.25%; the firm is riskier, and its default risk will increase

  Cost of Capital = 12.88% (0.8) + 5.25% (0.2) = 11.35%
- Digital will raise its return on capital to 11.35%, which is its cost of capital. (Pre-tax Operating margin will go up to 4%, which is close to the industry average)
- The reinvestment rate remains unchanged, but the increase in the return on capital will increase the expected growth rate in the next 5 years to 10%.
- After year 5, the beta will drop to 1, and the after-tax cost of debt will decline to 4%, as in the previous example.

The effect of these assumptions on the cash flows and present values is listed in the following table:

Year	FCFF	Terminal Value	PV at 11.35%
1	$156.29		$140.36
2	$171.91		$138.65
3	$189.11		$136.97
4	$208.02		$135.31
5	$228.82	$6,584.62	$3,980.29
Terminal Year	$329.23		
		Value of the firm =	$4,531.59

The lower cost of capital and higher growth rate increase the firm value from the status quo valuation of $2,110.41 million to $4,531.59 million. We can then estimate the value of control:

Value of firm (optimally managed) = $4,531.59 million

Value of firm (status quo) = $2,110.41 million

Value of control = $2,421.18 million

☞ *CC 26.2:* Does the fact that the value of control is $2.42 billion imply that this amount is available to be claimed by someone who acquires the firm? Why or why not?

In Practice 26.3: Value of Control

In chapter 25, we developed value enhancement strategies for Boeing, the Home Depot and InfoSoft. Using the estimates of value for each firm that we obtained based on these strategies, and comparing them to the status quo valuations in chapter 24, we can estimate the value of control at each of these firms:

	Boeing	*The Home Depot*	*InfoSoft*
Status-Quo Valuation	$ 13.14	$ 42.55	$ 55.15
Optimal Value	$ 28.73	$ 56.81	$ 117.40
Value of Control	$ 15.59	$ 14.26	$ 62.25
% Value of Control	118.65%	33.51%	112.87%

The value of control is greatest at Boeing and InfoSoft, albeit for different reasons. It is large at Boeing because of its poor investment returns and potential for improvement, whereas it is significant at InfoSoft because it is a small, private firm, constrained in terms of capital and expansion possibilities.

c. Valuing Operating Synergy

There is a potential for operating synergy, in one form or the other, in many takeovers. Some disagreement exists, however, over whether synergy can be valued and, if so, what that value should be. One school of thought argues that synergy is too nebulous to

be valued and that any systematic attempt to do so requires so many assumptions that it is pointless. If this is true, a firm should not be willing to pay large premiums for synergy if it cannot attach a value to it.

While valuing synergy requires us to make assumptions about future cash flows and growth, the lack of precision in the process does not mean we cannot obtain an unbiased estimate of value. Thus we maintain that synergy can be valued by answering two fundamental questions:

(1) *What form is the synergy expected to take?* Will it reduce costs as a percentage of sales and increase profit margins (e.g., when there are economies of scale)? Will it increase future growth (e.g., when there is increased market power) or the length of the growth period? Synergy, to have an effect on value, has to influence one of the four inputs into the valuation process – cash flows from existing assets, higher expected growth rates (market power, higher growth potential), a longer growth period (from increased competitive advantages), or a lower cost of capital (higher debt capacity).

(2) *When will the synergy start affecting cash flows?* — Synergies can show up instantaneously, but they are more likely to show up over time. Since the value of synergy is the present value of the cash flows created by it, the longer it takes for it to show up, the lesser its value.

Once we answer these questions, we can estimate the value of synergy using an extension of discounted cash flow techniques. First, we value the firms involved in the merger independently, by discounting expected cash flows to each firm at the weighted average cost of capital for that firm. Second, we estimate the value of the combined firm, with no synergy, by adding the values obtained for each firm in the first step. Third, we build in the effects of synergy into expected growth rates and cash flows, and we value the combined firm with synergy. The difference between the value of the combined firm with synergy and the value of the combined firm without synergy provides a value for synergy.

Figure 26.4 summarizes the effects of synergy and control in valuing a target firm for an acquisition. Notice the difference between figure 26.2, which is based upon the market price of the target firm before and after the acquisition, and figure 26.4, where we are looking at the value of the target firm with and without the premiums for control and synergy. A fair-value acquisition, which would leave the acquiring firm neither better nor worse off, would require that the total price (in figure 26.2) be equal to the consolidated value (in figure 26.4) with the synergy and control benefits built in.

Figure 26.4: Valuing an Acquisition

Component	Valuation Guidelines	Should you pay?
Synergy	*Value the combined firm with synergy built in*. This value may include a. a higher growth rate in revenues: *growth synergy* b. higher margins, because of *economies of scale* c. lower taxes, because of tax benefits: *tax synergy* d. lower cost of debt: *financing synergy* e. higher debt ratio because of lower risk: *debt capacity* *Subtract the value of the target firm (with control premium) + value of the bidding firm (pre-acquisition). This is the value of the synergy.*	*Which firm is indispensable for synergy?* - If it is the target, you should be willing to pay up to thevalue of synergy. - If it is the bidder, you should not.
Control Premium	Value the company as if optimally managed. This will usually mean altering investment, financing and dividend policy: Investment Policy: Earn higher returns on projects and divest unproductive projects. Financing Policy: Move to a better financing structure; eg. optimal capital structure Dividend Policy: Return cash for which the firm has no need. Practically, 1. Look at industry averages for optimal (if lazy) 2. Do a full-fledged corporate financial analysis	If motive is control or in a stand-alone valuation, the sum of the control premium and the status quo valuation is the maximium you should pay.
Status Quo Valuation	Value the company as is, with existing inputs for investment, financing and dividend policy.	If motive is undervaluation, the status quo value is the maximum you should pay.

In Practice 26.4: Valuing Synergy: Compaq and Digital

Returning to the Compaq/Digital merger, note that synergy was one of the stated reasons for the acquisition. To value this synergy, we needed to first value Compaq as a stand-alone firm. To do this, we made the following assumptions:

- Compaq had earnings before interest and taxes of $2,987 million on revenues of $25,484 million. The tax rate for the firm is 36%.
- The firm had net capital expenditures of $ 184 million and working capital is 15% of revenues.
- The firm had a debt to capital ratio of 10%, a beta of 1.25, and an after-tax cost of debt of 5%.
- The operating income, revenues and net capital expenditures are all expected to grow 10% a year for the next 5 years.
- After year 5, operating income and revenues are expected to grow 5% a year forever, and capital expenditures are expected to be 110% of depreciation. In addition, the firm will raise its debt ratio to 20%, the after-tax cost of debt will drop to 4% and the beta will drop to 1.00.

Based upon these inputs, the value of the firm can be estimated as follows:

Year	FCFF	Terminal Value	PV
1	$1,518.19		$1,354.47
2	$1,670.01		$1,329.24
3	$1,837.01		$1,304.49
4	$2,020.71		$1,280.19
5	$2,222.78	$56,654.81	$33,278.53
Terminal Year	$2,832.74		$38,546.91

The value of Compaq is $38.547 billion.

The value of the combined firm (Compaq+ Digital), with no synergy, should be the sum of the values of the firms valued independently. To avoid double counting the value of control, we add the value of Digital, optimally managed, that we estimated in illustration 26.2, to the value of Compaq to arrive at the value of the combined firm:

Value of Digital (optimally managed)= $ 4,531.59 million

Value of Compaq (status quo)= $38,546.91 million

Value of combined firm = $43,078.50 million

This would be the value of the combined firm in the absence of synergy.

To value they synergy, we made the following assumptions about the way in which synergy would affect cash flows and discount rates at the combined firm:

- The combined firm will have some economies of scale, allowing it to increase its current after-tax operating margin slightly. The annual dollar savings will be approximately $ 100 million. This will translate into a slightly higher pre-tax operating margin:
  - Current Operating Margin = $(EBIT_{Compaq}+EBIT_{Digital})/(Sales_{Compaq}+Sales_{Digital})$ = (2987+522)/(25484+13046) = 9.11%
  - New Operating Margin = (2987+522+100)/(25484+13046) = 9.36%
- The combined firm will also have a slightly higher growth rate of 10.50% over the next 5 years, because of operating synergies.
- The beta of the combined firm was computed in three steps. We first estimated the unlevered betas for Digital and Compaq:

  Digital's Unlevered Beta = 1.25/(1+ (1-.36)(.25)) = 1.07

  Compaq's Unlevered Beta=1.25/(1 + (1-.36) (.10/.90)) = 1.17

Figure 26.5: Valuing Compaq for Digital

Component	Valuation Guidelines	Value
Synergy	*Value the combined firm with synergy built in* . In the case of Compaq/Digital, the synergy comes from 1. Annual cost savings, expected to be $100 million 2. Slightly higher growth rate	$ 2,422 million
Control Premium	Value Digital as if optimally managed. This was done by assuming 1. Higher margins and a return on capital equal to the cost of capital 2. Higher debt ratio and a lower cost of capital	$ 2,421 million
Status Quo Valuation	Value Digital as is, with existing inputs for investment, financing and dividend policy.	$ 2,110 million

We then weighted these unlevered betas by the values of these firms to estimate an unlevered beta for the combined firm; Digital has a firm value[7] of $ 4.5 billion and Compaq's firm value was $ 38.6 billion.

Unlevered Beta for combined firm= 1.07 * (4.5/43.1) + 1.17 (38.6/43.1) = 1.16

We then used the debt to equity ratio for the combined firm to estimate a new levered beta and cost of capital for the firm. The debt to equity ratio for the combined firm, estimated by cumulating the outstanding debt and market value of equity at the two firms is 13.64%:

3. New Levered Beta = 1.16 (1+(1-0.36)(.1364)) = 1.26
4. Cost of Capital = 12.93% (.88) + 5% (.12) = 11.98%

Based on these assumptions, the cash flows and value of the combined firm, with synergy, can be estimated:

Year	*FCFF*	*Terminal Value*	*PV at 11.98%*
1	$1,726.65		$1,541.95
2	$1,907.95		$1,521.59
3	$2,108.28		$1,501.50
4	$2,329.65		$1,481.68
5	$2,574.26	$66,907.52	$39,463.87
Terminal Year	$3,345.38		$45,510.58

The value of the combined firm, with synergy, is $ 45,510.58 million. This can be compared to the value of the combined firm, without synergy, of $43,078.50 million, and the difference is the value of the synergy in the merger.

Value of combined firm (with synergy) = $45,510.58 million

Value of combined firm (with no synergy) = $43,078.50 million

[7] The values that we used were the values immediately before the acquisition announcement. This is to prevent the biases that may be created when target prices increase once an acquisition is announced.

Value of Synergy = $ 2,422.08 million

This valuation is based on the presumption that synergy will be created instantaneously. In reality, it can take years before the firms are able to see the benefits of synergy. A simple way to account for the delay is to consider the present value of synergy. Thus, if it will take Compaq and Digital three years to create the synergy, the present value of synergy can be estimated, using the combined firm's cost of capital as the discount rate:

Present Value of Synergy = $2,422 million/$(1.1198)^3$ = $1724.86 million

synergy.xls: This spreadsheet allows you to estimate the approximate value of synergy in a merger or acquisition.

d. Valuing Financial Synergy

Synergy can also be created from purely financial factors. We will consider three legitimate sources of financial synergy - a greater "tax benefit" from accumulated losses or tax deductions, an increase in debt capacity and therefore firm value, and better use for "excess" cash or cash slack. We will begin the discussion, however, with diversification, which though a widely used rationale for mergers, is not a source of increased value by itself.

Diversification

A takeover motivated only by diversification considerations has no effect on the combined value of the two firms involved in the takeover, when the two firms are both publicly traded and when the investors in the firms can diversify on their own. Consider the following example. Dalton Motors, which is in an automobile parts manufacturing firm in a cyclical business, plans to acquire Lube & Auto, which is an automobile service firm whose business is non-cyclical and high growth, solely for the diversification benefit. The characteristics of the two firms are as follows:

	Lube & Auto	*Dalton Motors*
Current Free cash flow to the firm	$100 million	$200 million

Expected growth rate -next 5 years	20%	10%
Expected growth rate – after year 5	6%	6%
Debt /(Debt + Equity)	30%	30%
After-tax cost of debt	6%	5.40%
Beta for equity - next 5 years	1.20	1.00
Beta for equity - after year 5	1.00	1.00

The treasury bond rate is 7%, and the market premium is 5.5%. The calculations for the weighted average cost of capital and the value of the firms are shown in Table 26.5:

Table 26.5: Value of Lube & Auto, Dalton Motors and Combined Firm

	Lube & Auto	*Dalton Motor*	*Lube & Auto + Dalton Motor*	*Combined Firm*
Debt (%)	30%	30%		30%
Cost of debt	6.00%	5.40%		5.65%
Equity(%)	70%	70%		70%
Cost of equity	13.60%	12.50%		12.95%
Cost of capital - Yr 1	11.32%	10.37%		10.76%
Cost of capital- Yr 2	11.32%	10.37%		10.76%
Cost of capital- Yr 3	11.32%	10.37%		10.77%
Cost of capital- Yr 4	11.32%	10.37%		10.77%
Cost of capital- Yr 5	11.32%	10.37%		10.77%
Cost of capital after	10.55%	10.37%		10.45%
FCFF in year 1	$120.00	$220.00		$340.00
FCFF in year 2	$144.00	$242.00		$386.00
FCFF in year 3	$172.80	$266.20		$439.00
FCFF in year 4	$207.36	$292.82		$500.18
FCFF in year 5	$248.83	$322.10		$570.93
Terminal Value	$5,796.97	$7,813.00		$13,609.97
Present Value	$4,020.91	$5,760.47	$9,781.38	$9,781.38

The cost of equity and debt for the combined firm is obtained by taking the weighted average of the individual firm's costs of equity (debt); the weights are based upon the relative market values of equity (debt) of the two firms. Since these relative market values change over time, the costs of equity and debt for the combined firm also change over time. The value of the combined firm is exactly the same as the sum of the values of the independent firms, indicating that there is no value gain from diversification.

This equality does not imply, however, that the shareholders in the bidding and target firms are indifferent about such takeovers, since the bidding firm pays a significant premium over the market price. To the extent that these firms were correctly valued before the merger (Market Value of Lube & Auto = $4,020.91, Market Value of Dalton Motors = $5,760.47), the payment of a premium over the market price will transfer wealth from the bidding firm to the target firm.

The absence of added value from this merger may seem puzzling, given the fact that the two firms are in unrelated businesses and thus should gain some diversification benefit. In fact, if the earnings of the two firms are not highly correlated, the variance in earnings of the combined firm should be significantly lower than the variance in earnings of the individual firms operating independently. This reduction in earnings variance does not affect value, however, because it is firm-specific risk, which is assumed to have no effect on expected returns. (The betas, which are measures of market risk, are always value-weighted averages of the betas of the two merging firms.) But what about the impact of reduced variance on debt capacity? Firms with lower variability in earnings can increase debt capacity and thus value. This can be a real benefit of conglomerate mergers, and we consider it separately later in this section.

Cash Slack

Managers may reject profitable investment opportunities if they have to raise new capital to finance them. Myers and Majluf (1984) suggest that since managers have more information than investors about prospective projects, new stock may have to be issued at less than true value to finance these projects, leading to the rejection of good projects and to capital rationing for some firms. It may therefore make sense for a company with excess cash and no investment opportunities to take over a cash-poor firm with good investment opportunities, or vice versa. The additional value of combining these two firms is the present value of the projects that would not have been taken if they had stayed apart, but can now be taken because of the availability of cash.

Cash slack can be a potent rationale for publicly traded firms that have more access to capital and want to acquire small, private firms that have capital constraints. It may also explain why acquisition strategies concentrating on buying smaller, private firms have worked fairly well in practice. Blockbuster video (video rental) , Browning and Ferris (waste disposal) and Service Merchandise (funeral homes) are good examples.

Tax Benefits

Several possible tax benefits accrue from takeovers. If one of the firms has tax deductions that it cannot use because it is losing money, whereas the other firm has income on which it pays significant taxes, combining the two firms can result in tax benefits that can be shared by the two firms. The value of this synergy is the present value of the tax savings that result from this merger. In addition, the assets of the firm being taken over can be written up to reflect new market values in some forms of mergers, leading to higher tax savings from depreciation in future years.

In Practice 26.5: Tax Benefits of writing up Asset Values after Takeover: Congoleum Inc.

One of the earliest leveraged buyouts (LBOs) occurred in 1979 and involved Congoleum Inc., a diversified firm in ship building, flooring, and automotive accessories. Congoleum's own management bought out the firm. The favorable treatment that would be accorded the firm's assets by tax authorities was a major reason behind the takeover. After the takeover — estimated to cost approximately $400 million — the firm was allowed to write up its assets to reflect their new market values and to claim depreciation on these new values. The estimated change in depreciation and the present value effect of this depreciation, discounted at the firm's cost of capital of 14.5%, are shown in Table 26.6.

Table 26.6: Depreciation Tax Benefits: Before and After Leveraged Buyout

Year	*Depreciation before*	*Depreciation after*	*Change in Depreciation*	*Tax Savings*	*Present Value*
1980	$8.00	$35.51	$27.51	$13.20	$11.53
1981	$8.80	$36.26	$27.46	$13.18	$10.05
1982	$9.68	$37.07	$27.39	$13.15	$8.76

1983	$10.65	$37.95	$27.30	$13.10	$7.62
1984	$11.71	$21.23	$9.52	$4.57	$2.32
1985	$12.65	$17.50	$4.85	$2.33	$1.03
1986	$13.66	$16.00	$2.34	$1.12	$0.43
1987	$14.75	$14.75	$0.00	$0.00	$0.00
1988	$15.94	$15.94	$0.00	$0.00	$0.00
1989	$17.21	$17.21	$0.00	$0.00	$0.00
1980-89	*$123.05*	*$249.42*	*$126.37*	*$60.66*	*$41.76*

Note that the increase in depreciation occurs in the first seven years, primarily as a consequence of higher asset values and accelerated depreciation. After year seven, however, the old and new depreciation schedules converge. The present value of the additional tax benefits from the higher depreciation, based upon a tax rate of 48%, amounted to $41.76 million, about 10% of the overall price paid on the transaction.

In recent years, the tax code covering asset revaluations has been significantly tightened. While acquiring firms can still reassess the value of the acquired firm's assets, they can do so only up to fair value.

Debt Capacity

If the cash flows of the acquiring and target firms are less than perfectly correlated, the cash flows of the combined firm will be less variable than the cash flows of the individual firms. This decrease in variability can result in an increase in debt capacity and in the value of the firm. The increase in value, however, has to be weighed against the immediate transfer of wealth to existing bondholders in both firms from the stockholders of both the acquiring and target firms. The bondholders in the pre-merger firms find themselves lending to a safer firm after the takeover. The coupon rates they are receiving are based upon the riskier pre-merger firms, however. If the coupon rates are not renegotiated, the bonds will increase in price, increasing the bondholders' wealth at the expense of the stockholders.

There are several models available for analyzing the benefits of higher debt ratios as a consequence of takeovers. Lewellen analyzes the benefits in terms of reduced default risk,

since the combined firm has less variable cash flows than do the individual firms. He provides a rationale for an increase in the value of debt after the merger, but at the expense of equity investors. It is not clear, therefore, that the value of the firm will increase after the merger. Stapleton evaluates the benefits of higher debt capacity after mergers using option pricing. He shows that the effect of a merger on debt capacity is always positive, even when the earnings of the two firms are perfectly correlated. The debt capacity benefits increase as the earnings of the two firms become less correlated and as investors become more risk averse.

Consider again the merger of Lube & Auto and Dalton Motor. The value of the combined firm was the same as the sum of the values of the independent firms. The fact that the two firms were in different business lines reduced the variance in earnings, but value was not affected, because the capital structure of the firm remain unchanged after the merger, and the costs of equity and debt were the weighted averages of the individual firms' costs.

The reduction in variance in earnings can increase debt capacity, which can increase value. If, after the merger of these two firms, the debt capacity for the combined firm were increased to 40% from 30% (leading to an increase in the beta to 1.21 and no change in the cost of debt), the value of the combined firm after the takeover can be estimated as shown in Table 26.7.

Table 26.7: Value of Debt Capacity – Lube & Auto and Dalton Motors

	Firm A	*Firm B*	*AB -No new debt*	*AB - Added Debt*
Debt (%)	30%	30%	30%	40%
Cost of debt	6.00%	5.40%	5.65%	5.65%
Equity(%)	70%	70%	70%	60%
Cost of equity	13.60%	12.50%	12.95%	13.65%
Cost of Capital- Yr 1	11.32%	10.37%	10.76%	10.45%
Cost of Capital- Yr 2	11.32%	10.37%	10.76%	10.45%
Cost of Capital- Yr 3	11.32%	10.37%	10.77%	10.45%
Cost of Capital- Yr 4	11.32%	10.37%	10.77%	10.45%
Cost of Capital- Yr 5	11.32%	10.37%	10.77%	10.45%
Cost of Capital after	10.55%	10.37%	10.45%	9.76%
FCFF in year 1	$120.00	$220.00	$340.00	$340.00
FCFF in year 2	$144.00	$242.00	$386.00	$386.00
FCFF in year 3	$172.80	$266.20	$439.00	$439.00

FCFF in year 4	\$207.36	\$292.82	\$500.18	\$500.18
FCFF in year 5	\$248.83	\$322.10	\$570.93	\$570.93
Terminal Value	\$5,796.97	\$7,813.00	\$13,609.97	\$16,101.22
Present Value	\$4,020.91	\$5,760.47	\$9,781.38	\$11,429.35

As a consequence of the added debt, the value of the firm will increase from \$9,781.38 million to \$11,429.35 million.

☞ *CC 26.3:* In the example described above, what would happen to stockholder wealth, if the merger went through and the combined firm's debt was kept at pre-merger levels? What would happen to bond prices?

Increase Growth and Price-Earnings Multiples

Some acquisitions are motivated by the desire to increase growth and price-cash flow (or price-earnings) multiples. Though the benefits of higher growth are undeniable, the price paid for that growth will determine whether such acquisitions make sense. If the price paid for the growth exceeds the fair market value, the stock price of the acquiring firm will decline even though the expected future growth in its cash flows may increase as a consequence of the takeover.

This can be seen in the previous example. Dalton Motor, with projected growth in cash flows of 10%, acquires Lube & Auto, which is expected to grow 20%. The fair market value for Lube & Auto is \$4,020.91. If Dalton Motor pays more than this amount to acquire Lube & Auto, its stock price will decline, even though the combined firm will grow at a faster rate than Dalton Motor alone. Similarly, Dalton Motor, which sells at a lower multiple of cash flow than Lube & Auto, will increase its value as a multiple of cash flow after the acquisition, but the effect on the stockholders in the firm will still be determined by whether or not the price paid on the acquisition exceeds the fair value.

Takeover Valuation: Biases and Common Errors

The process of takeover valuation has potential pitfalls and biases that arise from the desire of the management of both the bidder and target firms to justify their points of view

to their stockholders. The bidder firm aims to convince its stockholders that it is getting a bargain (i.e., that it is paying less than what the target firm is truly worth). In friendly takeovers, the target firm attempts to show its stockholders that the price it is receiving is a fair price (i.e., it is receiving at least what it is worth). In hostile takeovers, there is a role reversal, with bidding firms trying to convince target firm stockholders that they are not being cheated out of their fair share, and target firms arguing otherwise. Along the way, there are a number of common errors and biases in takeover valuation.

Use of Comparable Firms and Multiples

The prices paid in most takeovers are justified using the following sequence of actions: the acquirer assembles a group of firms comparable to the one being valued, selects a multiple to value the target firm, computes an average multiple for the comparable firms and then makes subjective adjustments to this "average". Each of these steps provides an opening for bias to enter into the process. Since no two firms are identical, the choice of comparable firms is a subjective one and can be tailored to justify the conclusion we want to reach. Similarly, in selecting a multiple, there are a number of possible choices - price-earnings ratios, price-cash flow ratios, price-book value ratios, and price-sales ratios, among others- and the multiple chosen will be the one that best suits our biases. Finally, once the average multiple has been obtained, subjective adjustments can be made to complete the story. In short, there is plenty of room for a biased firm to justify any price, using reasonable valuation models.

Mismatching Cash Flows and Discount Rates

One of the fundamental principles of valuation is that cash flows should be discounted using a consistent discount rate. Cash flows to equity should be discounted at the cost of equity and cash flows to the firm at the cost of capital, nominal cash flows should be discounted at the nominal discount rate and real cash flows at the real rate, after-tax cash flows at the after-tax discount rate, and pre-tax cash flows at the pre-tax rate. The

failure to match cash flows with discount rates can lead to significant under or over valuation. Some of the more common mismatches include:

(1) *Using the bidding firm's cost of equity or capital to discount the target firm's cash flows:* If the bidding firm raises the funds for the takeover, it is argued, its cost of equity should be used. This argument fails to take into account the fundamental investment principle that it is not who raises the money that determines the cost of equity as much as what the money is raised for. The same firm will face a higher cost of equity for funds raised to finance riskier projects and a lower cost of equity to finance safer projects. Thus, the cost of equity in valuing the target will reflect that firm's riskiness, i.e., it is the target firm's cost of equity. Note, also, that since the cost of equity, as we have defined it, includes only non-diversifable risk, arguments that the risk will decrease after the merger cannot be used to reduce the cost of equity, if the risk being decreased is firm-specific risk.

(2) *Using the cost of capital to discount the cash flows to equity:* If the bidding firm uses a mix of debt and equity to finance the acquisition of a target firm, the argument goes, the cost of capital should be used in discounting the target firm's cash flows to equity (cash flows left over after interest and principal payments). By this reasoning, the value of a share in IBM to an investor will depend upon how the investor finances his or her acquisition of the share - increasing if the investor borrows to buy the stock (since the cost of debt is less than the cost of equity) and decreasing if the investor buys the stock using his or her own cash. The bottom line is that discounting the cash flows to equity at the cost of capital to obtain the value of equity is always wrong and will result in a significant overvaluation of the equity in the target firm.

Subsiding the Target Firm

The value of the target firm should not include any portion of the value that should be attributed to the acquiring firm. For instance, assume that a firm with excess debt capacity or a high debt rating uses a significant amount of low-cost debt to finance an acquisition. If we estimated a low cost of capital for the target firm, with a high debt ratio

and a low after-tax cost of debt, we would over estimate the value of the firm. If the acquiring firm paid this price on the acquisition, it would represent a transfer of wealth from the acquiring firm's stockholders to the target firm's stockholders. Thus, it is never appropriate to use the acquiring firm's cost of debt or debt capacity to estimate the cost of capital for the target firm.

Structuring the Acquisition

Once the target firm has been identified and valued, the acquisition moves forward into the structuring phase. There are three interrelated steps in this phase. The first is the decision on how much to pay for the target firm, given that we have valued it, with synergy and control built into the valuation. The second is the determination of how to pay for the deal, i.e., whether to use stock, cash or some combination of the two, and whether to borrow any of the funds needed. The final step is the choice of the accounting treatment of the deal because it can affect both taxes paid by stockholders in the target firm and how the purchase is accounted for in the acquiring firm's income statement and balance sheets

Deciding on an Acquisition Price

In the last section, we explained how to value a target firm, with control and synergy considerations built into the value. This value represents a ceiling on the price that the acquirer can pay on the acquisition rather than a floor. If the acquirer pays the full value, there is no surplus value to claim for the acquirer's stockholders and the target firm's stockholders get the entire value of the synergy and control premiums. This division of value is unfair, if the acquiring firm plays an indispensable role in creating the synergy and control premiums.

Consequently, the acquiring firm should try to keep as much of the premium as it can for its stockholders. Several factors, however, will act as constraints. They include

1. *The market price of the target firm, if it is publicly traded, prior to the acquisition*: Since acquisitions have to based on the current market price, the greater the current

market value of equity, the lower the potential for gain to the acquiring firm's stockholders. For instance, if the market price of a poorly managed firm already reflects a high probability that the management of the firm will be changed, there is likely to be little or no value gained from control.

2. *The relative scarcity of the specialized resources that the target and the acquiring firm bring to the merger*: Since the bidding firm and the target firm are both contributors to the creation of synergy, the sharing of the benefits of synergy among the two parties will depend in large part on whether the bidding firm's contribution to the creation of the synergy is unique or easily replaced. If it can be easily replaced, the bulk of the synergy benefits will accrue to the target firm. If it is unique, the benefits will be shared much more equitably. Thus, when a firm with cash slack acquires a firm with many high-return projects, value is created. If there are a large number of firms with cash slack, and relatively few firms with high-return projects, the bulk of the value of the synergy will accrue to the latter.
3. *The presence of other bidders for the target firm*: When there is more than one bidder for a firm, the odds are likely to favor the target firm's stockholders. Bradley, Desai, and Kim (1988) examined an extensive sample of 236 tender offers made between 1963 and 1984 and concluded that the benefits of synergy accrue primarily to the target firms when multiple bidders are involved in the takeover. They estimated the market-adjusted stock returns around the announcement of the takeover for the successful bidder to be 2% in single bidder takeovers, and -1.33% in contested takeovers.

Payment for the Target Firm

Once a firm has decided to pay a given price for a target firm, it has to follow up by deciding how it is going to pay for this acquisition. In particular, a decision has to be made about the following aspects of the deal:

1. *Debt versus Equity*: A firm can raise the funds for an acquisition from either debt or equity. The mix will generally depend upon both the excess debt capacities of the

acquiring and the target firm. Thus, the acquisition of a target firm that is significantly under levered may be carried out with a larger proportion of debt than the acquisition of one that is already at its optimal debt ratio. This, of course, is reflected in the value of the firm through the cost of capital. It is also possible that the acquiring firm has excess debt capacity and that it uses its ability to borrow money to carry out the acquisition. Although the mechanics of raising the money may look the same in this case, it is important that the value of the target firm not reflect this additional debt. As we noted in the last section, the cost of capital used in valuing the acquisition should not reflect this debt raised. The additional debt has nothing to do with the target firm, and building it into the value will only result in the acquiring firm is paying a premium for a value enhancement that rightfully belongs to its own stockholders.

2. *Cash versus Stock*: There are three ways in which a firm can use equity in a transaction. The first is to use cash balances that have been built up over time to finance the acquisition. The second is to issue stock to the public, raise cash and use the cash to pay for the acquisition. The third is to offer stock as payment for the target firm, where the payment is structured in terms of a stock swap – shares in the acquiring firm in exchange for shares in the target firm. The question of which of these approaches is best utilized by a firm cannot be answered without looking at the following factors:

· *The availability of cash on hand*: Clearly, the option of using cash on hand is available only to those firms that have accumulated substantial amounts of cash.

· *The perceived value of the stock*: When stock is issued to the public to raise new funds or when it is offered as payment on acquisitions, the acquiring firm's managers are making a judgment about what the perceived value of the stock is. In other words, managers who believe that their stock is trading at a price significantly below value should not use stock as currency on acquisitions, since what they gain on the acquisitions can be more than lost in the stock issue. On the other hand, firms that believe their stocks are overvalued are much more likely to use stock as currency in

transactions. The stockholders in the target firm are also aware of this, and may demand a larger premium when the payment is made entirely in the form of the acquiring firm's stock.

- *Tax factors*; When an acquisition is a stock swap, the stockholders in the target firm may be able to defer capital gains taxes on the exchanged shares. Since this benefit can be significant in an acquisition, the potential tax gains from a stock swap may be large enough to offset any perceived disadvantages.

The final aspect of a stock swap is the setting of the terms of the stock swap, i.e., the number of shares of the acquired firm that will be offered per share of the acquiring firm. While this amount is generally based upon the market price at the time of the acquisition, the ratio that results may be skewed by the relative mispricing of the two firm's securities, with the more overpriced firm gaining at the expense of the more underpriced (or at least, less overpriced) firm. A fairer ratio would be based upon the relative values of the two firm's shares. This can be seen quite clearly in the illustration below.

In Practice 26.6: Setting the Exchange Ratio

We will begin by reviewing our valuation for Digital in Figure 26.5. The value of Digital with the synergy and control components is $6,964 million. Digital also has $1,006 million in debt, and 146.789 million shares outstanding. The maximum value per share for Digital can then be estimated as follows:

Maximum value per share for Digital =(Firm Value – Debt)/ Number of shares outstanding

= ($6,964 - $1,006)/146.789 = $40.59

The estimated value per share for Compaq is $27, based upon the total value of the firm of $38,546.91 million, the debt outstanding of $ 3.2 billion and 1,305.76 million shares.

Value per share for Compaq = (38,546.91-3,200)/1,305.76 = $ 27.07

The appropriate exchange ratio, based upon value per share, can be estimated:

$\text{Exchange ratio}_{\text{Compaq, Digital}} = \text{Value per share}_{\text{Digital}} / \text{Value per share}_{\text{Compaq}}$

= $40.59/$27.07 = 1.50 Compaq shares/Digital share

If the exchange ratio is set above this number, Compaq stockholders will lose at the expense of Digital stockholders. If it is set below, Digital stockholders will lose at the expense of Compaq stockholders.

In fact, Compaq paid $ 30 in cash and offered 0.945 shares of Compaq stock for every Digital share. Assessing the value of this offer,

Value per Digital share (Compaq offer) = $ 30 + 0.945 ($27.07) =	$55.58
Value per Digital share (Assessed value) =	$40.59
Over payment by Compaq =	$14.99

Based on our assessments of value and control, Compaq over paid on this acquisition for Digital.

exchratio.xls: This spreadsheet allows you to estimate the exchange ratio on an acquisition, given the value of control and synergy.

Figure 26.5: Valuing Compaq for Digital

Component	Valuation Guidelines	Value
Synergy	*Value the combined firm with synergy built in* . In the case of Compaq/Digital, the synergy comes from 1. Annual cost savings, expected to be $100 million 2. Slightly higher growth rate	$ 2,422 million
Control Premium	Value Digital as if optimally managed. This was done by assuming 1. Higher margins and a return on capital equal to the cost of capital 2. Higher debt ratio and a lower cost of capital	$ 2,421 million
Status Quo Valuation	Value Digital as is, with existing inputs for investment, financing and dividend policy.	$ 2,110 million

Accounting Considerations

There is one final decision that, in our view, seems to play a disproportionate role in the way in which acquisitions are structured and in setting their terms, and that is the accounting treatment. In this section, we describe the accounting choices and examine why firms choose one over the other.

Purchase versus Pooling

There are two basic choices in accounting for a merger or acquisition. In **purchase accounting,** the entire value of the acquisition is reflected on the acquiring firm's balance sheet, and the difference between the acquisition price and the restated[8] value of the assets of the target firm is shown as goodwill for the acquiring firm. The goodwill is then written off (amortized) over a period of 40 years, reducing reported earnings in each year. The amortization is not tax deductible and thus does not affect cash flows. If an acquisition qualifies for **pooling**, the book values of the target and acquiring firms are aggregated. The premium paid over market value is not shown on the acquiring firm's balance sheet.

For an acquisition to qualify for pooling, the merging firms have to meet the following conditions:

- Each of the combining firms has to be independent; pooling is not allowed when one of the firms is a subsidiary or division of another firm in the two years prior to the merger.
- Only voting common stock can be issued to cover the transaction; the issue of preferred stock or multiple classes of common stock is not allowed.
- Stock buybacks or any other distributions that change the capital structure prior to the merger are prohibited.
- No transactions that benefit only a group of stockholders are allowed.

[8] The acquiring firm is allowed to restate the assets that are on the books at fair value. This changes the tax basis for the assets, and can affect depreciation in subsequent periods.

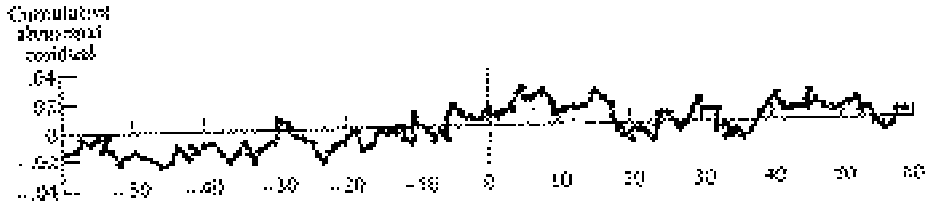
· The combined firm cannot sell a significant portion of the existing businesses of the combined companies, other than duplicate facilities or excess capacity.

The question whether an acquisition will qualify for pooling seems to weigh heavily on the managers of acquiring firms. Some firms will not make acquisitions if they do not qualify for pooling, or they will pay premiums to ensure that they do qualify. Furthermore, as the conditions for pooling make clear, firms are constrained in what they can do after the merger. Firms seem to be willing to accept these constraints, such as restricting stock buybacks and major asset divestitures, just to qualify for pooling.

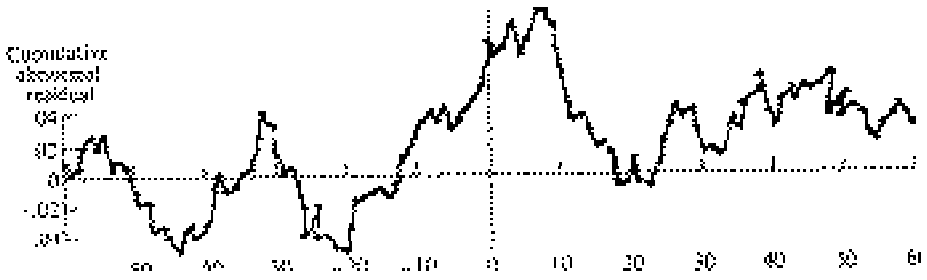
The bias toward pooling may seem surprising, since this choice does not affect cash flows and value, but it is really not surprising, when we consider the source of the bias. Firms are concerned about the effects of the goodwill amortization on their earnings, and about stockholder reactions to the lower earnings. Are firms that use purchase accounting punished by markets when they report lower earnings in subsequent periods? Hong, Kaplan and Mandelkar (1978) examined the monthly excess returns of 122 firms that acquired other firms between 1954 and 1964 using the pooling technique for 60 months after the acquisition. They compared these findings to 37 acquisitions that used the purchase approach to see if markets were fooled by the pooling technique. They found no evidence that the pooling raised stock prices or that the purchase technique lowered prices. The results are shown in Figure 26.6.

Figure 26.6: Pooling versus Purchase Accounting: Effect on Excess Returns

Panel A: Excess Returns for 122 firms that used Pooling



Panel B: Excess Returns for 37 firms that used Purchase Accounting



Note that there are no positive excess returns associated with pooling in the 60 months following the merger, nor are there negative excess returns associated with purchase in the same time period. . Lindenberg and Ross (1999) studied 387 pooling and 1055 purchase transactions between 1990 and 1999. They find that the stock price reaction to the acquisition announcement is more positive for purchase transactions than for pooling transactions, and that the market value of firms that use purchase accounting is not adversely affected by the reduction in earnings associated with amortization. They conclude that the earnings multiples of firms that use purchase accounting adjust to offset the decrease in earnings caused by amortization. To illustrate, a 10% decrease in earnings because of goodwill amortization is accompanied by a 12.1% increase in the price earnings ratio; the net effect is that stock price does not drop. Thus, markets seem to discount the negative earnings effect of amortizing goodwill.

There is another consideration, as well. When pooling is used, the shareholders of the acquired firm can transfer their cost basis[9] to the shares they receive in the acquiring firm and not pay taxes until they sell these shares. When purchase accounting is used, the stockholders of the acquired firm have to recognize the capital gain at the time of the transaction, even if they receive stock in the acquiring firm. Given the substantial premiums paid on acquisitions, this may be a significant factor in why firms choose to use pooling.

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[9] For tax purposes, the cost basis reflects what you originally paid for the shares. When pooling is used, the stockholders in the target firm can transfer the cost basis of the shares they have in the target firm to those that they receive in exchange. This allows them to defer the capital gains tax until they sell the stock.

In-process R&D

In the last few years, another accounting choice has entered the mix, especially for acquisitions in the technology sector. Here, firms that qualify can follow up an acquisition by writing off all or a significant proportion of the premium paid on the acquisition as **in-process R&D**. The net effect is that the firm takes a one-time charge at the time of the acquisition that does not affect operating earnings[10], and it eliminates or drastically reduces the goodwill that needs to be amortized in subsequent periods. The one-time expense is not tax deductible and has no cash flow consequences. In acquisitions such as IBM of Lotus and MCI by Worldcom, the in-process R&D charge allowed the acquiring firms to write off a significant portion of the acquisition price at the time of the deal.

The potential to reduce the dreaded goodwill amortization with a one-time charge is appealing for many firms, and studies find that firms try to take maximum advantage of this option. Lev (1998) documented this tendency and also noted that firms that qualify for this provision tend to pay significantly larger premiums on acquisitions than firms that do not.

In early 1999, as both the accounting standards board and the SEC sought to crack down on the misuse of in-process R&D, the top executives at high technology firms fought back, claiming that many acquisitions that were viable now would not be in the absence of this provision. It is revealing of managers' obsession with reported earnings that a provision that has no effects on cash flows, discount rates, and value is making such a difference in whether acquisitions get done.

Final Considerations

The managers of acquiring firms clearly weigh in the accounting effects of acquisitions, even when accounting choices have little or no effect on cash flows. This behavior is rooted in a fear of how much financial markets will punish firms that report

[10] The write-off of in-process R&D is viewed as a non-recurring charge and is shown separately from operating income.

lower earnings, largely as a consequence of the write off of goodwill. Given the transparency of this write off (firms report earnings before and after goodwill amortization), we believe that this fear is misplaced, and the empirical evidence backs us up.

When accounting choices weigh disproportionately in the outcome, the results can be expensive for stockholders in the acquiring firm. In particular,

- Firms will reject some good acquisitions, simply because they fail to meet the pooling test or because in-process R&D cannot be written off.
- Firms will overpay on acquisitions, just to qualify for favorable accounting treatment.
- To meet the requirements for pooling, firms will often acquire entire firms rather than the divisions that they are interested in and defer asset divestitures that make economic sense.

If the signals emerging from both the SEC and FASB have any basis, the rules for both pooling and writing off in-process R&D will be substantially tightened. In fact, it looks likely that firms will not be able to use pooling past 2001 and that they will have to write off goodwill over a much shorter period than the current 40 years[11]. These changes, though bitterly opposed by many top managers, should be welcomed by stockholders.

Following up on the Acquisition

We have described how firms value, pay for and structure an acquisition. The real work in an acquisition occurs after the transaction. In this section, we examine both the evidence on the success or failure of mergers at enhancing value and the reasons why many mergers do not work.

[11] Given the formidable lobbying skills of incumbent managers, we would not be surprised to see this change modified or delayed past 2001.

The Post-Deal Performance of Merged Companies

Many studies examine the extent to which mergers and acquisitions succeed or fail after the firms combine. Most studies conclude that many mergers fail to deliver on their promises of efficiency and synergy, and even those that do deliver seldom create value for the acquirers' stockholders.

Evidence that Mergers often fail

McKinsey and Co. examined 58 acquisition programs between 1972 and 1983 for evidence on two questions: (1) Did the return on the amount invested in the acquisitions exceed the cost of capital? (2) Did the acquisitions help the parent companies outperform the competition? They concluded that 28 of the 58 programs failed both tests, and six failed at least one test. In a follow-up study[12] of 115 mergers in the U.K. and the U.S. in the 1990s, McKinsey concluded that 60% of the transactions earned returns on capital less than the cost of capital, and that only 23% earned excess returns. In 1999, KPMG examined 700 of the most expensive deals between 1996 and 1998 and concluded that only 17% created value for the combined firm, 30% were value neutral and 53% destroyed value[13].

A study[14] looked at the eight largest bank mergers in 1995 and concluded that only two (Chase/Chemical, First Chicago/NBD) subsequently outperformed the bank-stock index. The largest, Wells Fargo's acquisition of First Interstate, was a significant failure. Sirower (1996) takes a detailed look at the promises and failures of synergy and draws the gloomy conclusion that synergy is often promised but seldom delivered.

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[12] This study was referenced in an article titled "Merger Mayhem" that appeared in Barrons on April 20, 1998.

[13] KPMG measured the success at creating value by comparing the post-deal stock price performance of the combined firm to the performance of the relevant industry segment for a year after the deal was completed.

The most damaging piece of evidence on the outcome of acquisitions is the large number of acquisitions that are reversed within fairly short time periods. Mitchell and Lehn note that 20.2% of the acquisitions made between 1982 and 1986 were divested by 1988. Studies that have tracked acquisitions for longer time periods (ten years or more) have found the divestiture rate of acquisitions rises to almost 50%, suggesting that few firms enjoy the promised benefits from acquisitions do not occur. In another study, Kaplan and Weisbach (1992) found that 44% of the mergers they studied were reversed, largely because the acquirer paid too much or because the operations of the two firms did not mesh.

Mergers that Succeed

There are clearly exceptions to this pattern of failure. Some firms, such as GE, Cisco and Browning Ferris, have successfully increased value over time using acquisitions. Even those firms classified as failures in the studies quoted in the previous section can claim that it takes time for acquisitions to work and create value.

Some studies find improvements in operating efficiency after mergers, especially hostile ones[15]. Healy, Palepu, and Ruback (1992) found that the median post-acquisition cash flow returns improve for firms involved in mergers, though 25% of merged firms lag industry averages after transactions. Parrino and Harris (1999) examined 197 transactions between 1982 and 1987 and categorized the firms based upon whether the management is replaced (123 firms) at the time of the transaction, and the motive for the transaction. They find that

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[14] This study was done by Keefe, Bruyette and Woods, an investment bank. It was referenced in an article titled "Merger Mayhem" in Barrons, April 20, 1998.

[15]A study by Healy, Palepu and Ruback (1989) looked at the post-merger performance of 50 large mergers from 1979 to 1983 and concluded that merged firms improved their operating performance (defined as

- On average, in the five years after the transaction, merged firms earned 2.1% more than the industry average.
- Almost all this excess return occurred in cases where the CEO of the target firm is replaced within one year of the merger. These firms earned 3.1% more than the industry average, whereas firms, whereas when the CEO of the target firm continued in place the merged firm did not do better than the industry

In addition, a few studies examine whether acquiring related businesses (i.e., synergy-driven acquisitions) provides better returns than acquiring unrelated business (i.e., conglomerate mergers) and come to conflicting conclusions with no consensus.[16] Nail and Megginson examined 260 stock swap transactions and categorized the mergers as either a conglomerate or a 'same-industry" transactions. They found no evidence of wealth benefits for either stockholders or bondholders in conglomerate transactions. However, they did find significant net gains for both stockholders and bondholders in the case of mergers of related firms.

Finally, on the issue of synergy, the KPMG study of the 700 largest deals from 1996 to 1998 concludes the following:

5. Firms that evaluate synergy carefully before an acquisition are 28% more likely to succeed than firms that do not.
6. Cost saving synergies associated with reducing the number of employees are more likely to be accomplished than new product development or R&D synergies. For instance, only a quarter to a third of firms succeeded on the latter, whereas 66% of firms were able to reduce headcount after mergers.

EBITDA/Sales) relative to their industries.

[16] Michel and Shaked (1984) and Duofsky and Varadarajan (1987) find that diversification-driven mergers do better than synergy-driven mergers, in terms of risk-adjusted returns. Varadarajan and Ramanujam (1987) find that the latter do better in terms of return on equity.

Odds of Success

In summary, the evidence on mergers adding value is murky at best and negative at worst. Considering all the contradictory evidence contained in different studies[17], we conclude that:

- Mergers of equals (firms of equal size) seem to have a lower probability of succeeding than acquisitions of a smaller firm by a much larger firm[18].
- Cost saving mergers, where the cost savings are concrete and immediate, seem to have a better chance of delivering on synergy than mergers based upon growth synergy.
- Acquisition programs that focus on buying small private businesses for consolidations have had more success than acquisition programs that concentrate on acquiring publicly traded firms.
- Hostile acquisitions seem to do better at delivering improved post-acquisition performance than friendly mergers.

Why do mergers fail?

Looking at the evidence, then, a large number of mergers fail. There are a several reasons, but these seem to be the most common:

- *Lack of a post-merger plan to deliver on synergy and control*: Firms in many mergers seem to believe that the value enhancements associated with synergy and control will arise on their own. In reality, however, firms must plan for and work at creating these benefits. The absence of planning can be attributed to the fact that firms are seldom concrete about what form synergy will take and do not try to quantitatively estimate the cash flows associated with synergy. That is why we believe it is important that firms try to estimate and value synergy, at the time of an acquisition. Though the estimates are

[17] Some of this evidence is anecdotal and is based upon the study of just a few mergers.

[18] This might well reflect the fact that failures of mergers of equal are much more visible than failures of the small firm/large firm combinations.

likely to be noisy, the process of thinking about synergy and putting projections down on paper is the first step in planning.

- *Lack of Accountability:* Closely related to the first problem is a lack of accountability after acquisitions are done. A large number of people want to be involved in and lay claim to the credit when acquisitions are announced, far fewer of these individuals want be held responsible for the post-acquisition work of delivering on the promises made at the time of the deal. This criticism applies not only to the managers of the acquiring and target firms, but to their investment bankers as well. The only way to ensure that the high expectations at the time of the deal come to fruition is to hold those pushing most strongly for the deal responsible for delivering on its promises.
- *Culture Shock*: A firm acquires a culture over time that helps it attract and keep its employees. When firms merge and try to consolidate, their cultures are likely to come into conflict. If not managed right, one or both firms will face employee flight and loss of morale. This problem becomes bigger as firms get larger, and the cultural differences run deeper.
- *Failure to consider external constraints*: In valuing control, we assumed that firms making poor investments would be able to raise their return on capital and become more productive. This is not always easily accomplished and may require painful decisions about employee layoffs. In an unconstrained free market, these actions can be carried out, albeit with significant emotional and economic pain to those involved. More realistically, firms have to deal with unions and governments that may not take kindly to these actions. In such cases, the firm may be constrained in terms of implementing the actions it had planned to take.
- *Managerial Ego*s: In most mergers, the managers at the top of the combining firms have to co-habit and share power. Although they might do so initially, power struggles often arise between the chief executives of the combining firms. These disagreements ripple

down through the organizational ranks, leading to a loss of focus on the original motives for the merger.

- *The Market Price Hurdle*: Even the best acquisitions will fail stockholders if the acquiring firm pays too much for the target firm. When acquiring a publicly traded firm, the acquirer has to pay the market price plus a premium. To the extent that the market price might already incorporate the value of synergy or control, and the premium is driven up by rival bids for the target firm, it becomes difficult to avoid the winner's curse[19]. This may explain why acquisitions of private firms, where the premium is not added to a market price, are more likely to succeed than acquisitions of publicly traded firms.

✒ CT 26.3: Assume that you have been in put in charge of coming up with an acquisition strategy for your firm. What are some of the actions you would take to make the strategy a success for your stockholders?

Takeover Restrictions

There are two classes of restrictions on takeovers - (1) those imposed by the firm through the use of anti-takeover clauses and amendments in the corporate charter, and (2) those imposed by the state to make takeovers more difficult or even impossible.

Anti-takeover Amendments

In response to a wave of hostile takeovers in the 1980s, many firms changed their corporate charters to make takeovers more difficult. The managers of these firms offered many reasons for these changes. First, they would release managers from the time-consuming tasks of having to deal with hostile takeovers and enable them to spend their

[19] The winner's curse refers to the likelihood that the winner in an auction is likely to overpay for the item he or she bid on. The same phenomenon would apply in acquisitions where there are multiple bidders for the same target firm.

time making productive decisions. Second, they would give managers additional tools to extract a higher price from hostile bidders in a takeover by increasing their bargaining power. Third, they would enable managers to focus on maximizing 'long-term' value as opposed to the 'short-term' value maximization supposedly implicit in most takeovers. The managers of firms offered a range of anti-takeover amendments to this end. Among them were staggered board elections, whereby only a portion of the board could be replaced each year, making it more difficult for a shareholder to gain control, supermajority clauses requiring more than majority approval for a merger (typically 70 to 80%), and the barring of two-tier offers[20].

In theory, these anti-takeover amendments should affect value negatively, because they make takeovers less likely and entrench incumbent management. One way to value these anti-takeover amendments is to rewrite the market price of a firm as follows:

Market Value of firm = Market value of firm as is + Probability of a takeover
* (Market Value of restructured firm-Market Value of firm as is)

By passing anti-takeover amendments, firms reduce the probability of a takeover and, hence, their market price. The net effect on value varies across firms, however; firms with the most inefficient management are most likely to experience a drop in value on the passage of these amendments, while firms with more efficient management are not likely to show any noticeable change in value.

There is a surprising lack of consensus on the effects of anti-takeover amendments on stock prices. Linn and McConnell (1983) studied the effects of anti-takeover amendments on the stock price and found positive but insignificant reactions to anti-takeover amendments. DeAngelo and Rice (1983) investigated the same phenomenon and

[20] In two tier tender offers, acquirers offer a higher price for the first 51% of the shares tendered, and a lower price for the remaining 49% that are not. By doing so, they hope to increase the number of stockholders who do tender.

found a negative, albeit insignificant, effect. Dann and DeAngelo (1983) examined standstill agreements[21] and negotiated premium buybacks[22] and reported negative stock price reactions around their announcements, a finding consistent with the loss of shareholder wealth. Dann and DeAngelo (1988) extended their study to anti-takeover measures passed not in response to a takeover attempt, but in advance of a takeover as a defensive measure. They reported a stock price decline of 2.33% around the announcement of these measures.

Restrictions on Acquisitions

Many financial markets outside the United States impose significant legal and institutional restrictions on takeover activity. While few markets forbid takeovers altogether, the cumulative effect of the restrictions is to make hostile takeovers just about impossible. Even in the United States, many states imposed restrictions on takeovers in the 1980s, in response to the public and political outcry against hostile takeovers. One example of state-imposed restrictions is the Pennsylvania law passed in 1990, which contained three provisions to make takeovers more difficult. First, bidders who cross ownership thresholds of 20, 33, or 50% without management approval must gain the approval of other shareholders to use their voting rights. This approval is made even more difficult to obtain because voting is restricted to only those shareholders who have held stock for more than 12 months. Second, the board of directors is allowed to weigh the effect of the takeover on all stakeholders, including customers, employees, and local community groups, in accepting or rejecting a takeover, thus providing members of the board with considerable leeway in rejecting hostile bids. Third, bidders are forced to return any profits made from any sale of

[21] In a standstill agreement, a firm enters into an agreement with a potential hostile acquirer whereby the acquirer agrees not to acquire any more shares. In return, the acquirer receives cash or other compensation.

[22] This is a fancy name for greenmail, whereby the stake acquired by a raider is bought back by the company at a substantial premium over the price paid. In return, the raider signs a 'standstill' agreement not

stock in the target corporation within 18 months of the takeover attempt, thus increasing the cost of an unsuccessful bid.

Karpoff and Malatesta (1990) examined the consequences of this law, and found that the stock prices of Pennsylvania-based firms dropped (after adjusting for market movements), on average, 1.58% on October 13, 1989, the first day a news story on the law appeared. Over the entire period, from the first news story to the introduction of the bill into the Pennsylvania legislature, these firms saw their stock prices decline 6.90%.[23]

✒ CT 26.4: Consider only anti-takeover amendments that require shareholder approval. What types of firms are most likely to be successful in getting such amendments approved? In particular, do you see such amendments having a greater chance of success in well managed or badly managed firms?

Analyzing Management and Leveraged Buyouts

In the first section, when describing the different types of acquisitions, we pointed out two important differences between mergers and buyouts. The first is that, unlike a merger, a buyout does not involve two firms coming together and creating a consolidated entity. Instead, the target firm is acquired by a group of investors that may include the management of the firm. The second is that the target firm in a buyout usually becomes a private business. Some buyouts in the 1980s also used large proportions of debt, leading to their categorization as leveraged buyouts. Each of these differences does have an effect on how we approach the valuation of buyouts.

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to acquire shares in the company for a specific time period.

[23] The controversy provoked by the Pennsylvania anti-takeover law created a strong counter-movement among institutional investors, who threatened to sell their holdings in Pennsylvania companies that opted to be covered by the law. Faced with this ultimatum, many Pennsylvania firms chose to opt out of the anti-takeover law.

The Valuation of a Buyout

The fact that buyouts involve only the target firm and that there is no acquiring firm to consider makes valuation much more straightforward. Clearly, there is no potential for synergy and, therefore no need to value it. However, the fact that the managers of a firm are also the acquirers of the firm does create two issues. The first is that managers have access to information that investors do not have. This information may allow managers to conclude, with far more certainty than would an external acquirer, that their firm is under valued. This may be one reason for the buyout. The second is that the management of the firm remains the same after the buyout, but the way in which investment, financing and dividend decisions are made may change. This happens because managers, once they become owners, may become much more concerned about maximizing firm value.

The fact that firms that are involved in buyouts become private businesses can also have an effect on value. In chapter 24, we noted that investments in private businesses are much more difficult to liquidate than investments in publicly traded firms. This can create a significant discount on value. One reason this discount may be smaller in the case of buyouts is that many of them are done with the clear intention, once the affairs of the firm have been put in order, of taking the firm public again.

If going private is expected to increase managers' responsiveness to value maximization in the long term — since they are part owners of the firm — the way to incorporate this in value is to include it in the cash flows. The increased efficiency can be expected to increase cash flows if it increases operating margins. The emphasis on long-term value should be visible in investment choices and should lead to a higher return on capital and higher growth. This advantage has to be weighed against the capital rationing the firm might face because of limited access to financial markets, which might reduce future growth and profits. The net effect will determine the change in value. The empirical evidence on going-private transactions, however, is clear cut. DeAngelo, DeAngelo and Rice (1984) report, for example, an average abnormal return of 30% for 81 firms in their sample that

went private. Thus, financial markets, at least, seem to believe that there is value to be gained for some public firms in going private.

Valuing a Leveraged Buyout

We have seen that leveraged buyouts are financed disproportionately with debt. This high leverage is justified in several ways. First, if the target firm initially has too little debt relative to its optimal debt ratio, the increase in debt can be explained partially by the increase in value moving to the optimal ratio provides. The debt level in most leveraged buyouts exceeds the optimal debt ratio, however, which means that some of the debt will have to be paid off quickly in order for the firm to reduce its cost of capital and its default risk. A second explanation is provided by Michael Jensen, who proposes that managers cannot be trusted to invest free cash flows wisely for their stockholders; they need the discipline of debt payments to maximize cash flows on projects and firm value. A third rationale is that the high debt ratio is temporary and will disappear once the firm liquidates assets and pays off a significant portion of the debt.

The extremely high leverage associated with leveraged buyouts creates two problems in valuation, however. First, it significantly increases the riskiness of the cash flows to equity investors in the firm by increasing the fixed payments to debt holders in the firm. Thus, the cost of equity has to be adjusted to reflect the higher financial risk the firm will face after the leveraged buyout. Second, the expected decrease in this debt over time, as the firm liquidates assets and pays off debt, implies that the cost of equity will also decrease over time. Since the cost of debt and debt ratio will change over time as well, the cost of capital will also change in each period.

In valuing a leveraged buyout, then, we begin with the estimates of free cash flow to the firm, just as we did in traditional valuation. However, instead of discounting these cash flows back at a fixed cost of capital, we discount them back at a cost of capital that will vary from year to year. Once we value the firm, we then can compare the value to the total amount paid for the firm.

In Practice 26.7: Valuing A Leveraged Buyout: Congoleum Inc.[24]

The managers of Congoleum Inc targeted the firm for a leveraged buyout in 1979. They planned to buy back the stock at $38 per share (it was trading at $24 prior to the takeover) and to finance the acquisition primarily with debt. The breakdown of the cost and financing of the deal is provided below:

Cost of Takeover:

Buy back stock: $38 * 12.2 million shares	: $463.60 million
Expenses of takeover:	: $ 7.00 million
Total Cost	: $ 470.60 million

Financing Mix for takeover:

Equity:	: $ 117.30 million
Debt:	: $ 327.10 million
Preferred Stock (@13.5%):	: $ 26.20 million
Total Proceeds	: $ 470.60 million

There were three sources of debt:

1. Bank debt of $125 million, at a 14% interest rate, to be repaid in annual installments of $16.666 million, starting in 1980.
2. Senior notes of $115 million, at 11.25% interest rate, to be repaid in equal annual installments of $7.636 million each year from 1981.
3. Subordinated notes of $92 million, at 12.25% interest, to be repaid in equal annual installments of $7.636 million each year from 1989.

The firm also assumed $12.2 million of existing debt, at the advantageous rate of 7.50%; this debt would be repaid in 1982.

[24] The numbers in this illustration were taken from the Harvard Business School case titled "Congoleum". The case is reprinted in Fruhan, Kester, Mason, Piper and Ruback (1992).

The firm projected operating income (EBIT), capital spending, depreciation and change in working capital from 1980 to 1984 as shown in Table 26.9 (in millions of dollars):

Table 26.9: EBIT, Net Cap Ex and Changes in Working Capital – Congoleum

Year	EBIT	Capital Spending	Depreciation	Δ Working Capital
Current	$ 89.80	$ 6.80	$ 7.5	$ 4.0
1980	$ 71.69	$ 15.0	$ 35.51	$ 2.0
1981	$ 90.84	$ 16.2	$ 36.26	$ 14.0
1982	$115.73	$ 17.5	$ 37.07	$ 23.3
1983	$113.15	$ 18.9	$ 37.95	$ 11.2
1984	$137.27	$ 20.4	$ 21.23	$ 12.8

The earnings before interest and taxes were expected to grow 8% after 1984, and the capital spending is expected to be offset by depreciation[25].

Congoleum had a beta of 1.25 in 1979, prior to the leveraged buyout. The treasury bond rate at the time of the leveraged buyout was 9.5%.

We begin the analysis by estimating the expected cash flows to the firm from 1980 to 1985. To obtain these estimates, we subtract the net capital expenditures and changes in working capital from the after-tax operating income.

Table 26.10: Projected Cash Flows to Equity and Firm: Congoleum

	1980	1981	1982	1983	1984	1985
EBIT	$71.69	$90.84	$115.73	$133.15	$137.27	$148.25
- EBIT (t)	$34.41	$43.60	$55.55	$63.91	$65.89	$71.16
= EBIT (1-t)	$37.28	$47.24	$60.18	$69.24	$71.38	$77.09
+ Depreciation	$35.51	$36.26	$37.07	$37.95	$21.93	$21.62
- Capital Exp.	$15.00	$16.20	$17.50	$18.90	$20.40	$21.62
- Δ WC	$2.00	$14.00	$23.30	$11.20	$12.80	$5.00
= FCFF	$55.79	$53.30	$56.45	$77.09	$60.11	$72.09

We follow up by estimating the cost of capital for the firm each year, based upon our estimates of debt and equity each year. The value of debt for future years is estimated based upon the repayment schedule, and it decreases over time. The value of equity in each of the

[25] We have used the assumptions provided by the investment banker, in this case. It is troubling, however, that the firm has an expected growth rate of 8% a year forever without reinvesting any money back.

future years is estimated by discounting the expected cash flows in equity beyond that year at the cost of equity.

Table 26.11: Cost of Capital – Congoleum

	1980	1981	1982	1983	1984	1985
Debt	$327.10	$309.96	$285.17	$260.62	$236.04	$211.45
Equity	$275.39	$319.40	$378.81	$441.91	$504.29	$578.48
Preferred Stock	$26.20	$26.20	$26.20	$26.20	$26.20	$26.20
Debt/Capital	52.03%	47.28%	41.32%	35.76%	30.79%	25.91%
Equity/Capital	43.80%	48.72%	54.89%	60.64%	65.79%	70.88%
Preferred Stock/Capital	4.17%	4.00%	3.80%	3.60%	3.42%	3.21%
Beta	2.02547	1.87988	1.73426	1.62501	1.54349	1.4745
Cost of Equity	20.64%	19.84%	19.04%	18.44%	17.99%	17.61%
After-tax cost of debt	6.53%	6.53%	6.53%	6.53%	6.53%	5.00%
Cost of preferred stock	13.51%	13.51%	13.51%	13.51%	13.51%	13.51%
Cost of Capital	13.00%	13.29%	13.66%	14.00%	14.31%	14.21%

An alternative approach to estimating equity, which does not require iterations or circular reasoning, is to use the book value of equity rather than the estimated market value in calculating debt-equity ratios.[26]

The cash flows to the firm and the cost of capital in the terminal year (1985), in conjunction with the expected growth rate of 8%[27], are used to estimate the terminal value of equity (at the end of 1984):

Terminal value of firm (end of 1984) $= FCFE_{1985}/(k_{e,1985}\text{-}08)$

$= \$\ 72.09/(.1421\text{-}.08) = \$\ 1161$ million

[26] The book value of equity can be obtained as follows:

$BV\ of\ Equity_t = BV\ of\ Equity_{t-1} + Net\ Income_t$

It is assumed that there will be no dividends paid to equity investors in the initial years of a leveraged buyout.

The expected cash flows to the firm and the terminal value were discounted back to the present at the cost of capital to yield a present value of $ 820.21 million[28]. Since the acquisition of Congoleum cost only $ 470.6 million, this acquisition creates value for the acquiring investors.


merglbo.xls: This spreadsheet allows you to evaluate the cash flows and the value of a leveraged buyout.

✒ CT 26.5: If the Congoleum acquisition creates value for the acquiring investors, what are the sources of the increase in value?

Summary

Acquisitions take several forms and occur for different reasons. Acquisitions can be categorized, based upon what happens to the target firm after the acquisition. A target firm can be consolidated into the acquiring entity (merger), create a new entity in combination with the acquiring firm or remain independent (buyout).

There are four steps in analyzing acquisitions. First, we specify the reasons for acquistions and list five: the undervaluation of the target firm, benefit from diversification, the potential for synergy, the value created by changing the way the target firm is run and management self-interest. Second, we choose a target firm whose characteristics make it the best candidate, given the motive chosen in the first step. Third, we value the target firm, assuming it would continue to be run by its current managers and then revalue it assuming

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[27] While this may seem to be a high growth rate to sustain forever, it would have been appropriate in 1979. Inflation and interest rates were much higher then than in the 1990s.

[28] When the cost of capital changes on a year-to-year basis, the discounting has to be based upon a cumulative cost. For instance, the cash flow in year 3 will be discounted back as follows:

PV of cash flow in year 3 = 56.45/(1.13) (1.1329) (1.1366)

better management. We define the difference between these two values as the value of control. We also value each of the different sources of operating and financial synergy and considered the combined value as the value of total synergy. Fourth, we look at the mechanics of the acquisition. We examine how much the acquiring firm should consider paying, given the value estimated in the prior step for the target firm, including control and synergy benefits. We also look at whether the acquisition should be financed with cash or stock, and how the choice of the accounting treatment of the acquisition affects this choice.

Buyouts share some characteristics with acquisitions, but they also vary on a couple of important ones. The absence of an acquiring firm, the fact that the managers of the firm are its acquirers and the conversion of the acquired firm into a private business all have implications for value. If the buyout is financed predominantly with debt, making it a leveraged buyout, the debt ratio will change in future years, leading to changes in the costs of equity, debt and capital in those years.

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