
THE GROWN-UPS: MATURE COMPANIES

At each stage of the life cycle of the firm, there is attrition. Most young companies fail to make it through early tests to become growth companies, and a large number of growth companies find that growth is short lived and either go out of business or are acquired by larger firms. In this chapter, we will focus on the companies that survive these grueling phases of competition and become mature companies: mature not only in terms of growth rates but also in terms of risk profiles and return characteristics.

Companies in the mature phase of the life cycle should present the least problems in valuations. They have long periods of operating and market history, allowing us to estimate most of the inputs for valuation from historical data. They have also settled into established patterns of investment and financing, resulting in fundamentals (risk and returns) that are stable over time, giving us more confidence in our estimates of these numbers. It is, however, these established patterns that may present a problem, since not all long standing practice is good. Put another way, there are mature firms that make financing and investment choices that are not optimal or sensible, and have been doing so for long periods. It is possible, therefore, that these firms, with new management in place, could be run differently (and better) and have higher values. Analysts valuing mature companies have to juggle two values – the status quo value and an optimal value – and how they deal with them will in large part determine the quality of the valuation.

Mature Companies in the Economy

Mature companies represent the backbone of most economies. While growth companies may capture our imagination and attention, mature companies deliver most of the current output and employment in an economy. In this section, we will begin by looking at how we could categorize companies as mature, and at characteristics that mature companies tend to share.

A Life Cycle View of Mature Companies

In the life cycle view of a firm, a business starts as an idea business and, assuming it survives, goes through being a young growth company, often privately held, to a more established growth company, generally in public markets. As we noted in the last chapter,

even the best growth companies eventually run into a wall when it comes to growth, partly because their success makes them larger and partly because they attract competition. Consequently, it is not a question of whether a company becomes a mature company but when it happens.

One way to categorize companies as growth and mature companies is to look at the growth rate, with lower growth companies being treated as mature. There are two problems with this approach. First, given that growth is a continuum, any growth rate that we adopt as a cut off point will be subjective –we will find more mature companies, if we adopt a 6% growth rate cut off than a 4% growth rate. Second, not all operating measures grow at the same rate; we have to decide whether the growth rate that we use for the categorization will be growth in revenues, units or earnings. It is conceivable for a company with low growth in revenues to deliver high earnings growth, at least over short periods.

A better way of thinking about growth is to use the financial balance sheet construct that we developed in the last chapter. Rather than focus on operating measures such as revenue or earnings growth, we can look at the proportion of a firm’s value that comes from existing investments as opposed to growth assets. If growth companies get the bulk of their value from growth as growth assets, mature companies must get the bulk of their value from existing investments (see figure 11.1 below):

Figure 11.1: A Financial Balance Sheet for a Business

Assets			Liabilities
Existing Investments Generate cashflows today	Investments already made	<i>Mature companies get most of their value from existing assets.</i>	Debt
Expected Value that will be created by future investments	Investments yet to be made	<i>Growth companies derive a significant [proportion of their value from growth assets.</i>	Equity

We can use the distribution, across all companies, of the proportion of value that comes from mature assets to determine our threshold for mature companies. Thus, if we define mature companies as the top 20% of all companies, in terms of proportion of value from mature assets, the threshold for being a mature company will vary across markets (it will

be lower in growth economies like India and China, than in the US or Western Europe) and across time (the threshold will be higher, when economies slow down as they did in 2008 and 2009, and lower, when economies are booming).

Characteristics of Mature Companies

There are clear differences across mature companies in different businesses, but there are some common characteristics that they share. In this section, we will look at what they have in common, with an eye on the consequences for valuation.

1. Revenue growth is approaching growth rate in economy: In the last section, we noted that there can be a wide divergence between growth rate in revenues and earnings in many companies. While the growth rate for earnings for mature firms can be high, as a result of improved efficiencies, the revenue growth is more difficult to alter. For the most part, mature firms will register growth rates in revenues that, if not equal to, will converge on the nominal growth rate for the economy.
2. Margins are established: Another feature shared by growth companies is that they tend to have stable margins, with the exceptions being commodity and cyclical firms, where margins will vary as a function of the overall economy. While we will return to take a closer look at this sub-group later in the book, even these firms will have stable margins across the economic or commodity price cycle.
3. Competitive advantages? The dimension on which mature firms reveal the most variation is in the competitive advantages that they hold on to, manifested by the excess returns that they generate on their investments. While some mature firms see excess returns go to zero or become negative, with the advent of competition, other mature firms retain significant competitive advantages (and excess returns). Since value is determined by excess returns, the latter will retain higher values, relative to the former, even as growth rates become anemic.
4. Debt capacity: As firms mature, profit margins and earnings improve, reinvestment needs drop off and more cash is available for servicing debt. As a consequence, debt ratios should increase for all mature firms, though there can be big differences in how firms react to this surge in debt capacity. Some will choose not to exploit any or most of the debt capacity and stick with financing policies that they established as growth companies. Others will over react and not just borrow, but borrow more than they can

comfortably handle, given current earnings and cash flows. Still others will take a more reasoned middle ground, and borrow money to reflect their improved financial status, while preserving their financial health.

5. Cash build up and return? As earnings improve and reinvestment needs drop off, mature companies will be generating more cash from their operations than they need. If these companies do not alter their debt or dividend policies, cash balances will start accumulating in these firms. The question of whether a company has too much cash, and, if so, how it should return this cash to stock holders becomes a standard one at almost every mature company.
6. Inorganic growth: The transition from a growth company to a mature company is not an easy one for most companies (and the managers involved). As companies get larger and investment opportunities internally do not provide the growth boost that they used to, it should not be surprising that many growth companies look for quick fixes that will allow them to continue to maintain high growth. One option, albeit an expensive one, is to buy growth: acquisitions of other companies can provide boosts to revenues and earnings.

One final point that needs to be made is that not all mature companies are large companies. Many small companies reach their growth ceiling quickly and essentially stay as small, mature firms. A few growth companies have extended periods of growth before they reach stable growth and these companies tend to be the large companies that we find used as illustrations of typical mature companies: Coca Cola, IBM and Verizon are all good examples.

Valuation Issues

As with young businesses and growth firms, the characteristics of mature companies can create estimation challenges, during valuations. In this section, we will first focus on the valuation issues in the discounted or intrinsic valuation of mature companies and then look at manifestations of the same problems, when we do relative valuation.

Intrinsic (DCF) Valuation

If the intrinsic value of a firm is the present value of the expected cash flows from its investments, discounted back at a risk adjusted rate, it would seem that mature firms should be easiest to value on that basis. While this is generally true, there are still problems that can lurk under the surface of the long and seemingly stable histories of these firms.

Existing Assets

We categorized mature companies as those that get the bulk of their value from existing assets. Consequently, measuring the value of these assets correctly becomes far more critical with mature firms than it was with the growth firms that we analyzed in the last two chapters. Since a key input into valuing existing assets is estimating the cash flows that they generate, there are two issues that we encounter when we value mature companies.

- a. Managed Earnings: Mature companies are particularly adept at using the discretionary power offered in accounting rules to manage earnings. While they are not necessarily committing accounting fraud or even being deceptive, it does imply that the earnings reported from existing assets by companies that aggressively approach accounting choices will be much higher than the earnings reported by otherwise similar conservative companies. Failing to factor in the differences in “accounting” mindset can lead us to over value the existing assets of the aggressive companies and under value them for conservative companies.
- b. Management inefficiencies: When valuing mature companies, we are often lulled by the fact that they have long periods of stable operating history into believing that the numbers from the past (operating margins, returns on capital) are reasonable estimates of what existing assets will continue to generate in the future. However, past earnings reflect how the firm was managed over the period. To the extent that managers may not have made the right investment or financing choices, the reported earnings may be lower than what the existing assets would be able to produce under better or optimal management. If there is the possibility of such a management change on the horizon, we will under value existing assets using reported earnings.

In summary, the notion that existing assets can be easily valued at a mature company, because of its long operating history, is defensible only at well-managed companies or at companies where existing management is so entrenched that there is no chance of a management change.

Growth Assets

There are two ways in which companies can create growth assets. One is to invest in new assets and projects that generate excess returns: this is generally termed organic growth. The other is to acquire established businesses and companies and thus short circuit the process: this is inorganic or acquisition driven growth. While both options are available to companies at any stage in the life cycle, mature companies are far more likely to take the “acquired growth” route for three reasons. The first is that as companies mature, internal investments start to become scarce, relative to what the firm has available to invest. The second is that as companies get larger, the new investments that they make also have to grow in size to have any impact on overall growth. While it is difficult to find multi-billion dollar internal projects, it is easier to find acquisitions that are of that size and affect the growth rate almost immediately. The third applies in businesses where there is a long lead-time between investment and payoff. In these businesses, there will be a lag between the initial investment in a new asset and the growth generated by that investment. With an acquisition, we are in effect speeding up the payoffs.

So what are the consequences for intrinsic valuation? As a general rule, the value of acquisition driven growth is much more difficult to assess than the value of organic growth. Unlike organic growth, where firms take several small investments each period, acquisitions tend to be infrequent and lumpy: a multi-billion dollar acquisition in one year may be followed by two years of no investments at all and then followed by another acquisition. The consequences of this lumpiness can be seen if we relate growth to fundamentals:

$$\text{Expected Growth Rate} = \text{Reinvestment Rate} * \text{Return on Capital}$$

Since reinvestment and returns on capital should reflect both organic and acquisition driven growth, we think it is far more difficult to estimate these numbers for acquisitive companies. If we follow the standard practice of using the reinvestment numbers from the

most recent financial statement, we risk overstating the value (if there was a large acquisition during the period) or understating it (if it was a period between acquisitions). Computing the return on capital on investments is much more difficult with acquisitions, partly because of the accounting treatment of the price paid and its allocation to goodwill and partly because we have far fewer observations to base our judgments on.

Discount Rates

When estimating discount rates, we start from a position of more strength, when analyzing mature companies, because we have more data to work with. Most mature companies have been publicly traded for extended periods, giving us access to more historical price data, and have settled risk profiles, which stabilizes the data. Thus, estimating equity risk parameters from historical data is more defensible with this group of companies than it was with the growth companies that we analyzed in the last two chapters. In addition, many mature companies, at least in the United States, use the corporate bond route to raise debt, which yields two benefits. The first is that we can get updated market prices and yields on these bonds, which are an input into the cost of debt. The second is that the bonds are accompanied by bond ratings, which not only provide measures of default risk but pathways to default spreads and costs of debt.

There are, however, three estimation issues that can affect discount rate estimates. The first is that mature companies accumulate debt from multiple places, leading to a complex mix of debt – fixed and floating rate, in multiple currencies, senior and subordinated, and with different maturities. Since they often carry different interest rates (and even different ratings), analysts are left with the challenge of how to deal with this complexity, when computing debt ratios and costs of debt. The second is that discount rates (costs of debt, equity and capital) are affected by the firm's mix of debt and equity and the estimates that we obtain from the current price data and ratings are reflective of the current financing mix of the firm. If that mix is altered, the discount rate will have to be re-estimated. The third factor comes into play for those firms that follow the acquisitive route to growth. Acquiring a firm in a different business or with a different risk profile can alter the discount rate for the firm.

Terminal Value

As in any intrinsic valuation, the terminal value accounts for a large share of the overall value of a mature firm. Since mature firms have growth rates that are close to that of the economy, the computation of terminal value may seem both more imminent and simpler with a mature company than a growth company. While this may be true, there are two factors that can still cause distortions in the computation.

- a. Stable growth rates, unstable risk and investment profile: While many mature companies have growth rates low enough to qualify for stable growth (by being less than the growth rate of the economy and the riskfree rate), the other inputs into the valuation may not reflect this maturity. Thus, a firm with a 2% growth rate in revenues and earnings would qualify as a stable firm, based upon its growth rate, but not if its beta is 2.00 and it is reinvesting 90% of its after-tax operating income back into the business. To qualify as a stable growth firm that can be valued using the terminal value equation, the firm should not only have a sustainable growth rate but also have a risk profile of a stable firm (close to average risk) and behave like a stable firm (in terms of reinvestment).
- b. Lock in inefficiencies in perpetuity: The cash flows from existing assets and the discount rates that we obtain from past data will reflect the choices made by the firm. To the extent that the firm is not managed optimally, the cash flows may be lower and the discount rate higher than it would have been for the same firm with a different management. If we lock in current values (margins, returns on investment and discount rates), when estimating terminal value, and the firm is poorly run, we are in effect undervaluing the firm by assuming that the current practices will continue forever.

The assumption that a firm is in stable growth and can be valued using a terminal value equation cannot be made easily, even for mature firms.

Relative Valuation

With mature companies, with positive revenues and earnings and book values that are meaningful, we have a luxury of riches when it comes to relative valuation. We can estimate revenues, earnings and book value multiples and compare how a company is priced, relative to other companies like it.

a. Too many values? The problem, though, is that while finding a multiple that works and comparable companies is easier with mature firms than with the growth firms that we analyzed in the last two chapters, the fact that each multiple that we use gives us a different estimate of value can be problematic. Put another way, relative valuation is a subjective process, where the same company can be assigned very different values, depending upon whether we are using a firm or equity multiple, whether that multiple is stated as a function of revenues, earnings and book value and the companies we pick to be its comparables. With mature firms, the problem we face is not that we cannot estimate a relative value but that there are too many values to pick between.

b. Management change: The multiples that we compute of revenues, earnings and book value reflect the mature firm as it is managed today. To the extent that changing the management of the firm could change all of these numbers, we are faced with the same problem as we were with discounted cash flow valuation. How do we best reflect, in a relative valuation, the potential for management change and the consequent increase in value? The problem is magnified, though, because the same issue of how a different management can affect operating numbers also affects all of the other companies that are used as a comparable firm.

c. Acquisition Noise: Acquisition driven growth, a source of intrinsic valuation angst, contaminates relative valuation. The accounting aftermath of acquisitions – the creation of goodwill as an asset and its subsequent treatment – can affect both earnings and book value, making multiples based on either number dicey.

d. Changing financial leverage: The other factor that can throw a wrench into relative valuations is changing financial leverage. Mature companies are capable of making large changes to their debt ratios overnight – debt for equity swaps, recapitalizations – and some multiples can be affected dramatically by such actions. In general, equity multiples, such as PE and Price to book ratios, will change more as financial leverage changes than enterprise value or firm multiples, that are based upon the collective value of both debt and equity. A stock buyback, using borrowed funds, can reduce market capitalization dramatically (by reducing the shares outstanding), but will have a much smaller impact on enterprise value (since we are replacing equity with debt). For the same reason, equity earnings (earnings per share, net income) will change when firms alter debt ratios.

The Dark Side of Valuation

The dark side of valuation manifests itself less often with mature companies than with growth or declining companies, but it still shows up with surprising frequency. In this section, we will look at some of ways in which mature company valuations are skewed by inconsistent or unrealistic assumptions.

Growth in Mature Companies

If we categorize companies as mature based upon whether they get the bulk of their value from existing assets, it would seem unlikely that growth assumptions alter value at these companies significantly. However, there are three common mistakes related to growth that can be damaging to valuations:

a. Mistaking bottom line growth for top line growth: We noted that earnings growth and revenue growth can diverge at many mature companies, at least over short time periods. Thus, a firm that improves the efficiency with which it operates existing assets can post growth rates in earnings that are much higher than growth rates in revenues. Analysts who focus on the former without paying much attention to the latter sometimes use earnings growth rates to estimate revenues and overvalue mature companies.

b. Stable growth rate models, with unstable growth rates: The advantage of assuming that a growth rate is sustainable forever is that it allows us to dispense with cash flow estimates beyond that point and compute a terminal value. In chapter 2, we noted the stable growth model comes with two constraints. The first is that the growth rate cannot exceed the nominal growth rate of the economy, with the nominal riskfree rate operating as a proxy for this growth rate. The second is that the risk profile and investment returns of the firm should also be consistent with stable growth, with risk converging on the average firm's risk and excess returns moving towards, if not, to zero. Analysts valuing mature companies sometimes overlook one or both of these assumptions, using stable growth models for firms with growth rates higher than the risk free rate and/or accompanying this growth rate with risk and return assumptions that are incompatible with a growth firm. They often justify the first action by arguing that the growth rate is close enough to the growth rate of the economy to employ a short cut: the mature firm is growing at only 4% and the economy is growing at 3%. What they fail to consider is that

even small violations of the stable growth rate cap (cannot exceed the riskfree rate) can create large effects on value.

Illustration 11.1: Stable growth, unstable inputs...

Hormel Foods sells packaged meat and other food products and has been in existence as a publicly traded company for almost 80 years. In 2008, the firm reported after-tax operating income of \$315 million, reflecting a compounded growth of approximately 5% over the previous 5 years. In addition, the firm had capital expenditures of \$126 million, matching its depreciation amount for the year, and working capital had increased about \$44 million a year on average, for the previous 5 years. The beta for the firm was 0.83 and the debt ratio was 10.39%. The riskfree rate at the time of the analysis is 2.35%, the marginal tax rate is estimated to be 40% and we used an equity risk premium of 6%. The cost of capital is computed below:

$$\text{Cost of equity} = \text{Riskfree Rate} + \text{Beta} * \text{Equity Risk Premium}$$

$$= 2.35\% + 0.83 (6\%) = 7.33\%$$

$$\text{Cost of debt} = \text{Riskfree Rate} + \text{Default Spread (based upon rating)}$$

$$= 2.35\% + 1.25\% = 3.60\%$$

$$\text{Cost of capital} = 7.33\% (.8961) + 3.60\% (1-.40) (.1039) = 6.79\%$$

Assume that the analyst decides to treat Hormel as a stable growth firm, arguing that its growth rate of 5% is low enough to be a stable growth rate and that it is behaving like a stable growth firm, with capital expenditures offsetting depreciation.¹ The value that he would assign the firm would be as follows:

$$\text{Free Cash flow to the firm} = \text{After-tax Operating Income} - (\text{Cap Ex} - \text{Depreciation}) -$$

$$\text{Change in non-cash working capital} = \$315 - \$44 = \$ 271 \text{ million}$$

$$\begin{aligned} \text{Value of Hormel's Operating Assets} &= \frac{\text{FCFF}_{\text{Last year}} (1 + g)}{(\text{Cost of capital} - g)} \\ &= \frac{271(1.05)}{(.0683 - .05)} = \$15,897 \text{ million} \end{aligned}$$

Adding the existing cash balance (\$155 million) and subtracting out debt (\$450 million) yields the value of equity in the firm:

¹ The analyst justifies the claim that 5% is a stable growth rate by noting that the average nominal growth rate in the US economy between 1981 and 2008 was approximately 5% a year.

$$\begin{aligned} \text{Value of Equity} &= \text{Value of operating assets} + \text{Cash} - \text{Debt} \\ &= 15,897 + 155 - 450 = \$ 15,602 \text{ million} \end{aligned}$$

Dividing this value by the number of shares outstanding (134.53 million) yields a value per share of \$115.97, well above the stock price of \$32 at the time of the analysis.

Before jumping on this investment opportunity, we should not there are internal inconsistencies in this valuation that make it fatally flawed. The first is that while a growth rate of 5% may have been perfectly reasonable as a stable growth rate in 1983 or 1995, it is inappropriate in January 2009. In fact, the riskfree rate of 2.35% is signaling dramatically lower inflation and/or real growth in the economy, looking forward. Consequently, the stable growth rate should not have been set higher than 2.35%. The second is that while the cost of capital may be consistent with a stable growth firm – the beta of 0.83 is well within a stable range (0.80-1.20) – the reinvestment that the analyst is building into the cash flows in perpetuity is not compatible with the growth rate that he is using.

$$\begin{aligned} \text{Reinvestment Rate} &= \frac{(\text{Cap Ex} - \text{Depreciation} + \text{Change in WC})}{\text{After-tax Operating Income}} \\ &= \frac{(120 - 120 + 44)}{305} = 14.49\% \end{aligned}$$

With the assumed growth rate of 5%, this would imply that Hormel would be able to generate returns on capital on its new investments of 34.5%, well above its current return on capital of about 14%.

$$\text{Implied Return on Capital} = \frac{g}{\text{Reinvestment Rate}} = \frac{.05}{.1449} = 34.5\%$$

In summary, the use of too high a growth rate (for stable growth) and an unrealistically high return on capital to accompany that growth rate is skewing the valuation.

Acquisition inconsistencies

When firms grow by acquiring other firms, rather than through internal investments, we noted the collateral damage that is created to the numbers that we depend upon for valuation. Growth rates, risk measures and accounting return computations can all be skewed by acquisitions.

The most common error made by analyst valuing acquisitive companies is their failure to look past the accounting numbers. When valuing a firm, analysts often use

historical growth rates in revenues and earnings as a basis for future projections and use the capital expenditure numbers reported in the statement of cash flows. Implicit here is a mismatch: the growth rate in operating numbers reflects the acquisitions that a firm has made over the time period but the accounting definition of capital expenditures does not incorporate acquisitions. Consequently, using these numbers in unison essentially gives a firm the benefits of future acquisition in the form of higher expected growth without factoring in the cost of making these acquisitions.

A secondary error is an over reliance on the most recent period's financial statements, when estimating inputs such as reinvestment and returns on capital. As we noted, acquisitions tend to be lumpy and infrequent and the most recent year's numbers can be skewed as a consequence. This error can cut both ways, resulting in over valuations of some acquisitive companies and under valuations of others.

Illustration 11.2: Acquisition inconsistency – Valuing Cisco

The 1990s belonged to Cisco, a firm that rode the networking and internet wave to increase its market capitalization from \$ 4 billion in 1991 to more than \$ 400 billion in 1999. During this period, it adopted a growth strategy that paid off richly: rather than develop new technologies internally, it acquired small companies with promising technologies and developed them commercially. While the success of the strategy has waned, Cisco still gets the bulk of its growth from acquisitions. Table 11.1 summarizes revenues and earnings each year from 2005 to 2008, with the reported numbers for depreciation, capital expenditures and acquisitions each year:

Table 11.1: Revenues, Earnings and Reinvestment: Cisco

	2005	2006	2007	2008	Aggregate	Growth rate
Revenues	\$24,801	\$28,484	\$34,922	\$29,540	\$117,747	6.00%
Operating Income	\$7,416	\$6,996	\$8,621	\$9,442	\$32,475	8.38%
After-tax Operating Income	\$5,298	\$5,114	\$6,682	\$7,414	\$24,508	11.85%
Net Income	\$5,741	\$5,580	\$7,333	\$8,052	\$26,706	11.94%
Cap Ex	\$692	\$772	\$1,251	\$1,268	\$3,983	
Depreciation	\$1,020	\$1,293	\$1,413	\$1,744	\$5,470	
Change in Working Capital	-\$34	-\$81	-\$36	-\$57	-\$208	
Reinvestment	-\$362	-\$602	-\$198	-\$533	-\$1,695	

Acquisitions	\$911	\$5,399	\$3,684	\$398	\$10,392	
Modified Reinvestment	\$549	\$4,797	\$3,486	-\$135	\$8,697	

In the last column of the table, we report on the growth rates in revenues and earnings over the period and they indicate healthy growth – 6% annually for revenues and almost 12% in after-tax operating income and net income. The reinvestment numbers based upon internal investment – net cap ex and change in working capital – seem inconsistent with a growing company, since the reinvestment over the entire period was negative (-\$1,684 million). It is only when we consider the \$10.392 billion spent on acquisitions over the period that we see the full picture: including that cost in reinvestment would result in a total reinvestment over the period of \$8.7 billion.

To illustrate the dangers of mismatching growth and reinvestment, consider the consequences of estimating the future growth in operating measures from historical data and using only traditional capital expenditures in computing the reinvestment. Table 11.2 summarizes the projected cash flows for the next 5 years, based on these assumptions:

Table 11.2: Cash Flows and Reinvestment – Mismatching Effect

	<i>Base</i>	<i>Growth Rate</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Revenues	\$29,540	6.00%	\$31,313	\$33,192	\$35,185	\$37,296	\$39,535
After-tax operating income	\$7,414	6.00%	\$7,859	\$8,330	\$8,830	\$9,360	\$9,922
Depreciation	\$1,744	6.00%	\$1,849	\$1,960	\$2,077	\$2,202	\$2,334
Capital Exp	\$1,268	6.00%	\$1,344	\$1,425	\$1,510	\$1,601	\$1,697
Change in WC	-\$57	6.00%	-\$60	-\$64	-\$68	-\$72	-\$76
FCFF	\$7,947	6.00%	\$8,424	\$8,929	\$9,465	\$10,033	\$10,635

To be conservative, we have use historical revenue growth as the basis for projecting growth in all of the numbers. Note that the free cash flows to the firm exceed the after-tax operating income in each year, because we are assuming that reinvestment will stay negative and become even more so. Even if we make reasonable assumptions about growth and reinvestment in the terminal value computation, we will over value Cisco, since we have in effect allowed the company the benefits of acquisition driven growth, without the cost.

Unreal Restructuring

Mature companies can be mismanaged or managed less than optimally. Analysts valuing these companies sometimes try to reflect the potential for management change in the values that they assign to companies, but the adjustments they make are not always reasonable.

The most damaging way of dealing with the possibility of a management change is to add an arbitrary premium to the estimated value of the firm. This addition, often termed a control premium, can increase the value of a firm by 20-25%. Analysts who use this adjustment generally base it on premiums paid by acquiring companies for target firms, over and above the market price. If acquiring companies pay 20% more than the current price, on average, they argue that this must be reflective of how much they can increase the value of the target company. The problem with this argument is that the premium paid on an acquisition reflects not only control expectations but two other variables – the expected value of the synergy that is anticipated from the merger and any overpayment by the acquirer.

In some cases, analysts recognize the need to consider the effects of a new management team on the operating characteristics of the firm. However, the adjustments that they make to operating margins and returns on capital do not reflect reality. In fact, the only thing they share in common is that they are more favorable than the current numbers. For instance, the operating margin for the firm will be increased from its current value of 10% to 14%, with no attention paid to whether this is feasible or even possible in the sector in which the firm operates.

The last scenario is if the firm being valued has been explicitly targeted for an acquisition and the analyst is familiar with the acquirer. If the acquirer is viewed as a “smart money” investor, a KKR, Blackstone or Carl Icahn, analysts allow the halo effect of past deals done to color their valuation. Put another way, the argument is that if a smart investors thinks a firm is worth \$ 200 million more than its existing price, it must be, because the smart investor knows what he or she is doing and has done this before. In effect, the value of a company then becomes whatever a smart investor is willing to pay for the company.

Debt and Value

In addition to having less than optimal operations, mature firms may be less than optimally financed – using too much or too little debt in funding the assets or mismatching debt and assets (using short term debt to fund long term assets, for example).

In trying to deal with the potential for changing financing mix, analysts sometimes fall into the trap of keeping the cost of equity and debt fixed and changing the mix of debt and equity. Since equity is generally much more expensive than debt, there is a predictable outcomes from this assumption. The cost of capital will decrease (and firm value will increase) as we increase the debt ratio.

The other approach used by many analysts is to compute the tax benefits of debt and to add this number on to the value of the firm with no debt – a version of adjusted present value (APV), which counts the benefits of debt while ignoring the costs. Here again, the value of the firm will increase as the firm borrows more money.

As a final quirk, even analysts who include the costs of borrowing money in their analysis, by adjusting the costs of debt and equity as the debt ratio increases or bringing in the expected bankruptcy costs of debt (in the adjusted present value approach) often value a company with a target debt ratio instead of an actual debt ratio. Given that the choices on financial leverage are made by the existing managers of the firm, and their views on what comprises a reasonable debt ratio may diverge from the target debt ratios used in the valuation, there is a very real chance that we will misvalue the firm using a target debt ratio.

Illustration 11.3: Debt and Value – The upside of debt and no downside

In illustration 11.1, we estimated a current cost of capital of 6.79% for Hormel Foods, based upon its current cost of equity of 7.33%, an after-tax cost of debt of 2.16% and a debt to capital ratio of 10.39%. Since this debt ratio is much lower than the industry average debt ratio of 25%, an analyst decides to use the industry average debt ratio as the target debt ratio and re-computes the cost of capital. In making the computation, though, he decides to stay with keep the cost of equity and debt at current levels:

$$\text{Cost of capital} = 7.33\% (.75) + 2.16\% (.25) = 6.04\%$$

Even if we accept the presumption that Hormel will move to the target debt ratio (and there is no guarantee that they will), this cost of capital understates the true cost. If Hormel increases its debt ratio, its equity will become riskier (leading to a higher cost of equity) and the default risk of its debt will increase (pushing up the cost of debt). We will return to examine the mechanics of this estimation later in this chapter.

Relative Valuation

The inconsistencies that contaminate the intrinsic valuations of mature companies show up in subtle ways when they are valued using multiples and comparables. In addition to all of the standard issues that are part of any relative valuation – finding comparable firms and adjusting for differences in growth and risk – the potential for a change in operating efficiency and differences in financial leverage can skew relative valuations.

Consider first the question of how best to reflect the possibility of management change. Many analysts who use relative valuation to value mature companies that they believe are poorly run, compute market multiples based upon comparable firms and then add control premiums (of the same 20% magnitude that we mentioned in the intrinsic value section). The problem with this approach is not just the arbitrary nature of the premium but the base on which it is applied. To the extent that the market prices for companies already reflect the likelihood of management change, the market multiples at which comparable companies trade already has at least a portion of the control premium built into them. Augmenting the relative value for control represents double counting. To illustrate, assume that we are valuing a cement company, with EBITDA of \$ 100 million, by looking at publicly traded cement companies (all of which are similar to the company we are valuing in terms of fundamentals), and that they are trading at 6 times EBITDA. The estimated enterprise value for the firm, on a relative basis, is then \$ 600 million:

$$\text{Enterprise value} = \text{EBITDA}_{\text{Company}} * \text{EV} / \text{EBITDA}_{\text{Comparables}}$$

Now assume that you believe that all of these companies are poorly managed and that earnings could be higher under a different management team. At first sight, it seems reasonable that we should add a premium to the \$ 600 million to reflect this potential for improvement. However, here is a reality that should make us pause. If the market agrees with our assessment that the firms are poorly managed, but also believes that there is a

good chance (say 50%) that management will change, the market price will reflect this expectation. Thus, the EV/EBITDA multiple already reflects half of the control premium. As a consequence, relative valuation when firms are poorly run and have the potential for increased value is difficult to do, since adjusting the observed prices (and market multiples) will require us to make judgments not only on the company being valued but on the comparable companies and what the market is building into prices.

The possibility of large changes in debt ratios at mature firms can also have consequences for the relative valuation of these firms. Analysts who use equity multiples to value mature firms are likely to find their numbers upended by a recapitalization, where debt is raised to buy back equity, or skewed when there are large differences in the use of debt across the comparable companies. In the latter scenario, firms that use higher debt ratios may look cheap in good times on a PE ratio basis, since increased leverage can improve earnings per share. When the firm is doing poorly, the higher debt ratios will hurt these firms, with earnings going down more than for the rest of the sector.

The Light Side of Valuation

Looking at both the estimation issues related to valuation and the dark side as it manifests itself in the valuation of mature companies, there are two aspects of mature companies that we have to be able to deal with well, in order to value them correctly. The first is how best to value growth at mature companies, especially when the growth is generated by acquisitions. The other is how to assess the impact on value of changing the way a mature company is run – as we noted earlier, there can be significant operating and financial inefficiencies in mature firms that have endured for long periods, under existing management.

Growth and Acquisitions

Some firms grow primarily through acquisitions and valuing these firms poses challenges. There are, however, some simple rules that can be followed to minimize the fallout from the acquisitions:

Step 1: Assess whether the acquisitions done by the firm in the past represent unusual transactions or are part of a long-term strategy. This judgment will be subjective, and based upon the motivation for the acquisitions and management views. If we conclude that the acquisition or acquisitions in the past represent unique events that will not be

repeated in the future, we can ignore acquisitions entirely in our valuation, both in the reinvestment and in the growth rate. In practical terms, this will imply that our future growth rate for the firm will be lower than the past growth rate (which was augmented by the acquisition) and that the reinvestment rate will reflect only internal investments.

Step 2: If acquisitions are part of the long-term strategy of the firm, collect data on what the acquisitions have cost the firm (including acquisitions paid for with stock) over a long period (3-10 years).² As acquisitions become more infrequent, we have to extend the time period over which we make this estimate.

Step 3: Estimate the reinvestment rate for the firm, with acquisitions counting as part of capital expenditures, over the period:

$$\text{Modified Reinvestment Rate} = \frac{(\text{Cap Ex} + \text{Acquisitions} - \text{Depreciation})}{\text{After-tax Operating Income}}$$

Looking at this rate over a longer period allows us to adjust it for the lumpiness of acquisitions.

Step 4: The conventional measure of return on capital that we derived in chapter 2, obtained by dividing the after-tax operating income by the book value of capital invested (equity plus net debt) can be skewed after acquisitions by the presence of and adjustments to goodwill. If we make the assumption that goodwill represents a premium paid for the growth assets of the target firm, the adjustment is a simple one:

$$\text{Return on capital} = \frac{\text{After-tax Operating Income}}{(\text{BV of Debt} + \text{BV of Equity} - \text{Cash} - \text{Goodwill})}$$

Since operating income is generated by existing assets, and not by growth assets, we are removing goodwill from capital invested to preserve consistency. This can, however, be too generous to acquisitive firms that consistently over pay on acquisitions. Goodwill, after all, includes not only a premium for growth assets but premiums for control and synergy, as well as any over payment on the acquisition. In a full information world, we would subtract out only that portion of goodwill that is due to growth assets and leave behind the portions attributable to synergy, control and overpayment; the first two should be part of capital invested because they should generate higher earnings, if true and the

² To account for an acquisition paid for with stock, we have to have information on the number of shares that were issued to cover the acquisition and the stock price at the time of the acquisition.

last should be part of capital invested, because a firm that consistently overpays on acquisitions will continue to deliver poor investment returns and destroy value.³

Illustration 11.4: Valuing an acquisitive mature company – Revisiting Cisco

While Cisco’s glory days of growth are behind it, the firm continues to make acquisitions and report a growth rate that is too high to qualify as stable. In Illustration 11.2, we looked at the consequences of mismatching growth and acquisitions in a valuation. In this one, we will look at how incorporate acquisition growth and costs into a valuation.

To Cisco, acquisitions are clearly an integral part of growth. A valuation of Cisco that ignores acquisitions entirely for both growth and reinvestment estimates, may be consistent, but it will not reflect reality. To assess how much acquisitions will affect cash flows, we begin in Table 11.3 by looking at the total reinvestment in the firm over the last 4 years, with acquisitions considered as capital expenditures:

Table 11.3: Cisco’s Reinvestment Rate – 2005-2008

	2005	2006	2007	2008	Aggregate
After-tax Operating Income	\$5,298	\$5,114	\$6,682	\$7,414	\$24,508
Cap Ex	\$692	\$772	\$1,251	\$1,268	\$3,983
Depreciation	\$1,020	\$1,293	\$1,413	\$1,744	\$5,470
Change in Working Capital	-\$34	-\$81	-\$36	-\$57	-\$208
Conventional Reinvestment	-\$362	-\$602	-\$198	-\$533	-\$1,695
Reinvestment Rate =	-6.83%	-11.77%	-2.96%	-7.19%	-6.92%
Acquisitions	\$911	\$5,399	\$3,684	\$398	\$10,392
Modified Reinvestment	\$549	\$4,797	\$3,486	-\$135	\$8,697
Modified Reinvestment Rate =	10.36%	93.80%	52.17%	-1.82%	35.49%

The average reinvestment rate, over the 4-year period, with acquisitions counted as part of capital expenditures, is 35.49%, with years of frenetic activity (2006 & 2007) interspersed with years of inactivity (2005 and 2008).⁴

³ While no firm will ever be willing to break out goodwill into these components, we can make our own estimates based upon the target company characteristics at the time of the acquisition or even by looking at the history of the acquiring company. If an acquiring firm has a history of making large acquisitions, followed by regret and goodwill impairments, it seems reasonable to conclude that a significant portion of goodwill should be left in capital invested.

⁴ Since Cisco does a large number of small acquisitions every year, it probably poses less of a challenge than a company that does much larger but more infrequent assumptions. With the latter, both averaging across time and making judgments about the future become more difficult to do.

Since the other piece of the growth puzzle is the return on capital earned on investments, we estimated the return on capital for Cisco as a company, using two different measures of invested capital: in the first, we left the entire goodwill in the invested capital, and in the second, we netted the entire goodwill out.

$$\begin{aligned} \text{ROC}_{\text{No goodwill netted}} &= \frac{\text{After - tax Operating Income}_{2008}}{(\text{BV of Debt}_{2007} + \text{BV of Equity}_{2007} - \text{Cash}_{2007})} \\ &= \frac{9445 (1 - .375)}{(6408 + 31490 - 3728)} = 16.82\% \end{aligned}$$

$$\begin{aligned} \text{ROC}_{\text{All goodwill netted}} &= \frac{\text{After - tax Operating Income}_{2008}}{(\text{BV of Debt}_{2007} + \text{BV of Equity}_{2007} - \text{Cash}_{2007} - \text{Goodwill}_{2007})} \\ &= \frac{9445 (1 - .375)}{(6408 + 31490 - 3728 - 12121)} = 25.53\% \end{aligned}$$

Given Cisco's good record on acquisitions, and since its targets are young, technology firms, with little in terms of revenues and earnings, we will stick with the measure computed with 100% of goodwill subtracted from invested capital.

If we assume that the reinvestment rate and returns on capital estimated above are sustainable, the resulting growth rate is 9.06%:

$$\begin{aligned} \text{Expected growth rate} &= \text{Reinvestment Rate} * \text{Return on capital} \\ &= 35.49\% * 25.53\% = 9.06\% \end{aligned}$$

We assume that Cisco will be able to maintain this growth rate for the next 5 years and preserve its current risk profile and cost of capital; with a beta of 1.73 and a debt ratio of 7.46%, the cost of capital is 11.95%.⁵ Table 11.4 summarizes the expected cash flows for the next 5 years, with the present value computed for each year.

Table 11.4: Expected Cash flows for high growth phase: Cisco

	<i>Current</i>	1	2	3	4	5
EBIT * (1 - tax rate)	\$5,978	\$6,520	\$7,111	\$7,755	\$8,458	\$9,225
- Reinvestment	-\$135	\$2,314	\$2,524	\$2,752	\$3,002	\$3,273
Free Cashflow to Firm	\$6,113	\$4,206	\$4,587	\$5,003	\$5,456	\$5,951
Cost of Capital		11.95%	11.95%	11.95%	11.95%	11.95%
Present Value		\$3,757	\$3,660	\$3,566	\$3,474	\$3,384
Reinvestent Rate	-1.82%	35.49%	35.49%	35.49%	35.49%	35.48%

⁵ We used a riskfree rate of 2.35% and an equity risk premium of 6%, in making our cost of equity estimates. The cost of debt was assumed to be 3.60%, reflecting a synthetic rating of AAA for the firm. The marginal tax rate used is 37.5%.

After year 5, the growth rate will drop to 2.35% (set at the riskfree rate cap). We will also assume that Cisco's beta will decrease to 1.20 (the cap for the stable growth phase) and that the debt ratio and the cost of debt will remain unchanged; this will cause the cost of capital to drop to 6.86%. Assuming also that Cisco maintains a return on capital of 10%, higher than its cost of capital in perpetuity, allows us to estimate the reinvestment rate and the terminal value:

$$\text{Reinvestment rate} = \frac{g_{\text{stable}}}{\text{ROC}_{\text{stable}}} = \frac{2.35\%}{10\%} = 23.5\%$$

$$\begin{aligned} \text{Terminal Value} &= \frac{\text{After-tax Operating Income}_5 (1 + g_{\text{stable}})^5 (1 - \text{Reinvestment Rate})}{(\text{Cost of capital}_{\text{stable}} - g_{\text{stable}})} \\ &= \frac{9225(1.0235)^5(1 - .235)}{(.0686 - .0235)} = \$160,102 \end{aligned}$$

Discounting this value back to today at the current cost of capital of 11.95% and adding it to the present value of the cash flows over the first 5 years, the value that we obtain for the operating assets of the firm is \$108,901 million.⁶

To get to the value of equity per share, we add the current cash balance (\$5,191 million), subtract out debt (\$7,758 million) and the value of management options outstanding (\$1,621 million), and divide by the number of shares outstanding (5,855.09 million shares) to arrive at a value per share of \$17.88 per share.

$$\text{Value per share} = \frac{108,901 + 5,191 - 7,758 - 1,621}{5,855.09} = \$17.88/\text{share}$$

In January 2009, Cisco was trading at \$16.15 a share, about 10% below our estimated value.

Changing management

If the key to valuing mature companies is assessing the potential change in value from changing the way they are run, it is critical that we come up with better ways of assessing that effect. In this section, we will begin by looking at the potential for enhancing value at any firm, first by focusing on changes in operations and then examining how financing policy and strategy can alter value. We will extend the

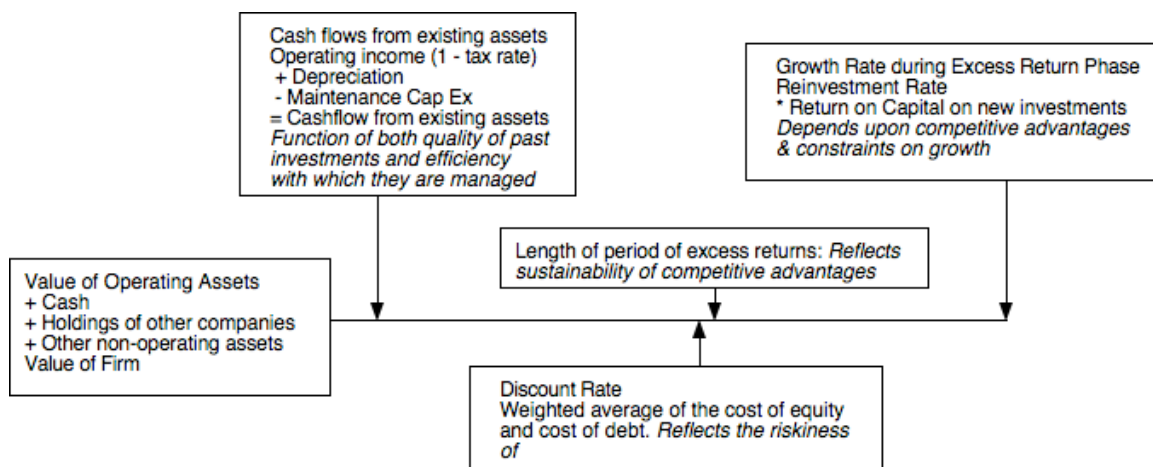
⁶ While the terminal value is computed using the stable period cost of capital of 6.86%, it will have to be discounted back at the high growth period cost of capital, since investors have to be exposed to higher risk for the next 5 years to get to the terminal value.

discussion by bringing both the potential for value change and the possibility of making that change into a measure of the expected value of control. We will close the section by evaluating the implications of the expected value of control not only in valuing mature companies but also in estimating the premium that we should pay for voting rights.

Operating Restructuring

When valuing a company, our forecasts of earnings and cash flows are built on assumptions about how the company will be run. If these numbers are based upon existing financial statements, we are, in effect, assuming that the firm will continue to be run the way it is now. In this section, we will look at how changes in operations manifest themselves in valuation, using the intrinsic value framework that we have already used extensively in this book. In this approach, the value of a firm is a function of five key inputs. The first is the cash flow from assets in place or investments already made, the second is the expected growth rate in the cash flows during what we can term a period of both high growth and excess returns (where the firm earns more than its cost of capital on its investments), the third is the length of time before the firm becomes a stable growth firm and the fourth is the discount rate reflecting both the risk of the investment and the financing mix used to fund it. The final element represents cash, cross holdings and other non-operating assets that the firm may hold that augment the value of operating assets. Figure 11.2 captures all five elements:

Figure 11.2: Determinants of Value



A firm can increase its value by increasing cash flows from current operations, increasing expected growth and the period of high growth, by reducing its composite cost of financing and managing its non-operating assets better. In this section, we will focus on all of these inputs, other than the cost of financing.

1. Increase Cash Flows From Assets In Place

The first place to look for value is in the existing assets of the firm. These assets reflect investments that have already been made and that generate the firm's current operating income. To the extent that these investments earn less than the cost of capital, or are earning less than they could, if optimally managed, there is potential for value enhancement. In general, actions taken to increase cash flows from assets in place can be categorized into the following groups:

- *Asset Redeployment*: To the extent that the assets of a business are poorly invested, you can increase the cash flows and value of the firm by divesting poorly performing assets⁷ or by moving assets from their existing uses to ones that generate higher value. One example would be a retail firm that owns its stores deciding that the store spaces would be worth more developed as commercial real estate instead of being used in retailing.
- *Improved operating efficiency*: When a firm's operations are riddled with inefficiencies, reducing or eliminating these inefficiencies will translate into an increase in operating cash flows and value. Thus, a telecommunications firm that is overstaffed should be able to generate value by reducing the size of its workforce. A steel company that is losing money because of outdated equipment in its plants may be able to increase its value by replacing them with newer, more efficient equipment. In recent years, manufacturing companies in developed markets like the United States and Western Europe have been able to generate substantial savings in costs by moving their operations to emerging markets where labor costs are lower.

⁷ At first sight, divesting businesses that are earning poor returns or losing money may seem like the ticket to value creation. However, the real test is whether the divestiture value exceeds the value of continuing in the business; if it is, divestiture makes sense. After all, when a business is earning poor returns, it is unlikely that a potential buyer will pay a premium price for it.

- *Reduce tax burden:* It is every firm's obligation to pay its rightful due in taxes but not to pay more than its fair share. If a firm can legally reduce its tax burden, it should do so. A multinational firm may be able to reduce its taxes by moving more of its operations (and the ensuing earnings) to lower tax locales. Risk management can also play a role in reducing taxes by smoothing out earnings over periods; spikes in income can subject a firm to higher taxes.
- *Reduce capital maintenance and working capital investments:* A significant portion of after-tax operating income is often reinvested in the firm not to generate future growth but to maintain existing operations. This reinvestment includes capital maintenance (which is capital expenditure designed to maintain and replace existing assets) and investments in inventory or accounts receivable. Much of this reinvestment may be unavoidable, because assets age and firms need working capital to generate sales. In some firms, though, there may be potential for savings, especially in working capital. A retail firm that maintains inventory at 10% of sales, when the average for the sector is only 5%, can increase cash flows substantially if it can bring its inventory levels down to industry standards.

2. Increase Expected Growth

A firm with low current cash flows can still have high value if it is able to grow quickly during the high growth period. As noted earlier, higher growth can come either from new investments or from more efficiently utilizing existing assets.

- With new investments, higher growth has to come from either a higher reinvestment rate or a higher return on capital on new investments or both. Higher growth does not always translate into higher value, since the growth effect can be offset by changes elsewhere in the valuation. Thus, higher reinvestment rates usually result in higher expected growth but at the expense of lower cash flows, since more reinvestment reduces free cash flows at least in the near term.⁸ To the extent that the return on capital on the new investments is higher (lower) than the cost of capital, the value of the business will increase (decrease) as the

⁸ Acquisitions have to be considered as part of capital expenditures for reinvestment. Thus, it is relatively easy for firms to increase their reinvestment rates but very difficult for these firms to maintain high returns on capital as they do so.

reinvestment rate rises. Similarly, higher returns on capital also cause expected growth to increase, but value can still go down if the new investments are in riskier businesses and there is a more than proportionate increase in the cost of capital.

- With existing assets, the effect is more unambiguous, with higher returns on capital translating into higher growth and higher value. A firm that is able to increase its return on capital on existing assets from 2% to 8% over the next 5 years will report healthy growth and higher value.

Which of these two avenues offers the most promise for value creation? The answer will depend upon the firm in question. For mature firms with low returns on capital (especially when less than the cost of capital), extracting more growth from existing assets is likely to yield quicker results, at least in the short term. For smaller firms with relatively few assets in place, generating reasonable returns, growth has to come from new investments that generate healthy returns.

3. Lengthen the Period of High Growth

As noted above, every firm, at some point in the future, will become a stable growth firm, growing at a rate equal to or less than the economy in which it operates. In addition, growth creates value only if the return on investments exceeds the cost of capital. Clearly, the longer high growth and excess returns last, other things remaining equal, the greater the value of the firm. Note, however, that no firm should be able to earn excess returns for any length of period in a competitive product market, since competitors will be attracted by the excess returns into the business. Thus, implicit in the assumption that there will be high growth, in conjunction with excess returns, is also the assumption that there exist some barriers to entry that prevent firms from earning excess returns for extended time periods.

Given this relationship between how long firms can grow at above-average rates and the existence of barriers to entry, one way firms can increase value is by augmenting existing barriers to entry and coming up with new barriers to entry. Another way of saying the same thing is to note that companies that earn excess returns have significant competitive advantages. Nurturing these advantages can increase value.

4. Manage non-operating Assets

In the first three components of value creation, we have focused on ways in which a firm can increase its value from operating assets. A significant chunk of a firm's value can derive from its non-operating assets – cash and marketable securities, holdings in other companies and pension fund assets (and obligations). To the extent that these assets are sometimes mismanaged, there is potential for value enhancement here.

4.1. Cash and Marketable Securities

In conventional valuation, we assume that the cash and marketable securities that are held by a firm are added on to the value of operating assets to arrive at the value of the firm. Implicitly, we assume that cash and marketable securities are neutral investments (zero NPV investments), earning a fair rate of return, given the risk of the investments. Thus, a cash balance of \$ 2 billion invested in treasury bills and commercial paper may earn a low rate of return but that return is what you would expect to earn on these investments.

There are, however, two scenarios where large cash balance may not be value neutral and thus provide opportunities for value enhancement. The first is when cash is invested at below market rates. A firm with \$ 2 billion in a cash balance held in a non-interest bearing checking account is clearly hurting its stockholders. The second arises if investors are concerned that cash will be misused by management to make poor investments or acquisitions. In either case, there will be a discount applied to cash to reflect the likelihood that management will misuse the case the consequences of such misuse. Reverting back to the example of the company with \$ 2 billion in cash, assume that investors believe that there is a 25% chance that this cash will be used to fund an acquisition and that the firm will over pay by \$ 500 million on this acquisition. The value of cash at this company can be estimated as follows:

Value of Cash = Stated Cash Balance – Probability of Poor Investment * Cost of Poor Investment = \$ 2 billion – 0.25* 0.5 billion = \$ 1.875 billion

If cash is being discounted, returning some or all of this cash to stockholders in the form of dividends or stock buybacks will make stockholders better off.

4.2. Holdings in other companies

When firms acquire stakes in other firms, the value of these holdings will be added on to the value of operating assets to arrive at the value of the equity of the firm. In conventional valuation, again, these holdings have a neutral effect on value. As with cash, there are potential problems with these cross holdings that can cause them to be discounted (relative to their true value) by markets.

Cross holdings are difficult to value, especially when they are in subsidiary firms with different risk and growth profiles than the parent company. It is not surprising that firms with substantial cross holdings in diverse businesses often find these holdings being undervalued by the market. In some cases, this undervaluation can be blamed on information gaps, caused by the failure to convey important details on growth, risk and cash flows on cross holdings to the markets. In other cases, the undervaluation may reflect market skepticism about the parent company's capacity to manage its cross holding portfolio; consider this a conglomerate discount.⁹ If such a discount applies, the prescription for increased value is simple. Spinning off or divesting the cross holdings and thus exposing their true value should make stockholders in the parent company better off.

4.3. Pension fund Obligations (and Liabilities)

Most firms have large pension obligations and matching pension assets. To the extent that both the obligations and assets grow over time, they offer both threats and opportunities. A firm that mismanages its pension fund assets may find itself with an unfunded pension obligation, which reduces the value of its equity. On the other hand, a firm that generates returns that are higher than expected on its pension fund assets could end up with an over-funded pension plan and higher equity value.

There are ways of creating value from pension fund investments, though some are more questionable from an ethical perspective than others. The first is to invest pension fund assets better, generating higher risk-adjusted returns and higher value for stockholders. The second (and more questionable approach) is to reduce pension fund

⁹ Studies looking at conglomerates conclude that they trade at a discount of between 5 and 10% on the value of the pieces that they are composed of.

obligations, either by renegotiating with employees or by passing the obligation on to other entities (such as the government) while holding on to pension fund assets.

Financial Restructuring

The one element of value that we did not address in the last chapter was the cost of financing. In this chapter, we will look at two aspects of financing that affect the cost of capital, and through it, the value that we derive for a firm. First, we will look at how best to reflect changes the mix of debt and equity used to fund operations in the cost of capital. Second, we will look at how the choices of financing (in terms of seniority, maturity, currency and other add-on features) may affect the cost of funding and value.

Changing financial mix

The question of whether changing the mix of debt and equity can alter the value of a business has long been debated in finance. While the answer to some may seem obvious – debt after all is always less expensive than equity – the choice is not that simple. In this section, we will first lay out the trade off on debt versus equity in qualitative terms and then consider three tools that can be used to assess the effect of financing mix on value.

Debt versus Equity: The trade off

Debt has two key benefits, relative to equity, as a mode of financing. First, the interest paid on debt financing is tax deductible, whereas cash flows to equity (such as dividends) are generally not.¹⁰ Therefore, the higher the tax rate, the greater the tax benefit of using debt. This is absolutely true in the United States and partially true in most parts of the world. The second benefit of debt financing is more subtle. The use of debt, it can be argued, induces managers to be more disciplined in project selection. That is, the managers of a company funded entirely by equity, and with strong cash flows, have a tendency to become lazy. For example, if a project turns sour, the managers can hide evidence of their failure under large operating cash flows, and few investors notice the effect in the aggregate. But if those same managers had to use debt to fund projects, then bad projects are less likely to go unnoticed. Since debt requires the company to

¹⁰ This is clearly the case in the United States. There are other markets, such as Brazil, where equity cash flows also provide tax advantages. Even in those markets, the tax advantages for debt tend to be higher than the tax advantages for equity.

make interest payments, investing in too many bad projects can lead to financial distress or even bankruptcy, and managers may lose their jobs.

Relative to equity, the use of debt has three disadvantages—an expected bankruptcy cost, an agency cost, and the loss of future financing flexibility.

- The expected bankruptcy cost has two components. One is simply that as debt increases, so does the probability of bankruptcy. The other component is the cost of bankruptcy, which can be separated into two parts. One is the direct cost of going bankrupt, such as legal fees and court costs, which can eat up to a significant portion of the value of the assets of a bankrupt firm. The other (and more devastating) cost is the effect on operations of being perceived as being in financial trouble.. Thus, when customers learn that a company is in financial trouble, they tend to stop buying the company's products. Suppliers stop extending credit, and employees start looking for more reliable employment elsewhere. Borrowing too much money can create a downward spiral that ends in bankruptcy.
- Agency costs arise from the different and competing interests of equity investors and lenders in a firm. Equity investors see more upside from risky investments than lenders to. Consequently, left to their own devices, equity investors will tend to take more risk in investments than lenders would want them to and to alter financing and dividend policies to serve their interests as well. As lenders become aware of this potential, they alter the terms of loan agreements to protect themselves in two ways. One is by adding covenants to these agreements, restricting investing, financing and dividend policies in the future; these covenants create legal and monitoring costs. The other is by assuming that there will be some game playing by equity investors and by charging higher interest rates to compensate for expected future losses. In both instances, the borrower bears the agency costs.
- As firms borrow more money today, they lose the capacity to tap this borrowing capacity in the future. The loss of future financing flexibility implies that the firm may be unable to make investments that it otherwise would have liked to make, simply because it will be unable to line up financing for these investments.

Table 11.5 captures the trade off inherent in the use of debt as opposed to equity.

Table 11.5: Trade off on Debt versus Equity

<i>Advantages of Debt</i>	<i>Disadvantages of Debt</i>
<p>1. <u>Tax Benefits of Debt</u>: As tax rates increase, the tax benefits of debt increase</p> <p>2. <u>Added Discipline</u>: Debt can make managers at all equity-funded firms with significant cashflows more prudent about the investments that they make.</p>	<p>1. <u>Expected Bankruptcy Costs</u>: As firms borrow more, the probability of bankruptcy increases. Multiplying by the cost of going bankrupt yields the expected bankruptcy cost.</p> <p>2. <u>Agency Costs</u>: As conflicts between equity investors and lenders increase, the costs to borrowers will rise (from monitoring costs and higher interest payments)</p> <p>3. <u>Loss of future financing flexibility</u>: As firms use their debt capacity today, they lose the capacity to use that debt capacity in the future.</p>

In the special case where there are no taxes, no default risk and no agency issues (between managers and stockholders as well as between stockholders and bondholders), debt has neither advantages nor disadvantages. This, of course, is the classic Miller-Modigliani world, where debt has no effect on value. In the real world, where there are tax benefits, agency problems and default looms as a problem, there is clearly an optimal mix of debt and equity for a firm. Firms can borrow too much as well as too little, and both have adverse effects on value.

Tools for assessing the effect of financing mix on value

There are three basic tools to determine how much debt a company can take on: the basic cost of capital approach which ignores indirect bankruptcy costs, an enhanced cost of capital approach that tries to incorporate indirect bankruptcy costs, and an adjusted present value (APV) approach that tries to capture the benefits of debt separately in value.

1. In the cost of capital approach, the optimal debt-to-equity ratio is the one that minimizes a company's cost of capital. In effect, we keep operating cash flows fixed

and assume that changing debt changes only the cost of capital. By minimizing the cost of capital, we are maximizing firm value.

2. The enhanced cost of capital approach introduces indirect bankruptcy costs into the analysis. In this case, the optimal debt ratio creates a combination of cash flows and cost of capital that maximizes a company's value.
3. In the adjusted present value approach, debt is separated from operations, and the company is valued as if it had no debt. Then, the positive and negative value effects of debt are considered as separate components.

To illustrate all three approaches, we will revisit the cost of capital computation for Hormel Foods that we introduced in illustration 11.1.

1. Cost of capital approach. The cost of capital approach has its roots in the discounted cash flow model for valuing a firm, where expected cash flows to the firm (prior to debt payments but after taxes and reinvestment needs) are discounted back at the cost of capital. If a company can keep its cash flows unchanged and lower its cost of capital, it will increase its present value. Therefore, the optimal debt ratio is the one at which the cost of capital is minimized.

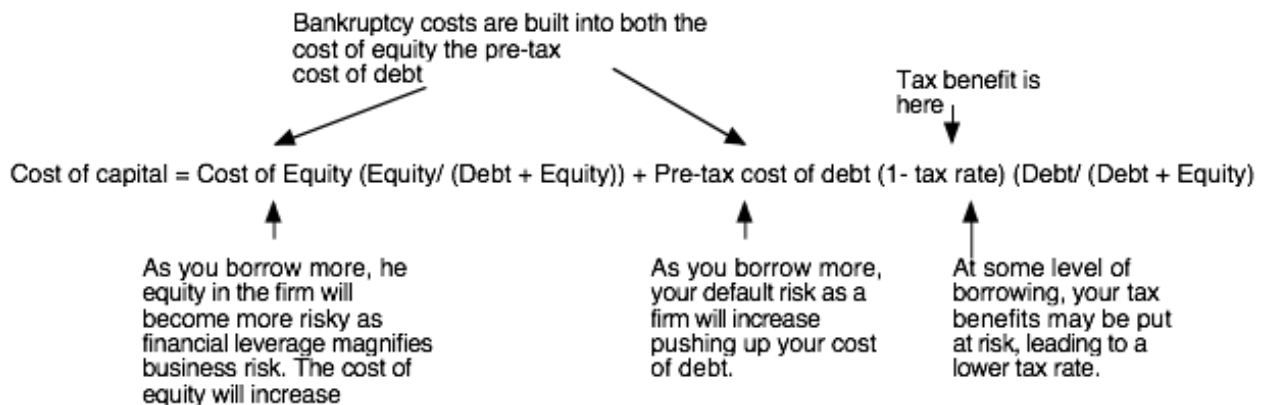
At first sight, the answer to what will happen to the cost of capital as the debt ratio is increased seems trivial, given that the cost of debt is almost always lower than the cost of equity for a business. However, that solution misses the dynamic effects of introducing debt into a business. To see these effects, consider the two components that drive the cost of capital— the cost of equity and cost of debt:

$$\text{Cost of capital} = \text{Cost of equity} \left(\frac{\text{Equity}}{\text{Debt} + \text{Equity}} \right) + \text{Pretax cost of debt} (1 - \text{Tax rate}) \left(\frac{\text{Debt}}{\text{Debt} + \text{Equity}} \right).$$

As the company borrows more money, its equity will become riskier. Even though it has the same operating assets (and income), it now has to make interest payments, and financial leverage magnifies the risk in equity earnings. Thus, the cost of equity will be an increasing function of the debt ratio. Furthermore, as borrowing increases, so does default risk, which, in turn, increases the cost of debt. The trade off on debt's effect on the cost of capital can be summarized as follows: replacing equity with debt has the positive effect of replacing a more expensive mode of funding with a less expensive one but in the process the increased risk in both debt and equity will push up the costs of both

components, creating a negative effect. Whether the cost of capital increases or decreases will be a function of which effect dominates. Figure 11.3 captures the trade off:

Figure 11.3: Trade off on Cost of Capital and Debt



To understand the mechanics of the cost of capital approach, we will work through it in steps.

Step 1: Start with a risk and return model for estimating the cost of equity. For instance, with the capital asset pricing model

$$\text{Cost of equity} = R_f + \text{Equity Beta (Equity Risk Premium)}$$

In this equation, R_f is the riskfree rate and neither this number nor the equity risk premium will change as the debt ratio changes, leaving us with only one input to estimate – the equity beta. To estimate this number, you should start with an asset or unlevered beta.¹¹ As the company increases borrowing, re-compute the debt-to-equity ratio and compute a levered beta based on this recomputed ratio:¹²

$$\text{Levered beta} = \text{Unlevered beta} \left[1 + (1 - t) \left(\frac{\text{Debt}}{\text{Equity}} \right) \right]$$

The levered beta is the equity beta and will risk inexorably as the firm borrows more money. As the equity beta climbs, so will the cost of equity.

Step 2: Now, consider the cost of debt, which is the rate at which you can borrow money long term today, given the firm's default risk.

$$\text{Pretax cost of debt} = R_f + \text{Default spread.}$$

¹¹ The simplest way to estimate an unlevered beta is by looking at publicly traded firms in the business, computing an average regression beta across these firms and then cleaning up for the debt to equity ratios of these companies. The process is described in more detail in other papers on my website.

¹² This is one variation on the levered beta equation. There are others that assume a beta for debt and still others that ignore the tax effect. Using any of these approaches consistently yields similar results.

As the firm borrows more money, its default risk (and the default spread) will go up. To get a simple measure of default risk, estimate the interest expense at each debt level and compute an interest coverage ratio based on expense:

$$\text{Interest coverage ratio} = \frac{\text{Operating income}}{\text{Interest expense}}$$

As debt increases, interest expenses will increase; holding the operating income fixed, this will result in lower interest coverage ratios at higher levels of debt. In chapter 2, we described the process of converting the interest coverage ratio to a synthetic rating, which can then be used to compute a default spread. Table 11.6 captures the essential steps in the process:

Table 11.6: Cost of capital computation

<p><i>Cost of Equity = Rf + Beta (Equity Risk Premium:</i></p> <p>Start with the beta of the business (asset or unlevered beta)</p> <p>As the firm borrows more, recompute the debt to equity ratio (D/E) .</p> <p>Compute a levered beta based on this debt to equity ratio Levered beta = Unlevered beta (1 + (1-t) (D./E))</p> <p>Estimate the cost of equity based on the levered beta</p>	<p><i>Pre-tax cost of debt = Rf + Defaultl sprrea</i></p> <p>Estimate the interest expense at each debt level</p> <p>Compute an interest coverage ratio based on expense Interest coverage ratio = Operating income/ Interest expense</p> <p>Estimate a synthetic rating at each level of debt</p> <p>Use the rating to come up with a default spread, which when added to the riskfree rate should yield the pre-tax cost of debt</p>
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As powerful as the cost of capital approach is, it clearly has flaws that may lead firms to choose the wrong financing mix. In particular, there are three elements of the analysis that are troublesome.

1. Indirect bankruptcy costs: One flaw is the assumption that cash flow can remain fixed even as the debt ratio is increased. Indirect bankruptcy costs should preclude a company with a rising debt ratio (and lower bond ratings) from maintaining the operating income at its existing level.
2. Static approach in a dynamic world: A second flaw is that the approach itself is static; it is based on the previous year's operating income and prevailing values for interest rates and default spreads. But conditions change. A recession for a cyclical firm, a loss of a major contract or increase in competition can all change the optimal debt ratio for a firm.

3. Risk Bearing Assumptions: It makes rigid assumptions about the ways in which market risk and default risk are borne by different claim holders as a company continues to increase debt. For instance, the approach that we have used for levering and unlevering betas assumes that all market risk is borne only by the equity investors.

Illustration 11.: The Cost of Capital Approach – Hormel Foods*

In illustration 11.1, we looked at Hormel Foods in January 2009 and computed a cost of capital of 6.79%, based upon the existing debt ratio of 10.39%. The cost of capital approach, in conjunction with the default spreads in January 2009, was used to derive the costs of debt and equity for Hormel at different debt ratios, with the results summarized in Table 11.7:

Table 11.7: Costs of Equity, Debt and Capital: Hormel Foods

Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Firm Value (G)
0%	0.78	7.00%	AAA	3.60%	40.00%	2.16%	7.00%	\$4,523
10%	0.83	7.31%	AAA	3.60%	40.00%	2.16%	6.80%	\$4,665
20%	0.89	7.70%	AAA	3.60%	40.00%	2.16%	6.59%	\$4,815
30%	0.97	8.20%	A+	4.60%	40.00%	2.76%	6.57%	\$4,834
40%	1.09	8.86%	A-	5.35%	40.00%	3.21%	6.60%	\$4,808
50%	1.24	9.79%	B+	8.35%	40.00%	5.01%	7.40%	\$4,271
60%	1.47	11.19%	B-	10.85%	40.00%	6.51%	8.38%	\$3,757
70%	1.86	13.52%	CCC	12.35%	40.00%	7.41%	9.24%	\$3,398
80%	2.70	18.53%	CC	14.35%	38.07%	8.89%	10.81%	\$2,892
90%	5.39	34.70%	CC	14.35%	33.84%	9.49%	12.01%	\$2,597

We use the unlevered beta of 0.78 to estimate the levered beta at 10% increments on the debt ratio, up to 90 percent debt. . The table also shows the effect of the rising debt ratio on the company's bond ratings, interest rate on debt, tax rate, cost of debt, weighted average cost of capital (WACC), and firm value.

The cost of equity and cost of debt both rise as debt increases, but the cost of capital drops and the firm value increases, at least initially. The benefits of debt exceed its costs, until the debt reaches 30 percent, at which point, the cost of capital starts climbing again and the firm value begins to drop. To minimize the cost of capital for Hormel, the optimal debt ratio would be about 30 percent, or \$1.4 billion in debt.

2. Enhanced cost of capital approach. Through the enhanced cost of capital approach, we introduce three innovations. First, indirect costs are built into the expected operating income. As the rating of the company declines, the operating income is

adjusted to reflect the loss in operating income that will occur when customers, suppliers, and investors react. Thus, we account for distress costs, such as indirect bankruptcy costs. Second, we can make the analysis more dynamic. Rather than examining a single, static number for operating income, we allow for the use of a distribution of operating income, thus allowing for a range of optimal debt ratios. Third, the levered beta formulations can be modified to reflect the fact that debt holders sometimes bear market risk (the beta of debt is greater than zero). Since the latter two modifications have little effect on the optimal debt ratio, we will present just the first modification in this section.

To quantify the distress costs, we tie operating income to a company's bond rating. As shown in Table 11.8, once a company's rating drops below A (that is, below investment grade), distress costs occur in the form of a percentage decrease in earnings.

Table 11.8: Operating Income and Bond Rating

Rating	Drop in EBITDA
A or higher	No effect
A-	2.00%
BBB	5.00%
BB+	10.00%
BB	15.00%
B+	20.00%
B	20.00%
B-	25.00%
CCC	40.00%
CC	40.00%
C	40.00%
D	50.00%

The result of this enhancement to the cost of capital approach can be seen in Table 11.9, where we compute the costs of capital, operating income and firm values at different debt ratios for Hormel:

Table 11.9: Firm Value, Cost of capital and Debt ratios: Enhanced Cost of Capital

Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Firm Value (G)
0%	0.78	7.00%	AAA	3.60%	40.00%	2.16%	7.00%	\$4,524
10%	0.83	7.31%	AAA	3.60%	40.00%	2.16%	6.80%	\$4,665
20%	0.89	7.70%	AAA	3.60%	40.00%	2.16%	6.59%	\$4,815
30%	0.97	8.20%	CCC	12.35%	40.00%	7.41%	7.96%	\$1,987
40%	1.20	9.53%	D	22.35%	18.41%	18.24%	13.01%	\$903
50%	1.44	10.97%	D	22.35%	14.73%	19.06%	15.01%	\$781
60%	1.80	13.12%	D	22.35%	12.27%	19.61%	17.01%	\$688
70%	2.39	16.72%	D	22.35%	10.52%	20.00%	19.01%	\$615

80%	3.59	23.90%	D	22.35%	9.20%	20.29%	21.01%	\$556
90%	7.18	45.45%	D	22.35%	8.18%	20.52%	23.01%	\$507

As long as the bond ratings remain investment grade, Hormel's value remains intact. Its value, in fact, achieves its highest level at an AAA rating and a debt ratio of 20 percent. But as soon as the rating drops below investment grade, the distress costs begin to take effect, and Hormel's value drops precipitously. Thus, the debt ratio of 30 percent that seemed optimal under the unmodified cost of capital approach now appears to be entirely imprudent. The optimal debt ratio is now 20 percent, which means that Hormel should borrow about \$1.2 billion, not \$934 million.

3. Adjusted present value approach. In the adjusted present value approach, we explicitly add the value added by the tax benefits from the use of debt and subtract the value destroyed by higher bankruptcy costs from the value of the firm with no debt (unlevered firm value).

Firm value = Unlevered firm value + (Tax benefits of debt – Expected bankruptcy costs from debt). As in the other two approaches, the optimum debt level is the one that maximizes the firm's value.

Three steps are needed for the adjusted present value approach. First, the value of the unlevered company must be estimated, and this can be done in two different ways:

- (1) Estimate the unlevered beta, which is the cost of equity based on the unlevered beta, and value the company using this cost of equity (which will also be the cost of capital in an unlevered company)
- (2) Start with the current market value of the company, subtract the current tax benefits of debt, and add the expected bankruptcy costs from debt. In effect, remove those components of market value that reflect the influence of the debt that the firm currently has on its books.

Second, calculate the present value of tax benefits at different levels of debt. The simplest assumption is that the tax benefits are perpetual, in which case the following equation applies:

$$\text{Tax benefits} = \text{Dollar debt} \times \text{Tax rate.}$$

Note that this equation can be easily adapted to meet more general descriptions of the debt. The key is that the interest tax savings are being discounted at the pre-tax cost of

debt to arrive at the value of the tax savings. (In some modifications of the APV approach, the tax benefits are discounted back at the unlevered cost of equity)

Third, estimate a probability of bankruptcy at each debt level and multiply that by the cost of bankruptcy (including direct and indirect costs) to estimate the expected bankruptcy cost. The probability of bankruptcy can usually be estimated using the synthetic ratings process described earlier in computing the cost of debt. However, estimating direct and indirect costs of bankruptcy is the most difficult task in the APV exercise and is often skipped. But if these costs, which represent the disadvantages of debt, are not estimated, the optimal debt ratio will be 100 percent, which is the reason that adjusted present value is the approach preferred by many proponents of high financial leverage.

Assuming that direct and indirect bankruptcy costs are roughly 25 percent of Hormel's firm value, we can compute the value of the firm at different debt ratios in table 11.10.

Table 11.10: Adjusted Present Value for Hormel

Debt Ratio	\$ Debt	Tax Rate	Unlevered Firm Value	Tax Benefits	Bond Rating	Probability of Default	Expected Bankruptcy Cost	Value of Levered Firm
0%	\$0	40.00%	\$4,477	\$0	AAA	0.07%	\$1	\$4,476
10%	\$467	40.00%	\$4,477	\$187	AAA	0.07%	\$1	\$4,663
20%	\$934	40.00%	\$4,477	\$374	AAA	0.07%	\$1	\$4,850
30%	\$1,402	40.00%	\$4,477	\$561	A+	0.60%	\$8	\$5,030
40%	\$1,869	40.00%	\$4,477	\$748	A-	2.50%	\$33	\$5,192
50%	\$2,336	40.00%	\$4,477	\$934	B	36.80%	\$498	\$4,913
60%	\$2,803	40.00%	\$4,477	\$1,121	CCC	59.01%	\$826	\$4,772
70%	\$3,271	40.00%	\$4,477	\$1,308	CC	70.00%	\$1,012	\$4,773
80%	\$3,738	38.07%	\$4,477	\$1,423	CC	70.00%	\$1,032	\$4,867
90%	\$4,205	27.99%	\$4,477	\$1,177	C	85.00%	\$1,201	\$4,452

Note that the unlevered firm value stays the same at every debt ratio. Up to a point, the tax benefits increase as debt increases, but then level off once the interest expenses exceed the operation income. The expected bankruptcy costs also increase, as the probability of bankruptcy rises at high debt ratios. The value of the firm reaches its highest point at a 40 percent debt ratio.

A summary of debt assessment tools: All three of these approaches rely on sustainable cash flow to determine the optimal debt ratio. They do not rely on market value or growth prospects, and I believe that is appropriate. The more stable and

predictable a company's cash flow and the greater the magnitude of these cash flows—as a percentage of enterprise value—the higher the company's optimal debt ratio can be. Furthermore, the most significant benefit of debt is the tax benefit. Higher tax rates should lead to higher debt ratios.

Based on the insights offered so far, the best candidates for large amounts of financial leverage will be mature or declining companies that have large, reliable cash flows. Growth companies—companies with their best days ahead of them—are not good candidates for high financial leverage because such companies have high market values, relative to cash flows, and usually need to plough these cash flows back into the business (rather than pay interest expenses) to generate future growth.

Finally, the macro environment has relatively little effect on optimal debt ratios, and two myths often asserted by market observers need to be dispelled. The first myth is that optimal debt ratios increase as interest rates decline. Certainly, it is true that lower interest rates decrease the cost of debt, but they also decrease the cost of equity and it is the relative costs that determine financing choices. The second myth is that optimal debt ratios increase as default spreads decline. It is true that lower default spreads lower the cost of debt, but periods, where default spreads decrease, are also usually periods when equity risk premiums also go down. In other words, the cost of debt and equity both decline when default spreads and equity risk premiums decline. It is only when one measure declines while the other remains unchanged that one mode of financing will dominate the other. The 2003-2007 period was an aberration in that sense, since default spreads decreased while equity risk premiums remained relatively stable. Not surprisingly, this provided an incentive for firms to borrow more money and for leveraged deals.

Financing Type

The fundamental principle in designing the financing of a firm is to ensure that the cash flows on the debt match as closely as possible the cash flows on the asset. Firms that mismatch cash flows on debt and cash flows on assets (by using short term debt to finance long term assets, debt in one currency to finance assets in a different currency or floating rate debt to finance assets whose cash flows tend to be adversely impacted by higher inflation) will end up with higher default risk, higher costs of capital and lower

firm values. To the extent that firms can use derivatives and swaps to reduce these mismatches, firm value can be increased.

Converting this intuitive statement about matching financing to assets and its effect on default risk into specifics can be difficult. In many cases, mismatching financing to assets shows up only after it has created a crisis: a firm that has used short term funding to finance long term assets is unable to refinance its debt and has to put its assets up for sale. We would suggest that there is a much simpler lesson embedded in the financing matching principle. Companies often use a bewildering array of debt and justify this complexity on the basis of cheapness, defined purely in terms of interest payments. Note that, if we follow this path, short term debt will be cheaper than long term debt in most periods as will borrowing money in lower inflation currencies (yen, dollar, euro) will be cheaper than borrowing money in high inflation currencies (peso, ruble). Rather than trying to assign different costs to each layer of debt, we would recommend a consolidation of all debt with a composite cost of debt attached to it; this composite cost should reflect the overall default risk of the firm (rather than the default risk of a specific bond or debt) and the cost of borrowing long term (even if the firm uses short term debt).

The Expected Value of Control

By considering the effects of operating and financing changes on value explicitly, rather than attaching an arbitrary control premium, we can get a much better handle on the value of control. In this section, we will first consolidate and summarize the effects of changing management on value and then look at the likelihood that we can make this change. The product of these analyses will be the expected value of control, which we then use to examine a wide array of valuation issues.

The Value of Changing Management

If we consider value to be the end result of the investment, financing and dividend decisions made by a firm, the value of firm will be a function of how optimal (or sub-optimal) we consider a firm's management to be. If we estimate a value for the firm, assuming that existing management practices continue, and call this a status quo value and re-estimate the value of the same firm, assuming that it is optimally managed, and call this estimate the optimal value, the value of changing management can be written as:

$$\text{Value of management change} = \text{Optimal firm value} - \text{Status quo value}$$

The value of changing management will be a direct consequence of how much we can improve the way the firm is run. The value of changing management will be zero in a firm that is already optimally managed and substantial for a firm that is badly managed.

Retracing the steps through value, it should also be quite clear that the pathway to value enhancement will vary for different firms. Sub-optimal management can manifest itself in different ways for different firms. For firms where existing assets are poorly managed, the increase in value will be primarily from managing those assets more efficiently – higher cash flows from these assets and efficiency growth. For firms where investment policy is sound but financing policy is not, the increase in value will come from changing the mix of debt and equity and a lower cost of capital. Table 11.11 considers potential problems in existing management, fixes to these problems and the value consequences:

Table 11.11: Ways of Increasing Value

Potential Problem	Manifestations	Possible fixes	Value Consequence
Existing assets are poorly managed	Operating margins are lower than peer group and return on capital is lower than the cost of capital	Manage existing assets better. This may require divesting some poorly performing assets.	Higher operating margin and return on capital on existing assets -> Higher operating income Efficiency growth -> in near term as return on capital improves
Management is under investing (It is too conservative in exploiting growth opportunities)	Low reinvestment rate and high return on capital in high growth period	Reinvest more in new investments, even if it means lower return on capital (albeit > cost of capital)	Higher growth rate and higher reinvestment rate during high growth period -> Higher value because growth is value creating.
Management is over investing (It is investing in value destroying new investments)	High reinvestment rate and return on capital that is lower than cost of capital	Reduce reinvestment rate until marginal return on capital is at least equal to cost of capital	Lower growth rate and lower reinvestment rate during high growth period -> Higher value because growth is no longer value destroying
Management is not	Short or non-existent	Build on	Longer high growth

exploiting possible strategic advantages	high growth period with low or no excess returns.	competitive advantages	period, with larger excess returns -> Higher value
Management is too conservative in its use of debt	Debt ratio is lower than optimal (or industry average)	Increase debt financing	Higher debt ratio and lower cost of capital -> Higher firm value
Management is over using debt	Debt ratio is higher than optimal	Reduce debt financing	Lower debt ratio and lower cost of capital -> Higher firm value
Management is using wrong type of financing	Cost of debt is higher than it should be, given the firm's earning power	Match debt up to assets, using swaps, derivatives or refinancing	Lower cost of debt and cost of capital -> Higher firm value
Management holds excess cash and is not trusted by the market with the cash.	Cash and marketable securities are a large percent of firm value; Firm has poor track record on investments.	Return cash to stockholders, either as dividends or stock buybacks	Firm value is reduced by cash paid out, but stockholders gain because the cash was discounted in the firm's hands.
Management has made investments in unrelated companies.	Substantial cross holdings in other companies that are being undervalued by the market.	As a first step, try to be more transparent about cross holdings. If that is not sufficient, divest cross holdings	Firm value is reduced by divested cross holdings but increased by cash received from divestitures. When cross holdings are under valued, the latter should exceed the former.

Illustration 11.5: A Valuation of Hormel Foods- Status Quo versus Optimal

To value control at Hormel, we valued the firm twice: the first time with existing management continuing to run the firm and once with an optimal management team in place. For the status quo value, we assumed that the firm would stay with its existing financing mix (10.5% debt) and that they will stay with their existing investment policy, thus preserving current reinvestment rates and returns on capital for the next 3 years. At the end of the third year, we assumed that the firm would be in stable growth and that excess returns would fade to zero. Table 11.12 summarizes the assumptions used to value Hormel Foods under the status quo:

Table 11.12: Inputs for Valuation: Hormel Foods – Status Quo

	High Growth Period	Stable growth phase
Length of High Growth Period =	3	After year 3
Growth Rate =	2.75%	2.35%
Debt Ratio used in Cost of Capital Calculation=	10.39%	10.39%
Beta used for stock =	0.83	0.90
Riskfree rate =	2.35%	2.35%
Risk Premium =	6.00%	6.00%
Cost of Debt =	3.60%	4.50%
Tax Rate =	40.00%	40.00%
Cost of capital =	6.79%	7.23%
Return on Capital =	14.34%	7.23%
Reinvestment Rate =	19.14%	32.52%

There are two things to note about the high growth phase. The first is that the high growth period is short and the growth rate during the period is anemic (2.75%), reflecting the conservative reinvestment policy of the existing management; the returns on capital on existing investments is healthy (14.34%) but the firm reinvests only 19.14% of its after-tax operating income back. The second is that the low growth rate that we have estimated, by itself, is not sufficient to allow us to use a stable growth model because it is higher than the risk free rate and the excess returns generated currently (almost 7.45%) are not compatible with a stable firm. Table 11.13 summarizes our estimates of cash flows for the first 3 years and the present value of these cash flows, for Hormel Foods:

Table 11.13: Cash Flows and Value Today

	Current	1	2	3
EBIT * (1 - tax rate)	\$315	\$324	\$333	\$342
- Reinvestment	\$60	\$62	\$64	\$65
Free Cashflow to Firm	\$255	\$262	\$269	\$276
Cost of capital		6.79%	6.79%	6.79%
Present value		\$245	\$236	\$227

In stable growth, we not only move the growth rate down to the riskfree rate but also assume that the return on capital drops to equal the cost of capital of 7.23%; the cost of capital increases marginally because we increased the beta in stable growth.

$$\text{Reinvestment rate} = \frac{g_{\text{stable}}}{\text{ROC}_{\text{stable}}} = \frac{2.35\%}{7.23\%} = 32.52\%$$

$$\text{Terminal Value} = \frac{\text{After-tax Operating Income}_3 (1 + g_{\text{stable}})(1 - \text{Reinvestment Rate})}{(\text{Cost of capital}_{\text{stable}} - g_{\text{stable}})}$$

$$= \frac{342(1.0235)(1 - .3252)}{(.0723 - .0235)} = \$4,840 \text{ million}$$

Adding the present value of the terminal value, discounted back 3 years at the current cost of capital of 6.79%, to the present value of the cash flows for the first 3 years gives us a value for the operating assets of \$4,682 million. Adding the cash holdings of the firm (\$155 million), subtracting out debt (\$491 million) and the value of management options outstanding (\$53 million) yields the value of equity in common stock, which when divided by the number of shares outstanding (134.53 million) generates a value per share of \$31.91.

$$\text{Value per share} = \frac{4682 + 155 - 491 - 53}{134.53} = \$31.91/\text{share}$$

To value the firm under optimal management, we made three key changes.

- a. More debt based financing: Based upon our analysis of Hormel's financing mix in the last section, we increased the debt ratio from 10.56% to 20%. Even allowing for the higher risk in equity (beta goes up to 0.90), the cost of capital for the firm decreases to 6.63% in the high growth phase and to 6.74% in stable growth.
- b. Higher reinvestment rate: We assumed that the firm would be more aggressive in seeking out new investments, using a higher reinvestment rate of 40%, but assumed that the return on capital would drop as a result to 14%.
- c. Longer growth period: Hormel has several key brand names in its stable and we will assume that it can exploit these brand names to generate excess returns for a longer time periods – 5 years instead of 3.

The resulting valuation inputs are summarized in table 11.14:

Table 11.14: Valuation Inputs: Hormel Foods – Optimal Management

	<i>High Growth</i>	<i>Stable growth</i>
Length of High Growth Period =	5	Forever
Growth Rate =	5.60%	2.35%
Debt Ratio used in Cost of Capital Calculation=	20.00%	20.00%
Beta used for stock =	0.90	0.90
Riskfree rate =	2.35%	2.35%
Risk Premium =	6.00%	6.00%
Cost of Debt =	3.60%	4.50%
Tax Rate =	40.00%	40.00%
Cost of capital	0.10%	6.74%

Return on Capital =	14.00%	6.74%
Reinvestment Rate =	40.00%	34.87%

The cash flows, terminal value and the value of the firm today that emerge from these assumptions are shown in table 11.15:

Table 11.15: Cashflows and Value today: Optimal Management

	Current	1	2	3	4	5
EBIT * (1 - tax rate)	\$315	\$333	\$351	\$371	\$392	\$414
- Reinvestment	\$131	\$133	\$141	\$148	\$157	\$165
Free Cashflow to Firm	\$184	\$200	\$211	\$223	\$235	\$248
Terminal value						\$6282
Cost of capital		6.63%	6.63%	6.63%	6.63%	6.63%
Present value		\$187	\$185	\$184	\$182	\$5,655
Value of operating assets	\$5,474					

To complete the story, we make the same adjustments for cash, debt and management options that we did in the status quo valuation to arrive at a value per share.

$$\text{Value per share} = \frac{5474 + 155 - 491 - 53}{134.53} = \$37.80/\text{share}$$

The value per share that we obtain for Hormel Foods, with a different management team in place, is \$37.80, an increase of \$ 5.89 over the status quo value per share. That would represent the overall value of control at Hormel Foods.

The Probability of Changing Management

While the value of changing management in a badly managed firm can be substantial, the increased value will be created only if management policies are changed. While this change can sometimes be accomplished by convincing existing managers to modify their ways, all too often it requires replacing the managers themselves. If the likelihood of management change happening is low, the expected value of control will also be low. In this section, we first consider the mechanisms for changing management, and then some of the factors that determine the likelihood of management change.

Mechanisms for changing management

It is difficult to change the way a company is run, but in general, there are four ways in which it can be done.

1. Activist investors: The first is a variation of moral or at least economic suasion, where one or more large institutional investors introduce shareholder proposals designed primarily to improve corporate governance, holding the threat of more

extreme action over the heads of managers. A mix of pension funds and private investors has shown a willingness to confront incumbent managers. These activist investors, with the weight of their large stockholdings, are able to present proposals to stockholders to change policies that they feel are inimical to shareholder interests. Often, these proposals are centered on corporate governance; changing the way the board of directors is chosen and removing anti-takeover clauses in the corporate charter are common examples.

2. Proxy contests: The second is a proxy contest, where incumbent managers are challenged by an investor who is unhappy with the way the firm is run, for proxy votes; with sufficient votes, the investor can get representation on the board and may be able to change management policy. In most companies, investors vote with their feet – selling their stockholdings when dissatisfied – and thus concede power to incumbent managers. In some companies, however, activist investors compete with incumbent managers for the proxies of individual investors, with the intent of getting their nominees for the board elected. While they may not always succeed at winning majority votes, they do put managers on notice that they are accountable to stockholders. There is evidence that proxy contests occur more often in companies that are poorly run, and that they create significant changes in management policy and improvements in operating performance.
3. Replacing Management The third is to try to replace the existing managers in the firm with more competent manager. In publicly traded firms, this will require a board of directors that is willing to challenge management. Top management turnover at most firms is usually a consequence of retirement or death and the successor usually follows in the incumbent's footsteps. In some cases, though, top managers are forced out by the board, because of displeasure over their performance, and a new management is brought in to head the firm. This provides an opening for a reassessment of the firm's current management policies and for significant changes. While forced management turnover was uncommon outside the United States until recent years, it is becoming more frequent.
4. Hostile acquisition: The fourth and most extreme is a hostile acquisition of the firm by an investor or another firm; the incumbent management is usually replaced after

the acquisition and management policy is revamped. Investor pressure, CEO turnover and proxy contests represent internal processes for management discipline. When these fail, the only weapon that stockholders have left is to hope that the firm will become the target of a hostile acquisition, where the acquirer will take over the company and change the way it is run. For hostile acquisitions to be effective as management disciplining mechanism, several pieces have to fall into place. First, firms that are badly managed and run should be targeted for acquisitions. Second, the system should give potential hostile acquirers a reasonable chance of success; the bias towards incumbency should be negligible or small. Third, the acquirer has to change both the managers and the management policies of the target company after the acquisition.

Determinants of Management Change

There is a strong bias towards preserving incumbent management at firms, even when there is widespread agreement that the management is incompetent or does not have the interests of stockholders at heart. Some of the difficulties arise from the institutional tilt towards incumbency and others are put in place to make management change difficult, if not impossible. In general, there are four determinants of whether management will be changed at a firm:

1. Institutional concerns: The first group of constraints on challenging incumbent management in companies that are perceived to be badly managed and badly run is institutional. Some of these constraints can be traced to difficulties associated with raising the capital needed to fund the challenge, some to state restrictions on takeovers and some to inertia.
 - You need to raise capital to acquire firms that are poorly managed and any constraints on that process can impede hostile acquisitions. It should come as no surprise that hostile acquisitions are rare in economies where capital markets – equity and debt - are not well developed. In general, then, we would argue that the likelihood of changing the management in badly managed firms is greater when financial markets are open and funds are accessible at low cost to a wide variety of investors (and not just to large corporations in good credit standing).

- 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.
 - If the stockholders in these firms are passive and don't respond to the pleas of acquirers or other investors by tendering their shares in an acquisition or their proxies in a proxy contest, it is very likely that incumbent managers will stay entrenched.
2. Firm-specific constraints: There are some firms where incumbent managers, no matter how incompetent, are protected from stockholder pressure by actions taken by these firms. This protection can take the form of anti-takeover amendments to the corporate charter, elaborate cross holding structures and the creation of shares with different voting rights. In some cases, the incumbent managers may own large enough stakes in the firm to stifle any challenge to their leadership.

The time-honored way for protecting incumbent management is to issue shares with different voting rights. In its most extreme form, the incumbent managers hold all of the shares with voting rights and issue only non-voting shares to the public. This is the rule rather than the exception in much of Latin America and Europe¹⁴, where companies routinely issue non-voting shares to the public and withhold voting shares for the controlling stockholders and managers. In effect, this allows the insiders in these firms to control their destiny with a small percentage of all outstanding stock. More generally, firms can accomplish the same objective by issuing shares with different voting rights.

3. Corporate Holding Structures: Control can be maintained over firms with a variety of corporate structures including pyramids and cross holdings. In a pyramid structure, an investor uses control in one company to establish control in other companies. For instance, company X can own 50% of company Y and use the assets of company Y to

¹⁴ Faccio, M. and L. Lang, 2002, *The Ultimate Ownership of European corporations*, Journal of Financial Economics, v65, 365-396. They analyze 5232 firms in Europe and find that while 37% are widely held, 44% are family controlled., with dual class shares and pyramid structures. Smaller firms on continental Europe are more likely to be family controlled whereas larger firms in the UK and Ireland are more likely to be widely held.

buy 50% of company Z. In effect, the investor who controls company X will end up controlling companies Y and Z, as well. Studies indicate that pyramids are a common approach to consolidating control in family run companies in Asia and Europe. In a cross holding structure, companies own shares in each other, thus allowing the group's controlling stockholders to run all of the companies with less than 50% of the outstanding stock. The vast majority of Japanese companies (keiretsus) and Korean companies (chaebols) in the 1990s were structured as cross holdings, immunizing management at these companies from stockholder pressure.

4. Large Shareholder/Managers: In some firms, the presence of a large stockholder as a manager is a significant impediment to a hostile acquisition or a management change. Consider, a firm like Oracle, where the founder/CEO, Larry Ellison, owns almost 30% of the outstanding stock. Even without a dispersion of voting rights, he can effectively stymie hostile acquirers. Why would such a stockholder/manager mismanage a firm when it costs him or her a significant portion of market value? The first reason can be traced to hubris and ego. Founder CEOs, with little to fear from outside investors, tend to centralize power and can make serious mistakes. The second is that what is good for the inside stockholder, who often has all of his or her wealth invested in the firm may not be good for the other investors in the firm.

What may cause the likelihood of management changing to shift?

If there is one constant in markets, it is change. Managers who were viewed as impervious to outside challenge can find their authority challenged. In this section, we consider some of the factors that may cause this shift.

- The first is that the rules governing corporate governance do change over time, sometimes in favor of incumbent managers and sometimes in favor of stockholders. In recent years, for instance, many emerging market economies have made it easier for stockholders in companies to challenge managers. A similar trend can be seen in Europe, where incumbent managers clearly had the upper hand until a few years ago. The impetus for this reform has come from institutional investors who have grown tired of being ignored by managers, when confronted with clear evidence of poor decisions.

- Even when the rules allow investors to challenge management decisions, most investors take the passive route of voting with their feet. It is here that the presence of activist investors who are willing to take large positions in companies and use these holdings as a platform to challenge and change management practices makes a difference. In the United States, these investors made their presence felt in the 1980s.¹⁷ While it has taken a little longer in the rest of the world, activist investors are part of the investment landscape in more and more countries now.
- Nothing changes the perceptions of management vulnerability to an outside challenge more than a well publicized hostile takeover or the ouster of a CEO of a large firm in the same market. In the late 1990s, for instance, the hostile acquisition of Telecom Italia by Olivetti changed the landscape in Europe and changed the perception that the managers at large European firms were immune from stockholder challenges.

Estimating the probability of management change

While the determinants of management change can be listed, it is far more difficult to quantitatively estimate the probability that it will occur. One statistical approach that is promising is a logit or probit, where we assess the probability of management change by contrasting the characteristics of firms where management has changed in the past with firms where that has not occurred. Researchers have applied this technique to look at both acquisitions and forced CEO change.

In one of the first papers to assess the likelihood of takeovers by comparing target firms in acquisitions to firms that were not targets, Palepu (1986) noted that target firms in takeovers were smaller than non-target firms and invested inefficiently.¹⁸ In a later paper, North (2001) concluded that firms with low insider/managerial ownership were

¹⁷ Del Guercio, D. and J. Hawkins, 1999, *The Motivation and Impact of Pension Fund Activism*, Journal of Financial Economics, v52, 293-340. The authors study five activist pension funds – CREF, CALPERS, CALSTRS, SWIB and NYC – which account for 20% of all pension fund investment between 1987 and 1993 and conclude that companies that they own stock in are more likely to be targets of hostile takeovers and management change than other companies.

¹⁸ Palepu, K.G. “*Predicting Take-Over Targets : A Methodological and Empirical Analysis.*” Journal of Accounting and Economics, 8 (1986), 3-35.

more likely to be targeted in acquisitions¹⁹. Neither paper specifically focused on hostile acquisitions, though. Nuttall (1999) found that target firms in hostile acquisitions tended to trade at lower price to book ratios than other firms and Weir (1997) added to this finding by noting that target firms in hostile acquisitions also earned lower returns on invested capital²⁰. Finally, Pinkowitz (2003) finds no evidence to support the conventional wisdom that firms with substantial cash balances are more likely to become targets of hostile acquisitions.²¹ In summary, then, target firms in hostile acquisitions tend to be smaller, trade at lower multiples of book value and earn relatively low returns on their investments.²²

While many CEO changes are either voluntary (retirement or job switching), some CEOs are forced out by the board. In recent years, researchers have examined when forced CEO turnover is most likely to occur.

- The first factor is stock price and earnings performance, with forced turnover more likely in firms that have performed poorly relative to their peer group and to expectations.²³ One manifestation of poor management is overpaying on acquisitions, and there is evidence that CEOs of acquiring firms that pay too much on acquisitions are far more likely to be replaced than CEOs who do not do such acquisitions.²⁴

¹⁹ North, D.S. 2001, *The Role of Managerial Incentives in Corporate Acquisitions: the 1990s Evidence*, *Journal of Corporate Finance*, 7, 125-149.

²⁰ Nuttall, R. "Take-Over Likelihood Models for UK Quoted Companies." Nuffield College working paper, Oxford University (1999) and Weir, C. "Corporate Governance, Performance and Take-Overs: An Empirical Analysis of UK Mergers." *Applied Economics*, 29 (1997), 1465-1475.

²¹ Pinkowitz, L. , 2003, "The Market for Corporate Control and Corporate Cash Holdings", Working Paper, SSRN. His study of hostile acquisitions between 1985 and 1994 concludes that firms with large cash balances are less (not more) likely to be targets of hostile acquisitions.

²² In a contrary finding, Franks and Mayer (1996) find no evidence of poor performance in target firms in hostile acquisitions in the UK, Franks, J. and C. Mayer, "Hostile Takeovers and the Correction of Management Failure", *Journal of Financial Economics*, v40, 163-181.

²³ Warner, J., R. Watts and K. Wruck, 1988, *Stock Prices and Top Management Changes*, *Journal of Financial Economics*, v20, 461-492; Murphy, K and J. Zimmerman, 1993, *Financial Performance surrounding CEO Turnover*, *Journal of Accounting and Economics*, v16, 273-316; Puffer, S. and J.B. Weintrop, 1991, *Corporate Performance and CEO Turnover: The Role of Performance Expectations*, *Administrative Science Quarterly*, v36, 1-19;

²⁴ Lehn, K. and M. Zhao, 2004, *CEO Turnover after Acquisitions: Do Bad Bidders get fired?*, Working Paper, University of Pittsburgh.

- The second factor is the structure of the board, with forced CEO changes more likely to occur when the board is small²⁵, is composed of outsiders²⁶ and when the CEO is not also the chairman of the board of directors.²⁷
- The third and related factor is the ownership structure; forced CEO changes are more common in companies with high institutional and low insider holdings.²⁸ They also seem to occur more frequently in firms that are more dependent upon equity markets for new capital.²⁹
- The final factor is industry structure, with CEOs more likely to be replaced in competitive industries.³⁰

In summary, firms where you see forced CEO change share some characteristics with firms that are targets of hostile acquisitions – they are poorly managed and run – but they tend to have much more effective boards of directors and more activist investors who are able to change management without turning over the firm to a hostile acquirer.

There is a widely held misconception that control is an issue only when you do acquisitions. To the contrary, we would argue that the stock price of every publicly traded firm includes an expected value for control, reflecting both the likelihood that the management of the firm will be changed and the value of making that change.

Illustration 11.6: The Probability of Control Changing – Hormel Foods

While making a precise estimate of the probability of control changing may be difficult with Hormel Foods, the fact that the Hormel Foundation holds 47.4% of the outstanding stock in the company is a key factor. While the foundation is run by independent trustees, it retains strong links with the incumbent managers and is unlikely

²⁵ Faleye, O., 2003, *Are large boards poor monitors? Evidence from CEO turnover*, Working Paper, SSRN. Using a proportional hazard model, he finds that every additional director on the board reduces the probability of a forced CEO change by 13%.

²⁶ Weisbach, M., 1988, *Outside Directors and CEO Turnover*, Journal of Financial Economics, v20, 431-460.

²⁷ Goyal, V.K., and C.W. Park, 2001, *Board Leadership Structure and CEO Turnover*, Journal of Corporate Finance, v8, 49--66.

²⁸ Dennis, D.J., D.K. Dennis and A. Sarin, 1997, *Ownership Structure and Top Executive Turnover*, Journal of Financial Economics, v45, 193-221.

²⁹ Hillier, D., S. Linn and P. McColgan, 2003, *Equity Issuance, Corporate Governance Reform and CEO Turnover in the UK*, Working Paper, SSRN. They find that CEO are more likely to be forced out just before new equity issues or placings.

³⁰ DeFondt, M.L. and C.W. Park, 1999, *The effect of competition on CEO Turnover*, Journal of Accounting and Economics, v27, 35-56.

to acquiesce to a hostile acquisition that will change key parts of the company. Management change, if it does come, will have to be made with the agreement of the foundation. Consequently, we will estimate a probability of only 10% of the change occurring; in effect, the firm has to be under extreme duress before the foundation will step in and agree to a change.

Implications

Once we have a measure of the expected value of control, it is useful not just to acquirers who are trying to buy a firm but to any investor in the firm. The market price that we observe for a publicly traded stock should reflect the expected value of control, as should the premium that we observe for voting shares, relative to non-voting shares.

Expectations and Stock Prices

To see how the expected value of control shows up in stock prices, assume that you live in a world where management change never happens and that the market is reasonably efficient about assessing the values of the firms that it prices. In this scenario, every company will trade at its status quo value, reflecting both the strengths and weaknesses of existing management. Now assume that you introduce the likelihood of management change into this market, either in the form of hostile acquisitions or CEO changes. If the market remains reasonably efficient, the stock price of every firm should rise to reflect this likelihood:

$$\text{Market value} = \text{Status quo value} + (\text{Optimal value} - \text{Status quo value}) * \text{Probability of management changing}$$

The degree to which this will affect stock prices will vary widely across firms, with the expected value of control being greatest for badly managed firms where there is a high likelihood of management turnover and lowest for well managed firms and for firms where there is little or no chance of management change.

There are many who will be skeptical about the capacity of markets to make these assessments with any degree of accuracy and whether investors actually try to estimate the expected value of control. The evidence indicates that while markets may not use sophisticated models to make these assessments, they do try to value and price in control. To the extent that the expected value of control is already built into the market value, there are important implications for acquirers, investors and researchers:

- a. *Paying a premium over the market price can result in over payment:* If the current market price incorporates some of all of the value of control, the effect of management change on market value (as opposed to status quo value) will be small or non-existent. In a firm where the market already assumes that management will be changed and builds it into the stock price, acquirers should be wary of paying a premium on the current market price even for a badly managed firm. Consider an extreme example. Assume that you have a firm with a status quo value of \$ 100 million and an optimally managed value of \$ 150 million and that the market is already building in a 90% chance that the management of the firm will change in the near future. The market value of this company will be \$ 145 million. If an acquirer decides to pay a substantial premium (say \$ 40 million) for this firm, based upon the fact that the company is badly managed, he will overpay substantially; in this example, he will pay \$ 185 million for a company with a value of \$ 150 million.
- b. *Anything that causes market perception of the likelihood of management change to shift can have large effects on all stocks.* A hostile acquisition of one company, for instance, may lead investors to change their assessments of the likelihood of management change for all companies and to an increase in stock prices. Since hostile acquisitions often are clustered in a particular sector – oil companies in the 1980s, for instance – it is not surprising that a hostile acquisition of a single company often leads to increases in stock prices of companies in its peer group.
- c. *Poor corporate governance = Lower stock prices:* The price of poor corporate governance can be seen in stock prices. After all, the essence of good corporate governance is that it gives stockholders the power to change the management of badly managed companies. Consequently, stock prices in a market where corporate governance is effective will reflect a high likelihood of change for bad management and a higher expected value for control. In contrast, it is difficult, if not impossible, to dislodge managers in markets where corporate governance is weak. Stock prices in these markets will therefore incorporate lower expected values for control. The differences in corporate governance are likely to manifest themselves most in the worst managed firms in the market.

Illustration 11.7: Market Prices and the Expected Value of Control

Consider the valuation of Hormel Foods in illustration 11.*. We estimated both the status quo and the optimal value of the equity in the company and arrived at the following results:

	Value of Equity	Value per share
Status Quo	\$ 4,293 million	\$ 31.91 per share
Optimally managed	\$ 5,085 million	\$ 37.80 per share

In illustration 11.*, we estimated the probability of management change happening at only 10%. If we assume that these are all reasonable estimates, the expected value per share for Hormel will be:

$$\text{Expected Value per share} = \$31.91 (.90) + \$37.80 (.10) = \$32.51$$

If our assessments are correct, the stock should be trading at \$32.51. The actual market price at the time of this valuation was about \$32.25. Assuming that both the market price and our values per share are correct, the market price can be written in terms of a probability of control changing and the expected value of control:

$$\text{Expected value per share} = \text{Status Quo Value} + \text{Probability of control changing} * (\text{Optimal Value} - \text{Status Quo Value})$$

$$\$ 32.25 = \$ 31.91 + \text{Probability of control changing} (\$37.80 - \$31.91)$$

The market is attaching a probability of 5.6% that management policies can be changed.

Voting and non-voting shares

To link the premium on voting shares to the expected value of control, let us begin with an extreme and very simplistic example. Assume that you have a company with n_v voting and n_{nv} non-voting shares and that the voting shareholders have complete and total control of the business. Thus they are free to ignore the views of non-voting shares in the event of a hostile takeover and negotiate the best deal that they can for themselves with the acquirer.³⁹ Assume further that this firm has a status quo value of V_b and an optimal value of V_a and that the likelihood of management changing in this firm is π . Since the non-voting shares have absolutely no say in whether the management can be changed, the value per non-voting share will be based purely upon the status quo value:

³⁹ In reality, even non-voting shareholders are provided at least partial protection in the event of a takeover and will share in some of the benefits.

Value per non-voting share = $V_b / (n_v + n_{nv})$

The voting shares will trade at a premium that reflects the expected value of control:

Value per voting share = $V_b / (n_v + n_{nv}) + (V_a - V_b) \pi / n_v$

The premium on voting shares should therefore be a function of the probability that there will be a change in management at that firm (π) and the value of changing management ($V_a - V_b$).

To the extent that non-voting shareholders are protected or can extract some of the expected value of control, the difference between voting and non-voting shares will be lower. It is possible, for instance, for non-voting shares to gain some of the value of control if it is accomplished by changing managers, rather than by a hostile takeover. In that case, the value of the firm will increase and all shareholders will benefit.

There is one special category of voting shares called golden shares that we sometimes see in government-owned firms that have been privatized. These shares are retained by the government after the privatization and essentially give the government veto power over major decisions made by the firm. In effect, they allow the government to retain some or a great deal of control over how the firm is run. While golden shares are not traded, they will affect the values of shares that are traded by reducing the expected value of control.

If the primary reason for the voting share premium is the value of control, there are several conclusions that follow:

- a. *The difference between voting and non-voting shares should go to zero if there is no chance of changing management/control.* This will clearly be a function of the concentration of ownership of the voting shares. If there are relatively few voting shares, held entirely by insiders, the probability of management change may very well be close to zero and voting shares should trade at the same price as non-voting shares. If, on the other hand, a significant percentage of voting shares is held by the public, the probability of management change should be higher and the voting shares should reflect this premium.
- b. *Other things remaining equal, voting shares should trade at a larger premium on non-voting shares at badly managed firms than well-managed firms.* Since the expected value of control is close to zero in well-managed firms, voting shares and

non-voting shares should trade at roughly the same price in these firms. In a badly managed firm, the expected value of control is likely to be higher, as should the voting share premium.

- c. *Other things remaining equal, the smaller the number of voting shares relative to non-voting shares, the higher the premium on voting shares should be.* Since the expected value of control is divided by the number of voting shares to get the premium, the smaller that number, the greater the value attached to each share. This has to be weighed off against the reality that when the number of voting shares is small, it is more likely to be held entirely by incumbent managers and insiders, thus reducing the likelihood of management change.
- d. *Other things remaining equal, the greater the percentage of voting shares that are available for trading by the general public (float), the higher the premium on voting shares should be.* When voting shares are entirely or predominantly held by managers and insiders, the probability of control changing is small and so is the expected value of control.
- e. *Any event that illustrates the power of voting shares relative to non-voting shares is likely to affect the premium at which all voting shares trade.* The expected value of control is a function of perceptions that management at these firms can be changed. In a market where incumbent managers are entrenched, voting shares may not trade at a premium because investors assess no value to control. A hostile acquisition in this market or a regulatory change providing protection to non-voting shareholders can increase the expected value of control for all companies and, with it, the voting share premium.

In summary, then, we would expect the voting share premium to be highest in badly managed firms where voting shares are dispersed among the public. We would expect it to be smallest in well-managed firms and in firms where the voting shares are concentrated in the hands of insiders and management.

Illustration 11.8: Valuing voting and non-voting shares

To value voting and non-voting shares, we will consider two companies - Embraer, the Brazilian aerospace company in 2004, and Under Armour, to complete the valuation we commenced in chapter 10. As is typical of most Brazilian companies,

Embraer has common (voting) shares and preferred (non-voting shares). Under Armour has two classes of shares, with all of the voting shares held by the founder (Kevin Plank).

a. Embraer

We valued the company twice, first under the status quo and next under optimal management. With existing management in place, we estimated a value of 12.5 billion \$R for the equity; this was based upon the assumption that the company would continue to maintain its conservative (low debt) financing policy and high returns on investments (albeit with a low reinvestment rate) at least for the near term. We then revalued the firm at 14.7 billion \$R, assuming that the firm would be more aggressive both in its use of debt and in its reinvestment policy.

There are 242.5 million voting shares and 476.7 non-voting shares in the company and the probability of management change is relatively low, partly because the bulk of the voting shares are held by insiders⁴⁰ and partly because the Brazilian government has significant influence in the company.⁴¹ Assuming a probability of 20% that management will change, we estimated the value per non-voting and voting share:

$$\begin{aligned}\text{Value per non-voting share} &= \text{Status Quo Value} / (\# \text{ voting shares} + \# \text{ non-voting shares}) \\ &= 12,500 / (242.5 + 476.7) = 17.38 \text{ $R/ share}\end{aligned}$$

$$\begin{aligned}\text{Value per voting share} &= \text{Status Quo value/sh} + \text{Probability of management change} * \\ &(\text{Optimal value} - \text{Status Quo Value}) = 17.38 + 0.2 * (14,700 - 12,500) / 242.5 = 19.19 \\ &\text{\$/share}\end{aligned}$$

With our assumptions, the voting shares should trade at a premium of 10.4% over the non-voting shares.

Under Armour

In chapter 10, we arrived at a status quo value of \$1.268 million for the equity in common stock in Under Armour. We revalued Under Armour, with three changes – a compounded revenue growth of 15% (instead of 12.5%) and a higher return on capital of 10% (instead of 9%) in perpetuity, from augmenting brand name. The value of equity,

⁴⁰ Of the 242.5 million voting shares, 80% is equally held by four entities – Cia Bozano, Previ, Sistel and the European Group. Effectively, they control the company.

⁴¹ The Brazilian government owns only 0.8% of the voting shares but a significant portion of Embraer's customer financing is provided by the Brazilian development bank (BNDES), which also owns 9.6% of the non-voting shares.

with these changes, is \$1,444 million. There are 36.791 million class A shares, with one voting right per share, and 12.5 million class B shares with ten voting rights per share. Since all of the class B shares are held by the founder, we will assume that the probability of change is only 10%. We can compute the expected value of control and the value per voting right as follows:

$$\begin{aligned} \text{Status Quo Value per share} &= \frac{\text{Status Quo Value}}{(\# \text{ Class A shares} + \# \text{ Class B shares})} \\ &= \frac{\$1,268}{(36.791 + 12.5)} = \$25.72 \end{aligned}$$

$$\begin{aligned} \text{Expected Value of Control} &= (\text{Optimal Value} - \text{Status Quo Value}) \text{Probability}_{\text{Change}} \\ &= (1444 - 1268) (.10) = \$17.6 \text{ million} \end{aligned}$$

$$\text{Value per voting right} = \frac{\text{Expected Value of Control}}{\# \text{ Voting Rights}} = \frac{17.6}{(36.791 * 1 + 12.5 * 10)} = \$0.1088$$

$$\begin{aligned} \text{Value per class A share} &= \text{Status Quo Value per share} + \text{Value of one voting right} \\ &= \$25.72 + \$0.11 = \$25.83 \end{aligned}$$

$$\begin{aligned} \text{Value per class B share} &= \text{Status Quo Value per share} + \text{Value of 10 voting rights} \\ &= \$25.72 + \$0.11 * 10 = \$26.82 \end{aligned}$$

Conclusion

In general, it is easier to value mature companies than high growth companies, because we have more relevant historical data on earnings, cash flows and revenues. That does not mean, however, that mature companies pose no challenges. In this chapter, we looked at two aspects of mature companies that may create problems in valuations, the shift that some mature firms make to acquisitions to jump start growth and the possibility that a change in management could create a change in value.

Valuing acquisitive companies requires us to deal with two estimation issues – the lumpiness of acquisitions, where a big acquisition in one year is followed by inactivity in the other and the accounting treatment of acquisitions, which is inconsistent with the treatment of internal investment, and skews key measures such as return on capital. Rather than treat acquisitions separately, we included them with capital expenditures, when estimating reinvestment, and used averages over extended periods to overcome the

year-to-year volatility. When measuring returns, we removed goodwill from invested capital, assuming that it represents a premium for growth assets.

To deal with the possibility of management change and the consequences for value, we value a firm twice, once with the incumbent management (status quo) and once with a different and better management in place (optimal). The difference between the two numbers is the overall value of control and when multiplied by the probability of management changing, yields the expected value of control. This has consequences not only in acquisitions, but also in valuing any publicly traded company and in assigning premiums to voting shares.