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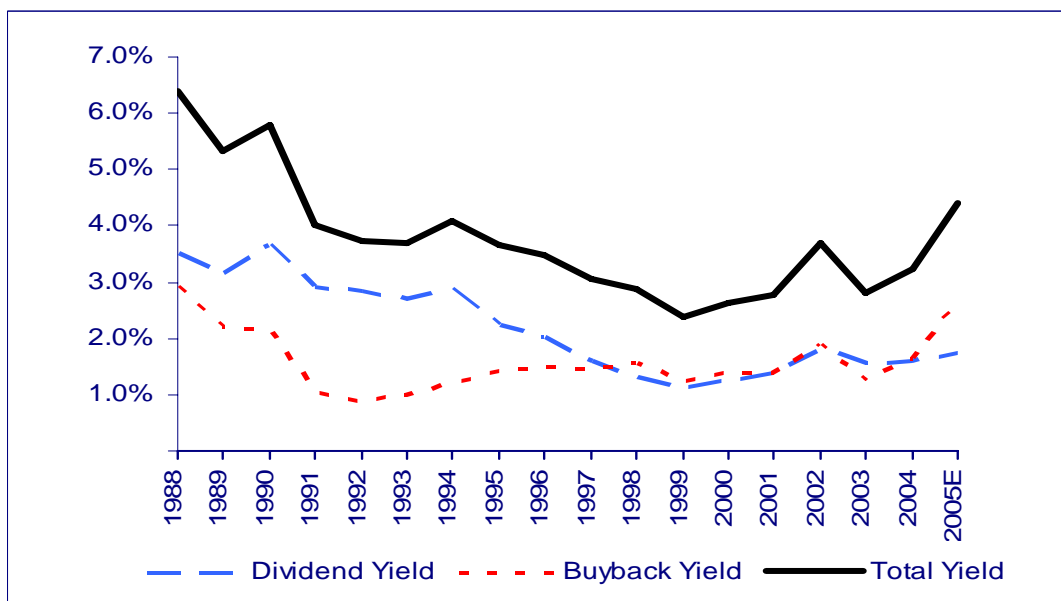
## Clear Thinking about Share Repurchase

### Capital Allocation, Dividends, and Share Repurchase

#### Why Buybacks are so Important Now

When companies with outstanding businesses and comfortable financial positions find their shares selling far below intrinsic value in the marketplace, no alternative action can benefit shareholders as surely as repurchases.

Warren Buffett  
*BerkshireHathaway 1984 Annual Report*



Source: *Empirical Research Partners.*

- **Corporate America is flush, and returns and cash flows remain strong. Capital deployment is front and center.**
- **Aggregate share buybacks are now larger than dividends. While buybacks and dividends are mathematical equivalents, executives and investors conceptualize them very differently.**
- **Managers cite multiple motivations for buying back stock. A number of these motivations risk conflicting with principles of value creation.**
- **Earnings-per-share accretion or dilution has nothing to do with whether a buyback makes economic sense. The relationship between price and expected value dictates a stock buyback's economic merits.**

## Introduction

Corporate America is in an unusual position today: even after returning a record one-half *trillion* dollars to shareholders in 2005, companies remain flush. Cash balances are high, debt levels are low, and free cash flow has never been stronger. Delivering superior shareholder returns in upcoming years may require companies to show the same savviness in capital markets as they do in product markets.

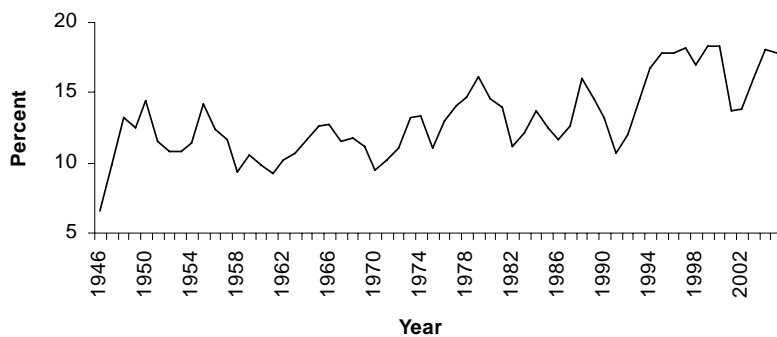
How did we get to this situation? The events of this century's first six years encouraged companies to focus internally, leading to today's financial position. These include a brutal three-year bear market in equities (2000-2002), a number of high-profile corporate scandals, terrorism, a tight U.S. presidential election, heightened perceived geopolitical risk, a recession, and increased regulation. Companies responded by honing their operations, limiting capital spending, hiring sparingly, and hoarding capital. A recent report noted that companies in major economies went from using over \$500 billion in capital to fund their operations in 2000 to generating close to \$600 billion in free cash flow in 2004, nearly a \$1.1 trillion swing in just four years.<sup>1</sup>

The statistics today are impressive. Returns on capital, by any measure, are at or near all-time peaks. (See Exhibit 1.) Industrial companies in the S&P 500 sat on a cash pile of over \$600 billion as of late 2005. Free cash flow margins (free cash flow divided by sales) are close to all-time highs, capital spending as a percentage of gross cash flow remains near fifty-year lows, and total debt as a percentage of assets pushes at a record low. This all occurs against a backdrop of sharp productivity gains and stable and solid economic growth.<sup>2</sup> While investors may fret about the fiscal health of the government or the consumer, companies are in great shape.

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### Exhibit 1: Return on Equity for the S&P 500 (1946-2005E)

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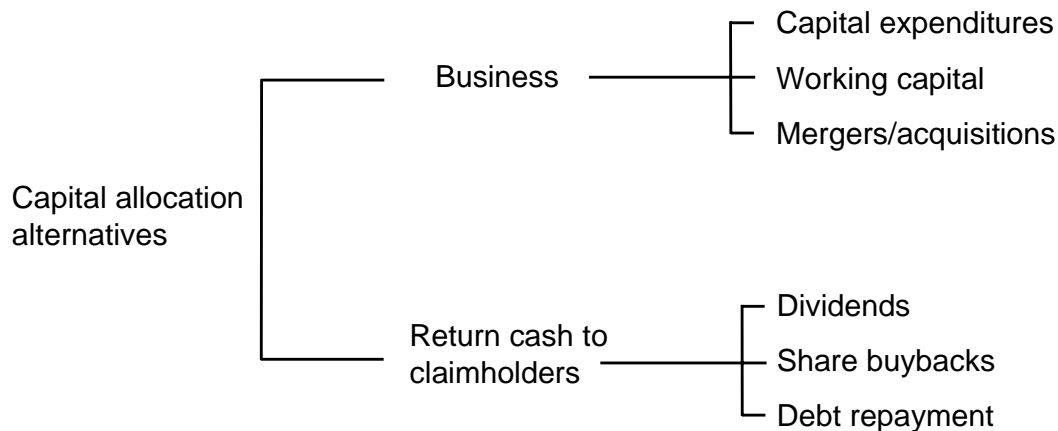
Source: Corporate reports, *Empirical Research Partners*, LMCM estimates.

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As a specific example, take the seventy-eight technology companies in the S&P 500. *Barron's* recently calculated that these companies held \$140 billion in net cash, about 7 percent of their aggregate market capitalization.<sup>3</sup> Adopting a 20 percent debt-to-total capital ratio would allow these companies to spend almost \$450 billion on some combination of capital investments, acquisitions, dividends, and buybacks. Appendix A argues corporate America's strong financial position may continue for some time.

So what will American companies do with this excess cash? Simplistically, companies have two alternatives for deploying capital: invest via capital spending, working capital, mergers and acquisitions or return capital to the business owners through dividends and share buybacks. (See Exhibit 2.) While capital deployment is ultimately senior management's most important task, many companies and investors fail to think clearly about how to best allocate capital systematically over the long term.<sup>4</sup>

**Exhibit 2: Capital Allocation Alternatives**



Source: LMCM.

Importantly, Exhibit 2 implies that corporate managers must judge the best and highest use for capital through constant evaluation of the tradeoffs between investing in the business and returning cash to the owners.<sup>5</sup> Management's inclination is almost always to plow capital back into the business. Indeed, as agents for the owners rather than large shareholders themselves, managements often have an incentive to expand the business versus giving cash back to shareholders. In reality, very few executives and corporate boards consider returning capital to the owners part of doing business.

This implicit bias fails to consider the crucial point that shareholders can reinvest the cash they receive into other companies or projects, often earning a higher return than the company can. While management's opportunity set is practically limited to the company's business or industry, shareholders do not have the same constraint. Ironically, the investment opportunity management should be most capable of valuing properly, the company's stock, is often dismissed in favor of harder-to-assess external investment opportunities.

**Dividends and Buybacks: Two Ways to Return Cash to Shareholders**

Companies choosing to return cash to shareholders can either pay a cash dividend or repurchase shares. Exhibit 3 shows the data for buybacks and dividends for the past 30 years or so. Since no unified approach to collecting these data exists, various sources provide differing sums.

Notwithstanding this qualification, the data reveal a few important points:

- *Buybacks took off in the mid-1980s.* In 1982, Congress enacted rule 10b-18, which provided companies with a safe harbor, or a legal shield from the threat of being sued, for the first time. This rule made large-scale buybacks viable for the first time in modern history. Any comparisons between the ratio of dividends to buybacks before and after 1982 appear misleading.
- *The value of buybacks exceeded dividends for the first time in the late 1990s.* Companies have consistently returned more capital to shareholders via share buybacks than dividends in recent years. Notably, the buyback numbers are heavily skewed: a small percentage of the companies represent a meaningful percentage of the total. That buybacks exceed dividends calls into question simple measures like dividend yield.
- *Dividends, while losing relative importance, continue to grow.* While the propensity to return cash has shifted toward buybacks, the total dividends companies pay are still increasing. This stable, albeit modest, growth points to some important psychological factors behind dividends.

- *Reappearing dividends?* In the early part of the 21<sup>st</sup> century, dividends gained relative ground versus buybacks for the first time in recent memory. Researchers attribute the rise in dividends to the general maturation of companies (more mature companies are more likely to pay dividends) and a desire to provide capital markets with a signal of confidence.<sup>6</sup>

**Exhibit 3: Dividend and Share Repurchase History (1977-2005E)**

Year	Dividends	Buybacks	Market Cap	Yield	Dividends as a % of total payout	Buybacks as a % of total payout
1977	34,861	2,018	894,890	4.1%	95%	5%
1978	40,551	4,049	939,880	4.7%	91%	9%
1979	45,050	4,825	1,113,170	4.5%	90%	10%
1980	50,675	5,037	1,214,619	4.6%	91%	9%
1981	56,606	6,866	1,355,451	4.7%	89%	11%
1982	63,097	7,189	1,279,223	5.5%	90%	10%
1983	66,051	9,869	1,779,503	4.3%	87%	13%
1984	70,375	11,318	1,656,984	4.9%	86%	14%
1985	78,512	30,413	1,939,516	5.6%	72%	28%
1986	81,519	48,063	2,448,451	5.3%	63%	37%
1987	91,050	50,990	2,986,688	4.8%	64%	36%
1988	102,284	67,932	2,777,652	6.1%	60%	40%
1989	105,842	61,636	3,283,610	5.1%	63%	37%
1990	107,844	56,868	3,241,494	5.1%	65%	35%
1991	108,759	40,122	3,961,906	3.8%	73%	27%
1992	108,499	36,498	4,552,283	3.2%	75%	25%
1993	114,697	41,421	5,338,308	2.9%	73%	27%
1994	119,507	51,087	5,417,098	3.1%	70%	30%
1995	125,186	77,144	6,733,531	3.0%	62%	38%
1996	137,611	100,077	8,313,157	2.9%	58%	42%
1997	136,794	129,821	10,646,546	2.5%	51%	49%
1998	144,140	184,693	13,064,650	2.5%	44%	56%
1999	146,299	180,690	15,206,862	2.2%	45%	55%
2000	160,561	194,778	15,066,000	2.4%	45%	55%
2001	163,321	179,563	13,291,000	2.6%	48%	52%
2002	163,262	176,378	10,167,000	3.3%	48%	52%
2003	175,288	166,494	13,042,100	2.6%	51%	49%
2004	202,190	223,717	13,343,000	3.2%	47%	53%
2005E	220,000	250,000	13,034,224	3.6%	47%	53%

In \$ millions.

Source: Corporate reports, *Empirical Research Partners*, *Bernstein Research*, FactSet, LCMCM estimates.

While dividends and buybacks both return cash to shareholders, a more fundamental question looms: are dividends and share buybacks mathematically equivalent?

While few executives or investors consider them the same (for reasons we will explore) the methods are identical assuming the same tax treatment, no transaction costs, comparable reinvestment rates, similar timing, and an efficient market. Appendix B shows this equivalence in detail.

Naturally, the laboratory conditions we impose on the model differ from the real world. Leaving aside the power of signals for a moment, evidence suggests that buybacks are a more efficient means of returning cash to shareholders for the following reasons:

- *Tax differential.* In May 2003, President George Bush signed legislation that, in part, lowered the maximum tax rate of dividends from 38 percent to 15 percent. While the permanence of this tax rate is still unclear, taxes on dividends and capital gains are equivalent for now. This equivalence obscures a benefit of buybacks: investors who elect to sell a portion of their holdings, creating a yield similar to a dividend, only pay taxes on

the difference between the selling price and their cost. In contrast, the full amount of a dividend is taxable.

- *Time is on your side.* Deferral provides buybacks with another tax advantage. Shareholders can choose to retain rather than sell their stock and hence defer tax payments until they sell. In this case, the benefit equals the time value of money.
- *Shareholder discretion?* With a dividend, the discretion lies with the firm. All shareholders receive the dividend and must deal with redeployment and tax consequences. In contrast, a share repurchase gives more discretion to the shareholders. Shareholders can opt in or out based on their tax situation, cost basis, the timing of their cash needs, and their company valuation.

For example, assume a shareholder believes a stock they own is undervalued (a likely condition). A dividend affects all shareholders the same way. But if the company buys back stock, the shareholder who decides not to sell ends up with a higher percentage stake in a more valuable company, provided the stock proves to be undervalued.

Despite this theoretical equivalence, corporate executives think about dividends and buybacks very differently. Executives generally consider maintaining the dividend to be on par with investment decisions, while having significant aversion to dividend cuts. In contrast, they perceive the buyback as a residual that follows investment and dividend commitments.

Similarly, executives deem buybacks much more flexible than dividends, reinforcing the sense that dividends are a quasi-contract while buybacks are more discretionary. Finally, even though corporate finance relies heavily on the role of taxes in judging the relative virtue of dividends versus buybacks, surveys of executives suggest taxes are a second-order concern in setting payout policy.<sup>7</sup> We find a substantial gap between the theory and practice in how companies return capital to shareholders.

### **The Golden Rule of Share Buybacks**

We can define a principle to serve as a universal yardstick for judging the rationale and attractiveness of a buyback program:<sup>8</sup>

*A company should repurchase its shares only when its stock is trading below its expected value and when no better investment opportunities are available.*

The first part of this principle—“a company should repurchase its shares only when its stock is trading below its expected value”—suggests management should act as a good investor by buying the stock when the price is below the value. Objective, analytical managers likely understand the business and its prospects better than outsiders, positioning them well to make this value-versus-price judgment. If price is truly below value, a buyback transfers wealth from selling shareholders to continuing shareholders. The resulting increase in expected value per share holds with management’s objective to maximize shareholder value for its continuing shareholders.

The principle’s second part, “no better investment opportunities are available,” addresses a company’s priorities. Buybacks may appear attractive, but reinvesting in the business may provide a better opportunity. Value-maximizing companies fund the highest return opportunities first.

The principle also has a couple of noteworthy corollaries.

First, the rate of return on a buyback depends on how deeply the market undervalues the stock. If a company buys back undervalued shares, continuing shareholders earn a return in excess of the

cost of equity. The shareholder rate of return is the cost of equity divided by the ratio of stock price to expected value. For instance, say a company has an 8 percent cost of equity and the stock is trading at 80 percent of expected value. Dividing 8 percent by 80 percent yields a 10 percent expected return for continuing shareholders. (See Exhibit 4.) Managers can compare this rate of return with alternative uses of capital. Alternatively, a buyback of undervalued shares serves to increase the per-share value of the remaining shares. Appendix C walks through this analysis in detail.

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**Exhibit 4: Rate of Return on a Stock Buyback**

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		Price-to-value ratio			
		0.60	0.80	1.00	1.20
Cost of equity	7%	11.7%	8.8%	7.0%	5.8%
	8%	13.3%	10.0%	8.0%	6.7%
	9%	15.0%	11.3%	9.0%	7.5%
	10%	16.7%	12.5%	10.0%	8.3%
	11%	18.3%	13.8%	11.0%	9.2%

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Source: LMCM analysis.

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Second, a buyback can be more attractive than an investment in the business. Properly-oriented managers recognize they should fund all investments that promise to create value. But what if a company has no excess cash or borrowing capacity and hence must partially or wholly forgo a value-creating investment in the business to repurchase shares? A company should consider the buyback when it provides a more attractive return than investing in the business. In reality, very few managers think this way.

Armed with a means for assessing management's share-buyback decision, we can take a look at the popular motivations for buying back stock. As we will see, management motivations are often far from pure and are flatly misguided in numerous instances.

**The Motivations for Share Buybacks**

Since 2000, over three-quarters of the companies in the S&P 500 have bought back stock. We now look at the four primary reasons companies cite for buying back their stock: signaling the shares are undervalued, managing earnings per share, offsetting dilution from option programs, and increasing financial leverage. Specifically we seek to distinguish between decisions that benefit continuing shareholders and those that potentially harm shareholders.

1. *To Signal to the Market the Shares are Undervalued*

Though managers most often cite signaling as their primary motivation,<sup>9</sup> the signal from buybacks has weakened over the years. Why?

First, managers have historically done a poor job of following through on buyback announcements, although they have improved in recent years. In the 1980s, for example, companies failed to complete 25 percent of authorized open-market buyback programs within three years of announcement.<sup>10</sup> Managers in general are not as committed to executing buyback programs as they are to paying dividends.

Another reason the signal has weakened over the past 20 years relates to the methods companies use to buy back their shares:

- *Open-market purchases.* In this method, the most widely used by far, companies simply purchase their own shares in the open market like any other investor. Although open-market purchases have legal restrictions, this method offers the greatest degree of

flexibility. On the other hand, open-market purchases convey the weakest signal of management conviction, particularly when made solely to offset dilution from options.

- *Dutch auction.* In a Dutch auction, management defines the number of shares it intends to buy, an expiration date, and a price range within which it is willing to buy (generally a premium to the market).<sup>11</sup> Shareholders may tender their shares at any price within the range. Starting at the bottom of the range, the company sums the cumulative number of shares necessary to satisfy the program. All tendering shareholders at or below the clearing price receive the clearing price for their stock. Dutch auctions generally send strong signals, and management can execute them relatively efficiently.<sup>12</sup>
- *Fixed-price tender offers.* With this method, management offers to repurchase a set number of shares at a fixed price through an expiration date. The price is often a significant premium to the market, and companies generally tender for a sizable percentage of the shares outstanding. Shareholders may or may not elect to tender their shares. Fixed-price tenders, especially debt-financed ones, tend to be powerful, positive signals to the market.
- *Privately negotiated purchases.* In this case, the company strikes a deal with a single shareholder. In the 1980s, some companies purchased positions from investors or companies threatening a takeover. However, such greenmail transactions represent less than 10 percent of privately negotiated buybacks in the past 20 years. This type of buyback remains relatively rare.

In recent years we have also seen an increase in accelerated share repurchase programs. Here, a company purchases shares from an investment bank, allowing the company to retire a large block of shares immediately. Simultaneously, the company enters into a forward contract with the investment bank, agreeing to pay the average market price of the shares the bank repurchases over a specified period, typically six to nine months.

At the end of the period, there is net settlement between the parties; the company pays the investment bank—or gets credited—the difference between the initial and average share buyback price. The bank pays the company the time value of the funds, less dividends. Companies utilizing accelerated share repurchase programs in 2005 include DuPont, Sara Lee, Hewlett-Packard, and Duke Energy.

Open-market purchases emit the weakest signal, whereas Dutch auctions and fixed-price tenders tend to convey much stronger signals. In the 1980s, Dutch auctions and fixed-price tenders represented about 22 percent of buyback volume in the U.S. In the 1990s, however, they constituted only 4 percent of the total. Consequently, the number of strong-signal announcements has fallen sharply. (See Exhibit 5.)

**Exhibit 5: The Waning Signal: Types of Buyback Programs**

Year	Open Market	Privately Negotiated Purchases	Fixed Price Tender Offers	Dutch Tender Offers
1980	100%	0%	0%	0%
1981	69%	0%	31%	0%
1982	73%	0%	27%	0%
1983	63%	0%	37%	0%
1984	59%	0%	41%	0%
1985	45%	11%	40%	3%
1986	62%	14%	17%	7%
1987	82%	7%	8%	3%
1988	68%	6%	9%	17%
1989	84%	6%	3%	7%
1990	78%	9%	8%	5%
1991	76%	17%	4%	4%
1992	87%	4%	3%	5%
1993	90%	4%	2%	3%
1994	92%	2%	5%	1%
1995	83%	16%	1%	1%
1996	91%	6%	2%	2%
1997	88%	7%	2%	3%
1998	95%	2%	2%	1%
1999	94%	2%	1%	3%
2000	88%	1%	9%	2%
2001	95%	3%	1%	0%
2002	93%	5%	1%	1%
2003	94%	3%	2%	2%
2004	95%	2%	1%	2%
2005E	93%	3%	1%	3%
<b>TOTAL</b>	<b>88%</b>	<b>5%</b>	<b>4%</b>	<b>3%</b>

Source: Gustavo Grullon and David L. Ikenberry, "What Do We Know About Stock Repurchases?" *Journal of Applied Corporate Finance*, Spring 2000, Securities Data Corporation, and LMCM estimates.

Buyback details also affect the interpretation of the signal. Specifically, a few factors point to management's conviction that the shares are undervalued:<sup>13</sup>

- *Size of buyback program.* All things being equal, the larger the program—the higher the percentage of the shares outstanding the company actually retires—the greater management's conviction. Recent data (2000-2005) show that very large programs (companies retiring 15 to 20 percent of shares) lead to better share price performance than the giant programs (20 percent-plus).<sup>14</sup>
- *Premium to market.* Sizable premiums reflect management's belief the shares are undervalued and a willingness to act. Since 2000, companies that have tendered at a premium delivered excess returns versus the S&P 500.
- *Insider ownership.* Relatively high insider ownership better aligns the economic interests of managers and shareholders. Managers with relatively significant equity will more likely invest only in value-creating opportunities than maximize firm size.



- *Insider selling.* When managers execute a sizeable buyback program and indicate they will not sell any of their shares, they increase their personal bet on the company's success. This action sends the market a positive signal.

Exhibit 6 summarizes the various buyback approaches along with their benefits, drawbacks and common motivations. In gauging the credibility of a buyback's signal, investors are well off to heed the age-old adage that actions speak louder than words.

**Exhibit 6: Benefits and Drawbacks of Various Buyback Approaches**

	Benefits	Drawbacks	Strength of Signal to Market	Tax Benefit	Common Reasons for this Method	
<b>Gradual Open Market Share Repurchase</b>	Most flexible method	May be announced, but not completed	Typically weak		Return cash to shareholders Buy "undervalued" stock Change capital structure Offset stock option dilution	
	Can time repurchases to offset dilution from options		Can be strong if firm previously over-invested excess cash			
	Inexpensive		Depends on management credibility			
	Gradually increases earnings per share by lowering share count					
<b>Accelerated Share Repurchase</b>	Can be structured to be flexible		Stronger than gradual repurchase, as firm buys back shares immediately	Company receives tax efficient return on purchase price of shares for period specified in forward contract	Return cash to shareholders Buy "undervalued" stock Change capital structure Offset stock option dilution	
	Inexpensive					Can be strong if firm previously over-invested excess cash
	Immediately increases earnings per share by lowering share count					
<b>Dutch Auction Tender Offer</b>	Usually results in permanent increase in stock price from strong positive signal to market	If investors do not heed positive signal, premium paid over market price can result in wealth transfer from ongoing shareholders	Strong positive signal		Return cash to shareholders Buy "undervalued" stock Change capital structure	
	Offers lower risk of undersubscription than fixed price tender		Strength of signal increases if insiders do not tender, and the size of the tender offer and the premium to market increases			
	Range of prices allows market forces to determine amount of shares tendered					
<b>Fixed Price Tender Offer</b>	Usually results in permanent increase in stock price from strong positive signal to market	If investors do not heed positive signal, premium paid over market price can result in wealth transfer from ongoing shareholders	Strong positive signal		Return cash to shareholders Buy "undervalued" stock Change capital structure	
	Often used to increase value via leveraged recapitalization		Strength of signal increases if insiders do not tender, and the size of the tender offer and the premium to market increases			
			Offers higher risk of undersubscription than Dutch auction			
<b>Private</b>	Can be used to buy back shares from shareholder who wants to sell	Usually associated with "greenmail" Management typically pays premium	Negative signal, as management displays willingness to transfer wealth from ongoing shareholders		Avoid takeover	
<b>Puts/Collars</b>	Lowers cost of repurchase if stock price goes up			Income from writing put warrants is tax-free to company	Hedge against share price appreciation	

Source: LMCM analysis.

Finally, a recent study suggests a number of repurchase programs are announced with the intention of misleading investors. The researchers focus on companies that aggressively deploy discretionary tools—a means to manipulate earnings—and find the companies suffer from poor operating performance over the long term. The analysis suggests these companies announce buybacks to boost the stock price in the short term. This risk adds ambiguity to the buyback signal, especially for open market programs.<sup>15</sup>

2. *To Manage Earnings per Share*

When management announces a share buyback for the purpose of managing earnings per share, management actions and the guiding principle of buybacks often come into direct conflict. Earnings per share do not explain value effectively because they do not incorporate the cost of capital, they neglect investment needs, and companies can compute them using alternative, acceptable methods.

Nevertheless, managements persist in their efforts to maximize earnings per share—sometimes, we will see, at the expense of maximizing value. Why? First, they often believe the investment community mechanically and uncritically applies a multiple to current earnings to establish value. (As disturbing, many investors believe this, as well.) Second, many executive compensation schemes are partially tied to earnings targets.

The EPS management motivation has no sound financial basis. Whether a buyback program increases or decreases earnings per share is a function of the price/earnings multiple and either the company's forgone after-tax interest income or the after-tax cost of new debt the company uses to finance the buyback. More concretely, when the inverse of the price/earnings multiple—often called the earnings yield—is higher than the after-tax interest rate, a buyback adds to earnings per share. When the earnings yield is less than the after-tax interest rate, a buyback reduces earnings per share. The relationship between the earnings yield and the after-tax interest rate has little or nothing to say about value.

Here's a very simple example. Assume three companies (A, B, and C) have identical \$100 cash balances, operating income, tax rates, shares outstanding, and earnings per share. Only their stock prices are different. (See Exhibit 7.)

Now assume each company uses its \$100 cash balance to buy back stock. A, B, and C can buy ten, three, and two shares, respectively. We can see that earnings per share rise for company A, remain unchanged for company B, and decline for company C. Note that the changes in earnings per share are completely independent of the relationship between price and expected value. A buyback of an overvalued stock can add to earnings per share while decreasing value for continuing shareholders and a buyback of an undervalued stock can reduce earnings per share while enhancing value for ongoing holders.

Thus, earnings-per-share accretion or dilution has nothing to do with whether a buyback makes economic sense because the relationship between the P/E and the interest rate dictates the accretion or dilution, while the relationship between price and expected value dictates a stock buyback's economic merits.

Repurchasing overvalued shares or refraining from buying undervalued shares because of the unfavorable earnings-per-share impact is shareholder-unfriendly finance. Similarly, the notion that buybacks of high-P/E stocks are bad, or that buybacks of low P/E stocks are good, defies economic reasoning.

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**Exhibit 7: EPS Impact of a Share Buyback**

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**Company Comparison prior to Share Buyback**

	<u>Company A</u>	<u>Company B</u>	<u>Company C</u>
Operating income	\$95	\$95	\$95
Interest income (\$100 at 5%)	\$5	\$5	\$5
Pretax income	\$100	\$100	\$100
Taxes (at 40%)	\$40	\$40	\$40
Net income	\$60	\$60	\$60
Shares outstanding	60	60	60
<b>Earnings per share</b>	<b>\$1.00</b>	<b>\$1.00</b>	<b>\$1.00</b>
Stock price	\$10.00	\$33.33	\$50.00
P/E	10.0	33.3	50.0
E/P	10.0%	3.0%	2.0%
After-tax interest rate	3.0%	3.0%	3.0%

**Company Comparison after Share Buyback**

	<u>Company A</u>	<u>Company B</u>	<u>Company C</u>
Operating income	\$95	\$95	\$95
Interest income	\$0	\$0	\$0
Pretax income	\$95	\$95	\$95
Taxes (at 40%)	\$38	\$38	\$38
Net income	\$57	\$57	\$57
Shares repurchased	10	3	2
Shares outstanding	50	57	58
<b>Earnings per share</b>	<b>\$1.14</b>	<b>\$1.00</b>	<b>\$0.98</b>

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Source: Rappaport and Mauboussin, 179-180.

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3. *To Reduce Dilution from Employee Stock Options*

A substantial percentage of executives cite ESO dilution management as an important input in their share-repurchase decision. In this case, companies aim to buy enough shares to keep the level of outstanding shares constant. Over 30 percent of the S&P 500 companies repurchasing since 2000 have not seen a net shrinkage in shares outstanding.

Although evidence suggests that part of the surge in share repurchases in the 1990s was related directly to countering the potentially dilutive impact of option grants, research shows the market reacts less favorably to repurchases by companies with substantial option programs.<sup>16</sup>

We strongly believe that managers should weigh the merits of a buyback and a compensation program separately. Buybacks effected solely to offset dilution from employee stock option programs risk destroying shareholder value for ongoing shareholders. The argument against this motivation runs similar to the one against EPS management: the magnitude and timing of the buybacks have nothing to do with the price-to-value gap.

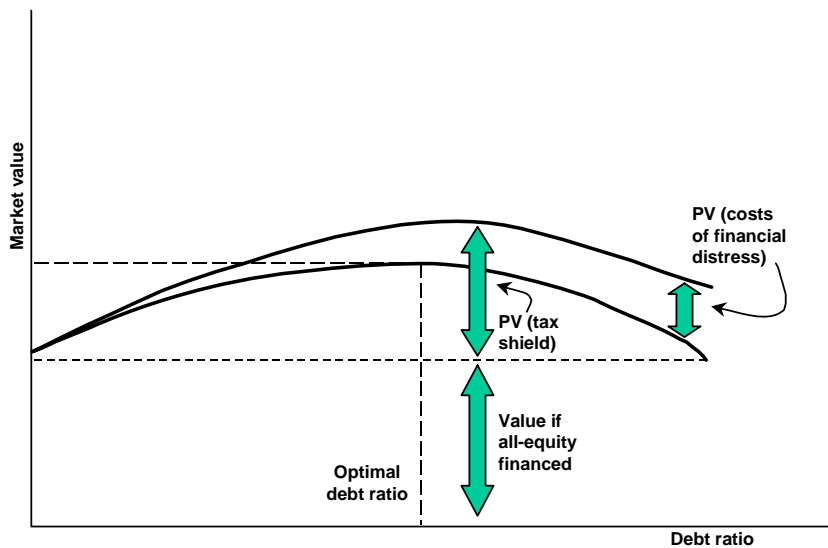
On the other hand, companies buying back stock to offset dilution are not necessarily destroying value for ongoing shareholders, as some pundits assume. Even if the motives are not correct, the outcome can be consistent with creating value.

4. *To Increase Financial Leverage.*

Share repurchase can play a central role in changing a company’s capital structure. Specifically, buybacks efficiently increase the debt/equity ratio for underleveraged firms. An appropriate level of financial leverage results in an optimal capital structure—a healthy balance between beneficial tax shields and the risk of financial distress. This minimizes the cost of capital, which enhances shareholder value. (See Exhibit 8).

Despite evidence that incorporating debt into the capital structure can increase firm value, the suggestion that leverage is a source of value creation from buybacks is less clear.<sup>17, 18</sup> Further, changes in the tax law have made debt relatively less attractive than equity.

**Exhibit 8: Optimal Capital Structure**



Source: Richard A. Brealey and Stewart C. Myers, *Principles of Corporate Finance, 6<sup>th</sup> ed.*, (New York: McGraw Hill, 2000), 511 .

Capital structure determines whether a firm pays out operating income as interest expense or as equity income.<sup>19</sup> The U.S. government taxes interest at the personal level (the top rate in the U.S. is currently 35%) and taxes equity income at both the corporate rate (35%) and on the personal level (15% for long-term capital gains). As a result, debt financing is slightly more desirable than equity financing, up to a point. (See Exhibit 9.)

**Exhibit 9: The Advantage of Debt versus Equity Financing**

	Interest	Equity income
Operating income	\$1.00	\$1.00
Corporate tax (@ 35%)	-	0.35
Income after corporate tax	1.00	0.65
Personal tax (@ 35%)	0.35	-
Capital gains tax (@ 15%) *	-	0.05
Income after all taxes	\$0.65	\$0.60

(\*) = Assumes the effective capital gains rate is 50% of the statutory rate.

Source: Brealey and Myers, LMCM analysis.

Increases in financial leverage can be beneficial beyond the capture of tax shields. Specifically, high interest expense payments mean a company has less discretionary cash to invest in value-destroying projects. As such, debt serves as a built-in check on the capital allocation process, forcing management to submit to the market’s judgment every time it wants to raise capital to

invest. Unsurprisingly, investors generally cheer debt-increasing financial maneuvers with a higher stock price.<sup>20</sup>

Other relevant capital structure considerations include the following:

- *The value of a tax shield is measurable.* For a company with positive pretax profits, tax-deductible interest expense creates a valuable tax shield. We can estimate the value of this shield using one of two ways. The first approach, which assumes a permanent change in capital structure, is to capitalize the tax savings.<sup>21</sup> You calculate this by dividing the tax savings (interest expense times the marginal tax rate) by the pretax cost of debt. Second is the adjusted present value (APV) method.<sup>22</sup> APV determines business value by summing its unlevered value and the value of its financial strategy. APV offers more flexibility than capitalizing tax shields because it accommodates changing capital structures.
- *Varying tax rates complicate the debt versus equity decision.* As seen above, changes in corporate, personal, and capital gains tax rates can amplify or dampen the advantage of debt versus equity financing.<sup>23</sup> The current tax code slightly favors the prudent use of debt.
- *At a certain point, the risks of financial distress outweigh the benefit of debt.* Too much debt can lead to an inability to meet contractually obligated commitments, even for a business with healthy cash flows. Financial distress is onerous, with substantial direct and indirect costs. Direct costs include legal and administrative fees in bankruptcy. Indirect costs include forgone business with suppliers and customers uncertain about the future of a financially distressed firm. Managers should weigh the benefit of financial leverage against the potential cost.
- *What about financial flexibility?* Managers often argue that a conservative capital structure is important in order to maintain financial flexibility, especially for companies largely reliant on intangible capital.<sup>24</sup> We can define financial flexibility as the ability to quickly access capital for an attractive investment opportunity or to weather a business downturn. This option has questionable value for a couple of reasons. First, a company can generally raise the capital required to fund value-creating projects, be it debt or equity, rapidly and cheaply. Second, managers often do not take into account the opportunity cost of excess capital parked on the balance sheet. If shareholders can redeploy funds at a rate higher than what the cash earns, the company should return the capital to shareholders.

## **Conclusion**

Given the substantial overcapitalization of many companies in America today, understanding how a company is likely to allocate capital is more important than ever. While buybacks reached record levels in 2005, the motivations behind buybacks do not always follow solid economic reasoning. Investors are well served to study the issues around buybacks, and insist the companies they invest in do the right thing.

## Appendix A: Why This Issue May Not Go Away Soon

Return on equity (ROE) has substantial limitations as a measure of economic returns.<sup>25</sup> But ROE, when combined with corporate payout policy, can provide some basic insights into the composition of growth. Simply, we can state:

$$\text{Earnings growth} = (1 - \text{payout ratio}) \times \text{ROE}$$

Over the last fifty years, the payout ratio (heavily determined by dividends until the mid-1980s) has been just over 50 percent and ROE in the 12 to 13 percent range, yielding nominal earnings growth of 6 to 7 percent. Inflation during the same period averaged 3 to 4 percent.

In turn, we can decompose ROE using the DuPont formula:

$$\text{ROE} = \text{net margin} \times \text{asset turnover} \times \text{financial leverage}$$

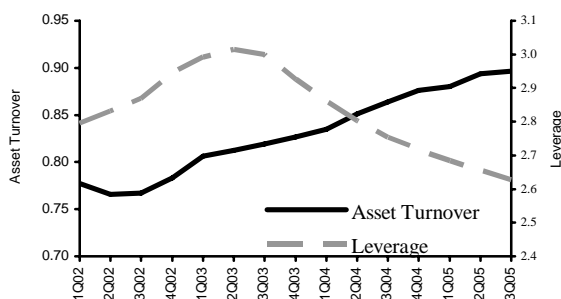
The S&P 500's estimated 2005 ROE of roughly 18 percent is above-average, reflecting high margins and average ratios for asset turnover and financial leverage. If today's ROE persists, one of the equation's factors has to change:

- *Earnings growth will exceed historic rates.* We find this unlikely because aggregate growth is governed by macro factors like GDP growth.
- *The payout will rise.* An increase in payout ratios via dividends and buybacks is the most likely of these scenarios.
- *Financial leverage will decline further.* Corporate America is arguably already underleveraged, and there has been a steady drumbeat from investors encouraging more leverage.

Alternatively, ROE's can come down, reverting toward the cost of capital. So what's the chance ROE's will remain at today's lofty levels? In their book, *Our Brave New World*, the GaveKal researchers point to the emergence of platform companies—entities that focus mostly on product design and marketing and outsource manufacturing to countries with lower labor costs. They argue the rise of platform companies leads to greater capital efficiency, lower volatility, and higher returns on equity.<sup>26</sup>

On the surface, the data do not seem to support the thesis, as asset turnover ratios are just average. But the aggregate ratio obscures the sharp rise in goodwill as the result of robust mergers and acquisitions activity in the last 10-15 years, as well as the substantial buildup of excess cash. Returns on tangible operating assets have been rising steadily. Further, asset turnover ratios have risen sharply and leverage ratios have dropped significantly in recent years. See Exhibit 10.

**Exhibit 10: Asset Turnover and Leverage (S&P Industrials)**



Source: Compustat, Morgan Stanley.

While more platform companies suggest less capital intensity in the U.S., the shift also implies greater investment in people. The sharp rise in employee stock grants in the late 1990s seemed to strongly reaffirm this perspective. As it turned out, however, option grants appear to have been strongly correlated to market performance. The value of option grants for S&P 500 companies peaked at over \$100 billion in 2000 and slid to a level below \$40 billion in 2004. As we will see, option grants and the mental models surrounding them play a significant role in how companies evaluate dividend and buyback tradeoffs.

**Appendix B: Demonstration that Dividends and Buybacks are Equivalent**

The best way to demonstrate the equivalence of dividends and buybacks looks simply at the numbers. Exhibit 11 shows a stream of distributable cash flows for a hypothetical company. Neither the pattern nor the longevity of the cash flow streams affects the result of the analysis. We then value the company at each time period. At the end of the last time period the cash flow stream is worth \$1,750, assuming the investor reinvests the cash flows at the cost of capital. (In fact, there is no need to assume investors reinvest at the cost of capital, we just need to assume they reinvest at the same rate.)

**Exhibit 11: Hypothetical Company**

Growth	9%	Shares outstanding	110.28
Cost of Capital	8%	Share price (t <sub>0</sub> )	\$ 10.00

Period	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Cash flows	100.0	109.1	119.1	129.9	141.8	1,000.0

**Present Value at Time 0**

PV cash flows	92.6	93.5	94.5	95.5	96.5	630.2
Plus realized cash	-					
Total value	1,102.8					

**Present Value at Time 1**

PV cash flows	101.0	102.1	103.1	104.2	680.6
Plus realized cash	100.0				
Total value	1,191.0				

**Present Value at Time 2**

PV cash flows	110.2	111.4	112.5	735.0
Plus realized cash	217.1			
Total value	1,286.3			

**Present Value at Time 3**

PV cash flows	120.3	121.5	793.8
Plus realized cash	353.5		
Total value	1,389.2		

**Present Value at Time 4**

PV cash flows	131.3	857.3
Plus realized cash	511.7	
Total value	1,500.3	

**Present Value at Time 5**

PV cash flows	925.9
Plus realized cash	694.4
Total value	1,620.4

**Present Value at Time 6**

PV cash flows	-
Plus realized cash	1,750.0
Total value	1,750.0

**Assumes:**

- \*Dividends/repurchase occur on last day of the year
- \*Dividend/repurchase proceeds are reinvested at the cost of capital
- \*Stock price is at "fair value" at year-end

Source: LMCM.



We now consider two scenarios. In the first, the company pays the cash out in the form of a dividend (see Exhibit 12).

**Exhibit 12: Cumulative Dividend Value**

Year	Current payment	Reinvestment	Total value
1	100.0	-	100.0
2	109.1	8.0	217.1
3	119.1	17.4	353.5
4	129.9	28.3	511.7
5	141.8	40.9	694.4
6	1,000.0	55.6	1,750.0

Source: LMCM.

In the second, the company repurchases stock with the funds (see Exhibit 13).

**Exhibit 13: Share Repurchase Program**

Year	Starting shares	Value/share	# Shares buyback	Adjusted shares	Adjusted value	Buyback value	Price	Reinvestment	Total value
1	110.3	\$ 10.80	9.3	101.02	1,091.0	\$ 100.0	\$ 10.80		1,191.0
2	101.0	\$ 11.66	9.4	91.67	1,069.2	\$ 109.1	\$ 11.66	8.0	1,286.3
3	91.7	\$ 12.60	9.5	82.21	1,035.7	\$ 119.1	\$ 12.60	17.4	1,389.2
4	82.2	\$ 13.60	9.5	72.67	988.6	\$ 129.9	\$ 13.60	28.3	1,500.3
5	72.7	\$ 14.69	9.6	63.02	925.9	\$ 141.8	\$ 14.69	40.9	1,620.4
6	63.0	\$ 15.87	63.0	-	-	\$ 1,000.0		55.6	1,750.0

Source: LMCM.

The analysis shows these two means of returning cash to shareholders are identical, under the following assumptions:

- No taxes
- No transaction costs
- Dividend and share repurchase proceeds are reinvested at the discount rate
- Dividends and share repurchases occur on the last day of the year
- The stock price is at fair value at year-end

Of course, reality is messier than the sterile world the model assumes. Still, the underlying principle is a central one: managers can return cash to shareholders using either dividends or share repurchase. Investors seeking current yield under the share repurchase scenario can simply sell a proportionate amount of their shares to create liquidity.

## Appendix C: How Buying Back Undervalued Shares Can Increase Shareholder Value

In Berkshire Hathaway's 1984 annual report, Warren Buffett noted, "When companies with outstanding businesses and comfortable financial positions find their shares selling far below intrinsic value in the marketplace, no alternative action can benefit shareholders as surely as repurchases." Here we develop this point through an example and formal proof. The analysis provides a formula to determine how much a company can increase its per-share intrinsic value by buying back undervalued shares.

In our example, a CFO correctly believes that the market undervalues her \$10 stock by 20%. Despite communicating the firm's excellent prospects to investors, this discount persists. See Exhibit 14.

### Exhibit 14: CFO's Perception versus Market Reality

Trading value of total firm	\$ 800
Intrinsic value of total firm	\$ 1,000
Trading value per share	\$ 8.00
Intrinsic value per share	\$ 10.00
Shares outstanding	100.0

Source: LMCM analysis.

The CFO decides to take advantage of this opportunity by repurchasing 20% of the outstanding shares. She uses the firm's \$160 in cash to purchase 20 shares at the market price of \$8 per share. This lowers the intrinsic value of the firm by the \$160, from \$1,000 to \$840. However, the firm now has 20 less shares. On a per-share basis, then, intrinsic value rises from \$10 to \$10.50—an increase of 5%. See Exhibit 15.

### Exhibit 15: Intrinsic Value Rises after Buying Undervalued Shares

Shares repurchased	20.0
New shares outstanding	80.0
Amount of cash needed to finance buyback	\$ 160
New intrinsic value of firm	\$ 840
Intrinsic value per share	\$ 10.50
Increase in intrinsic value per share	5.0%

Source: LMCM analysis.

We can derive a formula to yield the same result. We start with the formula for the percent increase in intrinsic value per share:

$$\% \text{ Increase in Intrinsic Value per Share} = \frac{\text{Post - Buyback Intrinsic Value/Share}}{\text{Pre - Buyback Intrinsic Value/Share}} - 1$$

Next, we can calculate Post-Buyback Intrinsic Value per Share as:

$$\text{Post - Buyback Intrinsic Value per Share} = \frac{\text{Pre - Buyback Intrinsic Value Share} - \text{Cash Spent on Repurchase}}{\text{Initial Share Count} - \text{Shares Repurchased}}$$

The cash spent on the repurchase is simply the equity market capitalization of the firm times the percentage of the shares the company repurchases.

Plugging these formulas into one another and canceling out terms, we arrive at the formula:

$$\% \text{ Increase in Intrinsic Value/Share} = \frac{(1 - (\% \text{ of Shares Repurchased} \times \frac{\text{Stock Price}}{\text{Intrinsic Value}}))}{(1 - \% \text{ of Shares Repurchased})} - 1$$

Testing this equation against the answer given by our spreadsheet, we find that both methods give us the same 5% increase in intrinsic value per share.

$$\% \text{ Increase in Intrinsic Value/Share} = \frac{(1 - (20\% \times \frac{\$8}{\$10}))}{(1 - 20\%)} - 1 = \frac{1 - (0.2 \times 0.8)}{0.8} - 1 = \frac{.84}{.8} - 1 = 5\%$$

## Appendix D: Why a Stock Buyback Earns the Cost of Equity in an Efficient Market

One basic principle in capital markets involves the trade off between risk and reward. The more risk, the higher the return an investor will demand. Consequently, investors in risk-free government bonds accept returns of less than 5%, while venture capital investors demand 20% to 30% returns.

Stocks lie somewhere in the middle of this range. Equity investors in public companies generally require a return in the neighborhood of 7% to 10%. This number is not set in stone because each company faces a different risk profile, varying from the stable cash flows of a utility to the volatile cash flows of a startup. In addition, debt can make equity more expensive, as debt is a prior claim on cash flows.

Whatever the cost of equity investors demand, however, the price of a stock should adjust so as to earn at least that return.

Indeed, in an efficient market, investors will bid stocks up and down until it becomes very difficult for an investor to earn more than the cost of equity. This is true whether we are talking about investors purchasing stock for their portfolios or companies repurchasing their shares in the open market.

### A Simple Example

Here's a simple example. Say two entities make separate promises to pay an investor \$1,000 next year. The first entity, the U.S. Treasury, is backed by the full faith and credit of the U.S. government while the second entity is a risky high-tech startup company backed only by the start-up's uncertain earnings power. If an investor were to sell both IOUs to a third party, it's natural to expect that the risk-free promise from the Treasury would be worth more than the riskier promise from the startup. Put more formally, while the timing and magnitude of the \$1,000 cash flow is the same for both entities, the higher riskiness of the startup's promise makes it less valuable. To value these promises, we turn to the standard discounting formula:

$$\text{Present Value} = \frac{\text{Cash Flow}}{(1 + \text{Demanded Rate of Return})^{\text{number of years before you receive the cash flow}}}$$

If we value the government's promise to pay \$1,000 a year from today using a risk-free rate of 4%, we find that this promise's present value is \$961.54.

$$\text{Present Value} = \frac{\$1,000}{(1 + 4\%)^1} = \frac{\$1,000}{(1.04)} = \$961.54$$

Similarly, we can value the startup's same promise, albeit with a higher demanded rate of return to compensate for the higher business risk inherent in Internet startups. Using a higher discount rate of 15%, we can calculate that the present value of the startup's promise is a much lower \$869.57.

$$\text{Present Value} = \frac{\$1,000}{(1 + 15\%)^1} = \frac{\$1,000}{(1.15)} = \$869.57$$

This simple example highlights that different prices have different embedded demanded rates of return. All things equal, a lower risk level translates to a lower discount rate, which means a higher stock price. Conversely, higher risk translates into a higher discount rate, which means a lower stock price.

## A Realistic Example

We can also demonstrate this with a more complex, realistic example as well. To do this, we created pro forma financial statements for a hypothetical company with a constant return on capital of 18%, and cash earnings that start at \$90 million. We assume the company has a competitive advantage period (CAP) of five years—that is, that investors believe the company will grow revenues for five years (at a modest 5%). This growth also necessitates additional capital expenditure, as the increasing annual investment during that same period reflects. For computational convenience, we also assume the company has no debt and investors use a 10% cost of equity to discount the company's cash flows. Finally, we translate these pro forma statements into a standard discounted cash flow analysis. This calculation values the company at \$968 million. See Exhibit 16.

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### Exhibit 16: Discounted Cash Flow Analysis for a Company

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Economic Profit Method of Valuation						
Year	1	2	3	4	5	6
Invested Capital (t)	500	525	551	579	608	608
Cash Earnings (t)	90	95	99	104	109	109
Return on Capital (%)	18.0%	18.0%	18.0%	18.0%	18.0%	
Cost of Capital (%)	10%	10%	10%	10%	10%	
Excess Return (%)	8%	8%	8%	8%	8%	
Economic profit (\$)	40	42	44	46	49	
PV of Economic Profit (t)	36	35	33	32	30	
Perpetuity of Economic Profit	375	394	413	434	486	
Σ PV of Economic Profit (0 ... t)	36	71	104	136	166	
PV of perpetuity	341	325	311	297	302	
Beginning Invested Capital	500	500	500	500	500	
<b>Core Enterprise Value</b>	877	896	915	932	968	
Excess Cash					-	
<b>Total Enterprise Value</b>					<b>968</b>	
Shareholder Value				\$	968	
Price per share				\$	968	
Price to cash earnings multiple					10.8	

FCF Method of Valuation						
Year	1	2	3	4	5	6
Cash Earnings (t)	90	95	99	104	109	109
Annual Investment (t)	25	26	28	29	-	-
FCF (t)	65	68	72	75	109	109
PV of FCF (t)	59	56	54	51	68	
Σ PV of FCF (0 ... t)	59	115	169	221	289	
Perpetuity of Cash Earnings (t)	900	945	992	1,042	1,094	
PV of perpetuity (t)	818	781	745	712	679	
<b>Core Enterprise Value</b>	877	896	915	932	968	
Excess Cash					-	
<b>Total Enterprise Value</b>					<b>968</b>	

Source: LMCM analysis.

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Next, we repeat this exercise for the company after a year has passed. This will give us the share price an investor would expect to enjoy with no change in the company's business plan and the passing of a year.

While expected cash flows for this company will remain the same, the most important difference will be the natural shortening of the CAP—the period during which the company can generate excess returns—from five to four years. After all, since a year has elapsed and there is no change in the business plan, the CAP will shorten. The other important difference is that the company will have generated a certain amount of excess cash. This cash in hand is the result of \$65 million of free cash

flow in its first year. Thus, in addition to the \$1 billion in value from the company's core operations, investors will give the company credit for an extra \$65 million from this cash in hand. See Exhibit 17.

**Exhibit 17: Discounted Cash Flow Analysis for a Company after One Year**

<b>Economic Profit Method of Valuation</b>					
Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Invested Capital (t)	525	551	579	608	608
Cash Earnings (t)	95	99	104	109	109
Return on Capital (%)	18.0%	18.0%	18.0%	18.0%	
Cost of Capital (%)	<u>10%</u>	<u>10%</u>	<u>10%</u>	<u>10%</u>	
Excess Return (%)	8%	8%	8%	8%	
Economic profit (\$)	42	44	46	49	
PV of Economic Profit (t)	38	36	35	33	
Perpetuity of Economic Profit	394	413	434	486	
Σ PV of Economic Profit (0 ... t)	38	75	109	143	
PV of perpetuity	358	342	326	332	
<u>Beginning Invested Capital</u>	<u>525</u>	<u>525</u>	<u>525</u>	<u>525</u>	
<b>Core Enterprise Value</b>	921	941	961	1,000	
Excess Cash					65
<b>Total Enterprise Value</b>				<b>\$ 1,065</b>	
Price per share				\$ 1,065	
Price to cash earnings multiple				11.3	

<b>FCF Method of Valuation</b>					
Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Cash Earnings (t)	95	99	104	109	109
<u>Annual Investment (t)</u>	<u>26</u>	<u>28</u>	<u>29</u>	-	-
FCF (t)	68	72	75	109	109
PV of FCF (t)	62	59	57	75	109
Σ PV of FCF (0 ... t)	62	121	178	253	362
Perpetuity of Cash Earnings (t)	945	992	1,042	1,094	
PV of perpetuity (t)	859	820	783	747	
<b>Core Enterprise Value</b>	921	941	961	1,000	
Excess Cash					65
<b>Total Enterprise Value</b>				<b>\$ 1,065</b>	

Source: LMCM analysis.

Interestingly, although the company's business plan and investors did not change at all, the company's value goes from \$968 million to \$1.065 billion. As theory predicts, this 10% increase in value means that investors earn exactly their demanded cost of equity of 10%.

**A Theoretical Proof**

A hardened skeptic may want more than examples to prove that the expected return on any stock—whether an open-market purchase or a company buying back stock—is the cost of equity. Here's a proof demonstrating this relationship always holds.

The logic starts with the premise that a stock's value is the present value of all future equity free cash flows, discounted at the cost of equity:

$$\text{Present Value (in Year 0)} = \sum_{\text{time}=1}^{\infty} \frac{\text{Free Cash Flow}_{\text{time}}}{(1 + \text{cost of equity})^{\text{time}}}$$

The formula for the value of a stock in a year is very similar. If we maintain the convention of calling the free cash flow (FCF) in each year by the same year number we used previously, the formula is:

$$\text{Present Value (in Year 1)} = \text{FCF}_1 + \sum_{\text{time}=2}^{\infty} \frac{\text{FCF}_{\text{time}}}{(1 + \text{cost of equity})^{\text{time}-1}}$$

where  $\text{FCF}_1$  represents the cash-in-hand that results from the free cash flow that the company generated in its first year of operation.

If we multiply both sides of the first equation by the quantity  $(1 + \text{cost of equity})$ , we arrive at the following equation.<sup>17</sup>

$$\text{PV}_0 \times (1 + k_e) = \sum_{\text{time}=1}^{\infty} \frac{\text{FCF}_{\text{time}}}{(1 + k_e)^{\text{time}}} \times (1 + k_e)$$

Canceling out the numerator and denominator on the right side of this equation, we arrive at this equation:

$$\text{PV}_0 \times (1 + k_e) = \sum_{\text{time}=1}^{\infty} \frac{\text{FCF}_{\text{time}}}{(1 + k_e)^{\text{time}-1}}$$

We can expand the summation to arrive at this equation:

$$\text{PV}_0 \times (1 + k_e) = \text{FCF}_1 + \sum_{\text{time}=2}^{\infty} \frac{\text{FCF}_{\text{time}}}{(1 + k_e)^{\text{time}-1}}$$

Because this equation describing the present value of a stock in year 0 is exactly equal to the previous equation describing the present value of a stock in year 1, we can equate the two:

$$\text{PV}_1 = \text{PV}_0 \times (1 + k_e)$$

Thus, after several algebraic manipulations, we arrive at our conclusion: the value of a stock next year is equal to the current value of a stock multiplied by 1 plus its cost of equity.

**Appendix E: Why an Asset-Sale-Financed Stock Buyback Can Be Dilutive to Earnings but Additive to Shareholder Value**

With Wall Street so focused on earnings per share growth, we should expect that many corporate managers work to boost earnings per share and avoid diluting earnings at all costs. Indeed, many managers like share repurchase for precisely that reason. Buybacks have become a popular way to augment earnings per share.

However, the accounting consequences of share buybacks are not always positive. For instance, many accounting-focused managers avoid selling value-destroying divisions, even at a price above intrinsic value, if the sale results in lower earnings per share. This is particularly true for companies that have executive compensation programs tied to EPS targets. Not surprisingly, we argue that executives should dwell on the economic consequences of such a decision.

Take for example a company with two divisions. The first division, Cash Cow, earns a return on invested capital of 40% on \$50 of invested capital. Assuming a 10% cost of capital, an 8% growth rate, and zero net investment, the standard perpetuity present value formula tells us the business is worth \$1,000. [ $\$1000 = \$20 / (10\% - 8\%)$ .] The second business, the Dog division, earns only a 5% return on its \$100 of invested capital. A no-growth business, Dog division's value is \$50. [ $\$50 = \$5 / 10\%$ .]

Accordingly, the two divisions have a combined market capitalization of \$1,050. With 100 shares outstanding, this translates to a price of \$10.50 per share. See Exhibit 18.

**Exhibit 18: A Tale of Two Divisions**

	"Cash Cow" Division	"Dog" Division
Cash earnings	\$ 20	\$ 5
Invested capital	50	100
Earnings per share contribution	0.20	0.05
Return on invested capital	40%	5%
Growth in cash earnings	8%	0%
<b>Value</b>	<b>\$ 1,000</b>	<b>\$ 50</b>

Market value of total firm	\$ 1,050
Shares outstanding	100
Price per share	\$ 10.50
Total earnings	\$ 25.00
Earnings per share	\$ 0.25
Price-to-earnings ratio	42 x

Note: Assumes 10% cost of capital and that capital expenditures equal depreciation.  
Source: LMCM analysis.

In our example, another firm approaches our company and offers to buy the assets of Dog for book value of \$100. This amount is double Dog's intrinsic value. As management has no investment needs, they would return this money to shareholders via share repurchase. Should management accept this offer?

The accounting and economic analyses give different answers. An economic analysis indicates that the company is now worth \$50 more, as it now has \$100 in cash versus owning a business worth \$50. Thus, firm value jumps from \$1,050 to \$1,100. Accordingly, before the company repurchases its shares, the share price would jump to \$11 to reflect this improvement. After the company returns the \$100 in cash to shareholders by repurchasing 9.1 shares, the company's value will fall back to \$1,000. However, as there will now be only 90.9 shares outstanding, the per-share value of our



company would remain at \$11, a 4.8% increase from \$10.50. Clearly, the economic analysis gives a green light to selling the Dog division. See Exhibit 19.

**Exhibit 19: Economic and Accounting Analysis of an Asset Sale-Financed Share Repurchase**

	<b>Cash Cow Alone</b>
Market value of total firm	\$ 1,000
Old shares outstanding	100.0
Shares repurchased	9.1
New shares outstanding	90.9
New price per share	\$ 11.00
New net income	\$ 20
New earnings per share	\$ 0.22
New price-to-earnings ratio	50 x

Source: LMCM analysis.

The accounting analysis points the other way. Selling Dog will result in losing \$5 in earnings power. Even with fewer shares outstanding, this translates into earnings of \$0.22 per share or 12% dilution versus the prior total. Given the reported earnings per share drop, many managers would incorrectly choose to pass on this value-creating opportunity.

**Endnotes**

<sup>1</sup> Greg Ip, "Taking the Measure of the World's Cash Hoard," *The Wall Street Journal*, November 3, 2005.

<sup>2</sup> Michael L. Goldstein, "Portfolio Strategy," *Empirical Research Partners*, November 14, 2005.

<sup>3</sup> Andrew Bary, "Hot Money," *Barron's Online*, November 7, 2005.

<sup>4</sup> For an interesting discussion of capital allocation and incentives, see Ulrike Malmendier and Geoffrey Tate, "CEO Overconfidence and Corporate Investment," *Journal of Finance*, vol. 60, 6, December 2005, 2661-2700.

<sup>5</sup> For an excellent discussion of resource allocation, see James M. McTaggart, Peter W. Kontes, and Michael C. Mankins, *The Value Imperative: Managing for Superior Shareholder Returns* (New York: Free Press, 1994), 239-255.

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<sup>7</sup> Alon Brav, John R. Graham, Campbell R. Harvey, and Roni Michaely, "Payout Policy in the 21st Century," *Tuck Contemporary Corporate Finance Issues III Conference Paper*, November 2005.

<sup>8</sup> Alfred Rappaport and Michael J. Mauboussin, *Expectations Investing: Reading Stock Prices for Better Returns* (Boston, MA: Harvard Business School Press, 2001), 174.

<sup>9</sup> Brav, Graham, Harvey, and Michaely.

<sup>10</sup> Clifford Stephens and Michael Weisbach, "Actual Share Repurchases in Open-Market Repurchase Programs," *Journal of Finance*, vol. 53, 1, February 1998, 313-333.

<sup>11</sup> One recent example comes from Agilent Technologies, Inc. According to the company, "Under the terms of the tender offer, Agilent is offering to purchase up to 73 million shares of its common stock at a price not less than \$32.00 per share and not greater than \$37.00 per share, net to the seller in cash, without interest. The tender offer will expire Dec. 13, 2005, at 12:00 midnight ET, unless extended." See <http://www.investor.agilent.com/phoenix.zhtml?c=103274&p=irol-newsArticle&ID=793423&highlight>.

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<sup>15</sup> Laszlo Birinyi Jr., Jeffrey Rubin, and Martha deLivron, "The Buyback Paradox: Part II—Topical Study #33," *Birinyi Associates*, November 2005.

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<sup>17</sup> John R. Graham, "How Big Are the Tax Benefits of Debt?" *Journal of Finance*, vol. 55, 5, October 2000, 1901-1941.

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<sup>19</sup> Richard A. Brealey and Stewart C. Myers, *Principles of Corporate Finance*, 6<sup>th</sup> edition (New York: McGraw Hill, 2000), 500-510.

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<sup>21</sup> For a more complete and sound approach, see Graham.

<sup>22</sup> Timothy A. Luehrman, "Using APV: A Better Tool for Valuing Operations," *Harvard Business Review*, May-June 1997.

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