Market Reality

Introduction

In chapter 1, I discussed market myths: popular but mistaken accounts of how share prices are set. In this chapter, I describe market reality: the fundamental but unseen forces that truly determine stock prices. The reality of the stock market is that all managers and all companies are essentially in the same business, the business of putting scarce capital to its most promising uses. To increase their company's stock price, managers must beat their capital competitors. They must earn rates of return on capital that exceed the return offered by other, equally risky companies that also are hungry for funds. If they do, they will add value to the capital placed at their disposal. If they do not, capital will have been misallocated or mismanaged and the company will sell for a stock market value that discounts the sum total of the resources employed. The Chase Manhattan Bank parable illustrates the competition for capital that drives stock prices.

The Chase Manhattan Bank Parable

A decade ago, at a time when I was associated with it, Chase Manhattan Bank paid a 5% rate of interest on savings accounts while Merrill Lynch offered 15% on virtually equally risky money market accounts. It did not take a rocket scientist to figure that 15 was a lot better than 5. Many people stormed into the bank, withdrew their life's savings, and marched down the street to Merrill Lynch. Economists politely labeled this aggressive behavior “disintermediation.” In practice, it meant that billions of dollars abandoned the banking system in search of a higher return.

The stock market works in essentially the same way. If the rate of return a company earns is not up to snuff with the return offered by other, equally risky investment alternatives, disintermediation will take place. But this time it will be a disintermediation of value. The tendency of value to flow from low- to high-return companies is expressed by the fundamental principle of valuation:

\[
\text{Corporate return} = \frac{\text{market value}}{\text{capital}}
\]

Or, in symbols:

\[
\frac{r}{c^*} = \frac{\text{market value}}{\text{capital}}
\]

The principle states that the relation between the rate of return \(r\) that a company earns within its businesses and its required return \(c^*\) is what drives a company's market value to a premium or discount to the level of its capital employed. (Signifying the cutoff rate or cost of capital, \(c^*\) is required by a company's investors because it is a return available to them by investing in other, comparably risky companies.) Before discussing the principle further, it is necessary to define “capital.”
Capital

Capital is a measure of all the cash that has been deposited into a company over its life without regard to the financing source, accounting name, or business purpose, much as if the company were just a savings account. It does not matter whether the investment is financed with debt or equity, it does not matter whether it is employed in working capital or in fixed assets. Cash is cash, and the question is how well does management manage it.

Capital employed can be estimated by taking the standard accounting book value for a company's net assets and then grossing it up three ways:

- To convert from accrual to cash accounting (by adding accounting reserves that are formed by recurring, non-cashbookkeeping provisions such as the deferred tax reserve)
- To convert from the liquidating perspective of lenders to the going-concern perspective of shareholders (as by capitalizing R&D outlays and market-building expenditures)
- To convert from successful-efforts to full-cost accounting (as by adding back cumulative unusual losses, less gains, after taxes)

These adjustments produce a more accurate measure of the capital base upon which a company's rate of return must be earned than is represented by conventional accounting book value. I will illustrate the calculation of capital and rate of return a little later on. For now, let's return to the parable.

The Parable Revisited

Recall that, when Chase offered a 5% return and Merrill Lynch provided 15%, the disparity induced a flow of funds, or disintermediation. By the same token, a company that produces a 5% return on its capital when its capital competitors offer investors the prospect of a 15% rate of return also will be faced with a disintermediation, but this time, a disintermediation of value. For every dollar of capital invested, only 33 cents of the dollar will now appear in the market's valuation of the firm, and value will have been lost:

\[
\frac{\text{Corporate return } \beta}{\text{Investors' required return } \beta^*} = \frac{\text{market value}}{\text{capital}}
\]

\[
\frac{5\%}{15\%} = \frac{\$0.33}{\$1.00}
\]

Flipping the coin, if Chase had offered to pay a 30% yield on savings accounts (including the monetary value of toasters, microwave ovens, and other such baubles that banks tend to give away) at a time when Merrill offered 15%, the bank would have been overwhelmed with new deposits. In the same way, a company that earns a 30% return within its businesses when its capital competitors offers just 15% will also experience a great infusion, but this time, an infusion of value. For every dollar invested, two dollars will appear in the stock market's valuation of the firm, and value will have been created.

\[
\frac{\text{Corporate return } \beta}{\text{Investors' required return } \beta^*} = \frac{\text{market value}}{\text{capital}}
\]

\[
\frac{30\%}{15\%} = \frac{\$2.00}{\$1.00}
\]

The message of the Chase parable is that earning an attractive rate of return, one in excess of the cost of capital, is a prerequisite for enhancing its shareholder wealth.

An Illustration

Six factors are needed to fully account for a company's market value (see chapter 5). But two factors—the relation between the rate of return and the cost of capital—are so important that together they often account for a large portion of a company's market value. Consider, for example, the fundamental principle
of market valuation for the food processing industry (a group of 34 food companies tracked in the Standard & Poor's Industry Survey) plotted in exhibit 3.1, with supporting data in exhibit 3.2. The horizontal axis plots "rate of return per unit of risk," the ratio of \( r \) to \( c^* \); it indicates the fraction or multiple of the cost of capital that each company has earned over the past 5 years. (The rate of return is measured on all capital employed after taxes but before non-cash-bookkeeping entries; the cost of capital is the weighted average cost of the debt and equity capital.)

The \( r \) to \( c^* \) index is graphed against the ratio of actual market value to capital employed. The strong upward-sloping relation indicates that the higher the rate of return in relation to the cost of capital, the greater the premium built into the market value of the shares. Put aside the differences in their lines of business, market shares, advertising effectiveness, and product innovations—none explain the stock prices of these food companies as well or as readily as their relative rates of return per unit of risk. Research performed by Stern Stewart & Co. demonstrates that this relation between corporate returns and required returns accounts for the share price premiums or discounts for countless industry groups worldwide. The reason for this is best expressed by exhibits 3.3 and 3.4: respectively a company's investment opportunity schedule and the market's risk-reward trade-off.

Exhibit 3.1 The Food Processing Industry

![Graph showing the relationship between rate of return and cost of capital.]

Exhibit 3.2 Rate of Return per Risk in the Food Processing Business (Dollars in Millions)

<table>
<thead>
<tr>
<th>Company</th>
<th>Value/Year Average</th>
<th>Value/Year Capital 1988</th>
<th>Value/Year Capital 1989</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-5 Year Average</td>
<td>Value/Year Capital 1988</td>
<td>Value/Year Capital 1989</td>
</tr>
<tr>
<td></td>
<td>r/c*</td>
<td>r</td>
<td>c*</td>
</tr>
<tr>
<td>1 Kellogg Co</td>
<td>2.94x</td>
<td>34.9%</td>
<td>11.9%</td>
</tr>
<tr>
<td>2 Tyson Foods Inc</td>
<td>2.62</td>
<td>25.1</td>
<td>9.6</td>
</tr>
<tr>
<td>3 Lance Inc</td>
<td>2.26</td>
<td>28.7</td>
<td>12.7</td>
</tr>
<tr>
<td>4 Conagra Inc</td>
<td>1.91</td>
<td>20.0</td>
<td>10.5</td>
</tr>
<tr>
<td>5 General Mills Inc</td>
<td>1.77</td>
<td>18.9</td>
<td>10.7</td>
</tr>
<tr>
<td>6 Dean Foods Co</td>
<td>1.64</td>
<td>20.2</td>
<td>12.3</td>
</tr>
<tr>
<td>7 H.J. Heinz Co</td>
<td>1.63</td>
<td>19.8</td>
<td>12.2</td>
</tr>
<tr>
<td>8 J.M. Smucker Co</td>
<td>1.61</td>
<td>22.4</td>
<td>14.0</td>
</tr>
<tr>
<td>9 Ralston Purina Co</td>
<td>1.55</td>
<td>16.2</td>
<td>10.4</td>
</tr>
<tr>
<td>10 Flowers Industries Inc</td>
<td>1.54</td>
<td>16.7</td>
<td>10.9</td>
</tr>
<tr>
<td>11 Holly Farms Corp</td>
<td>1.41</td>
<td>16.6</td>
<td>11.8</td>
</tr>
<tr>
<td>12 Pioneer Hi-Bred Intl</td>
<td>1.40</td>
<td>16.8</td>
<td>12.0</td>
</tr>
<tr>
<td>13 Hershey Foods Corp</td>
<td>1.38</td>
<td>16.7</td>
<td>12.1</td>
</tr>
<tr>
<td>14 Quaker Oats Co</td>
<td>1.32</td>
<td>15.4</td>
<td>11.7</td>
</tr>
<tr>
<td>15 Campbell Soup Co</td>
<td>1.28</td>
<td>15.6</td>
<td>12.2</td>
</tr>
<tr>
<td>16 Sara Lee Corp</td>
<td>1.22</td>
<td>14.5</td>
<td>11.8</td>
</tr>
<tr>
<td>17 Savannah Foods &amp; Inds</td>
<td>1.19</td>
<td>11.9</td>
<td>10.0</td>
</tr>
<tr>
<td>18 McCormick &amp; Co</td>
<td>1.11</td>
<td>13.2</td>
<td>11.9</td>
</tr>
<tr>
<td>19 Smithfield Foods Inc</td>
<td>1.08</td>
<td>10.9</td>
<td>10.1</td>
</tr>
<tr>
<td>20 Gerber Products Co</td>
<td>1.07</td>
<td>13.5</td>
<td>12.6</td>
</tr>
<tr>
<td>21 Hormel &amp; Co</td>
<td>1.03</td>
<td>13.0</td>
<td>12.5</td>
</tr>
<tr>
<td>22 CPC International Inc</td>
<td>1.03</td>
<td>12.4</td>
<td>12.1</td>
</tr>
<tr>
<td>23 Universal Foods Corp</td>
<td>0.96</td>
<td>11.4</td>
<td>11.9</td>
</tr>
<tr>
<td>24 Borden Inc</td>
<td>0.95</td>
<td>11.1</td>
<td>11.6</td>
</tr>
<tr>
<td>25 Carnes-Burns Food</td>
<td>0.93</td>
<td>8.6</td>
<td>9.2</td>
</tr>
<tr>
<td>26 Archer-Daniels-Midland</td>
<td>0.81</td>
<td>11.8</td>
<td>14.6</td>
</tr>
<tr>
<td>27 Infl Multifoods Corp</td>
<td>0.78</td>
<td>8.2</td>
<td>10.6</td>
</tr>
<tr>
<td>28 Pilgrims Pride Corp</td>
<td>0.77</td>
<td>7.3</td>
<td>9.5</td>
</tr>
<tr>
<td>29 Castle &amp; Cooke Inc</td>
<td>0.75</td>
<td>8.1</td>
<td>10.8</td>
</tr>
<tr>
<td>30 IBP Inc</td>
<td>0.70</td>
<td>8.9</td>
<td>12.8</td>
</tr>
<tr>
<td>31 United Brands</td>
<td>0.63</td>
<td>7.5</td>
<td>12.0</td>
</tr>
<tr>
<td>32 American MAize</td>
<td>0.58</td>
<td>6.9</td>
<td>11.9</td>
</tr>
<tr>
<td>33 Dekaib Genetics Corp</td>
<td>0.41</td>
<td>5.4</td>
<td>13.2</td>
</tr>
<tr>
<td>34 Thorn Apple Valley Inc</td>
<td>0.31</td>
<td>3.1</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Value in 1988 is market value of equity plus book value of net liabilities.
Capital is 1988 net operating assets (adjusted).
Average r's and c*’s are the arithmetic averages over 5 years (or years for which data is available).
The Investment Opportunity Schedule

In exhibit 3.3 a company’s potential new capital investment projects are ranked according to their prospective rates of return. Investment I comprises the additional funds that might be committed to build up working capital and acquire new long-term assets organized into projects (or strategies, if you prefer a grander aggregation). The rate of return r on the proposed investments is measured in relevant cash flow terms along lines I will describe a little later. The downward-sloping schedule indicates that the most attractive investment opportunities are taken first and the least attractive ones last.

Assuming that all projects entail roughly the same risk, there is a single rate c* beneath which new projects should not be accepted. As a cutoff rate or cost of capital, c* is not a cash cost. Rather, it is an opportunity cost that is equal to the rate of return investors could expect to earn by investing in the stocks and bonds of other companies of comparable risk. Management should reject projects providing a return less than c* because the company’s investors could do better elsewhere.

\[c^*\] also represents the rate of return that some other company, quite possibly outside the company’s industry or home country, is capable of earning on a new investment in its business. For if not one company anywhere could invest funds to cover its cost of capital, investors would be forced to accept a lower return if they still wanted to invest. Interest rates in general would have to fall to the point at which some company somewhere would be able to earn at least its cost of capital. Thus, \(c^*\) is an opportunity cost in a second way: It is the rate of return that some alternative, or marginal, project also up for consideration promises to earn. To be acceptable, any one project must beat the return offered by that hypothetical alternative project in order for the world at large to be better off.

Accepting a project likely to earn an r less than \(c^*\) now has an even more important consequence than merely eroding shareholders’ wealth. It also means that capital is misallocated, the greatest sin to which corporate management can fall prey. When capital is misallocated, whether intentionally or not, it is taken away from an even more worthwhile investment project. Economic growth and the standard of living will suffer worldwide. The objective of maximizing value is justifiable mainly on the ground that it promotes the greatest good for the greatest number of people and not just shareholders.

No matter which interpretation you prefer, cost of capital can be used to divide projects and, in the aggregate, companies, industries, and even countries, into three categories:

Group 1 Projects return more than the cost of capital. Because management can earn a greater return by investing capital inside the company than investors could by investing in the market, value is created. The common shares of group 1 companies sell at high P/E ratios and at premiums to their economic book values (a measure of the true cash invested and at risk in the business).

Group 2 Projects break even in economic terms. The return earned just covers the cost of capital, so that no value is created over and above the capital invested. The
common shares of group 2 companies sell at modest P/Es and at their economic book values.

Group 3 Projects, a favorite of many large, mature companies with cash to burn, return less than their cost of capital. Because the return earned on the capital invested within the company is less than investors could earn elsewhere, an economic, or opportunity, loss is suffered and value is destroyed. The common shares of group 3 companies sell at low P/Es and beneath their economic book values.

There is a biological analogy. Group 1 projects add muscle; a company grows in size and strength. Group 2 projects add fat; a company gets bigger but not better. Group 3 projects are tumorous; they sap the strength of the corporate body.

Incidentally, there is no guarantee that a group 3 company will go bankrupt. A company could in theory go on forever earning a rate of return that, though short of recovering the full cost of capital, is sufficient to cover the after-tax cost of whatever money it borrows. With positive accounting earnings, this unfortunate company could continue to invest, grow earnings per share, and seemingly prosper all the while, when in reality it destroys value with each additional breath that it takes. Culling the herd of such capital misallocators was one of the useful functions served by the corporate raiders in the 1980s.

The Risk-Reward Trade-off

Exhibit 3.4 shows the relationship between the risk investors bear and the expected rewards. The reward for investing is the total rate of return obtained through a combination of cash yield and cash-equivalent price appreciation. Risk is the variability or uncertainty in the prospective return. Even when they take no risk, investors can still expect to earn some return just because there is a time value to money. At any moment such a risk-free rate of return $R_f$ is indicated by the prevailing yield on U.S. government bonds. If held to maturity, U.S. government bonds guarantee investors a nominal return without subjecting their principal to a risk of default. Risk-free government bonds generally provide about a 3% real rate of return plus a premium to offset the expected rate of inflation.

To move beyond such riskless bonds, 100 can be used as an index to represent the degree of risk entailed in holding a broad common stock portfolio such as the S&P 500. That way, the risk of all individual equity investments can be positioned on a risk map that progresses from left to right. For example, it is around a risk score of 50 that public utilities tend to cluster. They are regulated to earn steady rates of return, and as a result, their common shares are only about half as risky as the average common stock investment.

Food companies tend to plot between 60 and 80 on the risk map, with food wholesalers such as SuperValu around 60 and food processors such as General Mills and Quaker Oats that take trademark risk closer to 80. In general, however, food stocks are less risky than the market because people tend to eat quite regularly. Around 100 are the consumer products giants such as Proctor & Gamble and Johnson & Johnson. It seems anything that people put in their mouths or wipe with anywhere plots around there. 120 to 140 is the domain of the cyclical stocks—the steel, cement, aluminum, automotive, chemical, textile, machine tool, and tire and rubber companies, for example.

From 150 on up are the airlines, hotel and motel chains, and construction, leisure time and photographic companies—busi-
nesses in which many of the costs are fixed and revenues are strongly tied to the economy, making profits highly dependent on the stage of the business cycle. The risk score can be as high as 200 to 300 for companies developing new technologies but without current products to sell and for firms in or near bankruptcy much like Chrysler in the early 80s—firms whose stocks behave more like options.

The upward slope of the line stretching beyond the risk-free yield indicates that, because they bear more risk, investors ought to expect to earn a greater return. I emphasize the word "ought" because, without the prospect of earning a greater reward, who would bother to buy riskier stocks? One of the greatest achievements in all financial academic research has been to prove that such a risk-reward trade-off does in fact exist in the stock market.

Comprehensive studies of actual share price data stretching back to 1925 show that in diversified portfolios of stocks (where forecasting errors cancel) and over sufficiently long periods of time (long enough for the long-term upward trend in the stock market to dominate its inherent near-term variability), investors have indeed been rewarded linearly for bearing additional risk. Risk and reward do in fact go hand-in-hand.1

**A Casino in Reverse.** The risk-reward trade-off study shows that the stock market works much like a gambling casino, although just in reverse. A casino loses many individual bets, but it always wins more than it loses because it establishes the odds in its favor, places many bets, and is in the game for the long haul. The risk in buying the common shares of casino operators is not knowing how many people will walk through their front doors, and not what happens on their gaming tables.

A casual observer who is unaware of that may be tempted to think casinos are exciting because some gamblers enjoy exhilarating winning streaks while others lose fortunes. Observing the anguish and ecstasy of gamblers in a casino may be fun, but it diverts attention from the central fact: The casino always wins and the gamblers always lose. There is no real excitement in a casino, just a predictable transfer of wealth.

The stock market works much like a casino but with one important difference. This time the gamblers win. The odds favor investors to win appropriate returns because the entry price on common shares is set at a level that discounts the value of likely future cash flows. Although individual stocks do over- and underperform investors' expectations, investing in a broad portfolio of stocks essentially guarantees that a return will be earned over the long haul to compensate for the degree of risk borne over the short term.

**The Patience Premium.** Now I know that you are thinking this sounds too easy. If investors are always rewarded for bearing additional risk, as indeed the evidence shows is the case, why wouldn't everyone invest in common stocks instead of bonds, and risky common stocks at that, and earn higher returns?

The reason is that an investor in stocks must often wait longer to earn a return that is higher than that provided by bonds, like as much as about 20 years longer, and the riskier the investment the longer the wait is likely to be. The return for risk really is a premium for patience.

With that in mind, The Vanguard Group of Valley Forge, Pennsylvania, rightly admonishes investors to "Take stock of time when investing in stocks." To support its case, Vanguard computed rates of return provided by an investment in the S&P 500 over the period from 1950 to 1980. As portrayed in exhibit 3.5 research shows that the return from common stocks was highly variable and uncertain over single-year intervals. The highest return garnered from the market in any one year was a positive 52.3% and the lowest was a negative 26.3%. But once the time horizon for investing was stretched out to even just 5 years, a remarkable central tendency began to appear. The cumulative return began to converge in accordance with a statistical phenomenon known as a regression toward the mean.

Notice that the highest cumulative annual return over 5 years was a positive 20.1%, whereas the lowest was only a negative 2.4%. In fact, the data show that extending the time horizon to 15 or 20 years leaves little risk to investing in the

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stock market. There is only the return sought by investors to compensate for risk. The Vanguard Group concludes: "Over the long haul, annual market swings tend to cancel each other out, making common stock investing prudent for even the cautious investor."

The risk-reward trade-off can now be presented in another way. Invest in “risk-free” bonds, and the result will be a steady if unexceptional return over a period of time (as represented by the $R_f$ line in exhibit 3.6). Invest in common stocks, and over the short term there is a great uncertainty over the potential return, but over the long run the return will narrow to the reward that investors expect in order to compensate them for risk.

The Market Is a Fair Game. The importance of the risk-reward trade-off can hardly be overstated. For one thing, it is one more bit of evidence that the market is dominated by sophisticated, lead-steer investors. The “average” investor in the market would be incapable of doing so, but lead steers are able to set stock prices in such a way that all investors get what they bargained for: a portfolio return that fairly compensates them for the risk that they take. The fact that the market is a fair game over the long haul may be the strongest evidence to prove that it is run by “sophisticated” investors.

The Definitive Evidence. But the risk-reward test makes an even stronger statement than that. It proves that share prices are the result of discounting projected cash flows. I will state that one more time in case you missed it: The risk-reward trade-off is proof that share prices are set by discounting cash flows, and not by capitalizing earnings. The observed risk-return trade-off falls right out of the mechanics of projecting and discounting cash flow to a present value. For the greater the risk in the future cash flows, the higher the rate used to discount them to a present value, the lower the
current stock price becomes, and thus the higher the return for investors as the company’s cash flows subsequently unfold and are paid out. Discounting cash flows is the only valuation procedure that can account for the fact that investment risk is rewarded with a higher cash return over a period of time and therefore must be the basis by which share prices are set.

Having never noticed a trading halt in a stock as market makers quickly recompute cash flow forecasts, you may be excused for being skeptical about this evidence. However, whether or not lead steers, to say nothing of the investing public at large, literally discount cash flows is unimportant. What is important is that the risk-reward test demonstrates conclusively that share prices behave as if all investors employed a discounted cash flow approach.

It is like suggesting to Minnesota Fats, the famous pool player, that he is a brilliant physicist. He might protest that he could hardly be considered such, having failed to graduate from high school. Nevertheless, to sink a pool ball in the pocket, Mr. Fats must put the right momentum and spin on the ball and properly calculate the angles of incidence and reflection. Minnesota again demurs, claiming that it is only his instinct for the game gained through years and years of practical experience that enables him to sink pool balls so reliably in the pockets. Although he is right in what he says, it is still true that his pool play can be modeled by a few simple laws of physics discovered by Sir Isaac Newton. Moreover, every time he sinks the ball in the pocket it is only because his instinct for the shot conforms to the laws of nature. So he really is a fabulous applied physicist.²

Its just the same in the stock market. Lead-steer investors, with their years of experience and sound business instincts, reach conclusions about value that are consistent with discounting projected cash flows, even though most do not explicitly employ such a technique, nor would many of them recognize it if they saw it.

The Cost of Capital Unveiled. The final important application of the risk-return trade-off is to estimate the required return for creating value. By measuring where a company (or project) plots along the risk map (going from left to right) and drawing a line northward and westward along the risk-reward trade-off, we get an intersection that is the cost of capital c* (exhibit 3.7). It is equal to the return investors could expect to earn by buying a portfolio of companies of similar risk; in short, it is the return offered by a firm’s capital competitors.

### Exhibit 3.7 The Foundations of the Economic Model of Value

#### The Company:
Investment Opportunity Schedule

<table>
<thead>
<tr>
<th>Rate of Return (r)</th>
<th>Cost of Capital (c*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### The Market:
Risk-Reward Tradeoff

| Investors’ Required Reward | Prospective Investment (I) | Company Risk | Risk |
|---------------------------|-----------------------------|--------------|
|                           |                             |              |

An interaction between two simple diagrams—one portraying the menu of investment opportunities available within a single company and the other showing the returns available to investors in the capital market relative to risk—is what truly drives stock prices. For readers who seek the assurance of academic support for my intuitively obvious propositions, I offer the two diagrams in exhibit 3.7 as the intellectual and empirical underpinnings for the Chase Manhattan parable (i.e., the tendency of value to flow from low- to high-return companies).

### A Practical Digression: How to Measure the Rate of Return

(High-level general-manager types can skip this section without much loss of continuity; on the other hand, it is required reading for all accountants, please.)

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The Chase parable, by illustrating the critical importance of earning an attractive rate of return, raises this question: What is the best way to measure a company's rate of return?

**ROE Is Not All It's Cracked Up to Be**

One candidate that may leap immediately to mind is the standard accounting return on common equity, which is computed by dividing bottom-line net income available to the common stockholders by bottom-line accounting equity capital:

$$\text{ROE} = \frac{\text{Income Available to Common}}{\text{Common Equity}}$$

Although it has the virtues of being easy to compute and being widely understood, ROE suffers from such severe distortions that I strongly recommend against using it.

**Accounting Distortions.** For one thing, ROE is based upon the same accounting earnings I roundly criticized in chapter 2. Reported accounting earnings are distorted by, among other things, the choice of LIFO or FIFO for inventory costing and purchase or pooling for acquisitions, the expensing of R&D, the use of successful efforts instead of full cost to account for risky investments, and accrual bookkeeping entries that bury in reserves the cash flows a company recurrently generates from its operations.

**Financing Distortions.** Another problem is that ROE reacts to changes in the mix of debt and equity that a company employs and in the rate of interest it pays on its debts. That makes it difficult to tell whether ROE rises or falls for operating or financial reasons. With ROE as its goal, management may be tempted to accept truly substandard projects that happen to be financed with debt and pass by very good ones if they must be financed with equity.

**An Explosive Concoction**

The Liquigas fallacy illustrates why a mixture of operating and financing decisions is an explosive concoction. As reported in a now famous Harvard Business School case, in one year the management of Liquigas would employ debt to finance the company's expansion and, accordingly, required all projects to return more than just the after-tax cost of borrowing funds. The logic for the decision-making criteria was that all such projects would increase EPS and ROE. Not surprisingly, many low-return projects were accepted in those years. By the next year, the company had become so highly leveraged that management was forced to raise equity. All projects up for review were required to cover the full cost of equity (once again to prevent dilution in EPS and ROE), which made it difficult for even very attractive projects to pass muster.

The moral of the Liquigas fallacy is not to associate sources with the uses of funds. Such association distorts the desirability of undertaking a project by mixing operating and financing decisions. Instead, all projects should be thought of as being financed with a target blend of debt and equity no matter how they might specifically be financed. That way, each investment stands or falls on its own merits.

To be consistent with this commendable capital budgeting procedure, subsequent performance should be measured and evaluated in a manner that clearly distinguishes operating and financing decisions. Unfortunately, comparing the rate of return on equity against the cost of equity does not (or at least, does not without great difficulty). Comparing the rate of return on total capital with the weighted average cost of debt and equity capital does.

**The Rate of Return on Total Capital**

In place of ROE, the rate of return on total capital is the return that should be used to assess corporate performance. Computed by dividing a firm's net operating profits after taxes (NOPAT) by the total capital employed in operations, it is a savings account
equivalent, after-tax, cash-on-cash yield earned in the business. It measures the productivity of capital employed without regard to the method of financing, and it is free from accounting distortions that arise from accrual bookkeeping entries, from the conservative bias of accounting statements, and from the tendency to understate capital by writing off unsuccessful efforts. It may be compared directly to the company's overall cost of capital to indicate whether value is being created or destroyed.

\[ r = \frac{\text{NOPAT}}{\text{capital}} \]

Capital is the sum of all cash that has been invested in a company's net assets over its life and without regard to financing form, accounting name, or business purpose—much as if the company were a savings account. NOPAT is the profits derived from the company's operations after taxes but before financing costs and non-cash-bookkeeping entries. As such, NOPAT also is the total pool of profits available to provide a cash return to all financial providers of capital to the firm.

The one non-cash charge that is subtracted from NOPAT is depreciation. Indeed, the "net" in NOPAT stands for "net of depreciation." Depreciation is subtracted because it is a true economic expense. The assets consumed in the business must be replenished before investors achieve a return on their investment. Another way to see this is to observe that a company, when it leases assets, must pay a rent that covers the depreciation the lessor suffers on the lessee's behalf (plus interest). Thus, the economic charge of depreciation does have a cash-equivalent cost. To be consistent with NOPAT, capital is charged with the accumulated depreciation suffered by the assets.

The rate of return on capital may be computed from either a financing or an operating perspective. The financing perspective, because it builds up to the rate of return on capital from the standard return on equity, is the most intuitive place to start.

The Rate of Return from a Financing Perspective

Step 1: Deleverage the Rate of Return. The first adjustment to the standard ROE formula removes the effect of gearing up the capital structure with debt. To do so, add all interest-bearing debt (and the present value of noncapitalized leases\(^1\)) to common equity and the interest expense on the debt (including the imputed interest in rents) to bottom-line accounting profits:

\[ r = \frac{\text{NOPAT}}{\text{capital}} \]

where

- NOPAT = Income available to common
- + Interest expense after taxes = Common equity
- Capital
- + Debt

When interest expense, net of the taxes saved by deducting it, is backed out of bottom-line profits, the result is the earnings that would have been reported had all of the company's capital requirements been financed solely with common equity. Thus, the NOPAT return on capital is what the return on equity would be assuming that only common equity financing had been employed. It is a return purged of the consequences of financial leverage.

This does not mean that leverage is unimportant for assessing performance. Debt does shelter operating profits from being fully taxed. This benefit, however, is incorporated into \( r^* \), the weighted average cost of capital, but by assuming that a target capital structure, not each year's actual financing proportions, is employed. That way, the temptation to improperly associate sources and uses of funds is avoided, but at the same time the tax benefit of debt is properly taken into account. (This is brought out more fully in chapter 7, on valuation.)

To illustrate this important principle, suppose that a company

\(^1\)Although some leases need not be capitalized for accounting purposes, so long as management intends to employ a leased asset in the business on a relatively permanent basis, the lease should be capitalized and treated as a debt and asset equivalent.
has $10,000 of capital, all equity-financed, and that it produces $1,000 of bottom-line profits (exhibit 3.8). Without any leverage, the $1,000 of bottom-line profits is also NOPAT, and the rates of return on equity and total capital are the same, in this case 10%.

### Exhibit 3.8 All Equity-Financed

<table>
<thead>
<tr>
<th></th>
<th>Total Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$16,667</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$15,000</td>
</tr>
<tr>
<td>Net operating profit</td>
<td>$1,667</td>
</tr>
<tr>
<td>Interest expense</td>
<td>$0</td>
</tr>
<tr>
<td>Net profit before taxes</td>
<td>$1,667</td>
</tr>
<tr>
<td>Taxes @ 40%</td>
<td>$667</td>
</tr>
<tr>
<td>Net profit after taxes (NOPAT)</td>
<td>$1,000</td>
</tr>
<tr>
<td>Debt</td>
<td>$0</td>
</tr>
<tr>
<td>Equity</td>
<td>$10,000</td>
</tr>
<tr>
<td>Capital</td>
<td>$10,000</td>
</tr>
<tr>
<td>NPAT</td>
<td>$1,000</td>
</tr>
<tr>
<td>Equity</td>
<td>$10,000</td>
</tr>
<tr>
<td>ROE</td>
<td>10.0%</td>
</tr>
<tr>
<td>NPAT</td>
<td>$1,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>$0</td>
</tr>
<tr>
<td>(Taxes saved)</td>
<td>$0</td>
</tr>
<tr>
<td>NOPAT</td>
<td>$1,000</td>
</tr>
<tr>
<td>Capital</td>
<td>$10,000</td>
</tr>
<tr>
<td>r</td>
<td>10%</td>
</tr>
</tbody>
</table>

### Exhibit 3.9 Debt- and Equity-Financed

<table>
<thead>
<tr>
<th></th>
<th>All Equity</th>
<th>$5,000 Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$16,667</td>
<td>$16,667</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$15,000</td>
<td>$15,000</td>
</tr>
<tr>
<td>Net operating profit</td>
<td>$1,667</td>
<td>$1,667</td>
</tr>
<tr>
<td>Interest expense</td>
<td>$0</td>
<td>$300</td>
</tr>
<tr>
<td>Net profit before taxes</td>
<td>$1,667</td>
<td>$1,367</td>
</tr>
<tr>
<td>Taxes @ 40%</td>
<td>$667</td>
<td>$547</td>
</tr>
<tr>
<td>Net profit after taxes</td>
<td>$1,000</td>
<td>$820</td>
</tr>
<tr>
<td>Debt</td>
<td>$0</td>
<td>$5,000</td>
</tr>
<tr>
<td>Equity</td>
<td>$10,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>Capital</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>NPAT</td>
<td>$1,000</td>
<td>$820</td>
</tr>
<tr>
<td>Equity</td>
<td>$10,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>ROE</td>
<td>10.0%</td>
<td>16.4%</td>
</tr>
<tr>
<td>NPAT</td>
<td>$1,000</td>
<td>$820</td>
</tr>
<tr>
<td>Interest expense</td>
<td>$0</td>
<td>$300</td>
</tr>
<tr>
<td>(Taxes saved)</td>
<td>$0</td>
<td>($120)</td>
</tr>
<tr>
<td>NOPAT</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Capital</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>r</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Despite the leverage, the underlying NOPAT profits remain unchanged, as does the NOPAT return on capital. The return on equity is another matter. It has increased profoundly even though the company’s underlying operating performance has not changed.

The example illustrates that the NOPAT to capital rate of return, unlike the ROE, is completely unaffected by a change in the mix of debt and equity a company chooses to employ. What matters is simply the productivity of capital employed in the business, no matter the financial form in which the capital has been obtained. Moreover, with after-tax interest on the debt added to profits, the return is insulated from changes in the level of interest rates too (although such changes will affect the cost of capital, not as an addition to NOPAT).

Note that the corporate income tax decreased from $667 to $547, a difference explained by multiplying the $300 interest expense by the 40% marginal income tax rate. In the economic model, the benefit of not paying this tax shows up as a reduction in the overall cost of capital, not as an addition to NOPAT.
capital). Because the effect of financial structure is entirely eliminated, this rate of return is a much clearer measure of operating performance than the standard return on equity, and it is one that can justifiably be compared year by year for an individual company and among companies in the same year. Projects, including acquisitions, that happen to be financed with debt will look no better with this return as a performance measure, nor will those financed with equity appear any worse.

**Step 2: Eliminate Other Financing Distortions.** The next step to improve the rate of return is to eliminate other financing distortions. This is accomplished by adding the equity provided by preferred stockholders and minority investors to capital and by bringing the income diverted to these equity sources back into NOPAT:

\[
r = \frac{\text{NOPAT}}{\text{capital}}
\]

where

- **NOPAT** = Income available to common
- + Preferred dividend
- + Minority interest provision
- + Interest expense after taxes

**Capital** = Common equity
- + Preferred stock
- + Minority interest
- + All debt

Observe that, for every component of capital, there is a corresponding entry in the calculation of NOPAT. NOPAT is the sum of the returns attributable to all the providers of funds to the company. In this way the NOPAT return is completely unaffected by the financial composition of capital.

**Step 3: Eliminate Accounting Distortions.** The next, and final, step is to eliminate accounting distortions from the rate of return by adding equity equivalent reserves to capital and the periodic change in such reserves to NOPAT.

\[
r = \frac{\text{NOPAT}}{\text{capital}}
\]

where

- **NOPAT** = Income available to common
- + Increase in equity equivalents
- Adjusted net income
- + Preferred dividend
- + Minority interest provision
- + Interest expense after tax

**Capital** = Common equity
- + Equity equivalents
- Adjusted common equity
- + Preferred stock
- + Minority interest
- + All debt

Equity equivalents (EEs) gross up the standard accounting book value into something I call economic book value, which is a truer measure of the cash that investors have put at risk in the firm and upon which they expect their returns to accrue. Furthermore, it is a standard better than conventional book value for judging a company’s market valuation. Only if its stock market value exceeds the economic book value of its common equity (which includes the equity equivalent reserves) is a company truly adding value to the funds shareholders have placed at its disposal.

EEs eliminate accounting distortions by converting from accrual to cash accounting, from a pessimistic lenders’ to a realistic shareholders’ perspective, and from successful- to full-cost accounting. EEs add back to capital such items as the deferred income tax reserve, the LIFO inventory valuation reserve, the cumulative amortization of goodwill, a capitalization of R&D and other market-building outlays, and cumulative unusual write-offs (less gains) after taxes. (See the appendix to this chapter for a more complete description.) Bringing these items into capital by no means guarantees that they will be included in the company’s market value, however. Only if an adequate return is subsequently earned on them will they carry over into stock market value, a question that no balance sheet (or single-period rate of return, for that matter) can ever answer.

In addition to correcting the balance sheet, EEs serve to eliminate the ways in which accountants distort the measurement of a firm’s true economic profits. Adding the change in EEs to reported earnings brings back into NOPAT the recurring cash flows...
and value buildups that the accountants have left to accumulate elsewhere. With the add-backs, NOPAT records the actual timing of cash receipts and disbursements, includes economic holding gains, is normalized to exclude nonrecurring gains and losses, and dodges an unrealistic immediate charge-off of such value-building outlays as R&D and up-front market development expenditures.

By adjusting capital and NOPAT for equity equivalents in the manner I have prescribed, the rate of return is made an even more accurate indication of the true yield actually being earned in the business—an important advantage. At some point a trade-off exists between achieving a more accurate return and additional complexity. Just how far to go is a decision that deserves careful consideration.

I confess that I do not expect these recommendations to be adopted by the Financial Accounting Standards Board anytime soon. Rather, I would like to think that corporate managers will adopt them (as modified for their particular circumstances) for the purpose of internal performance assessment and goal setting, competitor analysis, acquisition screening, communicating with lead steers, and as the basis for determining bonus awards. But as for influencing financial book reporting, it probably will not happen. The accountants are too much the slaves of the bankers and too much the captives of their own professional cynicism.

The Rate of Return from an Operating Perspective

Reflecting the great duality in the universe (to say nothing of the miracle of double-entry bookkeeping), there is another, entirely equivalent way to compute the rate of return on capital. From an operating perspective, capital can be defined as net working capital (NWC) plus net fixed assets (NFA). Net working capital, in turn, is current assets net of NIBCLS (pronounced “nib ik culs,” they are little Stephen Spielberg creatures that cover your floor in the dark of night and eat the socks you are missing). Actually, NIBCLS stands, boringly, for non-interest-bearing current liabilities, which are accounts such as accounts payable and accrued expenses, that arise as spontaneous sources of financing in the natural course of business and which offset the need to raise permanent capital. The rationale for excluding them from capital is that the financing costs associated with paying suppliers and employees with some delay are incorporated in the cost of goods sold, and nothing is to be gained by extracting them from earnings. Net fixed assets consist of net property, plant and equipment, goodwill, and other long-term capital necessary to run the business.

To obtain the same measure of capital as the financing approach produces, adjustments must be made to assets for certain equity equivalent reserves (e.g., by adding the LIFO reserve to inventories, the bad-debt reserve to receivables, the cumulative amortization of goodwill to goodwill, and the balance of capitalized intangibles to net fixed assets, and so on). Moreover, if the present value of noncapitalized leases is treated as a debt equivalent, it must also be considered the equivalent of a net fixed asset.

From an operating perspective, NOPAT is, quite literally, net operating profits after taxes. Start with sales as a proxy for operating cash receipts and then subtract, first, recurring cash economic operating expenses, including depreciation. That leaves net operating profits, or trading profits, as Europeans prefer to say. Next, take away taxes, but the taxes payable in cash on the net operating profits. Such “cash operating taxes” can be approximated by taking the accounting provision for taxes, subtracting the deferred taxes that were not paid, and then grossing up for the additional taxes that would have been paid had interest expense not sheltered operating profits from being fully taxed. NOPAT is what’s left.

\[
r = \frac{\text{NOPAT}}{\text{capital}}
\]

where \[\begin{align*}
\text{NOPAT} &= \text{Sales} - \text{Operating expenses} - \text{Taxes} \\
\text{Capital} &= \text{Net working capital} + \text{Net fixed assets}
\end{align*}\]
The Great Equivalence

There is a sequence of events that ties together the operating and financing approaches (see exhibit 3.10). First, a company raises a mix of debt and equity [capital defined from the financing perspective (1)] and then invests those funds in its business [in net working capital and net fixed assets comprising capital viewed from an operating perspective (2)]. Next, the business begins to generate sales and incur genuine operating expenses and taxes [resulting in NOPAT from the operating side (3)], which, in turn, constitutes a pool of cash that is available for distribution to all financiers (4). That is, it is available to provide cash returns (after taxes) to the prior-claim financiers (lenders, minority investors, and preferred stockholders) to be buried in some accounting reserve or to accrue as bottom-line accounting profits whose meaning is quite obscure to me. The point, though, is that what the business earns on the one hand must be the total cash available to reward investors on the other. The equivalence, true by definition because sources and uses of cash must balance, is the reason why the value of all investors' claims can be determined by discounting NOPAT, a topic we take up in chapter 7.

Once operations are separated from finance in this way, a powerful message is delivered: If management can be successful at managing the business, the investors in the business will be well taken care of.

A Calculation of NOPAT and Capital for Wal-Mart

The calculations of NOPAT and capital will be illustrated for Wal-Mart, the discount retailer.

The Accounting Presentation

The conventional accounting balance sheet for Wal-Mart at year-end 1987 and 1988 (FYE January 31, the following year) is presented in exhibit 3.11, and the income statement for the year 1988 appears in exhibit 3.12. Both exhibits deserve your close scrutiny. Of course, all of the really useful information is buried in the footnotes to the financial statements. The footnotes are where the equity equivalent reserves are to be found, as the following excerpts from Wal-Mart's annual report (FYE January 31, 1989) illustrate.

Find It in the Footnotes

Footnote 1 Inventories are stated principally at cost (last-in, first-out), which is not in excess of market. Conclusion: The LIFO reserve should be added back to inventories and to common equity, and the change taken into profits.

Footnote 2 Replacement cost for inventories would be $291,329,000 greater in 1988 and $202,796,000 greater in 1987. Conclusion: Here is the LIFO reserve to add to capital. Furthermore, the $88,533,000 increase in LIFO reserve ($291,329,000 less $202,796,000) will add to income and reduce the cost of goods sold.
In the absence of quoted prices, the market value of Wal-Mart's debt and leases is assumed to be the same as its accounting book value. But although the economic book value of Wal-Mart's common equity (including EEs) is $3,400,601M, the fair market value is estimated to be $17,748,245M, a result produced by multiplying Wal-Mart's 565,591M shares outstanding by the $31.38 stock price prevailing at the end of its 1988 fiscal year. The "fair" market value of Wal-Mart's capital thus amounts to 3.7 times its economic book value ($19,580,711M/$5,233,067M). Why it is that Wal-Mart should sell for so large a premium will become clearer in the next chapter when the company's extraordinary growth rate is taken into account.

Summary

Warren Buffett, chairman of Berkshire Hathaway, epitomizes the thinking behind the economic model of value. He believes that his primary responsibility as a CEO is to be an effective steward of his shareholders' funds, not a manager dedicated to any one particular business:

"I'm in the capital allocation business," he says. "My job is to figure out which businesses to invest in, with whom, and at what price. I'm not like a steel executive who can think only about how to invest best in steel. I've got a bigger canvas, simply because I have spent my life looking at companies from Abbott Labs and going through to Zenith."

"Leaders of the Most Admired"
Fortune
January 29, 1990

To satisfy astute investors who think like Buffett, a company must earn a rate of return that exceeds its cost of capital. Those that do so will add value to the capital they employ and will sell for premium stock prices. Those that do not will have misallocated or mismanaged capital and will sell for stock market values that discount their capital employed.

Although it is easy to compute and is relatively widely understood, the rate of return on equity is a flawed measure of performance. It is distorted by accounting conventions that make financial statements more useful for lenders than for shareholders. It also mixes operating and financing decisions in a flagrant contradiction of a fundamental principle of corporate finance. With ROE as its goal, management may be tempted to accept truly substandard projects that happen to be financed with debt and to pass by very good ones if they must be financed with equity.

In its place, the rate of return on total capital should be the measure employed to assess corporate performance. Computed by dividing NOPAT by the capital employed in operations, it is a savings account equivalent, after-tax cash-on-cash yield earned in the business. It measures the productivity of capital employed without regard to the method of financing, and it is free from accounting distortions that arise from accrual bookkeeping entries, from the conservative bias of accounting statements, and from the tendency to understate capital by writing off unsuccessful efforts.

The cost of capital is the minimum rate of return that must be earned in order to add value to capital. It is not a cash cost, though. Rather, it is an opportunity cost equal to the total rate of return that a company's investors could expect to earn by investing in the stocks and bonds of other companies of comparable riskiness. From the perspective of a company's investors, who can invest in anything ranging from essentially default-free government bonds to corporate bonds, high-yield bonds, common stocks, venture capital funds, and, ultimately, options, the cost of capital is driven by the proven trade-off between risk and expected reward.

For corporate managers the cost of capital can be defined perhaps more meaningfully as the rate of return that some alternative, or marginal, project also up for consideration promises to earn. To be acceptable, any one project must beat the return offered by that hypothetical alternative in order for the world at large to be better off. Although it may be difficult to visualize, it is nonetheless true that it is the competition for capital at the margin that drives stock prices, and not the trench warfare against business competitors per se.

The competition for capital is the essence of the economic framework, but it is only a snapshot. In reality, corporate performance is dynamic, and that adds another dimension to our quest for value.