

Capital Allocation

Evidence, Analytical Methods, and Assessment Guidance

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- Capital allocation is a senior management team's most fundamental responsibility. The problem is that many CEOs don't know how to allocate capital effectively. The objective of capital allocation is to build long-term value per share.
- Capital allocation is always important but is especially pertinent today because return on invested capital is high, growth is modest, and corporate balance sheets in the U.S. have substantial cash.
- Internal financing represented more than 90 percent of the source of total capital for U.S. companies from 1980-2015.
- M&A, capital expenditures, and R&D are the largest uses of capital for operations, and companies now spend more on buybacks than dividends.
- This report discusses each use of capital, shows how to analyze that use, reviews the academic findings, and offers a near-term outlook.
- We provide a framework for assessing a company's capital allocation skills, which includes examining past behaviors, understanding incentives, and considering the five principles of capital allocation.

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Executive Summary

- Capital allocation is the most fundamental responsibility of a senior management team of a public corporation. The problem is that many CEOs, while almost universally well intentioned, don't know how to allocate capital effectively. The proper goal of capital allocation is to build long-term value per share. The emphasis is on building value and letting the stock market reflect that value. Companies that dwell on boosting their short-term stock price frequently make decisions that are at odds with building value.
- Capital allocation is always important but is especially pertinent in the United States today given the high return on invested capital, modest growth, and substantial cash on corporate balance sheets. Companies that deploy capital judiciously have a significant opportunity to build value.
- Internal financing represented more than 90 percent of the source of total capital for U.S. companies from 1980-2015. This is a higher percentage than that of other developed countries including the United Kingdom, Germany, France, and Japan.
- Mergers and acquisitions (M&A), capital expenditures, and research and development (R&D) are the largest uses of capital for operations. In the past 35 years, capital expenditures are down, and R&D is up, as a percentage of sales. This reflects a shift in the underlying economy. M&A is the largest use of capital but follows the stock market closely. More deals happen when the stock market is up.
- The amount companies have spent on buybacks has exceeded dividends for the past decade, except for 2009. Buybacks did not become relevant in the U.S. until 1982, so you should treat comparisons of yields before and after 1982 with caution. Research shows that the overall proclivity to return cash has not changed much over the decades, but the means by which the payout occurs has shifted.
- Academic research shows that rapid asset growth is associated with poor total shareholder returns. Further, companies that contract their assets often create substantial value per share. Ultimately, the answer to all capital allocation questions is, "It depends." Most actions are either foolish or smart based on the price and value.
- Divestitures are substantial and generally create value. If the buyers tend to lose value, it stands to reason that the sellers gain value. Selling or spinning off poor performing businesses can lead to addition by subtraction.
- Past spending patterns are often a good starting point for assessing future spending plans. Once you know how a company spends money, you can dig deeper into management's decision-making process. Further, it is useful to calculate return on invested capital and return on incremental invested capital. These metrics can provide a sense of the absolute and relative effectiveness of management's spending.
- Understanding incentives for management is crucial. Assess the degree to which management is focused on building value and addressing agency costs.
- The five principles of value creation include: zero-based capital allocation; fund strategies, not projects; no capital rationing; zero tolerance for bad growth; and know the value of assets and be prepared to take action.

Introduction

Capital allocation is the most fundamental responsibility of a senior management team of a public corporation. Successful capital allocation means converting inputs, including money, things, ideas, and people, into something more valuable than they would be otherwise. The net present value (NPV) test is a simple, appropriate, and classic way to determine whether management is living up to this responsibility. Passing the NPV test means that \$1 invested in the business is worth more than \$1 in the market. This occurs when the present value of the long-term cash flow from an investment exceeds the initial cost.

Why should value determine whether a management team is living up to its responsibility? There are two reasons. The first is that companies must compete. A company that is allocating its resources wisely will ultimately prevail over a competitor that is allocating its resources foolishly. The second is that inputs have an opportunity cost, or the value of the next best alternative. Unless an input is going to its best and highest use, it is underperforming relative to its opportunity cost.

The process of making inputs more valuable has a number of aspects. A logical starting point is a strategy. Properly conceived, a strategy requires a company to specify the trade-offs it will make to establish a position in the marketplace that creates value. A strategy also requires a company to align its activities with its positioning and to execute effectively.¹

Since a company's strategy is often already in place when a new chief executive officer (CEO) takes over, capital allocation generally becomes his or her main responsibility. While a proper and comprehensive discussion of capital allocation requires a consideration of intangible and human resources, our focus here is on how companies spend money.

The problem is that many CEOs, while almost universally well intentioned, don't know how to allocate capital effectively. Warren Buffett, chairman and CEO of Berkshire Hathaway, describes this reality in his 1987 letter to shareholders. He discusses the point of why it is beneficial for Berkshire Hathaway's corporate office to allocate the capital of the companies it controls. Buffett is worth quoting at length:²

This point can be important because the heads of many companies are not skilled in capital allocation. Their inadequacy is not surprising. Most bosses rise to the top because they have excelled in an area such as marketing, production, engineering, administration or, sometimes, institutional politics.

Once they become CEOs, they face new responsibilities. They now must make capital allocation decisions, a critical job that they may have never tackled and that is not easily mastered. To stretch the point, it's as if the final step for a highly-talented musician was not to perform at Carnegie Hall but, instead, to be named Chairman of the Federal Reserve.

The lack of skill that many CEOs have at capital allocation is no small matter: After ten years on the job, a CEO whose company annually retains earnings equal to 10% of net worth will have been responsible for the deployment of more than 60% of all the capital at work in the business.

CEOs who recognize their lack of capital-allocation skills (which not all do) will often try to compensate by turning to their staffs, management consultants, or investment bankers. Charlie [Munger] and I have frequently observed the consequences of such "help." On balance, we feel it is more likely to accentuate the capital-allocation problem than to solve it.

In the end, plenty of unintelligent capital allocation takes place in corporate America. (That's why you hear so much about "restructuring.")

Intelligent capital allocation requires understanding the long-term value of an array of opportunities and spending money accordingly. It also includes knowing the value of a firm's individual assets and being willing to sell them when they are worth more to others.

We believe that long-term growth in value per share should guide capital allocation decisions. A necessary corollary is that there is a time when shrinking the business is the most beneficial course for ongoing shareholders. In some cases, for instance, buying back shares is a wiser choice than expanding by means of capital expenditures or acquisition.

Capital allocation is a dynamic process, so the correct answer to most questions is, "It depends." Sometimes acquiring makes sense and other times divesting is the better alternative. There are times to issue equity and times to retire it. Because the components that determine price and value are changing constantly, so too must the assessments that a CEO makes. As Buffett says, "The first law of capital allocation—whether the money is slated for acquisitions or share repurchases—is that what is smart at one price is dumb at another."³

Buffett also discusses what he calls the "institutional imperative," a force that is also pertinent.⁴ The force has multiple aspects as he describes it, but a pair of them are relevant here. One is that subordinates will readily create spreadsheets and studies to support the business craving of the leader. Another is that companies will "mindlessly" imitate one another, whether in M&A or executive compensation.

The message here should be clear. A decision isn't good just because someone in the organization can justify it or because some other company is doing it. Proper capital allocation requires a sharp analytical framework and independence of mind.

In our experience, very few CEOs, and chief financial officers for that matter, have what we call the "North Star of value." The North Star is not the brightest star, but it doesn't move much throughout the night or year. As a result, it provides a reliable sense of direction. Likewise, companies that have a North Star of value have an unwavering view of value no matter what is going on. It is common for executives to solicit input from a range of stakeholders, hear varying points of view, and walk away confused and unsure about the proper course of action. This doesn't happen to executives with the North Star of value, especially since they may have better information about their company's prospects than the market does.

Incentives are another barrier to proper capital allocation. An executive who is paid to deliver a target based on short-term earnings per share may well act very differently than an executive who is focused on building long-term value per share. In assessing management, ask a fundamental question: If there is a conflict between maximizing a reward based on the incentive plan and creating long-term value per share, which route will the executive select?

William Thorndike's excellent book, *The Outsiders: Eight Unconventional CEOs and Their Radically Rational Blueprint for Success*, deeply inspired this report.⁵ Thorndike shares the stories of eight CEOs who created tremendous value per share during their tenures. One theme that comes out clearly in the book, and is explicit in the subtitle, is that these CEOs appeared out of step with conventional wisdom as they were building value. The North Star of value guided their decisions, and they had the independence of mind to make the best choices.

This report has three parts:

1. **Groundwork.** This part starts by showing the sources of capital. It then specifies capital allocation options, shows how companies have allocated capital in the past 35 years, and explains why this issue of capital allocation is particularly relevant today.
2. **Capital allocation alternatives.** This section documents how much money companies have allocated to each alternative over time, offers an analytical framework for judging value creation, summarizes the academic research on the payoffs to such investments, and provides a brief outlook for spending.
3. **Assessing a company's capital allocation skills.** This part discusses methods to assess past capital allocation choices, how to evaluate incentives, and the five principles of capital allocation.

Groundwork: Where Does the Money Come From and Where Has It Gone?

If the job of management is to deploy capital so as to add value, it makes sense to start with a discussion of where capital comes from and how management teams have spent it in the past. The sources of capital include the cash the business generates and access to the capital of claimholders, including debtors and shareholders. A company can also sell an asset, which is a one-time realization of the cash flow the asset is expected to generate over its life.

Businesses that grow rapidly generally require a sizable amount of investment. For example, imagine a restaurant concept that is highly successful. To satiate demand that firm must build lots of restaurants and hence invest a substantial sum in expansion. The rate of return on incremental capital is the maximum growth rate in operating profit a business can reach without external financing. By extension, a company with a return on invested capital (ROIC) greater than its growth rate will generate surplus capital.⁶

Companies that cannot fund their growth internally must access cash externally, either by borrowing or selling equity. The pecking order theory is an idea in corporate finance that says that managers of companies will typically choose to fund investments first with cash that the company generates internally, next with debt, and finally with equity.⁷ One essential tenet of thoughtful capital allocation is that all capital has an opportunity cost, whether the source is internal or external.

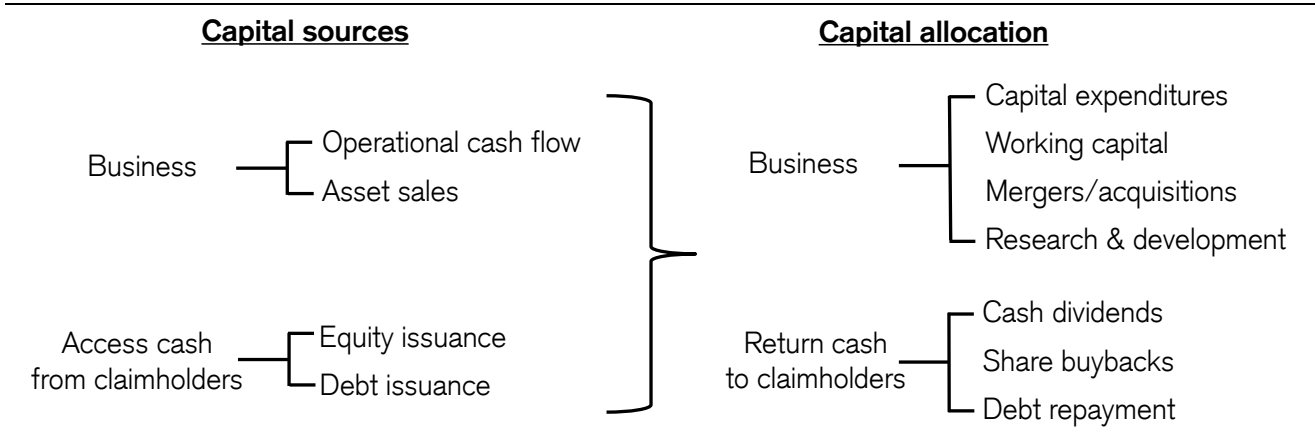
The uses of capital are where money goes. Executives can invest in the business through capital expenditures, increases in working capital, research and development, or mergers and acquisitions. These investments allow a company to grow. But growth, in and of itself, is never the goal of a thoughtful capital allocator. The proper metric of success is an increase in long-term value per share.

A company can also return cash to debt and equity holders. Debt repayment, a return of some or all principal and interest a company owes, is straightforward. A company can return cash to shareholders either by paying a dividend, where all holders receive the same amount, or by buying back stock. In a buyback, shareholders sort themselves. Those who want cash sell their shares and those who want to increase their stake in the company hold their shares. A dividend treats all shareholders the same no matter what the stock price.

In a buyback, selling shareholders benefit at the expense of ongoing shareholders if the stock is overvalued, and ongoing shareholders benefit at the expense of selling shareholders if the stock is undervalued. All shareholders are treated uniformly only if the stock price is at fair value.⁸

Exhibit 1 summarizes the sources and uses of financial capital. These follow closely the alternatives and choices that Thorndike specifies in *The Outsiders*.

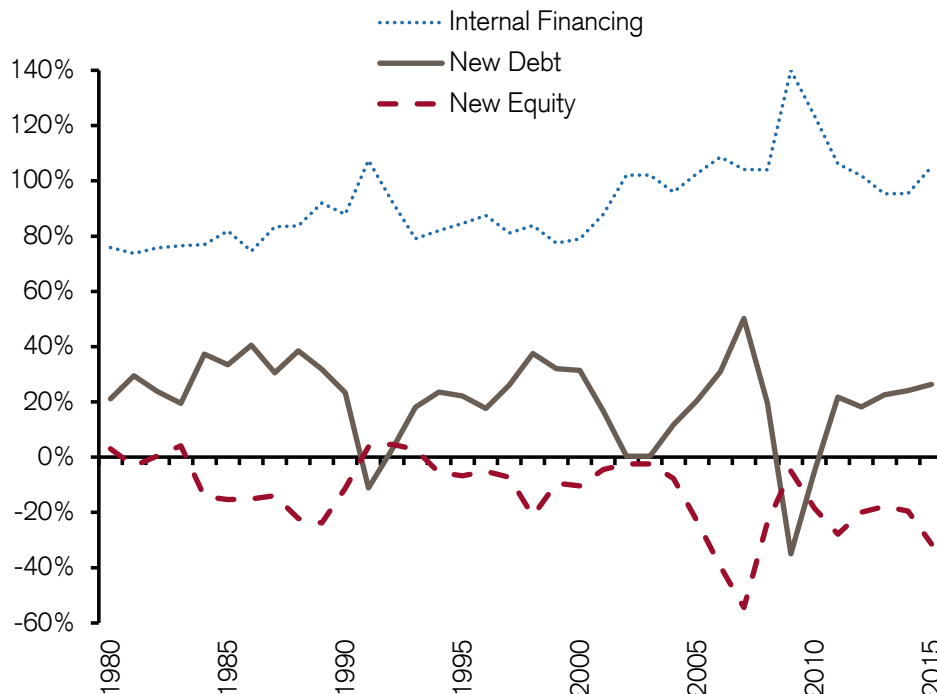
Exhibit 1: Sources and Uses of Financial Capital



Source: Credit Suisse.

Sources of Capital. Exhibit 2 shows the sources of capital for companies in the U.S. from 1980 through 2015. Internal financing, or the cash generated by the businesses, represented more than 90 percent of the total source of capital during this period. If we extend this analysis back to include all of the years following World War II, internal funding is still more than 80 percent of the total source of capital. Issuance of new debt is the next most significant source of capital. Equity has been a negative source of capital, which means that companies have bought back more shares than they have issued.

Exhibit 2: U.S. Sources of Capital, 1980-2015



Source: Board of Governors of the Federal Reserve System, Division of Research and Statistics, Flow of Funds Accounts Table F.103.

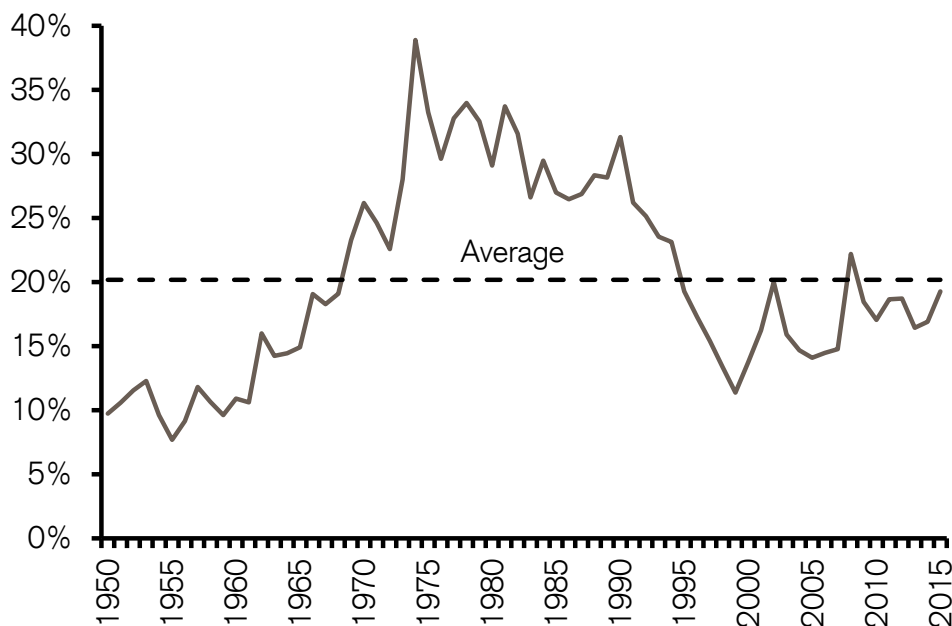
Internal financing represents a larger percentage of the total source of capital for companies in the U.S. than for companies in other developed countries. For example, internal financing has been about 70 percent of the total source for the United Kingdom, 66 percent for Germany, 55 percent for France, and 50 percent for Japan.⁹ The ratio of internal financing to the total source of capital tends to correlate with the underlying return on invested capital. A country with a high ROIC can fund a greater percentage of its investments with internally generated cash than a country with a low ROIC.

There are pros and cons to having internal financing represent a high percentage of investment funding. The pro is that companies are earning high returns on capital in general and need not rely on capital markets to fund their growth. The con is that companies can deploy internally generated funds into value-destroying investments. The need to raise money from the capital markets creates a check on management's spending plans.

Indeed, Peter Bernstein, the renowned financial historian and economist, once suggested that all companies should be required to pay out 100 percent of their earnings and then appeal to the markets when they want funds for investment. He argued that markets are more effective than companies at allocating capital, and as a result the overall effectiveness of capital allocation would improve if left to the devices of the market.¹⁰

The choice of debt or equity as a source of funding also determines capital structure. Exhibit 3 shows the debt-to-total capital ratio for the largest companies in the U.S. from 1950 through 2015. We define the debt-to-total capital ratio as the book value of debt divided by the sum of the book value of debt and the market value of equity. The ratio is currently 19 percent, just below the long-term average of about 20 percent. The availability and cost of debt, along with the appetite for debt and the general level of stock prices, determine this ratio.

Exhibit 3: U.S. Debt-to-Total Capital, 1950-2015

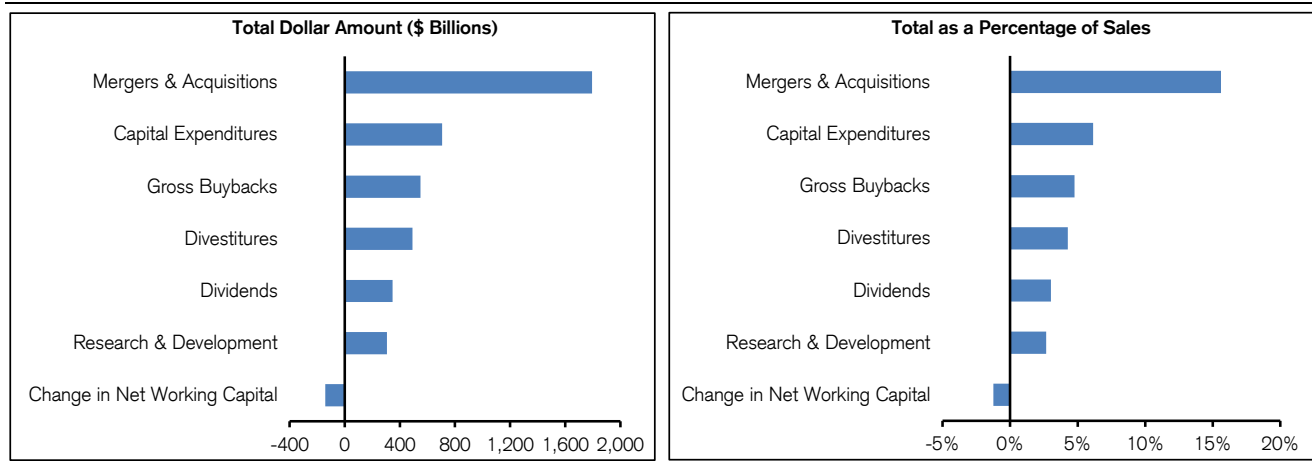


Source: Credit Suisse HOLT®.

Note: For data back to 1920, see John R. Graham, Mark T. Leary and Michael R. Roberts, "A Century of Capital Structure: The Leveraging of Corporate America," *Journal of Financial Economics*, Vol. 118, No. 3, December 2015, 658-683.

Uses of Capital. Exhibit 4 shows how the top 1,500 companies in the U.S., excluding companies in the financial services and regulated utility industries, deployed capital in 2015. While just a snapshot for a particular year, the ranking reasonably reflects how companies in the U.S. have allocated capital over time.

Exhibit 4: U.S. Capital Deployment, 2015

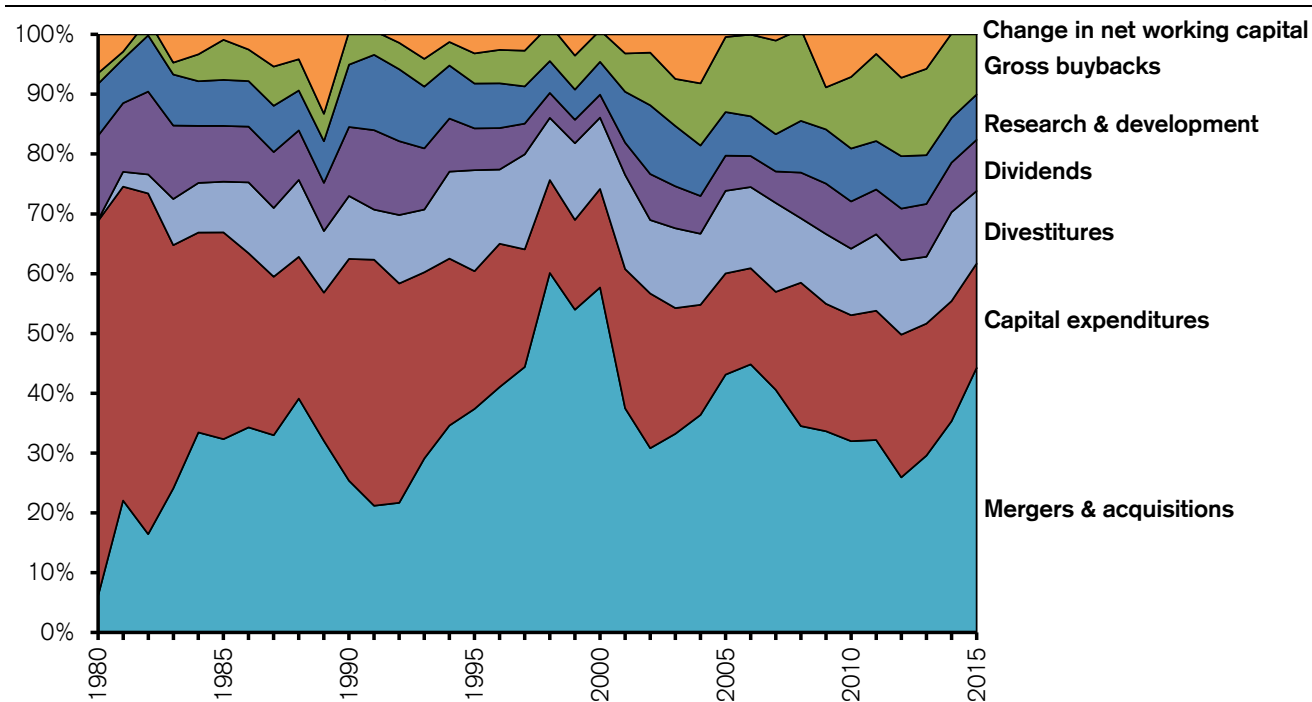


Source: Credit Suisse HOLT and Thomson Reuters.

Note: Data for R&D, capital expenditures, working capital, buybacks, and dividends exclude financial companies and regulated utilities; data for mergers & acquisitions and divestitures include all industries.

Exhibit 5 shows the breakdown of spending by source from 1980-2015.

Exhibit 5: U.S. Capital Deployment, 1980-2015



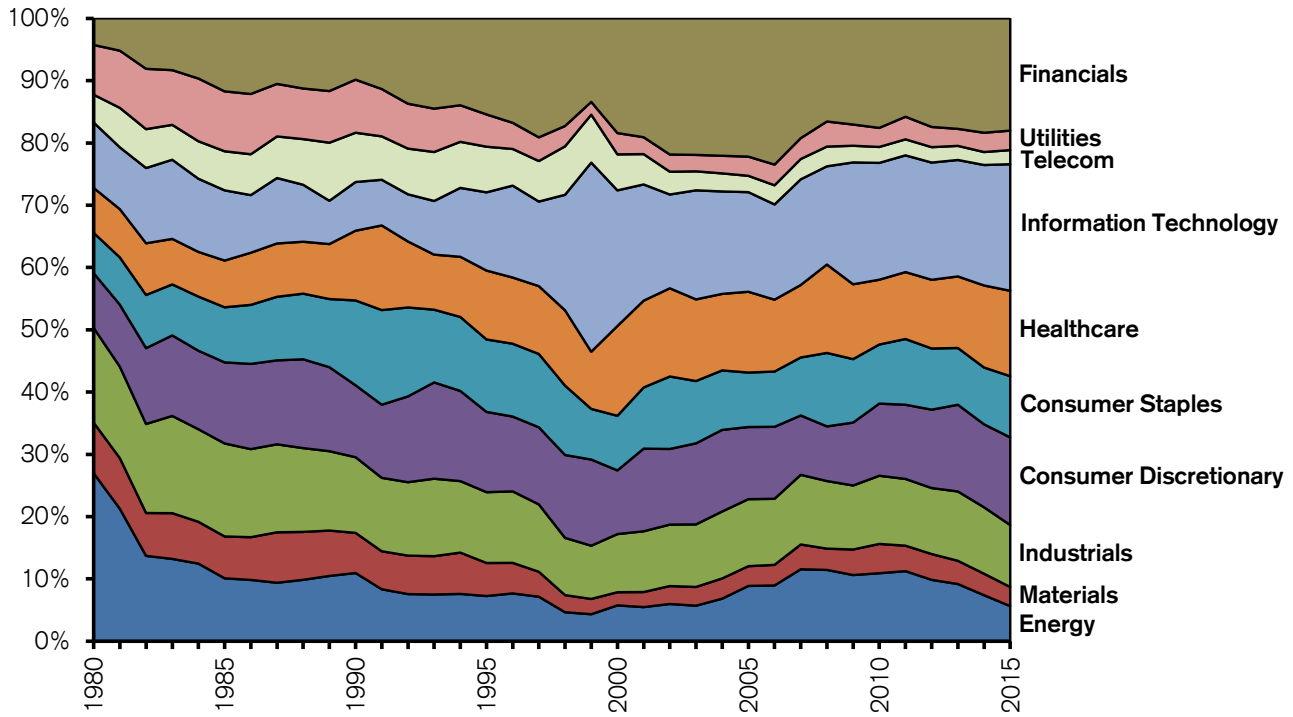
Source: Credit Suisse HOLT and Thomson Reuters.

Note: Data for R&D, capital expenditures, working capital, buybacks, and dividends exclude financial companies and regulated utilities; data for mergers & acquisitions and divestitures include all industries.

Similar to 2015, mergers and acquisitions (M&A) and capital expenditures are the largest uses of capital over time. An examination of the changes from 1980 through 2015 reveals some noteworthy patterns:

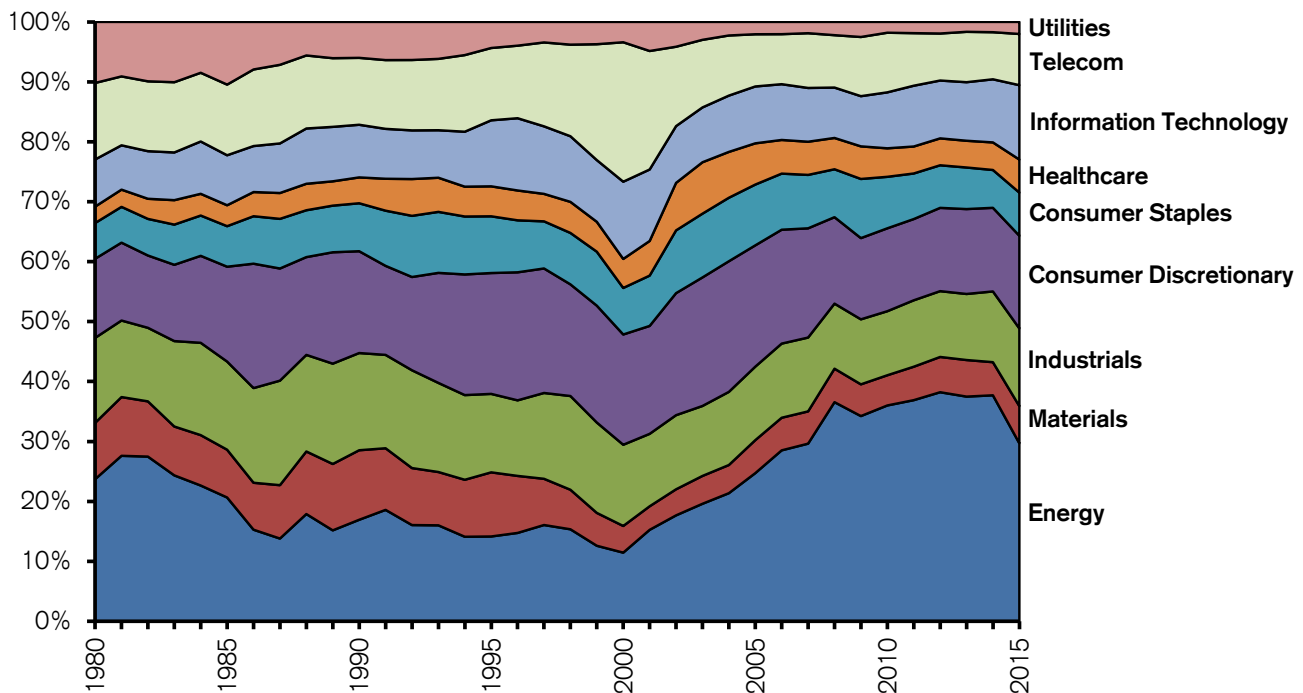
- M&A is by far the largest use of capital, but it is very cyclical, ranging from a low of less than 1 percent of sales in 1980 to almost 30 percent at its peak in the late 1990s. M&A activity tends to be greatest when the economy is doing well, the stock market is up, and access to capital is easy. As a result, companies frequently do deals when they can, rather than when they should.
- Capital expenditures went from roughly 10 percent of sales to approximately 6 percent over this period. The simplest explanation is that the composition of the economy has changed, with businesses that require less capital investment replacing those that require more. (See Exhibits 6 and 7.) For example, the energy, materials, and industrial sectors represented 50 percent of the market capitalization of the top 1,500 companies in the U.S. market in 1980 but just 19 percent in 2015. During the same time, the healthcare and technology sectors went from 18 to 34 percent of the market capitalization. This shift also helps explain the increase in cash holdings.¹¹ Another possible cause of the dip in capital expenditures is that public companies are now investing too little. Academic research suggests that public companies invest less than comparable private companies because they want to maximize short-term earnings.¹²
- Share buybacks went from being virtually nonexistent in 1980 to a large use of capital in the last decade. In 1982, the Securities and Exchange Commission defined rules that created a safe harbor for companies to repurchase shares, eliminating the threat of stock manipulation and opening the floodgates for buybacks. Over the past 30 years, companies have shifted their payouts from mostly dividends to a combination of dividends and buybacks. Research shows that the propensity to distribute cash to shareholders has held remarkably steady after accounting for firm characteristics including size, age, and profitability.¹³
- Research and development (R&D) expenditures have risen steadily, growing from 1.3 percent of sales in 1980 to 2.7 percent in 2015. The shift in the composition of the economy that accounts for the decline in capital expenditures also explains the rise in R&D (see Exhibits 6 and 8). Further, companies that rely on R&D tend to hold more cash than companies that are less reliant on R&D. This partially accounts for the swell of cash on corporate balance sheets.

Exhibit 6: U.S. Sector Composition, 1980-2015



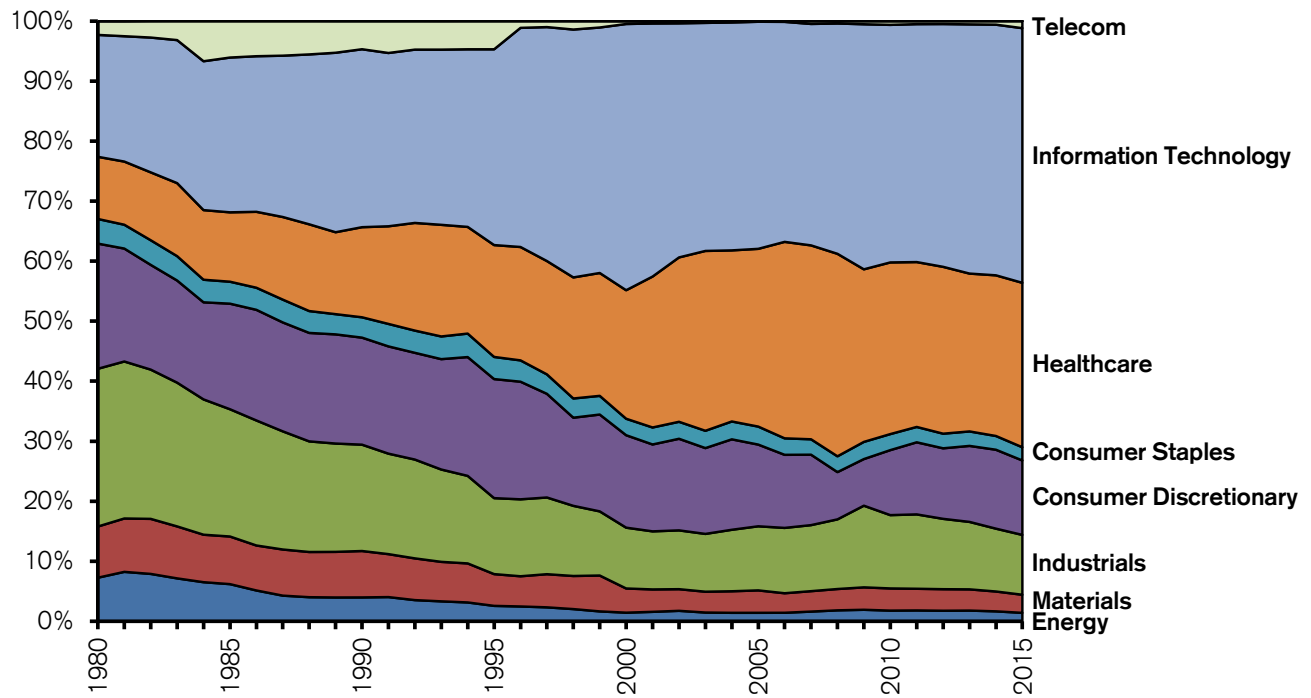
Source: Credit Suisse HOLT.

Exhibit 7: U.S. Capital Expenditures by Sector, 1980-2015



Source: Credit Suisse HOLT.

Exhibit 8: U.S. R&D Spending by Sector, 1980-2015



Source: Credit Suisse HOLT.

Exhibit 9 shows a detailed history of capital deployment from 1980-2015, adjusted for inflation. It is worth noting that the standard deviations of the growth rates, which appear in the bottom row, are small for R&D, dividends, and capital spending relative to those of buybacks, M&A, and divestitures. Standard deviation is a measure of how much something varies from an average. These standard deviations provide a glimpse into how managers think about each use of capital. The lower the standard deviation, the more sacrosanct management deems that investment. Exhibit 10 represents the same deployment numbers as a percentage of sales.

Exhibit 9: U.S. Capital Deployment, 1980-2015

	Total Amount (2015 U.S. Dollars)						
	Mergers & Acquisitions	Capital Expenditures	Research & Development	Net Working Capital	Gross Buybacks	Divestitures	Dividends
1980	50,253	520,088	71,993	53,889	14,814	1,521	116,637
1981	225,381	535,670	75,389	29,533	12,405	25,301	117,228
1982	141,179	488,507	80,637	-20,946	22,322	27,259	118,820
1983	242,876	409,811	85,940	47,519	20,049	77,761	123,750
1984	432,992	432,518	96,678	43,126	58,173	107,366	123,384
1985	420,956	449,881	100,102	11,726	87,281	110,364	121,425
1986	478,144	405,798	106,112	35,233	73,544	165,118	129,918
1987	461,134	370,220	108,061	75,116	91,665	160,599	130,690
1988	683,271	413,880	116,515	72,474	91,304	224,691	144,549
1989	553,739	428,250	120,284	229,262	79,220	177,805	139,242
1990	295,383	431,375	121,259	-5,211	64,057	122,457	134,137
1991	212,445	412,048	126,159	-5,887	40,124	83,928	133,087
1992	237,390	401,240	131,563	15,384	48,380	125,253	135,096
1993	378,627	405,027	134,359	53,161	60,386	136,471	133,051
1994	523,395	421,951	134,075	19,195	59,425	219,842	134,194
1995	766,489	472,148	153,712	65,064	103,342	346,251	143,091
1996	878,719	512,665	160,048	55,453	119,630	265,616	148,451
1997	1,288,698	570,647	180,472	78,888	173,504	461,206	149,023
1998	2,211,845	571,514	195,959	-58,454	222,428	382,228	153,364
1999	2,096,708	583,005	195,966	137,396	220,897	497,837	152,342
2000	2,250,465	642,519	214,058	-26,512	205,321	465,041	149,768
2001	985,141	611,609	223,344	83,590	168,343	413,595	141,818
2002	567,655	476,106	211,652	56,163	162,106	226,265	141,566
2003	711,817	450,099	215,801	159,293	168,725	285,682	150,398
2004	946,576	479,226	219,677	213,068	270,130	309,075	164,195
2005	1,329,986	521,592	224,934	13,320	386,924	425,874	181,276
2006	1,705,809	611,430	252,409	1,288	519,635	516,336	197,417
2007	1,613,404	651,015	247,862	41,035	622,232	590,845	209,102
2008	993,147	689,575	248,657	-25,491	441,422	309,937	219,827
2009	813,603	514,902	218,910	213,845	170,067	281,834	203,868
2010	866,109	570,059	239,529	192,518	323,887	300,931	213,699
2011	1,009,828	677,709	253,902	102,394	456,780	401,076	234,980
2012	791,509	727,572	267,333	221,022	399,896	379,758	263,139
2013	993,971	741,901	274,193	193,479	485,084	375,795	296,421
2014	1,377,516	793,966	294,884	-5,214	557,870	472,373	327,354
2015	1,795,752	709,394	299,654	135,221	572,826	491,768	354,687
CAGR	10.8%	0.9%	4.2%	2.7%	11.0%	18.0%	3.2%
St. Dev.	67.0%	10.2%	5.2%	737.6%	45.0%	265.0%	5.3%

Source: Credit Suisse HOLT; Thomson Reuters; Credit Suisse.

Note: All figures in 2015 U.S. dollars (millions); R&D, capital expenditures, working capital, buybacks, and dividends is the top 1,500 "industrials" (ex-financials and regulated utilities), whereas M&A and divestitures include all industries.

Exhibit 10: U.S. Capital Deployment, 1980-2015

	As a Percentage of Sales						
	Mergers & Acquisitions	Capital Expenditures	Research & Development	Net Working Capital	Gross Buybacks	Divestitures	Dividends
1980	0.9%	9.7%	1.3%	1.0%	0.3%	0.0%	2.2%
1981	4.2%	10.1%	1.4%	0.6%	0.2%	0.5%	2.2%
1982	2.8%	9.7%	1.6%	-0.4%	0.4%	0.5%	2.4%
1983	4.8%	8.2%	1.7%	0.9%	0.4%	1.5%	2.5%
1984	8.4%	8.4%	1.9%	0.8%	1.1%	2.1%	2.4%
1985	8.3%	8.9%	2.0%	0.2%	1.7%	2.2%	2.4%
1986	9.8%	8.3%	2.2%	0.7%	1.5%	3.4%	2.7%
1987	9.2%	7.4%	2.2%	1.5%	1.8%	3.2%	2.6%
1988	12.9%	7.8%	2.2%	1.4%	1.7%	4.2%	2.7%
1989	10.2%	7.9%	2.2%	4.2%	1.5%	3.3%	2.6%
1990	5.3%	7.7%	2.2%	-0.1%	1.2%	2.2%	2.4%
1991	3.8%	7.4%	2.3%	-0.1%	0.7%	1.5%	2.4%
1992	4.2%	7.1%	2.3%	0.3%	0.9%	2.2%	2.4%
1993	6.5%	6.9%	2.3%	0.9%	1.0%	2.3%	2.3%
1994	8.5%	6.8%	2.2%	0.3%	1.0%	3.6%	2.2%
1995	11.7%	7.2%	2.3%	1.0%	1.6%	5.3%	2.2%
1996	12.6%	7.4%	2.3%	0.8%	1.7%	3.8%	2.1%
1997	17.3%	7.6%	2.4%	1.1%	2.3%	6.2%	2.0%
1998	29.6%	7.7%	2.6%	-0.8%	3.0%	5.1%	2.1%
1999	26.8%	7.4%	2.5%	1.8%	2.8%	6.4%	1.9%
2000	26.7%	7.6%	2.5%	-0.3%	2.4%	5.5%	1.8%
2001	11.7%	7.3%	2.7%	1.0%	2.0%	4.9%	1.7%
2002	7.0%	5.8%	2.6%	0.7%	2.0%	2.8%	1.7%
2003	8.2%	5.2%	2.5%	1.8%	1.9%	3.3%	1.7%
2004	9.9%	5.0%	2.3%	2.2%	2.8%	3.2%	1.7%
2005	13.3%	5.2%	2.2%	0.1%	3.9%	4.3%	1.8%
2006	16.1%	5.8%	2.4%	0.0%	4.9%	4.9%	1.9%
2007	15.2%	6.1%	2.3%	0.4%	5.9%	5.6%	2.0%
2008	9.0%	6.2%	2.2%	-0.2%	4.0%	2.8%	2.0%
2009	8.4%	5.3%	2.3%	2.2%	1.8%	2.9%	2.1%
2010	8.2%	5.4%	2.3%	1.8%	3.1%	2.8%	2.0%
2011	8.7%	5.9%	2.2%	0.9%	4.0%	3.5%	2.0%
2012	6.8%	6.2%	2.3%	1.9%	3.4%	3.2%	2.2%
2013	8.4%	6.3%	2.3%	1.6%	4.1%	3.2%	2.5%
2014	11.2%	6.5%	2.4%	0.0%	4.5%	3.8%	2.7%
2015	15.3%	6.1%	2.6%	1.2%	4.9%	4.2%	3.0%

Source: Credit Suisse HOLT; Thomson Reuters; Credit Suisse.

Note: R&D, capital expenditures, working capital, buybacks, and dividends is the top 1,500 "industrials" (ex-financials and regulated utilities), whereas M&A and divestitures include all industries.

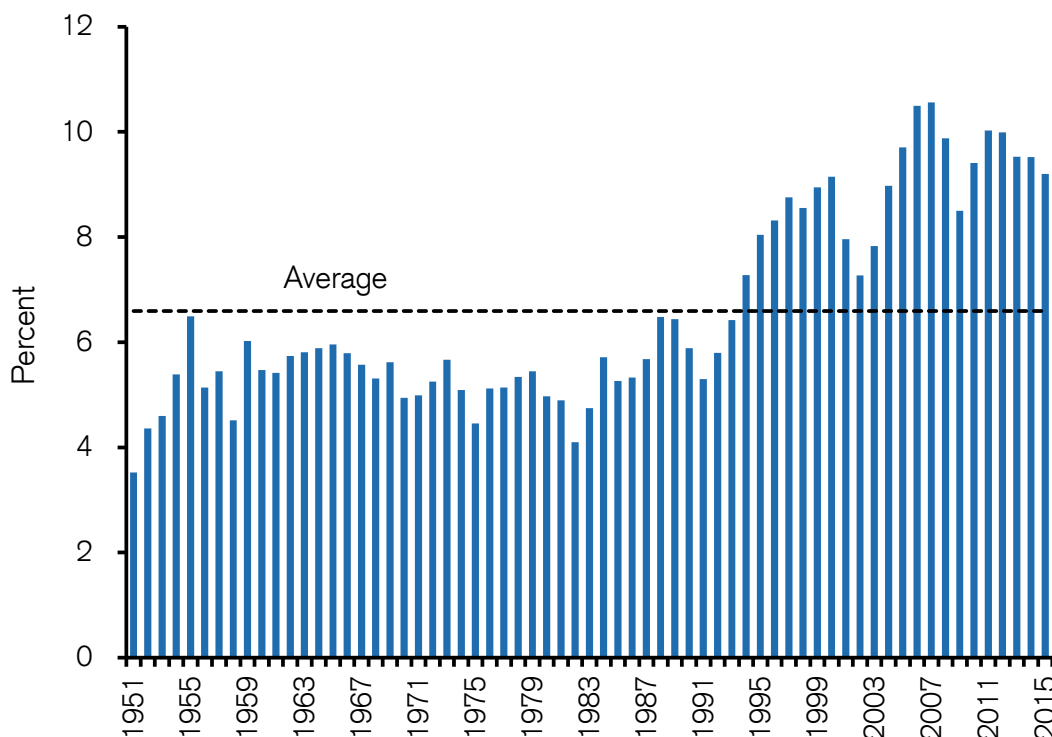
The issue of judicious capital allocation is certainly nothing new. Henry Singleton, the CEO whom William Thorndike holds up as the standard for excellence, started his company, Teledyne, more than 50 years ago. And Buffett's quote about capital allocation is more than a quarter century old. Still, the issue feels particularly pressing today.

Recent Trends in Cash Flow Return on Investment and Asset Growth. Larry Fink, the chairman and CEO of BlackRock, Inc., an investment firm with more than \$5.1 trillion in assets under management, captured the current zeitgeist in a letter dated February 1, 2016. Addressed to the leaders of large global corporations, the letter argued that many companies are shying away from investments with long-term payoffs in favor of returning cash to shareholders via dividends and buybacks. In effect, Fink argued that the chiefs of industry are misallocating capital.¹⁴

Let's turn to some concepts and numbers to quantify Fink's assertion. The maximum earnings growth rate a company can achieve through internal funding is a function of its ROIC and payout ratio. High ROICs and low payout ratios allow for greater achievable growth rates than low ROICs and high payout ratios. Low ROIC or high payout businesses can certainly grow but need to access debt or equity capital to do so.

Here are the numbers. Cash flow return on investment (CFROI[®]) remains high in the U.S. (see Exhibit 11). CFROI measures the cash returns a business earns on the investments it makes. Since CFROI is also adjusted for inflation, it is an ideal tool for comparing results over time. The current level of 9.2 percent is well above the historical average of approximately 6.6 percent from 1951-2015. The number is even higher excluding the excess cash parked on the balance sheets of many companies. The current levels of ROIC and CFROI suggest that companies today can fund substantial growth through internally-generated funds.

Exhibit 11: U.S. CFROI, 1951-2015



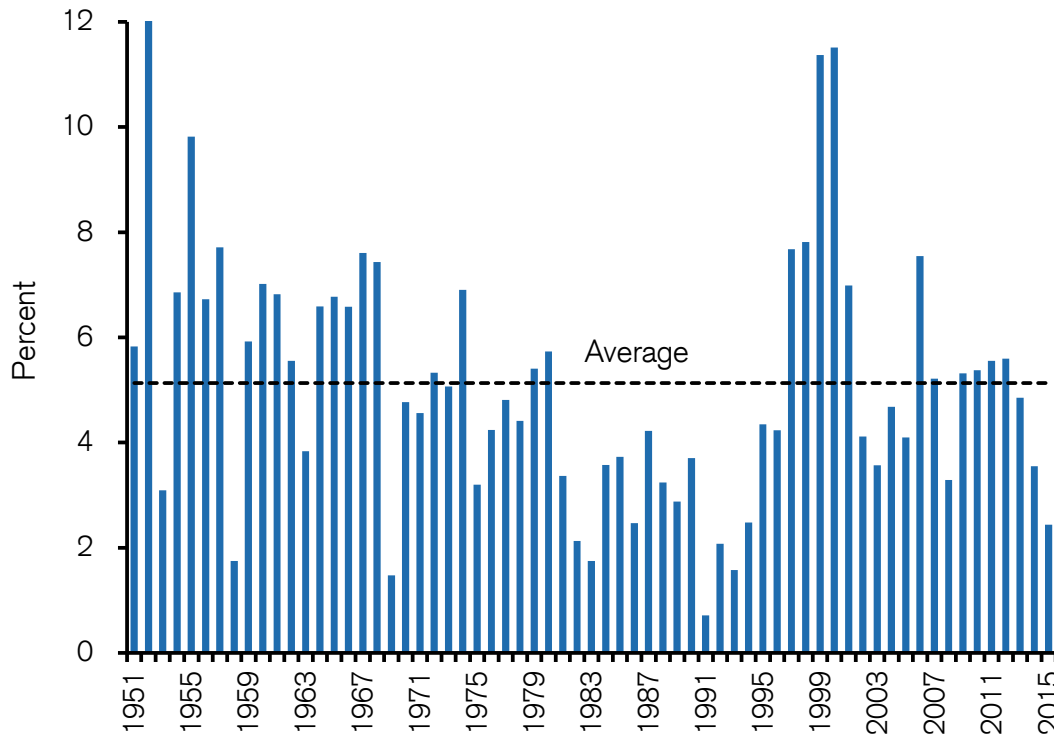
Source: Credit Suisse HOLT.

Note: U.S. industrial firms, weighted by net assets.

* CFROI[®] is a registered trademark in the United States and other countries (excluding the United Kingdom) of Credit Suisse Group AG or its affiliates.

Exhibit 12 shows the annual rate of asset growth, adjusted for inflation, from 1951-2015. In 2015, spending was very weak relative to the long-term average, a point that is particularly pronounced given that CFROIs are high. It's hard to know exactly why companies remain so reticent to invest, but executives commonly point to political and economic uncertainty.¹⁵

Exhibit 12: U.S. Real Asset Growth Rate, 1951-2015

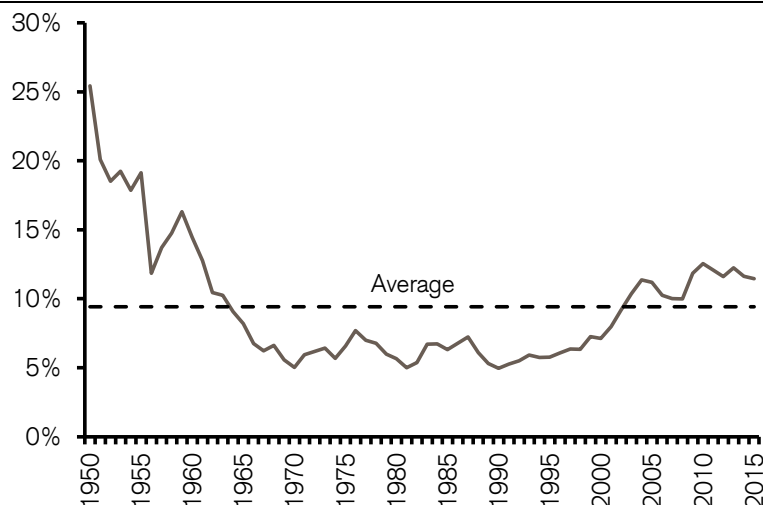


Source: Credit Suisse HOLT.

Note: U.S. industrial firms, weighted by gross investments.

The combination of high return on investment and modest growth means that businesses are generating sizable sums of cash. For example, companies in the S&P 500, excluding the financial services, transportation, and utilities industries, had a balance of cash and marketable securities of \$1.4 trillion as of June 30, 2016, roughly 8 percent of the market capitalization of the index. This cash balance is even more remarkable considering that companies in the S&P 500 disbursed \$975 billion to their shareholders through buybacks and dividends in the 12 months ending June 30, 2016.

Cash balances are high today, and it is common to hear market commentators say that we are at all-time highs. But we are by no means in uncharted waters if you measure cash as a percentage of assets. Exhibit 13 shows that at 11 percent, today's cash as a percentage of assets is well below the levels in the post-World War II period. Further, a sizable sum of today's cash balance is offshore, and companies cannot repatriate it without incurring an additional tax burden. So between the shift in the composition of the economy and tax policy, some increase in cash holdings should come as no surprise.

Exhibit 13: U.S. Cash as a Percentage of Total Assets, 1950-2015

Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms.

We can summarize the discussion so far as follows:

- Internal financing represents the vast majority of the source of capital for U.S. companies. Internal financing supplies less capital to companies in other developed countries, in part because those countries have lower ROICs.
- The primary uses of capital include M&A and capital expenditures, although M&A is very cyclical. Over the last 35 years spending on capital expenditures and dividends has declined as a percentage of sales, while R&D and share buybacks have increased as a percentage of sales. These changes reflect the shift in the structure of the underlying economy.
- ROIC is high in the U.S., and the rate of investment is middling. As a consequence, companies are generating strong free cash flow, and capital allocation is more important than ever.

Before delving into each of the specific uses of capital, it is worth considering what the academic research says about capital allocation. The findings are easy to condense: “Asset growth rates are strong predictors of future abnormal returns.” This is true in both U.S. and international markets.¹⁶

More specifically, firms with low asset growth rates earn substantially higher shareholder returns, after adjusting for risk, than firms with high asset growth rates. Further, companies that contract their assets tend to generate higher shareholder returns than companies that expand their assets.

High returns to shareholders tend to follow events such as spin-offs, dividend initiations, share buybacks, and debt prepayments, whereas low returns to shareholders generally follow events such as acquisitions and stock and debt issuance.

The academic research supports the notion that capital allocation is challenging and that growth is not inherently good. But we must keep in mind that context is very important. Recall that the correct answer to almost every capital allocation question is, “It depends.” We need to look beyond base rates, as informative as they are, to understand what truly drives or impedes value creation. We now turn to the details of the major uses of capital.

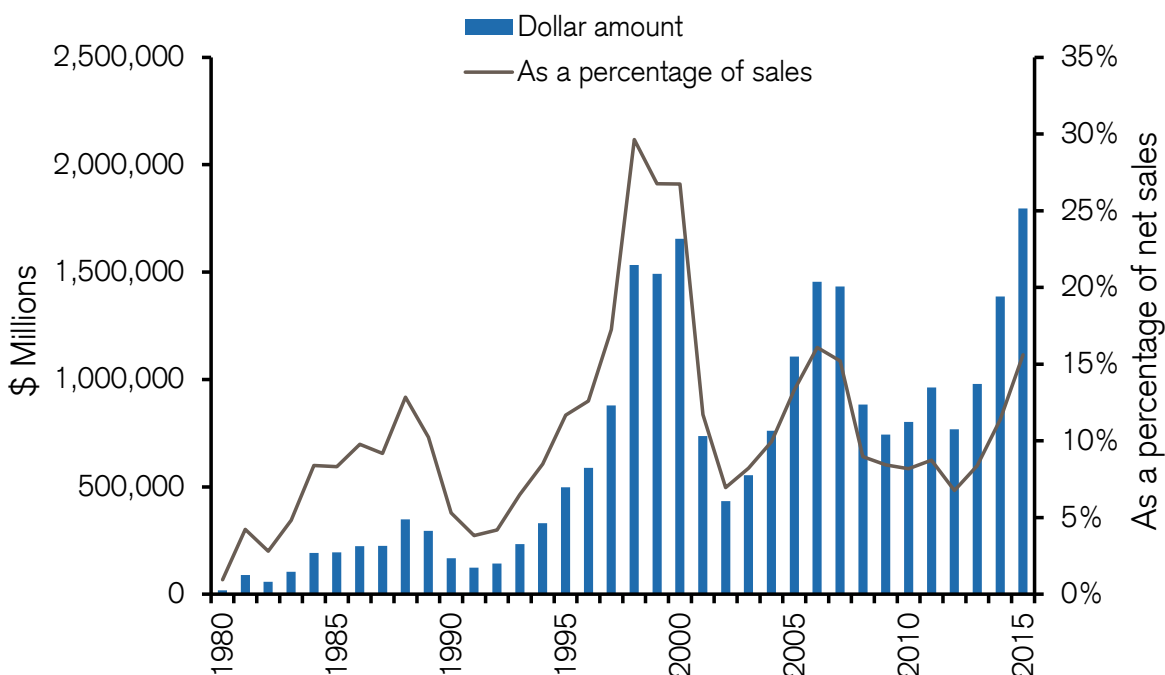
Capital Allocation Alternatives

For each alternative, we will consider four aspects: the trend in spending, how to think about the alternative from an economic standpoint, the empirical research, and the outlook for future spending.

Mergers and Acquisitions. M&A is by far the largest source of redistribution of corporate resources of all the alternatives. For many companies, M&A is the most significant means to pursue strategic goals and the most costly way to do so. And if M&A volume continues to average 9 percent of the equity market capitalization of the U.S., as it has since 1980, nearly all companies and investment portfolios will feel the effect of M&A at some point.

Exhibit 14 shows the dollar amount of M&A as well as M&A as a percentage of sales from 1980 to 2015. M&A tends to follow the stock market closely, with more M&A activity when the stock market is up.¹⁷ It comes as no surprise that companies that act early in an M&A cycle tend to generate higher returns than those that act later. The first movers in an M&A wave enjoy the benefits of a larger pool of acquisition targets and cheaper valuations than companies that acquire later in the cycle. Later acquirers are encouraged to act based on bandwagon effects, or what Buffett calls the institutional imperative, and an accommodating environment for financing.¹⁸

Exhibit 14: U.S. Mergers and Acquisitions, 1980-2015

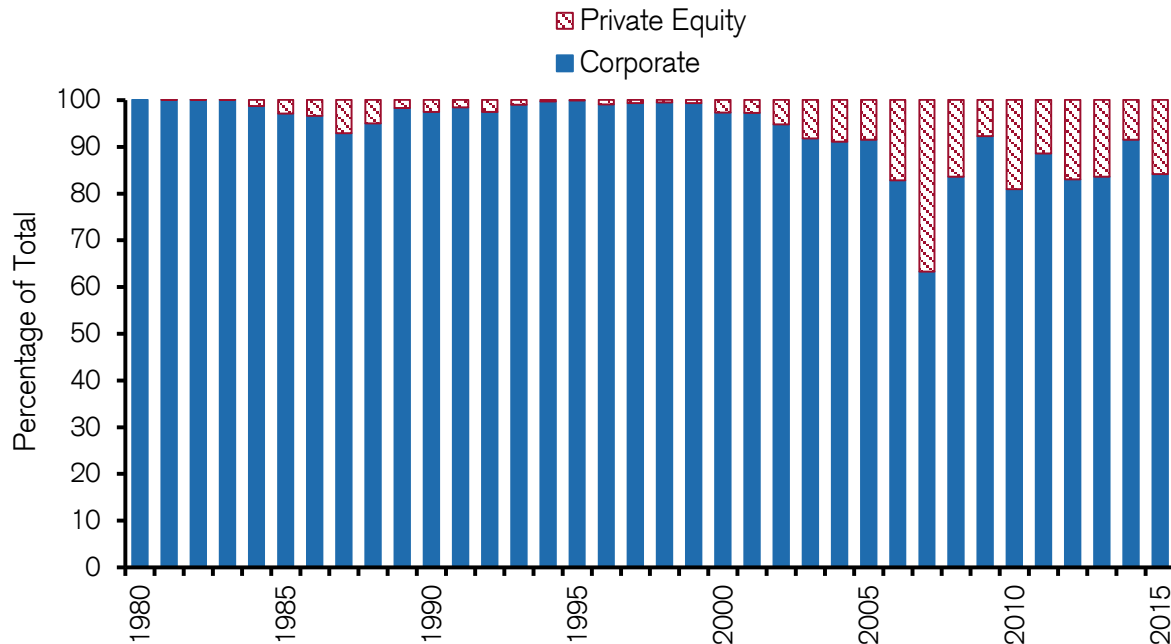


Source: Thomson Reuters and Credit Suisse HOLT.

Note: Dollar amounts are not inflated. U.S. announced domestic mergers; excludes debt tender offers, equity carve-outs, exchange offers, loan modifications, and open market repurchases.

Private equity has also played an increasingly prominent role in M&A (see Exhibit 15). Private equity rose from essentially nothing to seven percent of deal volume at the peak of the leveraged buyout boom in the 1980s. In the early 2000s, private equity's percentage of M&A rose steadily, reaching a peak in 2007 at 37 percent of the volume. There was a substantial drop-off in participation through the financial crisis, but private equity is back to an average of about 10-15 percent of volume in recent years.

Exhibit 15: Private Equity Percentage of M&A Volume, 1980-2015



Source: Thomson Reuters; Credit Suisse; Amy Or, "Private Equity Firms Were Busy in 2015, but Not as Much as Corporates," Wall Street Journal, January 5, 2016.

Note: U.S. deal activity; corporate M&A includes announced domestic mergers and excludes debt tender offers, equity carve-outs, exchange offers, loan modifications, and open market repurchases.

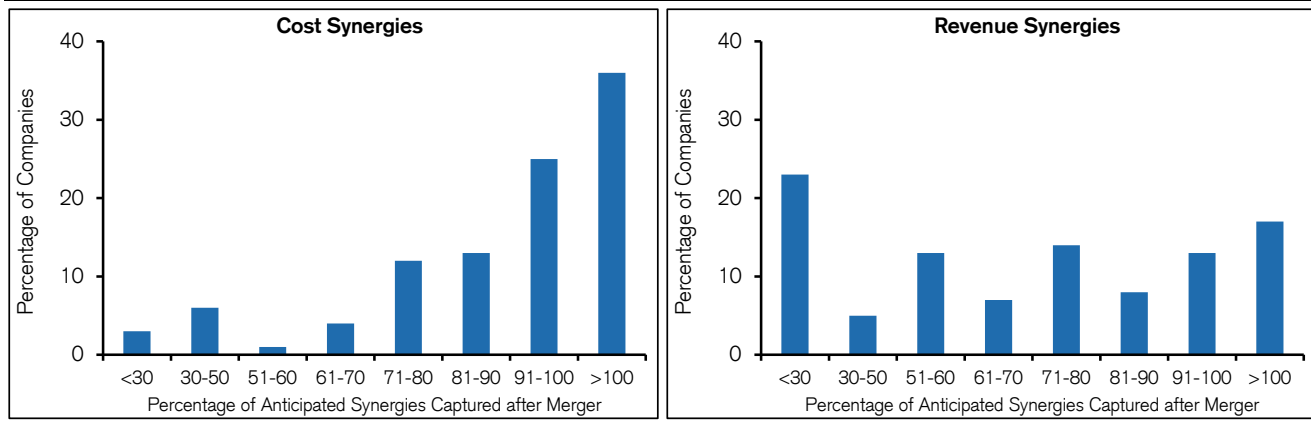
How should companies assess the merit of an M&A deal? Mark Sirower, a consultant at Deloitte, suggests that acquirers use the following formula:¹⁹

$$\text{Net present value of the deal} = \text{present value of the synergies} - \text{premium}$$

Simply stated, the formula says that a deal is good if the acquirer gets more than it pays for. The underlying premise is that the target's stock price, pre-deal, accurately reflects the present value of the company's future free cash flow. So the deal creates value for the buyer only if the synergy from putting the businesses together exceeds the premium for control the acquirer must pay to close the deal. This equation is more fundamental than superficial metrics such as accretion to earnings per share, which doesn't appear to factor into the market's reaction.²⁰ As a result, the formula provides much more insight into a deal's economic virtue.

Let's take a closer look at the terms in the equation. Exhibit 16 shows the results of a survey of corporate executives that McKinsey, a consulting firm, conducted regarding synergy. There is a clear difference between cost synergies, the cost the companies can save by removing redundancies, and revenue synergies, the anticipated increase in sales from combining businesses. Other forms of synergies have historically played a less substantial role.²¹

Exhibit 16: Cost Synergies Are More Reliable Than Revenue Synergies

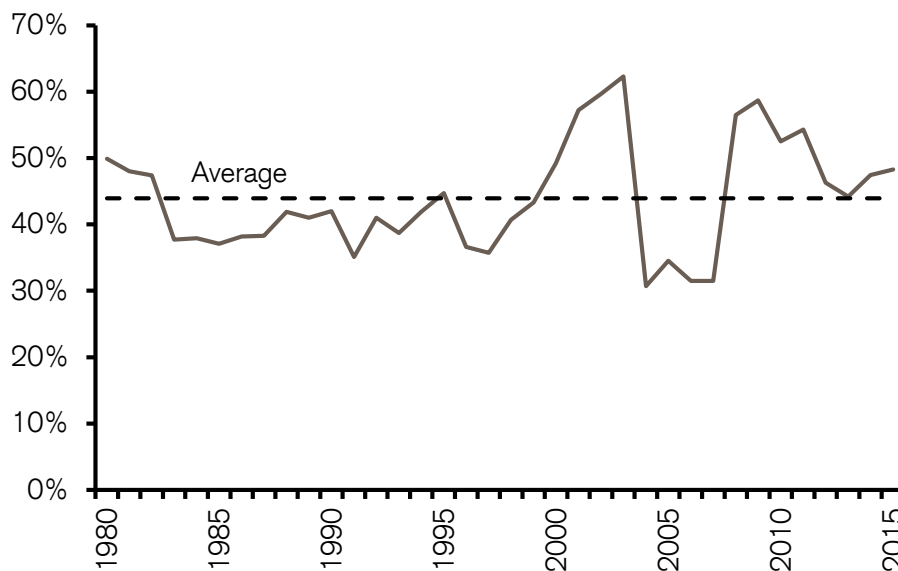


Source: Scott A. Christofferson, Robert S. McNish, and Diane L. Sias, "Where Mergers Go Wrong," McKinsey on Finance, Winter 2004, 1-6.

Cost synergies are much more reliable than revenue synergies. About one-third of the executives surveyed said that their company achieved all or more of the anticipated cost synergy, while one-quarter of the companies overestimated their cost synergy by 25 percent or more. But roughly 70 percent of mergers fail to deliver the anticipated revenue synergy. The most common challenges companies cite for synergy realization include delays in implementing planned actions, underestimation of costs and complexities, and flat-out overestimation of synergies.²²

Exhibit 17 shows the average deal premium, with each deal receiving an equal weight. The premium is the difference between the price a buyer is willing to pay and the prevailing market price prior to any anticipation of a deal. For example, if a stock is trading at \$100 and a buyer offers \$140, the premium is 40 percent (\$40/\$100). While the premium is generally straightforward to calculate for a particular transaction, the series of premiums over time is difficult to aggregate. The current average premium is 48 percent, not far from the long-term norm.

Exhibit 17: U.S. Average Deal Premium, 1980-2015

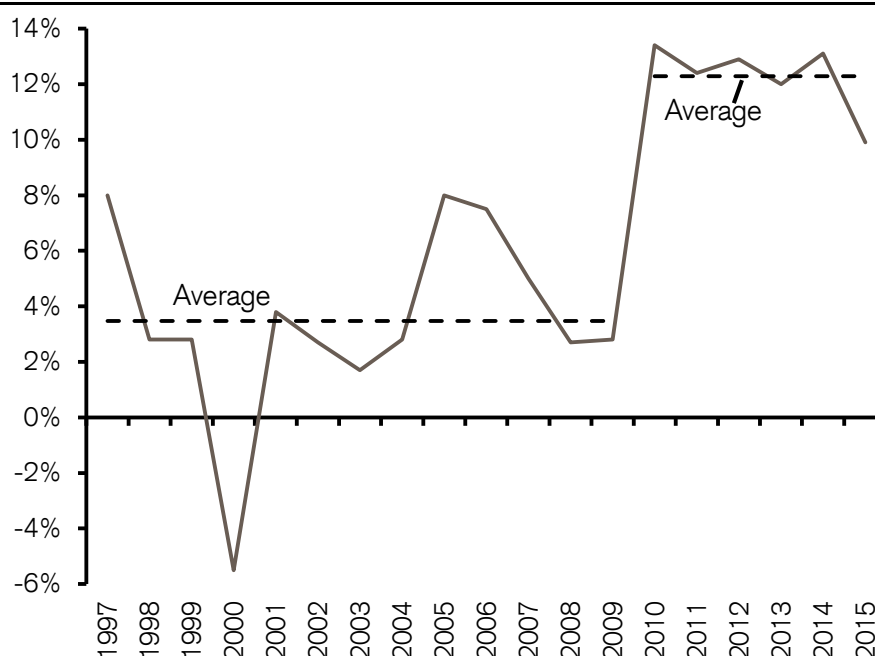


Source: Patrick A. Gaughan, Mergers, Acquisitions, and Corporate Restructurings – Sixth Edition (Hoboken, NJ: John Wiley & Sons, 2015), 605; FactSet; Thomson Reuters; Credit Suisse.

Any analysis of M&A should focus on the difference between the synergy and the premium. Succeeding at M&A is not easy for a number of reasons. First, if the premium is too large a company cannot recoup its investment, no matter how strategic the deal. Second, often competitors can replicate the benefits of a deal or take advantage of a company's lack of focus as it goes through an integration process. Third, M&A requires payment up front for benefits down the road, which creates legitimate skepticism for investors. Finally, M&A deals are generally costly to reverse.²³

The empirical evidence on M&A underscores the challenges that buyers face.²⁴ Over time, it appears that a majority of acquirers see their stock prices decline following the announcement of a deal. Research by McKinsey concluded that about one-third of deals create value for acquirers, and the other two-thirds are value neutral or value destructive.²⁵ That said, you must recognize that M&A creates value when you consider both the buyer and the seller. Exhibit 18 shows a measure that McKinsey calls "deal value added," which is the percentage increase in the combined market capitalizations of the buyer and seller. This has averaged about 6 percent over the past 19 years, with the only negative year in 2000 at the peak of the dot-com bubble. M&A creates substantial value but most of that value goes to the sellers, not the buyers.

Exhibit 18: Average Deal Value Added, 1997-2015



Source: Richard Dobbs, Marc Goedhart, and Hannu Suonio, "Are Companies Getting Better at M&A?" McKinsey on Finance, Winter 2007, 7-11; David Cogman, "Global M&A: Fewer Deals, Better Quality," McKinsey on Finance, Spring 2014, 23-25; David Cogman, McKinsey & Company.
 Note: DVA is McKinsey's calculation of the combined (acquirer and target) change in market capitalization relative to the market from two days prior to two days after the announcement, as a percentage of transaction value.

One comment we hear consistently from management is that the market is short-term oriented and fails to recognize the virtue of the announced deal. Mark Sirower and his colleague, Sumit Sahni, studied this assertion. Exhibit 19 summarizes their findings, which are based on an analysis of more than 300 deals.²⁶

The first observation is that about one-third of the deals (103/302) result in a stock price for the buyer that is initially higher, net of the market's change. This is consistent with past studies. Next, there is a clear correlation between the premium the buyer paid (the column on the right) and the announcement return (the column in the middle). Smaller premiums yielded positive returns, and higher premiums generated negative returns. This is consistent with Sirower's formula to determine a deal's net present value for the buyer.

Exhibit 19: The Stock Market Takes a Long-Term View When It Judges M&A

<u>Stock Reaction</u>	<u># of Deals</u>	<u>Announcement Return</u>	<u>One-Year Return</u>	<u>Premium</u>
Persistent positive	52	5.6%	33.1%	25.8%
Initial positive	103	5.7%	4.9%	30.7%
Full sample	302	-4.1%	-4.3%	35.7%
Initial negative	199	-9.2%	-9.0%	38.4%
Persistent negative	133	-10.3%	-24.9%	40.5%

Source: Mark L. Sirower and Sumit Sahni, "Avoiding the 'Synergy Trap': Practical Guidance on M&A Decisions for CEOs and Boards," Journal of Applied Corporate Finance, Vol. 18, No. 3, Summer 2006, 85.

Sirower and Sahni then wanted to see if the market's initial reaction was accurate. So they checked on the deals one year later. Those that were initially positive remained positive overall, with a one-year total shareholder return of 4.9 percent. More than half of the initial positive deals were persistently positive.

Deals that were initially negative remained so on average, with a total shareholder return of -9.0 percent. Two-thirds of the negative deals were persistently negative. This research suggests that while the market's initial read of a deal isn't perfect, there does not appear to be a bias. Indeed, if there is a bias it is that the market is too optimistic, as one-half of the positive deals turned negative but only one-third of the negative deals turned positive.

The story for buyers should not come across as too dour. There are ways to shade the odds of a deal to be more favorable. One empirical finding is that not all types of deals have the same chances of success. Peter Clark and Roger Mills, finance experts who focus on M&A, found substantially different success rates for varying categories of deals. Exhibit 20 summarizes their analysis.

Exhibit 20: Probability of M&A Success Based on Type of Deal

Success Rate	Category	Type	Description	Example(s)	Success Threats (Ex-Pricing, Phase)
87-92	Opportunistic	Bottom-trawlers	Dying competitor signals exit, advantage to fast, cash bidders	Marconi, Palm	Obsolescence, incompatible technologies
80-85	Operational	Bolt-ons	Fills void in acquirer's existing product/service offer, quickly	P&G/Pantene	Hidden integration difficulties cancel timing advantage
65-70	Operational	Line extension equivalents	Next generation/different variant of existing product/service	Volkswagen/Skoda	Actual synergies limited to scale, insufficient to cover APP
55-60	Transitional	Consolidation -- mature	Same industry contraction: scale, overhead synergies	Pharma, telecoms	Overestimation of market share gain importance
40-45	Operational	Multiple core-related complementary	Logical complements to present offer: products/channels/areas Two or more related elements	Disney/ABC; P&G/Gillette; Coty/Avon	Mistaken judgment of development potential (r-synergies)
37-42	Transitional	Consolidation -- emerging	Same industry contraction: Picking winners	ABC Capital Cities/Dumont	Overstated premiums (APP) based on target's prior performance
30-35	Operational	Single core-related complementary	Similar to complementary but one or less related elements	Daimler Chrysler	Exaggerated benefits attributed to target in 'marriage made in heaven'
20-25	Transformational	Lynchpin strategic	Major change in emphasis in acquiring company's business mix and forward strategy	IBM/PwC Consulting	Dependent on extraordinary acquiring company
15-20	Transformational	Speculative strategic	Radical, high-risk experimentation with company's business mix and model	AOL/TW; Vivendi (Messier)	CEO's imagined vision inconsistent with market realities

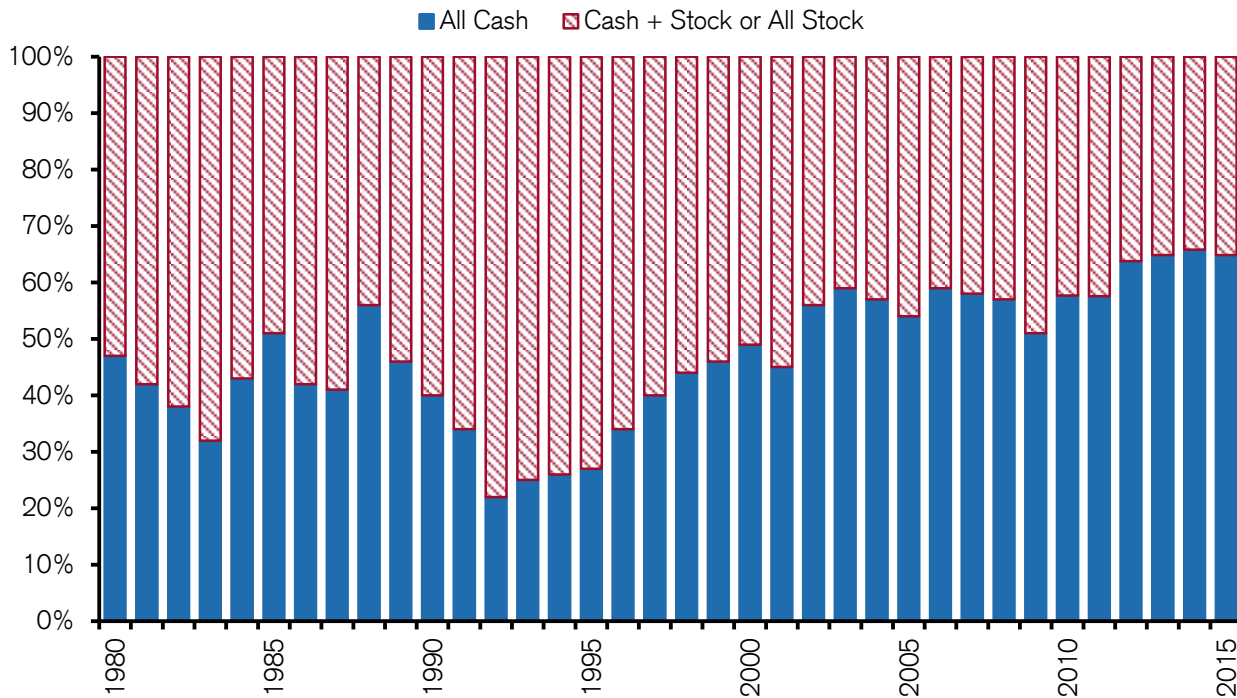
Based on Peter J. Clark and Roger W. Mills, *Masterminding the Deal: Breakthroughs in M&A Strategy and Analysis* (London: Kogan Page, 2013), 148-149.

For example, deals they call “opportunistic,” where a weak competitor sells out, succeed at a rate of around 90 percent. “Operational” deals, or cases where there are strong operational overlaps, also have an above-average chance of success. The rate of success varies widely for “transitional” deals, which tend to build market share, as the premiums buyers must pay to close those deals can be prohibitive. Finally, the success rate of “transformational” deals, large leaps into different industries, tends to be very low.²⁷

Another factor that can work in favor of acquirers is the source of deal financing. The research suggests the market greets cash deals much more kindly than stock deals.²⁸ There are a number of plausible explanations for this. First, you can consider an acquisition funded with stock as two separate transactions: selling stock to the public, and using the proceeds to buy the target. Management teams generally sell their stock when it's expensive, providing a negative signal to the market. Second, in a cash transaction all of the deal's risk and reward accrues to the buyer. In a stock-for-stock deal, the buyer shares the risk with the seller. This, too, provides a weaker signal of conviction.²⁹

Exhibit 21 shows the mix between all-cash deals and all-stock or blend deals. Cash deals are a much higher percentage of the total than a decade or so ago. This reflects sizable cash balances, good access to the debt markets, and the perception of many executives that the stocks of their companies remain undervalued.

Exhibit 21: All-Cash Deals and All Stock or Blend Deals, 1980-2015

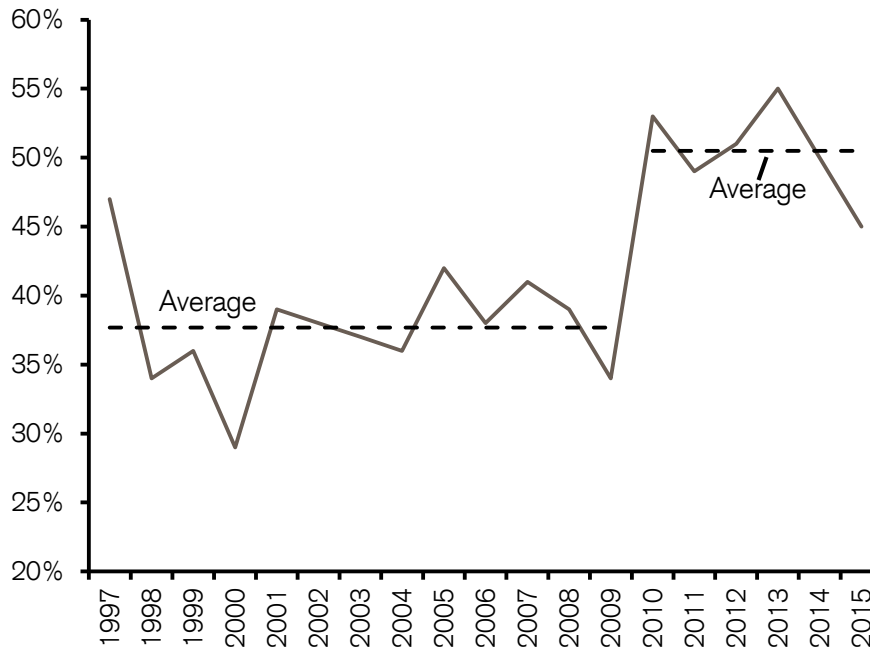


Source: Patrick A. Gaughan, *Mergers, Acquisitions, and Corporate Restructurings – Fifth Edition* (Hoboken, NJ: John Wiley & Sons, 2011), 577; FactSet; Credit Suisse.

M&A was slow to rebound in the current cycle despite the stock market’s results and low interest rates. But deal volume picked up sharply in the past couple of years and hit a record in 2015 in the U.S. and on a global basis. Activity remains strong in 2016 but is down from the 2015 highs. Through the first three quarters of 2016, U.S. M&A is down by about 30 percent and global M&A is down about 20 percent year over year. One noteworthy aspect of this M&A cycle is how well the market has received deals. Exhibit 18 shows that the average deal value added in 2015 was nearly 60 percent higher than the average since 1997. What is also unusual is how much of that value buyers are capturing.

Exhibit 22 shows McKinsey’s calculation of the percentage of deals that create value for acquirers. A buyer is judged to create value if its stock goes up relative to the market. Note that an average of 38 percent of deals created value for acquirers from 1997-2009, but the percentage rose to an average of 51 percent from 2010-2015.

Exhibit 22: Percentage of Deals That Create Value for Acquirers, 1997-2015

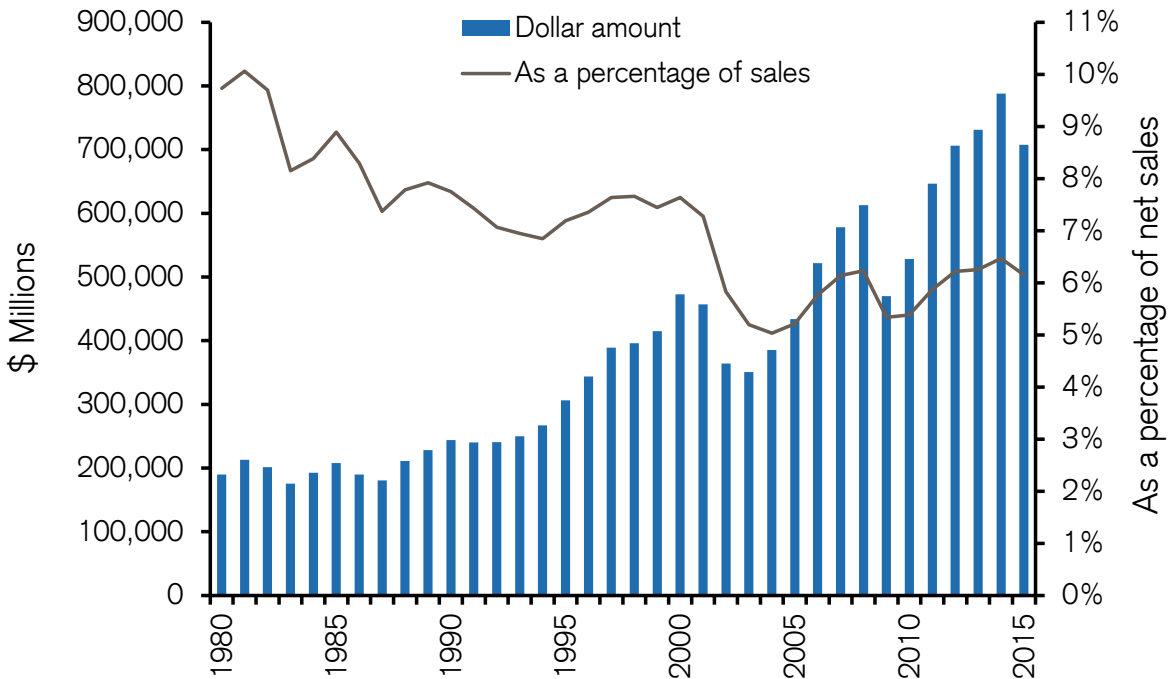


Source: Richard Dobbs, Marc Goedhart, and Hannu Suonio, "Are Companies Getting Better at M&A?" McKinsey on Finance, Winter 2007, 7-11; David Cogman, "Global M&A: Fewer Deals, Better Quality," McKinsey on Finance, Spring 2014, 23-25; David Cogman, McKinsey & Company. Note: The percentage that create value is 1 minus the percentage of overpayers (POP). POP is McKinsey's calculation of the percentage of transactions in which the relative price movement of stocks was negative for the acquirer from two days prior to two days after the announcement.

Capital Expenditures. Capital expenditures are the second largest use of capital for companies. In 2015, capital expenditures were about two-fifths of the amount companies spent on M&A. However, capital expenditures tend to be steady and have a vastly lower variance than M&A over time.

Exhibit 23 shows the dollar amount of capital expenditures since 1980, as well as capital expenditures as a percentage of sales. Spending declined from 10 percent of sales in 1981 to 5 percent of sales in 2004, but rebounded to more than 6 percent of sales in 2015. A substantial part of the pickup in capital spending since 2004 is related to the resurgence in commodity prices, which led to sharp increases in spending in the energy and materials sectors. For instance, the energy sector's capital expenditures went from around 13 percent of the total in the early 2000s to about 35 percent in recent years. But as the commodity cycle has cooled, so too has capital spending, with the energy sector's share of total expenditures dipping to 30% in 2015.

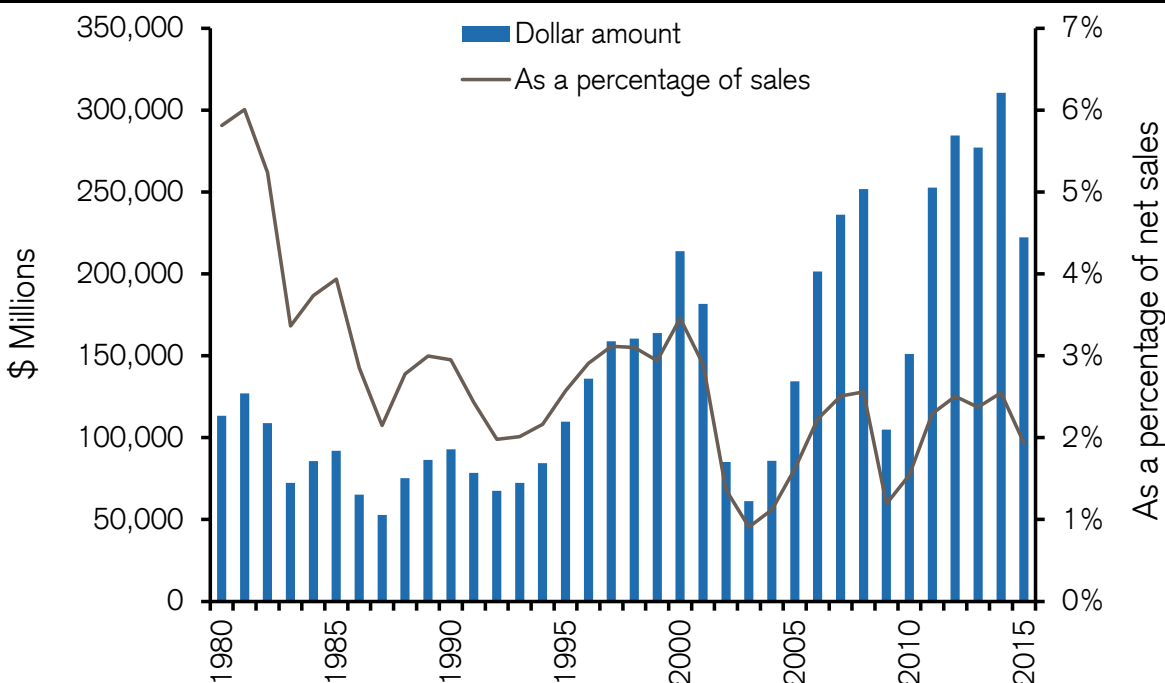
Exhibit 23: U.S. Capital Expenditures, 1980-2015



Source: Credit Suisse HOLT.
 Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

Executives and investors frequently distinguish between “maintenance” capital expenditures and total capital expenditures. Maintenance spending is the minimum required to maintain or replace the long-term assets in place. We can assume that capital expenditures beyond the maintenance level are in pursuit of growth.

Depreciation expense serves as a rough proxy for maintenance capital spending.³⁰ Exhibit 24 shows capital expenditures net of depreciation. Measured as a percentage of sales, growth capital expenditures are roughly 40 percent of overall capital expenditures. That maintenance is essential explains a good deal of the stability of capital expenditures. Further, it suggests that in assessing the value creation prospects of capital expenditures, you are best served to focus on the component that supports growth.

Exhibit 24: U.S. Capital Expenditures Net of Depreciation, 1980-2015

Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

What factors should you consider to judge whether capital expenditures create value? The industry is a good starting point. Companies that invest in industries with a high return on invested capital and good growth prospects are more likely to create value. You can refine this analysis by considering whether the company has a specific competitive advantage as a low-cost producer or through differentiation.³¹

The cyclicity of the industry is another important consideration in assessing capital expenditures. Spending in cyclical industries tends to follow the same pattern as what we have seen in M&A and buybacks: companies spend when things look good and hunker down when they don't. As a consequence, companies tend to add too much capacity at the top of the cycle and suffer when the cycle recedes.

Finally, be mindful that relative comparisons of capital expenditures can be tricky. For example, analysts and executives generally compare the level of a company's spending to its peers. The retail industry is known for this. The crucial question is not whether one company is spending more or less than another, but rather whether a company is spending the proper amount.

The relative game applies on the country level as well. For example, in the early 1990s there was a palpable fear that U.S. companies were investing too little relative to peer companies in countries such as Japan.³² What received less attention was the possibility that Japanese companies were investing too much and hence failing to create value with many of their investments. We can make a similar distinction between public and private companies. The goal is not to spend more or less than the competitor but rather to spend the correct amount given the economic opportunity at hand.

Academic work on capital expenditures broadly supports the idea that the market rewards value creation and refutes the idea that investors prefer short-term earnings gains at the expense of long-term value creation.³³ The research shows that the stock market rewards companies that invest in high-quality projects, which is

generally signaled by a record of investments that have generated returns in excess of the cost of capital, and penalizes companies that invest in low-quality projects. And for businesses with high economic returns, the market responds positively to unexpected increases in capital expenditures and negatively to unexpected decreases in capital expenditures.³⁴

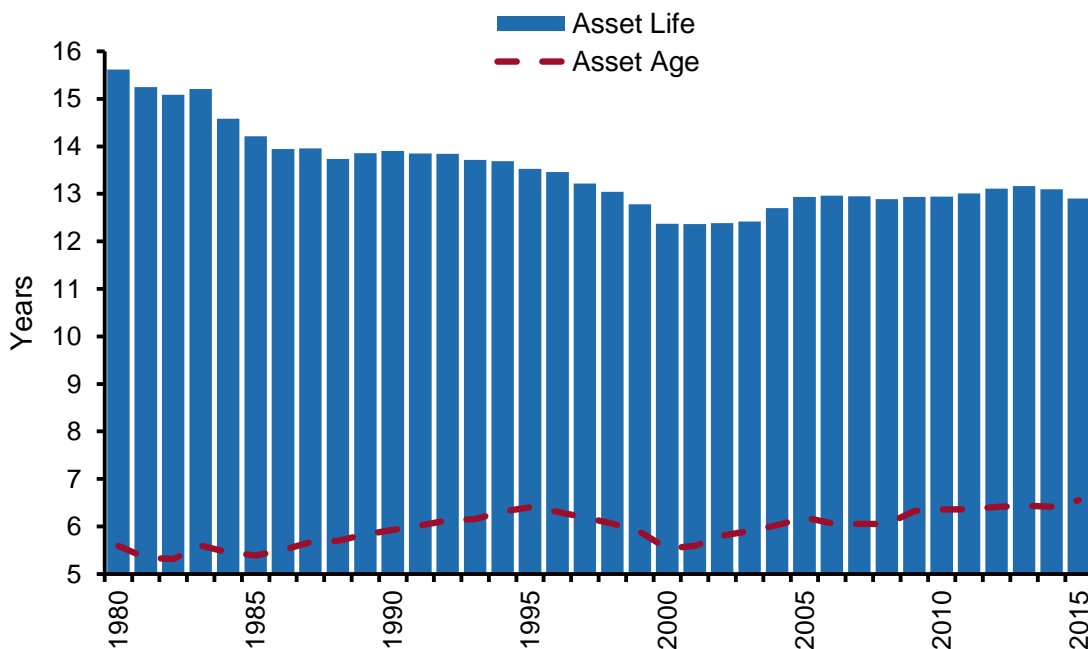
But there is also a limit to how rapidly a company can grow. Firms that increase their investments the most tend to suffer from poor relative total shareholder returns in the years following the growth. This is consistent with the thesis that empire building generally results in stock market underperformance and the evidence that rapid asset growth predicts poor stock returns.³⁵

Notwithstanding the steady economic recovery from the low of the financial crisis, capital expenditures are expected to decline in 2016, having fallen by about 6 percent through the first half of the year. This in part reflects a decline in oil prices, which has prompted a retrenchment of spending in energy.

Analysis of asset life and age supports a case for steady growth in capital expenditures over time. Exhibit 25 shows that the average asset life for the top 1,500 companies in the U.S. declined from roughly 16 years in 1980 to a low of 12 years in the early 2000s, with a rebound to 13 years today.

The average asset age rose from about 5 years in the early 1980s to 6.6 years currently. As a result, the difference between asset life and asset age for the U.S. capital stock has shrunk from 10 years in the 1980s to 6 years now. While numerous commentators have emphasized the aging capital stock over the past decade, few have noted the simultaneous, albeit gentle, rise in asset lives.

Exhibit 25: U.S. Asset Life and Age, 1980-2015



Source: Credit Suisse HOLT.

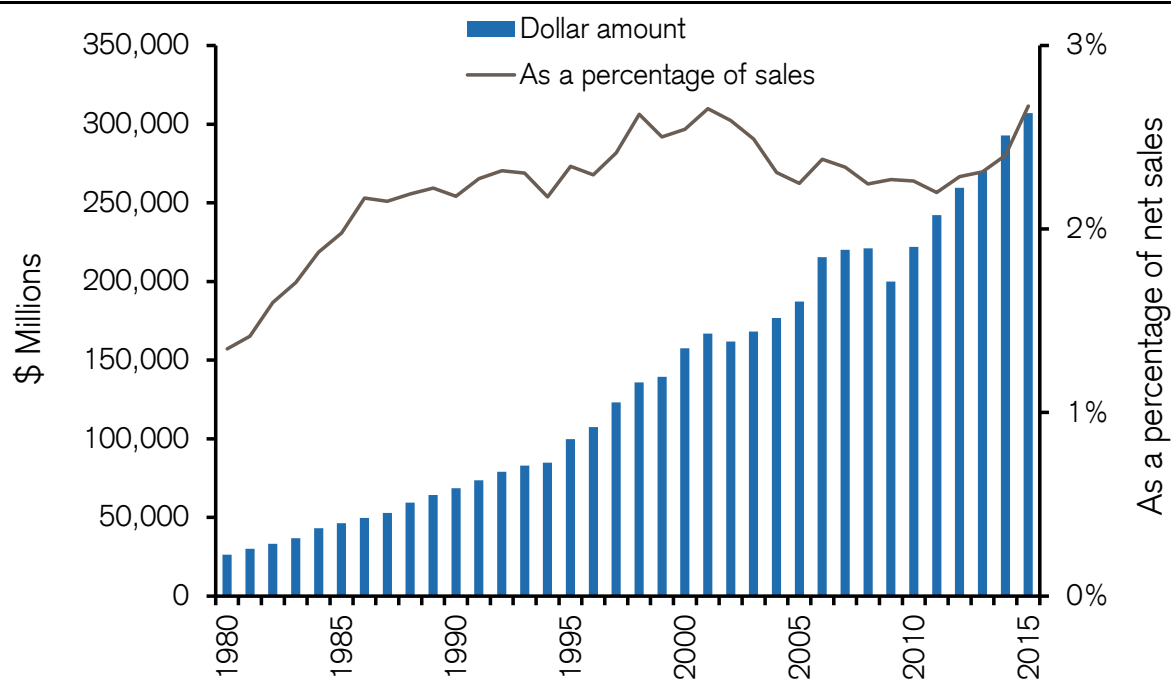
Note: Top 1,500 U.S. industrial firms; asset life is based on gross plant/depreciation expense; asset age = asset life * (1 - net plant / gross plant).

Research and Development. Unlike M&A and capital expenditures, R&D is a capital allocation choice that shows up on the income statement rather than the balance sheet. Accountants expense R&D in the period the company incurs it, notwithstanding the potential long-term benefits, because they deem the outcomes too uncertain and difficult to quantify. R&D is a set of activities that seeks to develop new products or the tools to create new products.

In the U.S., businesses account for about 70-75 percent of total R&D spending, with the government and academia splitting the other 25-30 percent. The industries that spend the most include information technology, healthcare, materials, and aerospace and defense. Technology and healthcare combined represent more than two-thirds of all R&D spending in the U.S., and technology R&D spending is roughly 1.6 times that of healthcare.

Exhibit 26 shows the dollar amount of R&D since 1980 as well as R&D as a percentage of sales. R&D rose from 1.3 percent of sales in 1980 to 2.7 percent of sales at the time of the dot-com bubble, only to decline to 2.2 percent in 2008 before returning to the prior peak of 2.7 percent of sales in 2015. The substantial rise in R&D as a percentage of sales during the full period reflects the change in the composition of the market. During this time, R&D-intensive sectors such as technology and healthcare have become a larger part of the economy than sectors that are less R&D intensive.

Exhibit 26: U.S. Research and Development, 1980-2015



Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

R&D productivity is the relationship between the value a new product creates and the company’s investment in that product. But assessing productivity is a challenge because there is a lag between investment and outcome. A host of other factors, which are hard to capture, also weigh on the outcome. It is useful to distinguish between the cost to launch, or “R&D efficiency,” and the value per launch, or “R&D effectiveness.” One company may be good at bringing a product to market (R&D efficiency) while a different company may be able to create more value for the product as the result of better design, marketing, or distribution capabilities (R&D effectiveness).³⁶

One approach to assess a company's R&D productivity is to capitalize R&D, amortize it over an appropriate period, and calculate the return on invested capital (ROIC) so as to be comparable to businesses that are not R&D intensive.³⁷ R&D capitalization has the effect of increasing profit (the R&D amortization amount is almost always less than expensed R&D, hence adding to profit) and increasing invested capital (since R&D is reclassified as a capital item rather than an expense). The challenge is to determine the appropriate amortization period, or roughly the time to develop a product.

Some researchers who study the pharmaceutical industry assess R&D productivity by dividing a company's R&D budget over some period by the number of drugs the company has brought to market. Rather than examining the cost of successful drugs only, this method captures the total costs a company incurs including the cost of failure. Exhibit 27 shows the results of this analysis for the top 10 companies measured by R&D dollars spent per drug. A great deal has been written about the decline in R&D productivity in the pharmaceutical industry, and attitudes about the virtue of R&D are at the crux of alternative strategies for value creation within the sector.³⁸

Exhibit 27: R&D Cost per New Drug for 10 Large Pharmaceutical Companies

	Company	10-year R&D spending	Number of new drugs	R&D per drug
1	Abbott	\$13.2 billion	1	\$13.2 billion
2	Sanofi	\$60.8	6	\$10.1
3	AstraZeneca	\$38.2	4	\$9.6
4	Hoffmann-La Roche	\$70.9	8	\$8.9
5	Pfizer	\$77.8	10	\$7.8
6	Wyeth	\$22.7	3	\$7.6
7	Eli Lilly	\$26.7	4	\$6.7
8	Bayer	\$33.1	5	\$6.6
9	Schering-Plough	\$18.8	3	\$6.3
10	Novartis	\$60.7	10	\$6.1

Source: Matthew Herper, "How Much Does Pharmaceutical Innovation Cost? A Look at 100 Companies," *Forbes*, August 8, 2013.

The academic research on the effectiveness of R&D spending is somewhat equivocal, in part because of the measurement challenges and the decline in R&D productivity in the pharmaceutical industry. One of the best ways to study the market's reaction to any form of investment is to examine unexpected changes. In one such study, finance professors studied more than 8,000 unexpected increases in R&D spending over a 50-year period ended in 2001 and found that the stocks of those companies rose.³⁹ Other researchers conclude that the returns to R&D are positive and higher than other capital investments.⁴⁰

A reasonable question is whether the stock market effectively reflects R&D spending. One large study found that the market does it well. This means that companies that spend a large percentage of sales on R&D realize similar stock market returns as companies that spend a small percentage of sales on R&D. The researchers came to similar conclusions for advertising expenses, which are about one-half as large as R&D expenses in the aggregate.⁴¹

Academics have also found that larger companies that significantly increase their R&D expenditures tend to fare poorly in the stock market.⁴² That said, companies with strong execution capabilities can create value by enhancing R&D effectiveness.⁴³

Some recent research suggests that the technology companies that are in the bottom one-third of R&D spending as a percentage of sales deliver higher returns to shareholders than those in the top third.⁴⁴ This

finding underscores how tricky it is to assess R&D spending because a number of technology companies have benefitted from R&D that was funded by the government.

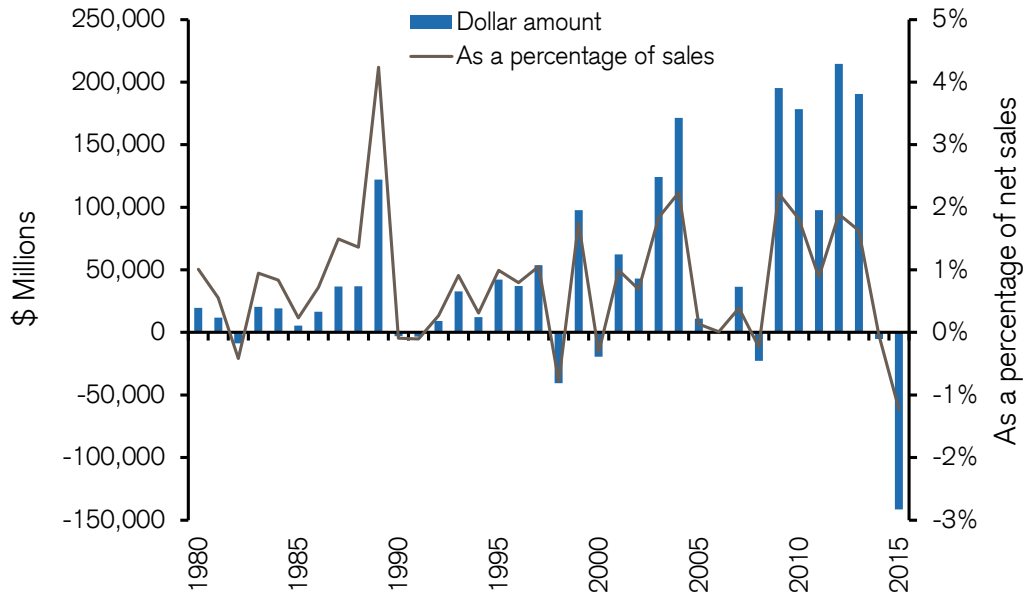
Mariana Mazzucato, a professor of economics at the University of Sussex, addresses this issue in her provocative book, *The Entrepreneurial State*.⁴⁵ Her thesis is that the government funds a great deal of high-risk R&D that companies go on to exploit commercially. She uses the vivid example of the iPhone from Apple Inc., a company that has created a huge amount of shareholder value in the past decade. Four of the main technologies inside the iPhone, including the Global Positioning System (GPS), the Internet, touch screen, and voice recognition software, were developed by the U.S. government. As Mazzucato notes, Apple did a brilliant job of integrating these technologies, designing an attractive and intuitive product, and marketing effectively. But it did not develop some of the key technologies inside the phone, which means the company's shareholders did not have to shoulder those expenses.

Forecasters expect R&D spending to increase by about 3.5 percent in the U.S. and on a global basis in 2016. The U.S., China, and Japan together represent more than half of global R&D spending, and ten countries account for nearly 80 percent of the total. At current rates of funding and growth, China will surpass the U.S. as the largest spender on R&D in the year 2026. In the U.S., growth in R&D spending is expected for all industries engaged in significant R&D activity. The greatest increases are expected in the information and communications technologies industry and the automotive and transportation systems industry, and the smallest increase is seen in the life science industry.⁴⁶

Net Working Capital. Net working capital is the capital a company requires to run its day-to-day operations. It is defined as current assets minus non-interest-bearing current liabilities. Net working capital equals about one-quarter of assets on average for companies in the U.S.⁴⁷ The primary components of net working capital include inventory, accounts receivable, and accounts payable. Interest-bearing current liabilities, which include short-term debt and the current maturities of long-term debt, are a form of financing and are therefore not part of net working capital.

Exhibit 28 shows the annual change in net working capital from 1980 through 2015. At the end of 2015, net working capital stood at \$1.9 trillion for the top 1,500 companies in the U.S., excluding the financial services and regulated utility industries. We consider changes in net working capital as opposed to the absolute amount, because changes are what you should consider to be an incremental investment. Net working capital investments are substantially smaller than M&A, capital expenditures, or R&D.

Exhibit 28: U.S. Change in Net Working Capital, 1980-2015

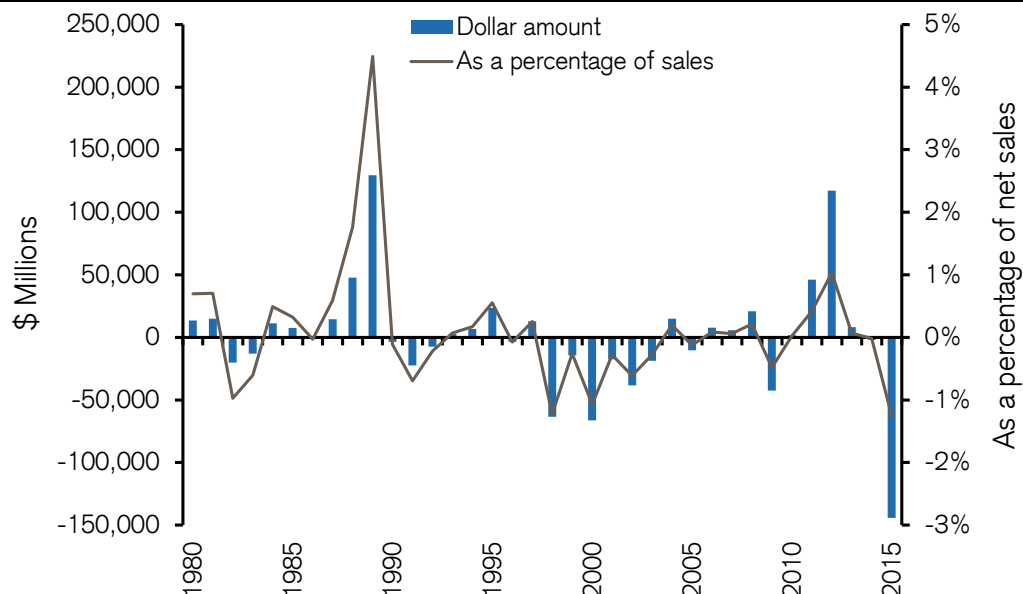


Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

We have defined net working capital to include cash. The picture changes dramatically if we exclude cash. Two trends are noteworthy. First, the percentage of firms that are financed solely with equity has gone from 6 percent in 1980 to 20 percent today. Second, the cash held by the all-equity financed firms has gone from 9 percent of assets to 33 percent over the same period.⁴⁸ As a result, increases in cash make up a substantial fraction of the increase in net working capital. At the end of 2015, net working capital excluding cash was about \$200 billion for the top 1,500 U.S. industrial companies, roughly 10 percent of the total net working capital sum. Exhibit 29 shows the change in net working capital excluding cash.

Exhibit 29: U.S. Change in Net Working Capital Excluding Cash, 1980-2015

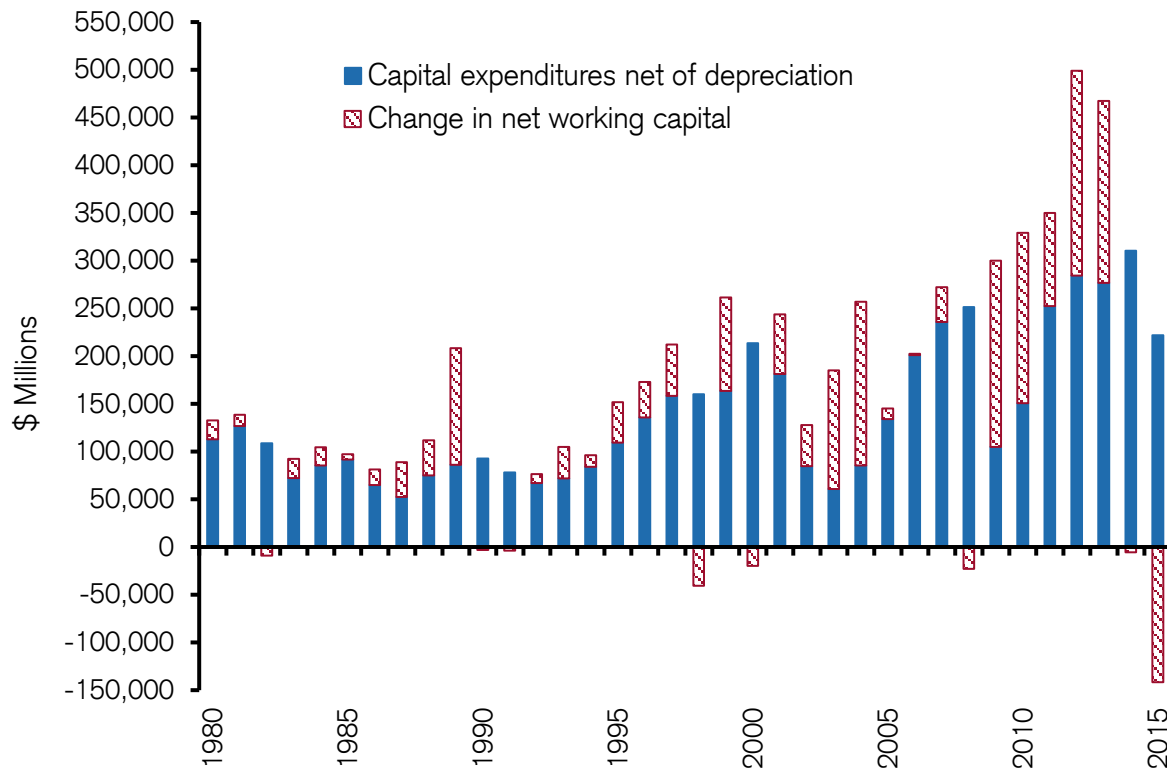


Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

Exhibit 30 shows both investments in net working capital and net capital expenditures together. These items reflect capital investments in organic growth. The exhibit provides a useful view of the relative spending between working and fixed capital. Net working capital declines in a handful of years, making it a source of cash.

Exhibit 30: U.S. Change in Net Working Capital Plus Net Capital Expenditures, 1980-2015

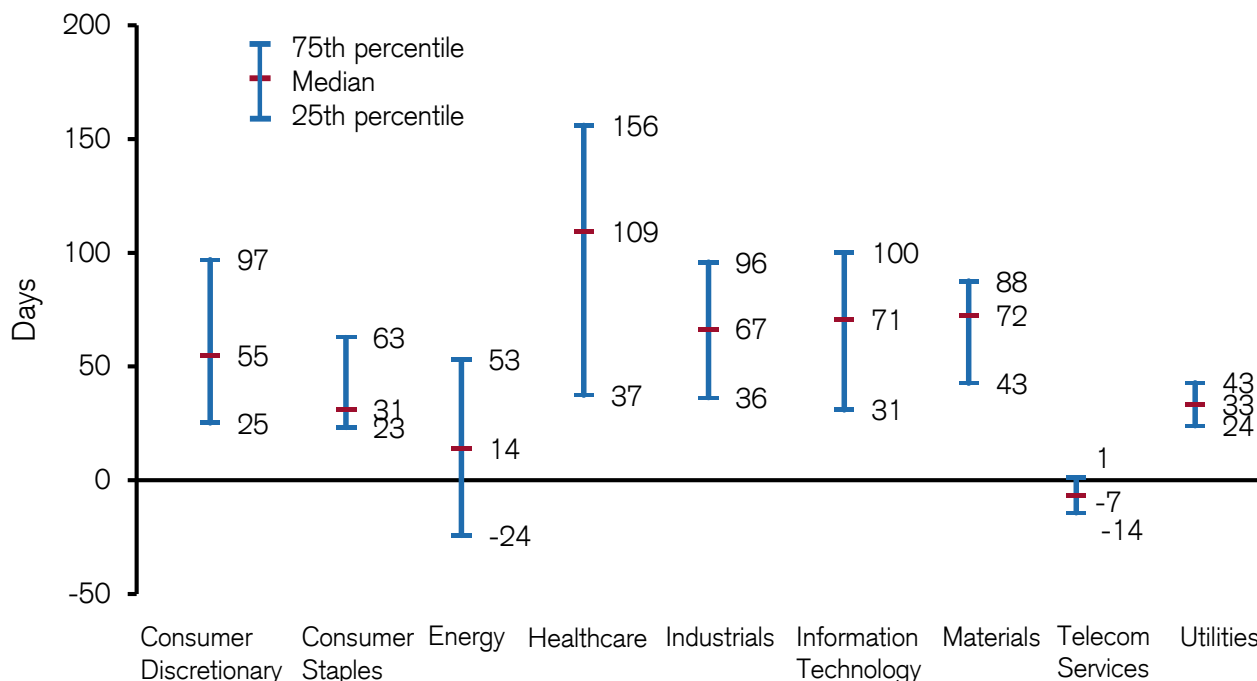


Source: Credit Suisse HOLT.
 Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

The cash conversion cycle (CCC), a calculation of how long it takes a company to collect on the sale of inventory, is the standard way to analyze working capital efficiency. The CCC equals days in sales outstanding (DSO) plus days in inventory outstanding (DIO) less days in payables outstanding (DPO).⁴⁹ For example, Cisco Systems, Inc.’s CCC in its latest fiscal year was 80 days (2016) while Apple’s was -33 days (2015).

Some firms, including Apple, have a negative CCC, which means that the company receives cash on the sale of inventory before it pays its suppliers. This effectively makes the company’s suppliers a source of financing and can be relevant in competitive interactions. For instance, Walmart Stores Inc.’s CCC in its latest fiscal year was 11 days (2016) while Amazon.com’s was -24 days (2015). With a CCC for each company in hand, you can compare the efficiency of working capital use from one company to the next. Exhibit 31 shows the cash conversion for sectors within the S&P 500, excluding financials.

Exhibit 31: Cash Conversion Cycles for Sectors within the S&P 500, 2015



Source: FactSet and Credit Suisse. Format of exhibit from Ryan Davies and David Merin, "Uncovering Cash and Insights from Working Capital," McKinsey & Company, July 2014.
 Note: S&P 500 companies, excluding financials, as of December 31, 2015.

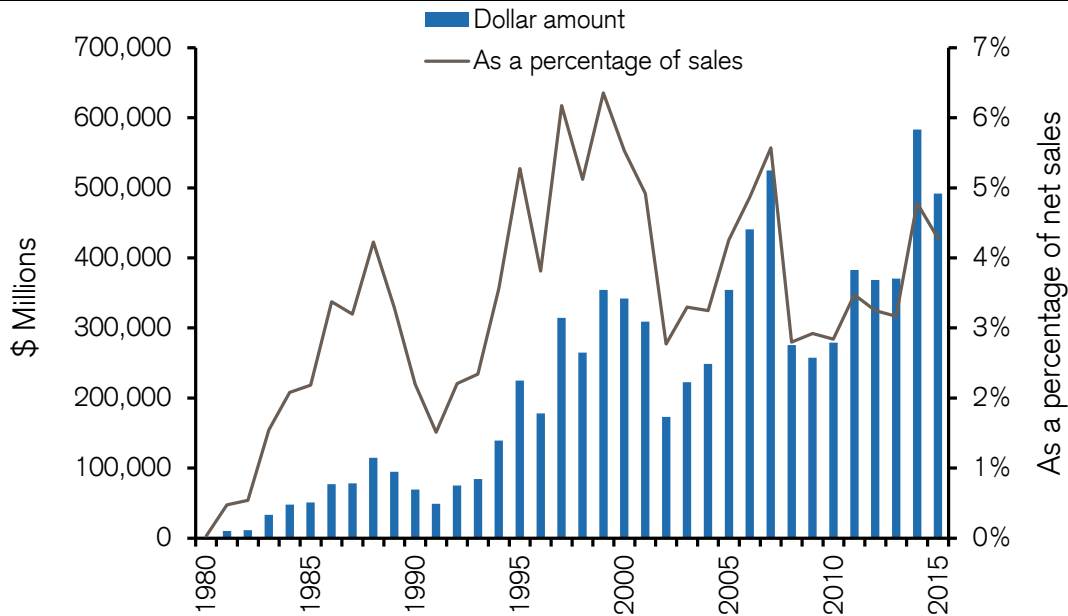
Academic research shows a strong relationship between a lower CCC and a higher return on capital within, and across, industries.⁵⁰ In other words, good working capital management is associated with high returns on invested capital. The impact on total shareholder returns, however, is less clear. Research suggests that a dollar invested in working capital is worth less than a dollar either held in cash or invested in the firm. Further, extending credit to customers through increasing receivables has a bigger effect on shareholder value than increasing inventory.⁵¹

The main issue in the outlook for net working capital is what companies choose to do with their cash hoards. Research shows that investors value cash on the balance sheet of companies with poor governance at \$0.40-\$0.90 on the dollar in anticipation of value-destroying moves.⁵² M&A continues to be a likely use of cash and, as we will see, companies continue to return cash to shareholders via buybacks and dividends at a steady clip.

Divestitures. Companies use divestitures to adjust their business portfolio. Actions include the sale of divisions, spin-offs, and equity carve-outs. A company will divest an operation when it perceives the value to another owner to be higher, or if the divestiture adds focus to the parent and hence improves results.

Exhibit 32 shows the magnitude of divestitures from 1980-2015. While divestitures generally draw less attention than M&A, they represent a substantial component of capital allocation. In the last decade, divestitures have averaged 3.8 percent of sales for the top 1,500 companies in the U.S., a level comparable to gross buybacks and higher than dividends and R&D spending.

Exhibit 32: U.S. Divestitures, 1980-2015

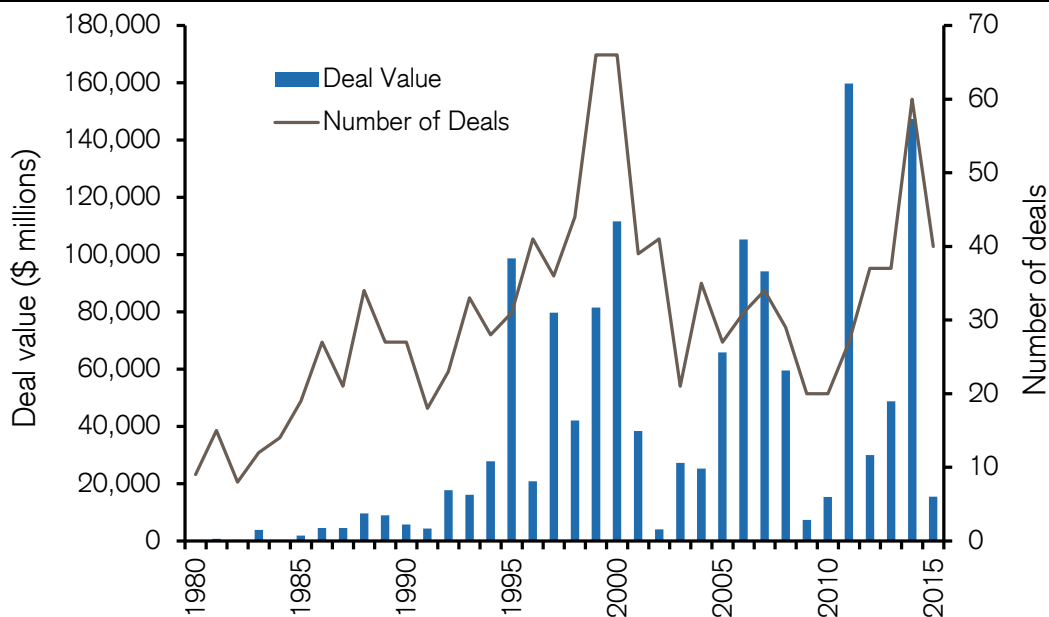


Source: Thomson Reuters and Credit Suisse HOLT.

Note: U.S. announced divestitures; excludes debt tender offers, equity carve-outs, exchange offers, loan modifications, and open market repurchases. Dollar amounts are not inflated.

Spin-offs are a prominent form of divestiture. In a spin-off, a company distributes shares of a wholly owned subsidiary to its shareholders on a pro-rata and tax-free basis. For example, Danaher Corporation spun off several of its segments into a new company, Fortive Corporation, in July 2016. Following the spin-off Danaher shareholders owned shares in Danaher and Fortive. Exhibit 33 shows the value of announced spin-offs and the number of completed spin-offs from 1980-2015.

Exhibit 33: U.S. Spin-Offs, 1980-2015



Source: Thomson Reuters; Spin-Off Research; Hemang Desai and Prem C. Jain, "Firm Performance and Focus: Long-Run Stock Market Performance Following Spinoffs," Journal of Financial Economics, Vol. 54, No. 1, October 1999, 81.

Note: Dollar amounts are not inflated.

There are a few considerations in assessing divestitures. First, research has established that most of the value creation for a typical company comes from a relatively small percentage of its assets.⁵³ This means that most companies have businesses or assets that do not earn the cost of capital and that may be more valuable to another owner.

Divestitures can lead to “addition by subtraction” when a company that divests an operation with a low return on invested capital receives more than what the business is worth as an ongoing part of the firm. So there’s an addition of value to the company even as there’s a subtraction in the size of the firm.

Second, we have already reviewed the evidence showing that M&A creates value in the aggregate but that acquirers struggle to capture much, if any, of that value. This suggests it is better to be a seller than a buyer on average. This point is particularly relevant when there are multiple bidders for an asset. Contested deals frequently lead to what economists call the “winner’s curse.”⁵⁴ When this occurs, the “winner” of the bidding pays too much for the asset, hence the “curse.” The winner’s curse means there is a wealth transfer, above and beyond the value of the asset, from the buyer to the seller.

Finally, most companies have a natural tendency to want to grow rather than shrink. As companies grow and diversify, capital allocation and strategic control can become more challenging. When a CEO who understands capital allocation takes the helm of a company with underperforming assets, there is a great opportunity to create value through divestitures.⁵⁵

Notwithstanding their significance in capital allocation, divestitures have received substantially less attention than M&A in the academic literature. Research for the most part concludes that divestitures create value. A meta-analysis of nearly 100 studies on divestitures concludes: “In the broadest possible terms, our results suggest that on average, divestiture actions are associated with positive performance outcomes for the parent firm.”⁵⁶

Analysis also shows that spin-offs create value for the spin-offs themselves as well as the corporate parents.⁵⁷ Researchers who did a meta-analysis of more than 25 papers in the spin-off literature summed up their findings this way: “The main conclusion is consistent: spin-offs are associated with strongly significant abnormal returns.” In 2016, the Bloomberg Spinoff Index is up more than twice as much as the S&P 500 Index. Researchers suggest the factors that explain these wealth effects include sharpened focus, better information, and in some cases tax treatment.⁵⁸

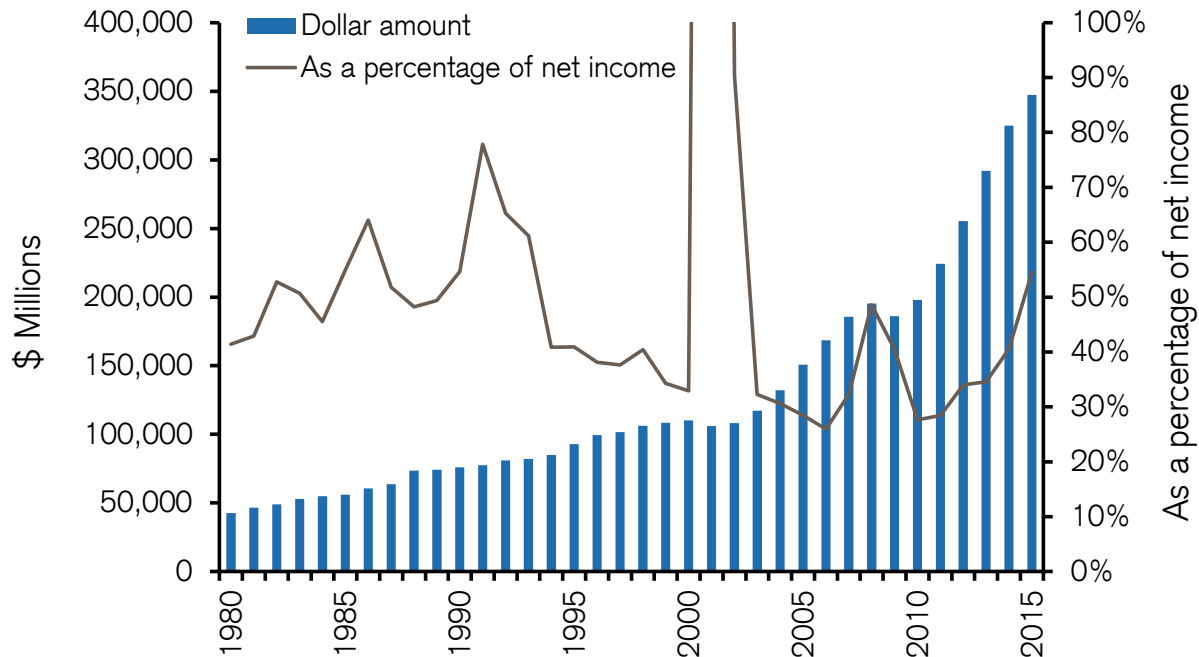
Divestitures remain active in 2016, reflecting the influence of activist investors and ongoing pressure for companies to create value. The number of spin-offs in 2016 is on pace with the 40 completed deals in 2015.⁵⁹ Similar to acquisitions, divestitures follow a wave with deals done at the peak of the cycle delivering lower returns for shareholders than those done at the beginning.⁶⁰

Dividends. A dividend is a cash payment to a shareholder that is generally paid from profits. Dividends and share buybacks are the main ways companies return cash to shareholders. Companies can also return cash to shareholders by selling the company for cash.

The most profound difference between buybacks and dividends may be the attitude of executives. Most executives believe that once a dividend is established, paying it is on par with investment decisions such as capital spending. In contrast, they tend to view buybacks as something to do with residual cash flow after the company has made all investments that are appropriate.⁶¹

There are a couple of consequences of this difference in attitude. The first is that dividend payments are vastly less volatile than buybacks. Indeed, of all the capital allocation options, dividends have among the lowest standard deviation in growth, as exhibit 9 demonstrates. Exhibit 34 shows the annual amount of dividends on common and preferred stock for the top 1,500 companies in the U.S., excluding the financial services and regulated utility industries, from 1980 to 2015. Dividends are remarkably resilient and were especially stable through the financial crisis from 2007-2009.⁶²

Exhibit 34: U.S. Common and Preferred Dividends, 1980-2015

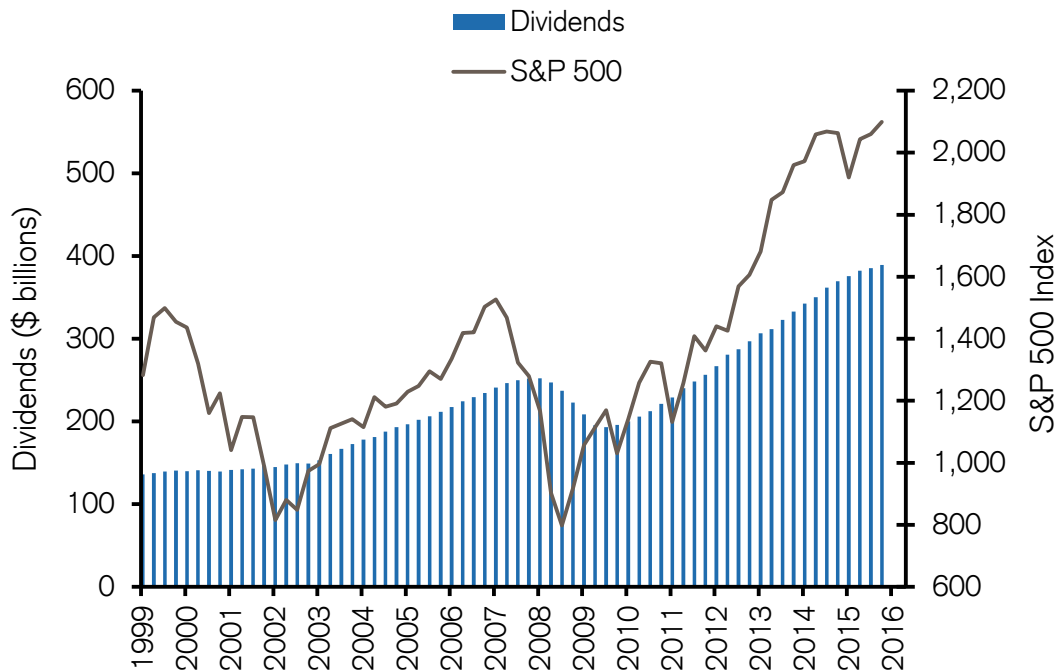


Source: Credit Suisse HOLT.

Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

Exhibit 35 illustrates the quarterly dividends for the S&P 500, including financials, versus the price of the index. Dividends dipped during the financial crisis as many companies in the financial services industry suspended, or eliminated, their payouts. But overall, dividends fluctuated much less than the price of the S&P 500.

Exhibit 35: S&P 500 Dividends and Index Price, 1999-June 2016



Source: S&P Dow Jones and FactSet.

How should investors assess dividends? First, dividends are useful to consider in the context of cash flow. To sustain a cash dividend, a company has to generate cash flow beyond the basic needs to maintain the business and support its growth. So an investor should gauge a company’s cash flow prospects in order to anticipate a company’s ability to pay dividends.⁶³

Second, dividends can play an important role in the capital accumulation rate, also known as total shareholder return (TSR). From time to time you hear that dividends provide the bulk of shareholder returns for equities in the long run. That assertion is wrong if you assume the goal of an investor is to accumulate capital. In fact, price appreciation is the only source of investment return that increases accumulated capital over time.⁶⁴

The equity rate of return is a one-period measure and is simply the sum of stock price appreciation and the dividend. The capital accumulation rate, or TSR, is a multi-period measure that assumes all dividends are reinvested in the stock. Knowing price appreciation and dividend yield, the following equation allows you to calculate TSR:

$$\text{Total shareholder return (TSR)} = \text{Price appreciation} + [(1 + \text{price appreciation}) * \text{dividend yield}]$$

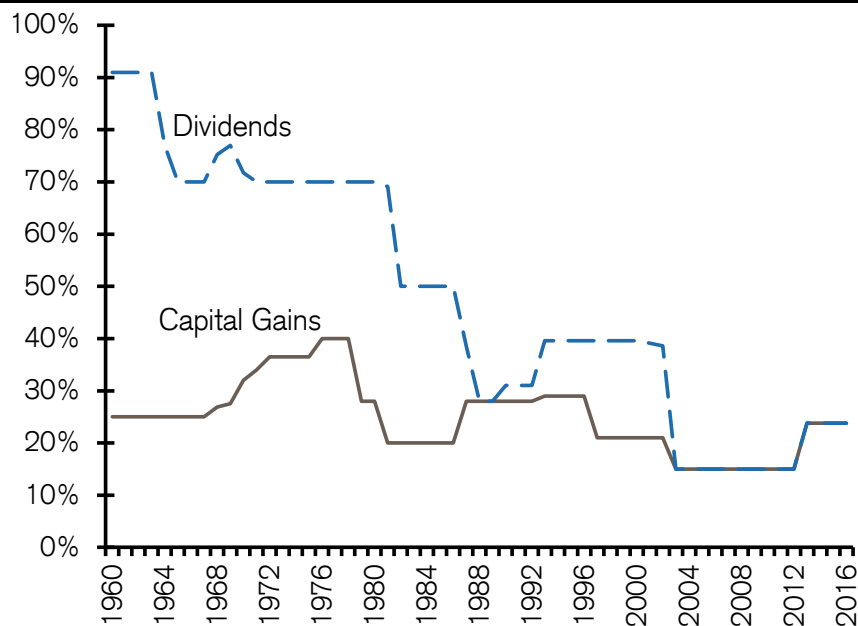
The value of the compounding reinvested dividends means that the equity rate of return is always lower than the TSR as long as price appreciation is positive. For example, assume price appreciation of 7 percent and a dividend yield of 2 percent. The equity rate of return is 9 percent (.07 + .02) and the TSR is 9.14 percent (.07 + [(1 + .07)*.02]).

The key is that for an investor to actually earn the TSR, all of the dividends they receive must be reinvested back into the stock. That’s why price appreciation only determines the TSR.

It's crucial to acknowledge that almost no one earns the full TSR because most individuals do not reinvest the dividends they receive, and dividends are generally taxable. While there are no clear-cut data on the topic, it appears that only one-tenth of all dividend proceeds are reinvested. Naturally, investors can use dividends to consume. But if they do, they can't earn the TSR.

Further, most investors must pay taxes on the dividends they receive. Exhibit 36 shows the top marginal tax rate on dividends and capital gains from 1960 to the present. The TSR declines when you assume that only a fraction is reinvested in the stock. Academic research supports the view that the tax rate on payouts affects shareholder returns.⁶⁵

Exhibit 36: U.S. Top Marginal Tax Rate, 1960-2016



Source: Credit Suisse HOLT and the Tax Foundation.

Finally, investors in the U.S. should recognize that many of the mature, cash-rich companies that are excellent candidates for paying a healthy dividend generate a high percentage of their profits outside the U.S. The companies cannot repatriate this cash to the U.S. without incurring additional taxes. There are a number of U.S. multinationals that do not have enough domestic cash to pay their dividends, even though their balance sheets are flush. A number of these businesses simply borrow in the U.S. to fund their dividends.⁶⁶

Academic research on dividends supports a few points. To begin, older companies are more likely to pay dividends than younger companies. So any analysis of dividend yields must take into account the maturity of the population of companies under consideration.⁶⁷

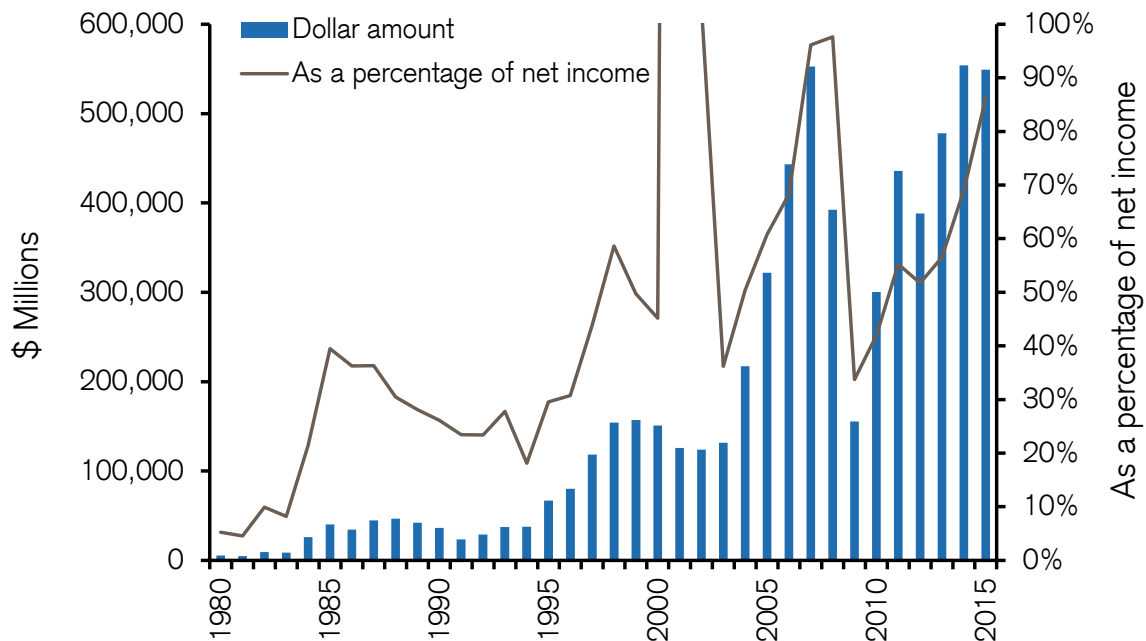
Second, dividends provide a strong signal about management's commitment to distribute cash to shareholders and its confidence in the future earnings of the business. This is consistent with the managerial attitude that dividends are sacrosanct once declared. For this reason, companies are very deliberate about the decision to initiate a dividend.⁶⁸

Dividends maintain steady, if modest growth. For example, dividends for the companies in the S&P 500 totaled roughly \$390 billion over the 12 months ending June 30, 2016, up 5% over the preceding 12 months.⁶⁹ But an assessment of payout policy is not complete without considering share buybacks.

Share Buybacks. A share buyback is the second main way that companies return cash to shareholders. Whereas all shareholders are treated equally with a dividend, only shareholders who sell to the company receive cash with a buyback. This means that shareholders realize very different outcomes based on whether they choose to sell or hold the stock when they deem it to be overvalued, fairly valued, or undervalued.

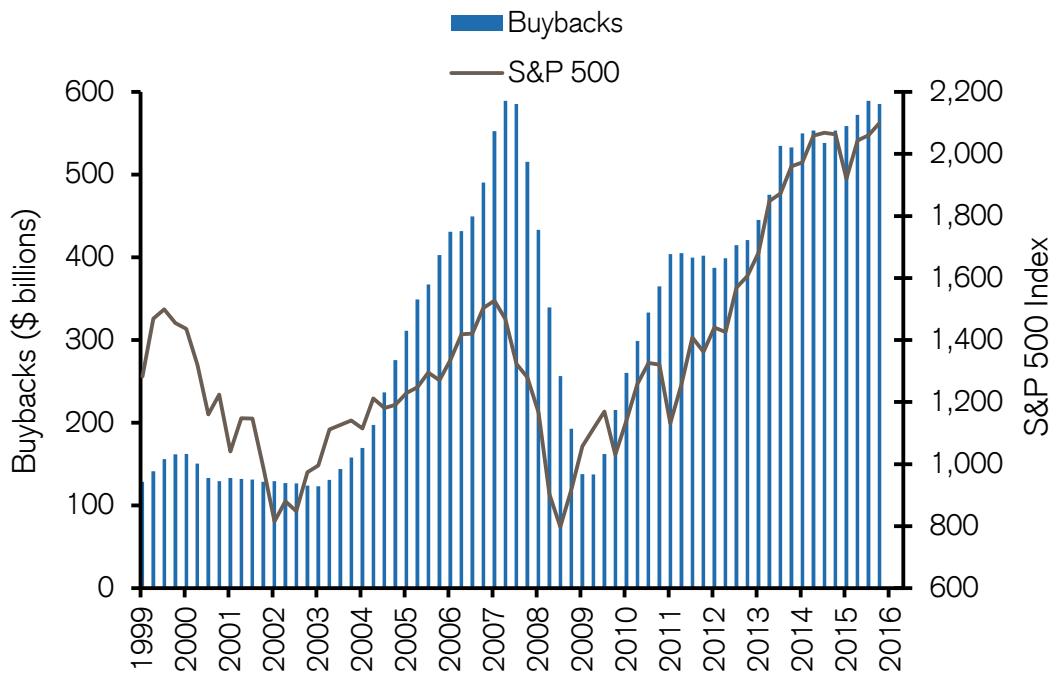
Exhibit 37 shows that gross buybacks for the top 1,500 companies in the U.S. have grown considerably from 1980 to 2015. Buybacks are much more cyclical than dividends, consonant with the attitude that a company should fund a buyback with cash that's left over after all other uses, including dividends, have been exhausted.

Exhibit 37: U.S. Gross Share Buybacks, 1980-2015



Source: Credit Suisse HOLT.
 Note: Top 1,500 U.S. industrial firms. Dollar amounts are not inflated.

Exhibit 38 narrows the sample to companies in the S&P 500 Index from 1999 through the first half of 2016, and compares their quarterly buyback volume to the level of the index. The exhibit makes clear that buybacks hug the results for the market. This fits the notion that buybacks are a use for residual cash and also implies that managements have a proclivity to buy high and not buy low.

Exhibit 38: S&P 500 Gross Buybacks and Index Price, 1999-June 2016

Source: S&P Dow Jones and FactSet.

Despite the sharp rise in buybacks, many market analysts insist on using dividend yield as a measure of payout policy and as a means to anticipate future market returns.⁷⁰ In fact, you need to be very cautious in comparing data before and after 1982. Buybacks were very scarce prior to that date because the Securities and Exchange Act of 1934 prohibited the manipulation of securities prices. Since the rules weren't clear about what constituted manipulation, most companies avoided buybacks altogether.⁷¹

In 1982, Congress enacted Rule 10b-18, which grants companies a safe harbor provided they follow certain rules. Those rules form a legal shield from the threat of being sued by specifying how a company can execute a buyback in terms of manner, timing, price, and volume.⁷² The Securities and Exchange Commission has subsequently updated the rules to reflect current market conditions. The year 1982 marks a new regime in how companies return cash to shareholders.

When assessing a repurchase program, investors and executives should consider the golden rule of share buybacks, which states: A company should repurchase its shares only when its stock is trading below its expected value and when no better investment opportunities are available.⁷³

The golden rule addresses both absolute and relative value. Companies should only invest where they anticipate a payoff that has a positive net present value. This is a fancy way of saying "you will get more than what you pay for." This absolute benchmark applies to all of a company's capital allocation decisions, including M&A, capital expenditures, and R&D.

The rule also addresses relative value when it emphasizes that companies should prioritize higher return internal investment opportunities over buybacks. Ideally, executives should rank their investment opportunities by expected return and fund them from highest to lowest. A company should expect that all of the investments it funds will earn above the cost of capital. While access to capital can be a constraint, most companies generate sufficient cash flow to fund their internal investments.⁷⁴

The second aspect of assessing a buyback is its impact on various shareholders under different conditions. Only if a stock trades exactly at intrinsic value do buybacks and dividends treat all shareholders the same. If a stock is overvalued or undervalued, the effect of a buyback is different for selling shareholders than it is for those who continue to hold.

From the company's standpoint, corporate value is conserved no matter how the company chooses to pay out cash. What differs is who wins and who loses as the result of buying stock below or above intrinsic value. Since management should focus on building value per share for continuing shareholders, it should always try to buy back shares that are undervalued.

Exhibit 39 illustrates the principle. Say we have a company with a value of \$100,000 and 1,000 shares outstanding that decides to return \$20,000 to its shareholders.

Exhibit 39: The Value Conservation Principle

Assumptions	Base	Scenario A	Scenario B	Assumptions	Scenario C
		Assume buyback @ \$200	Assume buyback @ \$50		Assume dividend of \$20
Buyback amount		\$20,000	\$20,000	Dividend amount	\$20,000
Firm Value	\$100,000	\$80,000	\$80,000	Firm Value	\$80,000
Shares outstanding	1,000	1,000	1,000	Shares outstanding	1,000
Current price	\$100	\$200	\$50	Current price	\$10
Shares post buyback		900	600		
Value/share	\$100	\$88.89	\$133.33	Value/share	\$80.00
				Dividend/share	\$20.00
Selling shareholders		100	400		
		\$200	\$50		
Value to sellers		\$20,000	\$20,000		
Ongoing shareholders		900	600	Ongoing shareholders	\$80,000
		\$88.89	\$133.33	Dividends	\$20,000
		\$80,000	\$80,000		
Total value		\$100,000	\$100,000	Total value	\$100,000
Per share +/- sellers		\$100.00	(\$50.00)		
Per share +/- holders		(\$11.11)	\$33.33		

Source: Credit Suisse.

In Scenario A, we assume the stock price is \$200, double the fair value of \$100 ($\$100,000/1,000$). The company can buy 100 shares, leaving \$80,000 of value and 900 shares outstanding. In this case, the selling shareholders gain \$100 per share ($\200 proceeds - $\$100$ value = $\$100$) and the continuing shareholders lose \$11.11 per share ($\88.89 continuing value - $\$100$ initial value = $-\$11.11$). Buying back overvalued stock benefits sellers at the expense of buyers.

In Scenario B, we assume the stock trades at one-half of fair value, or \$50 per share. The company can buy 400 shares, with \$80,000 of remaining value and 600 shares outstanding. Now we see that the selling shareholders lose \$50 per share ($\50 proceeds - $\$100$ value = $-\$50$) and continuing shareholders gain \$33.33 per share ($\133.33 continuing value - $\$100$ initial value = $\$33.33$).

In Scenario C, the company pays a \$20 dividend to all shareholders. Just as in the prior scenarios, the firm value drops to \$80,000, but each shareholder receives identical treatment, leaving aside tax considerations.

This analysis suggests a couple of points that investors commonly overlook. First, if you are the shareholder of a company that is buying back stock, doing nothing is doing something. By choosing to hold the shares instead of selling a pro-rated amount, you are effectively increasing your percentage ownership in the company. One alternative is to sell shares in proportion to your stake, creating a homemade dividend and maintaining a steady percentage ownership in the business.

Second, it is logical that you would prefer that the companies you hold in your portfolio buy back stock rather than pay a dividend. If you own shares of companies that you think are undervalued, buybacks will increase value per share by definition. The only instance where this may not be true is if you believe that a dividend would provide a more powerful signal to the market, hence creating more value than a buyback.

Tying together these thoughts, there are basically three schools of thought regarding buybacks: fair value, intrinsic value, and accounting-motivated. The intrinsic value school is where you want to be if possible.

The fair value school takes a steady and consistent approach to buybacks. Management believes that over time it will buy back shares when they are both overvalued and undervalued, but for the most part when they are about fairly priced. This approach offers shareholders substantial flexibility as it allows them to hold shares and defer tax liabilities or create homemade dividends by selling a pro-rated number of shares.

The fair value school is consistent with the free cash flow hypothesis, which says that managers who have excess cash will invest it in projects with a negative net present value. By disbursing cash, a company buying back its shares reduces the risk of doing something foolish with the funds.⁷⁵ Research suggests that most companies would have been better off buying back stock consistently versus their actual behavior of buying heavily in some periods and lightly, or not at all, in others.⁷⁶

The intrinsic value school believes a company should only buy back shares when it deems them to be undervalued. A company must have asymmetric information or beliefs, as well as analytical prowess, to profitably pursue this approach. Asymmetric information means that company management has information that the stock price fails to reflect. Differing beliefs occur when management has the same information as the market but comes to different conclusions about what that information means.

Analytical prowess means that the executives at the company know how to translate their differential view into an estimate of the relationship between the stock price and intrinsic value. Investors should not assume that management has this ability. Indeed, surveys consistently show that executives believe their stock to be cheap. For example, in a survey from mid-2013, 60 percent of chief financial officers (CFOs) thought that U.S. equities were overvalued, but only 11 percent thought their own stock was overvalued.⁷⁷

Management can act on its conviction by being bold with its buyback program, buying back a substantial percentage of the shares or even buying them at a premium to the prevailing price through a tender offer.⁷⁸ This school fits the signaling hypothesis, which suggests that companies buy back shares when they deem them to trade below intrinsic value. Further, it is important to focus on actual share buybacks versus buyback announcements. The evidence supporting the signaling hypothesis is mixed, but 85 percent of CFOs believe that their buyback decision conveys information.⁷⁹

Boosting short-term accounting results, especially earnings per share (EPS), is what motivates the final school.⁸⁰ When surveyed, three-fourths of CFOs cite increasing EPS as an important or very important factor

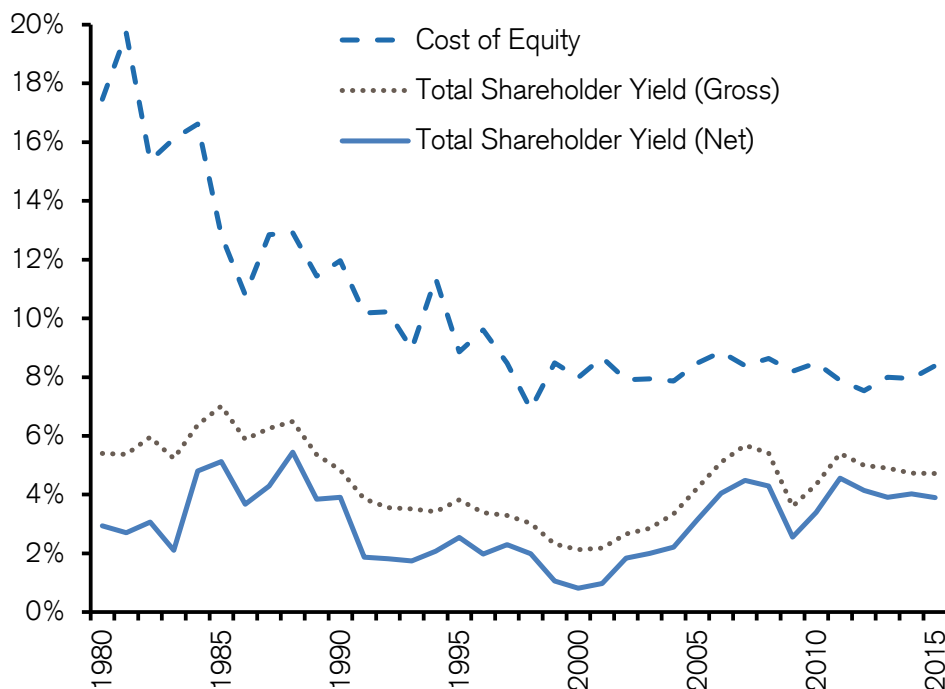
in the decision to buy back shares. Two-thirds of CFOs say that offsetting the dilution from option or other stock-based programs is important. This underscores another essential point: you should consider buybacks net of equity issuance.

The problem with the accounting-motivated school is that its actions are not necessarily aligned with the principle of value creation.⁸¹ For example, there may be a case where buying back overvalued stock boosts EPS and helps management reach a financial objective that prompts a bonus. In this case the motivation is impure because management's proper goal is to allocate capital in an economically sound fashion for shareholders.

Investors assessing companies buying back stock should make an effort to determine which school the management team is in. It can be the case that management buys back stock for the right reason and realizes accounting benefits as a result. That's fine. But investors should be on the lookout for companies that make decisions based on the accounting results without sufficient regard for the economic merits.

A couple of findings from the academic research are worth highlighting. The first is that it appears companies are increasingly using buybacks as a substitute for dividends.⁸² As a result, total shareholder yield (sum of dividends and buybacks divided by equity market capitalization) may be a better indicator of a company's proclivity to pay out than a simple dividend yield. Exhibit 40 shows the total shareholder yield, with and without equity issuance, and the cost of equity for the top 1,500 companies in the U.S. from 1980-2015. The shareholder yield has been remarkably stable, belying the decline in dividend yield. Equity issuance lowers the total shareholder yield by 140 basis points on average, with a range of 70 to 310 basis points.⁸³

Exhibit 40: U.S. Total Shareholder Yield versus Cost of Equity, 1980-2015



Source: Credit Suisse HOLT and Aswath Damodaran.
 Note: Top 1,500 U.S. industrial firms.

Research suggests that buybacks were well received by the stock market in the early days. This is likely the result of a couple of drivers, including the novelty of buybacks and hence the stronger signal they sent, as well as the fact that more buybacks were in the form of Dutch auctions and tender offers versus open market purchases, which are more prevalent today. Analysis of recent buybacks suggests mixed effects.⁸⁴

Buybacks continue at a healthy clip. For example, buybacks for the companies in the S&P 500 totaled \$585 billion over the 12 months ending June 30, 2016.⁸⁵ This fits the idea that managements buy when they feel confident. Buybacks and dividends combined totaled \$975 billion for companies in the S&P 500 for the 12 months ending June 30, 2016, in line with the all-time 12-month record set in March 2016.

Assessing Management's Capital Allocation Skills

"All roads in managerial evaluation lead to capital allocation."⁸⁶

The final part of this report provides a framework for assessing a management team's capital allocation skills. This framework has four components. First, you want to study how a company has allocated capital in the past. Next, you need to examine the company's return on invested capital and, more importantly, return on incremental invested capital. Third is a careful consideration of incentives and corporate governance. And finally, you can compare management's actions to the five principles of capital allocation.

Regulation may constrain the choices a management team has in the allocation of capital. In industries including insurance and banks, regulators seek to establish capital adequacy to offset possible adverse outcomes. In utilities, regulations limit the returns on invested capital in order to best serve the public good. Understanding regulations and how they might change is essential for these industries.

Past Spending Patterns. The first step in assessing a company's capital allocation skills is to see how management has allocated capital in the past. You should break the analysis into two parts, one dealing with investments in the operations (M&A, capital expenditures, R&D, and working capital) and the other with returning cash to claimholders (dividends, buybacks, and debt repayment).

The value of a business is the present value of future free cash flow (FCF). Free cash flow is defined as net operating profit after tax (NOPAT), a measure of the cash earnings of the business that assumes no financial leverage, minus investment (I) in future growth:

$$\text{FCF} = \text{NOPAT} - I$$

NOPAT is determined by sales and sales growth, operating profit margins, and the cash tax rate. Investment is determined by changes in working capital, capital expenditures net of depreciation, and acquisitions net of divestitures. You can calculate these sums using what Alfred Rappaport, a professor emeritus at the J. L. Kellogg Graduate School of Management at Northwestern University, calls "value drivers."⁸⁷ Capital allocation is primarily about the value drivers that determine investment.

To make the comparison clean, Rappaport defines value drivers as the number of cents the company invests in each use for every \$1.00 change in sales. For example, if a company's working capital grows by \$10 in a given year and its sales grow by \$100, the incremental working capital rate is 10 percent (\$10/\$100). If in the same year capital expenditures are \$130 and depreciation is \$70, the fixed capital rate is 60 percent (\$60/\$100). You can calculate the value driver for acquisitions less divestitures in the same way.

A useful first step in assessing capital allocation is to see how much was invested in each area for an incremental dollar of sales over time. We like to calculate results for a minimum of three years, if available, and prefer to go back five to ten years when possible. Here are the numbers for Walmart for the five years ending in fiscal 2016:⁸⁸

Incremental working capital investment rate	=	3.6 percent
Incremental fixed capital rate	=	31.6 percent
Incremental M&A rate	=	0.2 percent

Instantly, you will see whether the company is investing in working capital, capital expenditures, or M&A. That allows you to focus your attention. In this case, it is clear that capital expenditures are the main use of capital.

Here are the numbers for Cisco Systems over the past five years (fiscal 2011-2016):

Incremental working capital investment rate	=	17.0 percent
Incremental fixed capital rate	=	41.2 percent
Incremental M&A rate	=	226.7 percent

Now you can see that M&A has been more important than capital expenditures. In this case, you would roll up your sleeves and figure out how management approaches its M&A decisions. You might also review past deals to see how the market reacted.

This analysis is also useful to assess the change in practices from one CEO to the next. Some CEOs may seek to grow primarily organically, which will raise one set of analytical issues. A successor may be more acquisitive, raising a separate set of issues. Assuming past behaviors provide some basis for anticipating future behavior, this analysis is very useful.

Look for inflection points as well. Are capital expenditures ramping up versus prior levels of spending? Is the company improving its cash conversion cycle? You want to note changes in spending patterns so as to align your analysis with the developments at the company.

The second component of this analysis is to understand how and why management has returned cash to claimholders. This also requires considering a company's capital structure and whether it can or should change. The key is to understand the rationale and motivation for the decisions management makes to evaluate whether they are consistent with the principles of building long-term value per share.

In assessing a company's past capital allocation, it's interesting to determine who exactly is making the decision. Researchers surveyed executives and found that CEOs are least likely to delegate decisions about M&A but much more likely to defer to colleagues on issues such as capital structure and payout ratio. CEOs delegate less if they have a master's degree in business administration, have been around for a long time, or are particularly knowledgeable about a project. CEOs delegate more when the firm is large or complex. Most companies say they use the net present value rule to make investments, but the reputation of the division manager requesting resources is important as is senior management's "gut feel."⁸⁹

It's also useful to understand how the process works. As a practical matter, many companies approach capital allocation through a budgeting process. In a simple version, each division has a capital budget and can either accept that amount or ask for more. Such a request may be subject to a value audit. Research shows that such a budgeting process can lead to overinvestment in low return projects if the budget exceeds the opportunities and underinvestment if the opportunities exceed the budget.⁹⁰

Calculating Return on Invested Capital and Return on Incremental Invested Capital. The second component to assessing capital allocation is determining the output of management's decisions through an analysis of return on invested capital (ROIC) and return on incremental invested capital (ROIIC). ROIC provides a picture of the company's overall performance while ROIIC dwells on the efficiency of incremental spending. Our report, "Calculating Return on Invested Capital: How to Determine ROIC and Address Common Issues," provides details on how to calculate ROIC and ROIIC and includes case studies.⁹¹ Here's a quick summary.

NOPAT is the numerator of ROIC. Because NOPAT assumes no financial leverage, the sum is the same whether a company is highly levered or free of debt. This is essential for comparability within and across industries.

Invested capital is the denominator of ROIC. You can think of invested capital in two ways that are equivalent. First, it's the amount of net assets a company needs to run its business. Alternatively, it's the amount of financing a company's creditors and shareholders need to supply to fund those net assets. These approaches are the same since dual-entry accounting requires that both sides of the balance sheet equal one another.

You should calculate ROIC using the assets side of the balance sheet if given a choice, as that allows you to see how efficiently the company is using capital. In contrast, the right-hand side shows only how much capital the firm has and how it has chosen to finance the business. Ideally, you should calculate ROIC from both the left- and right-hand sides of the balance sheet.

In fiscal 2016, Walmart's NOPAT was \$15.5 billion and its average invested capital was \$143.0 billion, for an ROIC of 10.8 percent. This is well in excess of the company's cost of capital. Since strategies, a bundle of investments, must earn a return in excess of the cost of capital in order to pass the NPV test, ROIC can be a rough proxy for value creation.

Academic research shows that the market rewards investment in organic growth in high return businesses. Typically, companies that earn high ROICs are said to have some sort of competitive advantage. A quick analysis of ROIC indicates whether a company has a competitive advantage and, if so, what lies at the foundation of that advantage.

Bruce Greenwald, a professor at Columbia Business School, argues that there are two sources of competitive advantage: consumer advantage and production advantage. The key to each advantage is the creation of barriers to entry that fend off competition. Barriers to entry are particularly strong when a company enjoys economies of scale, which mean that the cost per unit for the incumbent is lower than that for a challenger.⁹²

A consumer advantage is the result of the habitual use of a product, high costs of switching to a new product, or high costs of searching for a superior product. A production advantage allows a company to deliver its goods or services more cheaply than its competitors and is the result of either privileged access to inputs or to proprietary technology that is difficult or costly to imitate. A competitive strategy analysis focuses on identifying these sources of advantage and assessing their durability.

ROIC can provide a quick and useful way to investigate competitive advantage. You can decompose ROIC into two parts, a modified version of what is known as a DuPont Analysis:

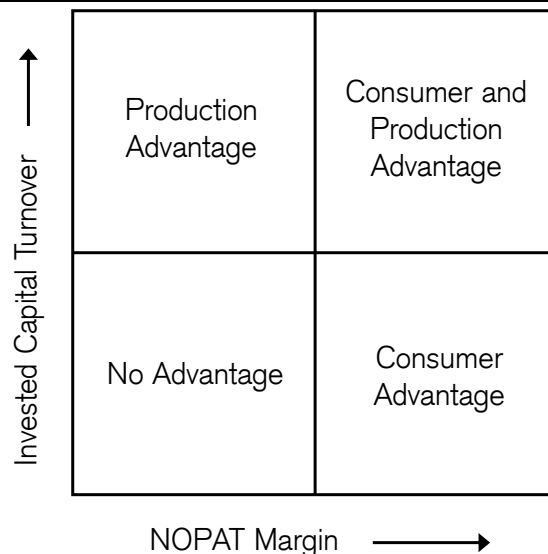
$$\text{Return on invested capital (ROIC)} = \frac{\text{NOPAT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Invested Capital}}$$

The ratio of NOPAT/Sales, or NOPAT margin, is a measure of profit per unit. Sales/Invested Capital, or invested capital turnover, is a measure of capital efficiency. Sales cancel out when you multiply the terms and you are left with NOPAT/Invested Capital, or ROIC.

It is easy to imagine two companies arriving at the same ROIC by different paths. Walmart got to its 10.8 percent ROIC with a 3.2 percent NOPAT/Sales ratio and a 3.4 times Sales/Invested Capital ratio. This is a classic low-margin, high-invested capital turnover business. A luxury goods seller, on the other hand, may reach the same ROIC with an 18.0 percent NOPAT/Sales ratio and 0.6 times invested capital turnover.

Exhibit 41 summarizes the analysis. If a company gets to a high ROIC through a high NOPAT margin, you should focus your analysis on a consumer advantage. If the company's high return comes from a high turnover ratio, emphasize analysis of a production advantage. For companies that are high in both, consider how the advantages are reinforced by economies of scale.

Exhibit 41: ROIC and Competitive Advantage



Source: Credit Suisse.

Having defined and discussed ROIC we must now emphasize that it's not the absolute ROIC that matters but rather the change in ROIC. Or, even more accurately, what's crucial is the expectation for changes in ROIC. Needless to say, the market is not always perfect at anticipating change in ROIC, so having a sense of where ROIC is going can be of great value.⁹³

One potentially useful measure is return on incremental invested capital, or ROIIC. ROIIC properly recognizes that sunk costs are irrelevant and that what matters is the relationship between incremental earnings and incremental investments.

The definition of ROIIC is as follows:

$$\text{ROIIC} = \frac{\text{Year}_2 \text{ NOPAT} - \text{Year}_1 \text{ NOPAT}}{\text{Year}_1 \text{ invested capital} - \text{Year}_0 \text{ invested capital}}$$

In words, ROIIC compares the change in NOPAT in a given year to the investments made in the prior year. Let's say a company's Year₀ invested capital is \$2,000 and it invests \$200 during the year (making Year₁ invested capital \$2,200). Further, NOPAT from Year₁ to Year₂ climbs from \$300 to \$350. Given these assumptions, ROIIC is 25 percent $[(\$350-300)/(\$2,200-2,000)]$.

It is preferable to calculate ROIIC on a rolling three- or five-year basis for businesses with investments or NOPAT that are lumpy. At the other extreme, you can take quarterly changes and annualize them if you want to see if there are any recent trends or improvements. Obviously these results will be the most volatile, but they can give you some insights into how the business is doing. As an example of the calculation, Walmart's ROIIC is 105 percent for fiscal 2016, -44 percent for a rolling three-year period ended 2016, and -11 percent for the rolling five-year period ended 2016.

High ROIICs generally indicate that a business is either capital efficient or has substantial operating leverage (which often proves transitory). Calculating a company's historical ROIIC can be very helpful in understanding potential earnings moves.

A final note of warning: ROIIC—for a host of technical reasons—is not really an economic measure of value. Further, ROIIC makes the strong underlying assumption that the ROIC on the base business remains stable. This is clearly not always true. So use the measure to determine the likelihood of change and to understand past patterns, but don't compare it with the cost of capital or consider it a true return measure.⁹⁴

Incentives and Corporate Governance. One of the essential lessons of economics is that incentives matter. But it is also the case that incentives designed to achieve one objective can lead to unintended consequences.⁹⁵ The goal of this section is to consider whether the incentives a company has in place encourage judicious capital allocation. Most of these incentives address compensation.

Agency theory is the classic way to explain why the managers of a company may not act in the interests of the shareholders.⁹⁶ The idea is that conflicts can arise when there is a separation between ownership and control of a firm. There are three areas where these conflicts tend to arise.⁹⁷

The first is that while it is clear that shareholders want management to maximize the value of their holdings, management may derive benefits from controlling resources that don't enrich shareholders. For example, if remuneration is roughly correlated with the size of the firm, management may seek to do value-destroying M&A deals to grow.

The second area of conflict is with tolerance for risk. Since shareholders tend to hold stocks as part of a diversified portfolio and managers are disproportionately exposed to their own company, managers may seek less risk than shareholders would deem appropriate.

The final conflict is with time horizon. To the degree that compensation plans have a shorter time horizon than the period shareholders use to assess the merit of an investment, there can be a mismatch. So managers may dwell on short-term boosts in earnings. Indeed, research shows that a large majority of managers are willing to forego value-creating investments to deliver near-term earnings.⁹⁸

So what kind of executive compensation scheme provides the proper incentives for management to build value? You can start with what you don't want, which is incentive compensation that is completely independent of value creation. In this case, an executive would have limited incentive to build value because he or she would not benefit directly from that increase. At the other extreme would be the case where the CEO owns 100 percent of the company, blunting any concerns about agency theory.

As a broad characterization, compensation for CEOs in the past 30 years has moved from one based heavily on salary and bonus to one much more sensitive to stock price performance.⁹⁹ But the shift to stock-based compensation, seemingly a step in reducing agency costs, has brought with it a host of other challenges. Most pronounced is that many executives are now focused on boosting the stock price by whatever means they can rather than focusing on creating value, which ultimately gets reflected in the market price.

There is a spirited debate about whether equity-based compensation is doing a proper job of encouraging management to focus on long-term performance.¹⁰⁰ In practice, there are two challenges to equity-based compensation that make it less effective than it might be. Properly structured compensation programs can address both challenges, but rarely do. The first is a company's stock price is only a rough measure of corporate performance. Factors outside of management's control, including general economic conditions, interest rates, inflation expectations, and the equity risk premium, can play a larger role in stock price changes than corporate results do.¹⁰¹

The second challenge is that while the stock market does provide managers with information about investment opportunities and the past decisions of managers, that information can be noisy in the short run.¹⁰² That few managers understand market expectations effectively compounds this challenge.¹⁰³

Before discussing how to address these challenges, let's take a look at the metrics that companies most commonly use in their incentive compensation. Frederic W. Cook & Co., a consulting firm dedicated to executive compensation, does an annual survey of the largest 250 companies in the S&P 500. Exhibit 42 shows the results. In recent years, TSR has emerged as the most common incentive metric, followed by measures of profit and capital efficiency.¹⁰⁴

Exhibit 42: Most Commonly Used Long-Term Incentive Metrics

	<u>2015</u>	<u>2014</u>	<u>2013</u>
Total shareholder return	54%	58%	54%
Profit (EPS, etc.)	51	50	49
Capital efficiency	41	41	40
Revenue	20	21	20
Cash flow	11	13	12
Other	14	15	17

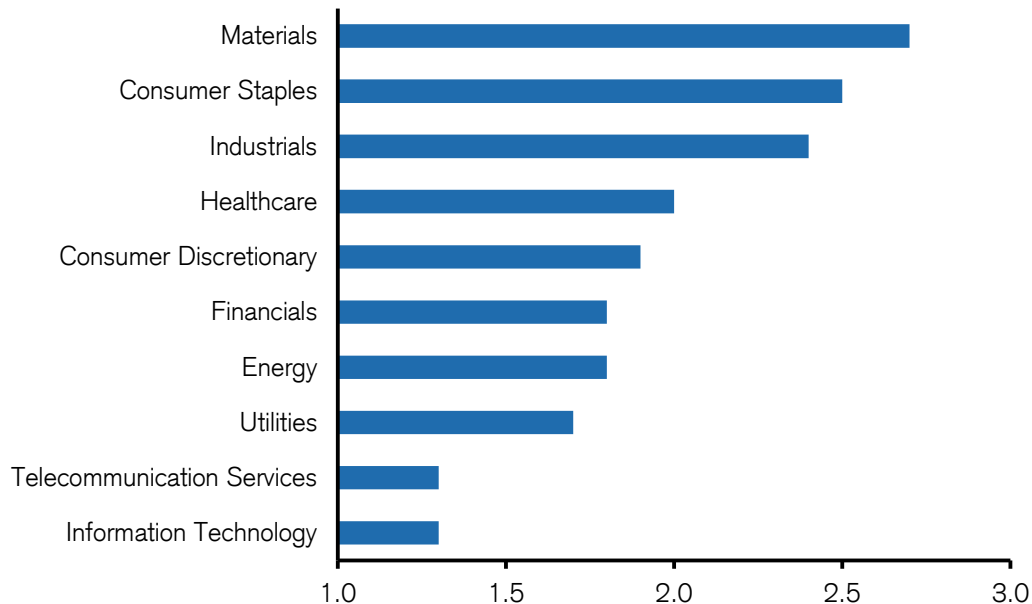
Source: Frederic W. Cook & Co., "The 2015 Top 250 Report: Long-Term Incentive Grant Practices for Executives," December 2015.

On the surface it may appear encouraging that TSR is on top of the list. But there are a couple of reasons for caution. Using TSR as an incentive metric doesn't really matter if a company doesn't know how to create value. Having the right goal isn't helpful if you don't know how to achieve that goal. And since TSR is absolute versus relative to some benchmark, external factors may play a bigger role in compensation than company-specific factors. So unless TSR is relative to an appropriate benchmark, it fails to reflect the efforts of the firm.

The Credit Suisse HOLT team built a scorecard to assess the quality of management incentives. Unlike the Frederic W. Cook & Co. survey, the HOLT approach is to award points for positive incentive measures such as operational drivers, return on capital, relative TSR, and long-term plans, and to deduct points for negative measures including no disclosure, absence of financial targets, substantial option expense, and no long-term plan. The sample includes most of the top 1,000 companies in the U.S.¹⁰⁵

Exhibit 43 shows the average management incentive score by sector using the proxy statements filed in 2015. The sectors with the most positive scores include materials and consumer staples, while telecommunication services and information technology fare relatively poorly.

Exhibit 43: Average Management Incentive Scores by Sector, 2015



Source: Credit Suisse HOLT.

So what elements should you look for in an effective incentive program? The key is to look for a company that seeks to build long-term value per share with the belief that the stock market will ultimately follow that value. If the market fails to reflect that value, management can take action by sharpening communication or buying back stock.

There are three elements to an incentive compensation program that supports judicious capital allocation.¹⁰⁶ The first is to compensate senior executives with stock options or restricted stock units that are indexed to either the market overall or an appropriate peer group. Presuming that exogenous factors affect peers in a similar fashion as the target firm, indexing takes a large step toward isolating management skill and reducing the role of luck. Only individuals who can influence the stock price should be paid in equity, which limits the number of eligible executives.

Second, executives who run operating units, as well as front line employees, should be paid for exceeding long-term goals for the operating value drivers. These include sales growth, operating profit margins, and some measure of return on invested capital. Broader value drivers can be further broken down into leading indicators of value, performance measures that roll up to the value drivers.

For example, if a retailer has a goal of opening five new stores in a year, a leading indicator of value might include finding a store location and signing a lease. Here again, the incentives are awarded based on what the individual employees can control. Warren Buffett explains that a good plan “should be (1) tailored to the economics of the specific operating business; (2) simple in character so that the degree to which they are being realized can be easily measured; and (3) directly related to the daily activities of the plan participants.”¹⁰⁷

Finally, recognize that the debate about the short term versus the long term is an empty one. Instead, acknowledge that the goal is to maximize long-term value per share. This applies to activities that management expects to pay off quickly or in the distant future.¹⁰⁸ Amazon.com is a company that appears comfortable taking a long-term view. The company's CEO, Jeff Bezos, argues that there is less competition for long-term initiatives. He says, "If everything you do needs to work on a three-year time horizon, then you're competing against a lot of people. But if you're willing to invest on a seven-year time horizon, you're now competing against a fraction of those people, because very few companies are willing to do that. Just by lengthening the time horizon, you can engage in endeavors that you could never otherwise pursue. At Amazon we like things to work in five to seven years."¹⁰⁹

Incentives are an important determinant of behavior. Examine whether a management team is committed to building long-term value by examining their words, incentives, and actions. Agency costs are alive and well, and in many cases companies try to boost their stock price using artificial or superficial methods versus boosting underlying long-term value through the proper conception and execution of a strategic plan.

Five Principles of Capital Allocation. In their book, *The Value Imperative*, James McTaggart, Peter Kontes, and Michael Mankins describe four principles of resource allocation that apply readily to our discussion about capital allocation.¹¹⁰ We added one to expand the list to five and believe that these principles are a sound benchmark that you can use to measure management's mindset regarding their capital allocation practices.¹¹¹

1. Zero-based capital allocation. Companies generally think about capital allocation on an incremental basis. For example, a study of more than 1,600 U.S. companies by McKinsey found that there was a 0.92 correlation between how much capital a business unit received in one year and the next. For one-third of the companies, that correlation was 0.99.¹¹² In other words, inertia appears to play a large role in capital allocation.

The proper approach is zero-based, which simply asks, "What is the right amount of capital (and the right number of people) to have in this business in order to support the strategy that will create the most wealth?"¹¹³ There is no reference to how much the company has already invested in the business, only how much should be invested.

Research by McKinsey suggests that those companies that showed a zero-based allocation mindset, and hence were the most proactive in reallocating resources, delivered higher TSRs than the companies that took more of an incremental approach.¹¹⁴ Further, academic research shows that those companies that are good at internal capital allocation tend to be good at external allocation as well.¹¹⁵

2. Fund strategies, not projects. The idea here is that capital allocation is not about assessing and approving projects, but rather assessing and approving strategies and determining the projects that support the strategies. Practitioners and academics sometimes fail to make this vital distinction.¹¹⁶ There can be value-creating projects within a failed strategy, and value-destroying projects within a solid strategy.

Another reason to be cautious about a project approach is that it is easy to game the system. It is common for companies to have thresholds for project approval. For instance, a plant manager can approve small projects, business unit heads larger ones, the CEO bigger ones still, and the board of directors the largest investments. But at each level, analysts can manipulate the numbers to look good. One of the aspects of the institutional imperative, as Buffett describes it, is, "Any business craving of the leader, however foolish, will be quickly supported by detailed rate-of-return and strategic studies prepared by his troops."¹¹⁷

The key to this principle is recognizing that a business strategy is a bundle of projects and that the value of the bundle is what matters. The CEO and board must evaluate alternative strategies and consider the financial prospects of each.

- 3. No capital rationing.** The attitude at many companies, which the results of surveys support, is that capital is “scarce but free.” The sense is that the business generates a limited amount of capital which makes it “scarce,” but since it comes from within it is “free.”

The primary source of capital for companies in the U.S. is the cash they generate. The patterns of spending on the various uses of capital indicate the attitude of managements. Capital expenditures, R&D, and dividends receive priority, and M&A and share buybacks are considered when economic results are good. Internal capital allocation tends to be very stable from year to year, and inertia plays a large role. Business units may jockey for more capital but, as we have seen, the changes in year-to-year allocation tend to be modest. These observations are consistent with the “scarce but free” mindset.

A better mindset is that capital is plentiful but expensive. There are two sources of capital that companies can tap beyond the cash generated internally. The first is redeploying capital from businesses that do not earn sufficient returns. Management can execute this inside the company or sell the underperforming businesses and redeploy the proceeds. The second is the capital markets. When executives have value-creating strategies that need capital, the markets are there to fund them in all but the most challenging environments.

The notion that internally generated capital is free is also problematic. Thoughtful capital allocators recognize that all capital has an opportunity cost, whether the source is internal or external. As a consequence, managers should explicitly account for the cost of capital in all capital allocation decisions. Too frequently, companies select actions that add to earnings or earnings per share without properly reckoning for value.

The limiting resource for many companies is not access to capital but rather access to talent. Finding executives with the proper skills for success, including an aptitude for allocating capital, is not easy. This is a valid challenge but relates to recruiting and development, not access to capital.

- 4. Zero tolerance for bad growth.** Companies that wish to grow will inevitably make investments that do not pay off. The failure rate of new businesses and new products is high. Seeing an investment flop is no sin; indeed it is essential to the process of creating value. What is a sin is remaining committed to a strategy that has no prospects to create value, hence draining human and financial resources.

Executives who follow this principle invest in innovation but are ruthless in cutting losses when they see that a strategy is unlikely to pay off. Many companies have the opportunity to create substantial value by exiting businesses where they have no advantage. This reduces cross-subsidization within the organization and allows for the best managers to work for the businesses that create the most value.

- 5. Know the value of assets, and be ready to take action to create value.** Intelligent capital allocation is similar to managing a portfolio of stocks in that it is very useful to have a sense of the difference, if any, between the value and price of each asset. This includes the value of the company and its stock price. Naturally, such analysis must include considerations such as taxes.

With a ready sense of value and price, management should be prepared to take action to create value. Sometimes that means acquiring, other times that means divesting, and frequently there are no clear gaps

between value and price. As we have seen, managers tend to prefer to buy than to sell, even though the empirical record shows quite clearly that sellers fare better than buyers, on average.

As we mentioned in the introduction, the answer to most capital allocation questions is, “It depends.” Managers who adhere to this final principle understand when it makes sense to act on behalf of long-term shareholders.

Conclusion

Capital allocation is one of management’s prime responsibilities. Yet few senior executives are versed or trained in methods to allocate capital most effectively. Further, incentive programs frequently encourage behaviors that are not in the best interests of long-term shareholders. We believe that the goal of capital allocation is to build long-term value per share.

In this report, we examined the sources and uses of capital. We found that U.S. corporations fund most of their investments internally and that M&A and capital expenditures are the largest uses of capital for operations. We then examined seven capital allocation alternatives, noting what the actual spending has been, how to think about that alternative analytically, what the academic research says, and the near-term outlook.

Finally, we set out a framework to assess the capital allocation practices of a management team. This framework includes examining past behavior, calculating return on invested capital, weighing incentives, and considering the five principles of thoughtful capital allocation.

Acknowledgment

We thank the Credit Suisse HOLT team for their essential contributions to this research. In particular, we appreciate the assistance of Ron Graziano, Tom Hillman, David Matsumura, Bryant Matthews, and Chris Morck. We could not have done this analysis without their aid.

Checklist for Assessing Capital Allocation Skills

Past Spending Patterns

- Have you analyzed how companies have spent money in the past, separating operating uses from return of capital to claimholders?
- How has the company funded its investments?
- Identify the prime use of capital. Do you know if management thinks about that use of capital properly?
- Have there been shifts in the pattern of spending?
- If there is new management, has spending changed?
- Who makes which capital allocation decision?
- How does the company conduct its budgeting process?

Calculate ROIC and ROIIC

- Have you calculated ROIC over time and observed a trend?
- Examine composition of ROIC through a DuPont analysis—does this suggest a consumer or production advantage?
- Have you compared the company's results to those of its peers?
- Have you calculated ROIIC for one-, three-, and five-year rolling periods?

Incentives and Governance

- How is the company's incentive compensation structured?
- How much stock does senior management own?
- Is total shareholder return calculated on a relative basis?
- Have you examined the company's incentive score?
- Are the measures in place to encourage management to think for the long term?

Five Principles of Capital Allocation

- Does the company use zero-based capital allocation or is it dominated by spending inertia?
- Is the company focused on funding strategies or projects?
- Does the company have a "scarce but free" attitude about capital, or "abundant but costly"?
- Does the company prune businesses with poor prospects for creating value?
- Does the company know how to calculate the value of its assets and does it act accordingly?

Endnotes

¹ Michael E. Porter, "What is Strategy?" *Harvard Business Review*, November-December, 1996, 61-78. For a more in-depth discussion, see Joan Magretta, *Understanding Michael Porter: The Essential Guide to Competition and Strategy* (Boston, MA: Harvard Business Review Press, 2012).

² Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report, 1987*. See www.berkshirehathaway.com/letters/1987.html.

³ Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report, 2011*. See www.berkshirehathaway.com/letters/2011ltr.pdf.

⁴ Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report, 1989*. See www.berkshirehathaway.com/letters/1989.html.

⁵ William N. Thorndike, Jr., *The Outsiders: Eight Unconventional CEOs and Their Radically Rational Blueprint for Success* (Boston, MA: Harvard Business Review Press, 2012). For another text that describes capital allocation, see Justin Pettit, *Strategic Corporate Finance: Applications in Valuation and Capital Structure* (Hoboken, NJ: John Wiley & Sons, 2007).

⁶ Michael J. Mauboussin and Dan Callahan, "What Does a Price-Earnings Multiple Mean? An Analytical Bridge between P/Es and Solid Economics," *Credit Suisse Global Financial Strategies*, January 29, 2014.

⁷ Stewart C. Myers and Nicholas S. Majluf, "Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have," *Journal of Financial Economics*, Vol. 13, No. 2, June 1984, 187-221.

⁸ Michael J. Mauboussin and Dan Callahan, "Disbursing Cash to Shareholders: Frequently Asked Questions about Buybacks and Dividends," *Credit Suisse Global Financial Strategies*, May 6, 2014.

⁹ Stephen A. Ross, Randolph W. Westerfield, Jeffrey F. Jaffe, *Corporate Finance – Sixth Edition* (Boston, MA: McGraw-Hill/Irwin, 2002), 385.

¹⁰ Jason Zweig, "Peter's Uncertainty Principle," *Money Magazine*, November 1994, 143-149.

See http://money.cnn.com/2004/10/11/markets/benstein_bonus_0411/index.htm.

Here is Zweig's question and Bernstein's answer:

Q: Hugh Liedtke, the former CEO of Pennzoil, used to joke that he believed in the "bladder theory":

Companies pay dividends so that management can't p--s all the money away.

A: It's hard to improve on that. In the 1960s, in "A Modest Proposal," I suggested that companies should be required to pay out 100% of their net income as cash dividends. If companies needed money to reinvest in their operations, then they would have to get investors to buy new offerings of stock. Investors would do that only if they were happy both with the dividends they'd received and the future prospects of the company. Markets as a whole know more than any individual or group of individuals. So the best way to allocate capital is to let the market do it, rather than the management of each company. The reinvestment of profits has to be submitted to the test of the marketplace if you want it to be done right.

For academic research supporting this point, see Jeffrey Wurgler, "Financial Markets and the Allocation of Capital," *Journal of Financial Economics*, Vol. 58, Nos. 1-2, 2000, 187-214.

¹¹ Juliane Begenau and Berardino Palazzo, "Firm Selection and Corporate Cash Holdings," *Harvard Business School Working Paper, No. 16-130*, May 2016. Also, Thomas W. Bates, Kathleen M. Kahle, and René M. Stulz, "Why Do U.S. Firms Hold So Much More Cash than They Used To?" *Journal of Finance*, Vol. 64, No. 5, October 2009, 1985-2021.

¹² John Asker, Joan Farre-Mensa, and Alexander Ljungqvist, "Corporate Investment and Stock Market Listing: A Puzzle?" *European Corporate Governance Institute (ECGI) - Finance Research Paper Series*, January 27, 2014.

¹³ For the mix shift, see Douglas J. Skinner, "The Evolving Relation Between Earnings, Dividends, and Stock Repurchases," *Journal of Financial Economics*, Vol. 87, No. 3, March 2008, 582-609. Also, Gustavo Grullon, Bradley Payne, Shane Underwood, and James P. Weston, "Has the Propensity to Pay Out Declined?" *Journal of Financial and Quantitative Analysis*, Vol. 46, No. 1, February 2011, 1-24. Also, Jacob Boudoukh, Roni

Michael, Matthew Richardson, and Michael R. Roberts, "On the Importance of Measuring Payout Yield: Implications for Empirical Asset Pricing," *Journal of Finance*, Vol. 63, No. 2, April 2007, 877-915.

¹⁴ See <http://www.blackrock.com/corporate/en-no/literature/press-release/ldf-corp-gov-2016.pdf>.

¹⁵ Erin Medlyn and Alex Granados, "Survey: CFOs Weigh In on Affordable Care Act, Interest Rates, Stock Market Overhang," *Fuqua School of Business, Duke University Press Release*, September 11, 2013. See www.fuqua.duke.edu/news_events/news-releases/cfo-survey-results-2013-q3/#.U63JUuTD-KQ. Also, Ryan Banerjee, Jonathan Kearns, and Marco Lombardi, "(Why) Is Investment Weak?" *BIS Quarterly Review*, March 2015, 67-82.

¹⁶ Michael J. Cooper, Huseyin Gulen, and Michael J. Schill, "Asset Growth and the Cross-Section of Stock Returns," *Journal of Finance*, Vol. 63, No. 4, August 2008, 1609-1651. Also, Eugene F. Fama and Kenneth R. French, "A Five-Factor Asset Pricing Model," *Journal of Financial Economics*, Vol. 116, No. 1, April 2015, 1-22. Also, Adriana S. Cordis and Chris Kirby, "Capital Expenditures and Firm Performance: Evidence from a Cross-Sectional Analysis of Stock Returns," *Accounting & Finance*, Forthcoming, 2016. For non-U.S. results, see Akiko Watanabe, Yan Xu, Tong Yao, and Tong Yu, "The Asset Growth Effect: Insights for International Equity Markets," *Journal of Financial Economics*, Vol. 108, No. 2, May 2013, 259-263. Also, Sheridan Titman, K. C. John Wei, and Feixue Xie, "Market Development and the Asset Growth Effect: International Evidence," *Journal of Financial and Quantitative Analysis*, Vol. 48, No. 5, October 2013, 1405-1432. The quotation in the body of the text comes from Cooper, Gulen, and Schill.

¹⁷ Peter J. Clark and Roger W. Mills, *Masterminding the Deal: Breakthroughs in M&A Strategy and Analysis* (London: Kogan Page, 2013). Also, Matthew Rhodes-Kropf and S. Viswanathan, "Market Valuation and Merger Waves," *Journal of Finance*, Vol. 59, No. 6, December 2004, 2685-2718.

¹⁸ Gerry McNamara, Jerayr Halebian, and Bernadine Johnson Dykes, "The Performance Implications of Participating in an Acquisition Wave," *Academy of Management Journal*, Vol. 51, No. 1, February 2008, 113-130.

¹⁹ Mark L. Sirower, *The Synergy Trap: How Companies Lose the Acquisition Game* (New York: Free Press, 1997). For a tutorial and spreadsheet that guides this analysis, see www.expectationsinvesting.com/tutorial10.shtml.

²⁰ Tim Koller, Marc Goedhart, and David Wessels, *Valuation: Measuring and Managing the Value of Companies – Sixth Edition* (Hoboken, NJ: John Wiley & Sons, 2015), 587. Also, Connor Lynagh, "Does the Market Reward Accretive Deals? An Investigation of Acquirer Performance and Earnings per Share Accretion," *Glucksman Institute for Research in Securities Markets Working Paper*, April 1, 2014.

²¹ Erik Devos, Palani-Rajan Kadapakkam, and Srinivasan Krishnamurthy, "How Do Mergers Create Value? A Comparison of Taxes, Market Power, and Efficiency Improvements as Explanations for Synergies," *Review of Financial Studies*, Vol. 22, No. 3, March 2009, 1179-1211. One exception is the surge in "inversions," cases where U.S. companies change domiciles after acquiring foreign targets to reduce their taxes. Congress passed a law in 2004 that was meant to stop inversions, but companies figured out how to circumvent the rules a few years ago. This led to a mini-boom in inversions, including more than 20 since 2012. See Zachary Mider and Jesse Drucker, "Tax Inversion: How U.S. Companies Buy Tax Breaks," *Bloomberg.com*, April 6, 2016. In April 2016, the U.S. Treasury Department proposed stringent new regulations to make inversions more difficult, and in October 2016 the department finalized the rules. Despite allowing for a variety of exceptions, the government expects to collect \$461-\$600 million per year through the new regulations. See Richard Rubin, "Treasury Announces Final Regulations on Earnings Stripping," *Wall Street Journal*, October 13, 2016.

²² "How Synergies Drive Successful Acquisitions: Identifying, Realizing, and Tracking Synergies in the M&A Process," *Transaction Services Roundtable-PricewaterhouseCoopers*, 2010.

²³ Alfred Rappaport and Mark L. Sirower, "Stock or Cash? The Trade-Offs for Buyers and Sellers in Mergers and Acquisitions," *Harvard Business Review*, November-December 1999, 147-158. Further, academic research suggests that serial acquirers fail to create value. See Tomi Laamanen and Thomas Keil,

"Performance of Serial Acquirers: Toward an Acquisition Program Perspective," *Strategic Management Journal*, Vol. 29, No. 6, June 2008, 663-672.

²⁴ Jerayr Haleblian, Cynthia E. Devers, Gerry McNamara, Mason A. Carpenter, and Robert B. Davison, "Taking Stock of What We Know About Mergers and Acquisitions: A Review and Research Agenda," *Journal of Management*, Vol. 35, No. 3, June 2009, 469-502.

²⁵ Koller, Goedhart, and Wessels, 570.

²⁶ Mark L. Sirower and Sumit Sahni, "Avoiding the 'Synergy Trap': Practical Guidance on M&A Decisions for CEOs and Boards," *Journal of Applied Corporate Finance*, Vol. 18, No. 3, Summer 2006, 83-95.

²⁷ For a similar analysis, see Joseph L. Bower, "Not All M&A's Are Alike—and That Matters," *Harvard Business Review*, March 2001, 92-101.

²⁸ Tim Loughran and Anand M. Vijh, "Do Long-Term Shareholders Benefit From Corporate Acquisitions?" *Journal of Finance*, Vol. 52, No. 5, December 1997, 1765-1790. Also, Anushree Awasthee and David Cogman, "Creating Value from M&A—Advantage Asia?" *McKinsey on Finance*, Number 58, Spring 2016, 12-14.

²⁹ Here's an example. Assume a buyer has a market capitalization of \$2,000 and a seller has a pre-deal market capitalization of \$800. Say that the buyer bids \$1,000 (a \$200 premium, or 25 percent) in cash but that the true synergy is \$400. The value of the buyer would rise to \$2,200 as the synergy exceeds the premium by \$200. Now assume the same starting point but that the buyer is using stock for the deal. The buyer will end up with two-thirds percent of the combined entity, and two-thirds of the \$200 in additional value will flow to the buyer and one-third will go to the seller.

³⁰ For a more detailed, and likely more accurate, approach see Bruce C. N. Greenwald, Judd Kahn, Paul D. Sonkin, and Michael van Biema, *Value Investing: From Graham to Buffett and Beyond* (Hoboken, NJ: John Wiley & Sons, 2001), 96. Specifically, they recommend three steps: 1. Calculate the ratio of gross property, plant, and equipment (PPE) to sales for each of the past five years and find the average; 2. Use this to indicate the dollars of PPE it takes to support each dollar of sales; 3. Multiply this ratio by the growth (or decrease) in sales dollars the company achieved in the current year. The result of that calculation is capital expenditures dedicated to growth.

³¹ For a general framework for competitive strategy analysis, see Michael J. Mauboussin and Dan Callahan, "Measuring the Moat: Assessing the Magnitude and Sustainability of Value Creation," *Credit Suisse Global Financial Strategies*, July 22, 2013. For more specific issues surrounding capital expenditures, see Alan C. Shapiro, "Corporate Strategy and the Capital Budgeting Decision," *Midland Corporate Finance Journal*, Spring 1985, 22-36.

³² Michael E. Porter, "Capital Choices: Changing the Way America Invests in Industry," *Journal of Applied Corporate Finance*, Vol. 5, No. 2, Summer 1992, 4-16.

³³ J. Randall Woolridge and Charles C. Snow, "Stock Market Reaction to Strategic Investment Decisions," *Strategic Management Journal*, Vol. 11, No. 5, September 1990, 353-363.

³⁴ John J. McConnell and Chris J. Muscarella, "Corporate Capital Expenditure Decisions and the Market Value of the Firm," *Journal of Financial Economics*, Vol. 14, No. 3, September 1985, 399-422. Also, Kee H. Chung, Peter Wright, and Charlie Charoenwong, "Investment Opportunities and Market Reaction to Capital Expenditure Decisions," *Journal of Banking & Finance*, Vol. 22, No. 1, January 1998, 41-60.

³⁵ Sheridan Titman, K. C. John Wei, and Feixue Xie, "Capital Investments and Stock Returns," *Journal of Financial and Quantitative Analysis*, Vol. 39, No. 4, December 2004, 677-700.

³⁶ Steven M. Paul, Daniel S. Mytelka, Christopher T. Dunwiddie, Charles C. Persinger, Bernard H. Munos, Stacy R. Lindborg, and Aaron L. Schacht, "How to Improve R&D Productivity: The Pharmaceutical Industry's Grand Challenge," *Nature Reviews Drug Discovery*, Vol. 9, March 2010, 203-214.

³⁷ Aswath Damodaran, "Research and Development Expenses: Implications for Profitability Measurement and Valuation," *NYU Working Paper No. FIN-99-024*, 1999.

³⁸ Jack W. Scannell, Alex Blanckley, Helen Boldon, and Brian Warrington, "Diagnosing the Decline in Pharmaceutical R&D Efficiency," *Nature Reviews Drug Discovery*, Vol. 11, March 2012, 191-200. Also, Gary

P. Pisano, *Science Business: The Promise, The Reality, and the Future of Biotech* (Boston, MA: Harvard Business School Press, 2006). Also, Jonathan D. Rockoff and Dana Mattioli, "Bid for Allergan Puts Valeant's Research and Development Cuts Under Scrutiny," *Wall Street Journal*, June 10, 2014.

³⁹ Allan C. Eberhart, William F. Maxwell, and Akhtar R. Siddique, "An Examination of Long-Term Abnormal Stock Returns and Operating Performance Following R&D Increases," *Journal of Finance*, Vol. 59, No. 2, April 2004, 623-650.

⁴⁰ Bronwyn H. Hall, Jacques Mairesse, and Pierre Mohnen, "Measuring the Returns to R&D," in Bronwyn H. Hall and Nathan Rosenberg, eds., *The Handbook of the Economics of Innovation—Volume 2* (Amsterdam: Elsevier, 2010), 1033-1082. Also, Missaka Warusawitharana, "Research and Development, Profits, and Firm Value: A Structural Estimation," *Quantitative Economics*, Vol. 6, No. 2, July 2015, 531-565.

⁴¹ Louis K. C. Chan, Josef Lakonishok, and Theodore Sougiannis, "The Stock Market Valuation of Research and Development Expenditures," *Journal of Finance*, Vol. 56, No. 6, December 2001, 2431-2456.

⁴² Mohsen Saad and Zaher Zantout, "Over-Investment in Corporate R&D, Risk, and Stock Returns," *Journal of Economics and Finance*, Vol. 38, No. 3, July 2014, 438-460.

⁴³ Tom Hillman and Chris Morck, "Using the HOLT Framework to Assess Acquisition Skill," *Credit Suisse HOLT Research*, July 2014.

⁴⁴ Patrick Seitz, "Top Tech Stocks Not Big R&D Spenders, Surprising Study Shows," *Investors.com*, July 7, 2014.

⁴⁵ Mariana Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (London: Anthem Press, 2013).

⁴⁶ "2016 Global R&D Funding Forecast," *R&D Magazine*, Winter 2016.

⁴⁷ Robert Kieschnick, Mark Laplante, and Rabih Moussawi, "Working Capital Management and Shareholders' Wealth," *Review of Finance*, Vol. 17, No. 5, September 2013, 1827-1852.

⁴⁸ Michael Kisser, "The Real Option Value of Cash," *Review of Finance*, Vol. 17, No. 5, September 2013, 1649-1697.

⁴⁹ $DSO = [(\text{Beginning accounts receivable} + \text{ending accounts receivable})/2]/(\text{Revenue}/365)$. $DIO = [(\text{Beginning inventory} + \text{ending inventory})/2]/(\text{Cost of goods sold}/365)$. $DPO = [(\text{Beginning accounts payable} + \text{ending accounts payable})/2]/(\text{Cost of goods sold}/365)$.

⁵⁰ Manuel L. Jose, Carol Lancaster, and Jerry L. Stevens, "Corporate Returns and Cash Conversion Cycles," *Journal of Economics and Finance*, Vol. 20, No. 1, Spring 1996, 33-46; For recent trends on cash conversion cycles for U.S. corporations, see The Hackett Group, "2016 U.S. Working Capital Survey," 2016.

⁵¹ Kieschnick, Laplante, and Moussawi.

⁵² Amy Dittmar and Jan Mahrt-Smith, "Corporate Governance and the Value of Cash Holdings," *Journal of Financial Economics*, Vol. 83, No. 3, March 2007, 599-634.

⁵³ James M. McTaggart, Peter W. Kontes, and Michael C. Mankins, *The Value Imperative: Managing for Superior Shareholder Returns* (New York: Free Press, 1994), 241.

⁵⁴ Richard H. Thaler, "Anomalies: The Winner's Curse," *Journal of Economic Perspectives*, Vol. 2, No. 1, Winter 1988, 191-202.

⁵⁵ Robert E. Hoskisson and Thomas A. Turk, "Corporate Restructuring: Governance and Control Limits of the Internal Capital Market," *Academy of Management Review*, Vol. 15, No. 3, July 1990, 459-477. For a discussion of the type of proceeds from divestitures and TSRs, see Myron B. Slovin, Marie E. Sushka, and John A. Polonchek, "Methods of Payment in Asset Sales: Contracting with Equity versus Cash," *Journal of Finance*, Vol. 60, No. 5, October 2005, 2385-2407. For a discussion of investment of proceeds from divestitures, see Thomas W. Bates, "Asset Sales, Investment Opportunities, and the Use of Proceeds," *Journal of Finance*, Vol. 60, No. 1, February 2005, 105-135. Also, Pascal Nguyen, "The Role of the Seller's Stock Performance in the Market Reaction to Divestiture Announcements," *Journal of Economics and Finance*, Vol. 40, No. 1, January 2016, 19-40.

⁵⁶ Donghum "Don" Lee and Ravi Madhavan, "Divestiture and Firm Performance: A Meta-Analysis," *Journal of Management*, Vol. 36, No. 6, November 2010, 1345-1371.

⁵⁷ Patrick J. Cusatis, James A. Miles, and Randall Woolridge, "Restructuring through Spinoffs: The Stock Market Evidence," *Journal of Financial Economics*, Vol. 33, No. 3, June 1993, 293-311. Also, Hemang Desai and Prem C. Jain, "Firm Performance and Focus: Long-Run Stock Market Performance Following Spinoffs," *Journal of Financial Economics*, Vol. 54, No. 1, October 1999, 75-101. For a non-academic treatment, see Joel Greenblatt, *You Can Be a Stock Market Genius (Even if you're not too smart!): Uncover the Secret Hiding Places of Stock Market Profits* (New York: Fireside, 1997).

⁵⁸ For the recent performance of spin-offs, see Dani Burger, "Cold Spell Ends for Spinoffs as Rising Market Aids Activist Tool," *Bloomberg News*, October 10, 2016. For the research that explains the contributing factors, see Chris Veld and Yulia V. Veld-Merkoulova, "Value Creation through Spinoffs: A Review of the Empirical Evidence," *International Journal of Management Reviews*, Vol. 11, No. 4, December 2009, 407-420.

⁵⁹ Daniel P. Collins, "This strategy is up over the S&P in the last 10 years," *Modern Trader*, July 22, 2016.

⁶⁰ Matthias F. Brauer and Margarethe F. Wiersema, "Industry Divestiture Waves: How a Firm's Position Influences Returns," *Academy of Management Journal*, Vol. 55, No. 6, December 2012, 1472-1492.

⁶¹ Alon Brav, John R. Graham, Campbell R. Harvey, and Roni Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics*, Vol. 77, No. 3, September 2005, 483-527.

⁶² Eric Floyd, Nan Li, and Douglas J. Skinner, "Payout Policy Through the Financial Crisis: The Growth of Repurchases and the Resilience of Dividends," *Journal of Financial Economics*, Vol. 118, No. 2, November 2015, 299-316.

⁶³ Douglas J. Skinner and Eugene Soltes, "What Do Dividends Tell Us About Earnings Quality?" *Review of Accounting Studies*, Vol. 16, No. 1, March 2011, 1-28.

⁶⁴ Alfred Rappaport, "Dividend Reinvestment, Price Appreciation and Capital Accumulation," *Journal of Portfolio Management*, Vol. 32, No. 3, Spring 2006, 119-123.

⁶⁵ Bo Becker, Marcus Jacob, and Martin Jacob, "Payout Taxes and the Allocation of Capital," *Journal of Financial Economics*, Vol. 107, No. 1, January 2013, 1-24.

⁶⁶ David Zion, Ron Graziano, Ravi Gomatam, and Jason Williams, "Parking Lots of Cash & Earnings Overseas: At Least \$750 Billion in Cash & Nearly \$2.3 Trillion in Earnings," *Credit Suisse Equity Research*, March 11, 2016. Also, C. Fritz Foley, Jay C. Hartzell, Sheridan Titman, and Garry Twite, "Why Do Firms Hold So Much Cash? A Tax-Based Explanation," *Journal of Financial Economics*, Vol. 86, No. 3, December 2007, 579-607.

⁶⁷ Ali Fatemi and Recep Bildik, "Yes, Dividends are Disappearing: Worldwide Evidence," *Journal of Banking & Finance*, Vol. 36, No. 3, March 2012, 662-677.

⁶⁸ Jayant R. Kale, Omesh Kini, and Janet D. Payne, "The Dividend Initiation Decisions of Newly Public Firms: Some Evidence on Signaling with Dividends," *Journal of Financial and Quantitative Analysis*, Vol. 47, No. 2, April 2012, 365-396. Also, Doron Nissim and Amir Ziv, "Dividend Changes and Future Profitability," *Journal of Finance*, Vol. 56, No. 6, December 2001, 2111-2133.

⁶⁹ Shirley A. Lazo, "Another Banner Year for Dividends," *Barron's*, June 7, 2014.

⁷⁰ Robert D. Arnott and Clifford S. Asness, "Surprise! Higher Dividends = Higher Earnings Growth," *Financial Analysts Journal*, Vol. 59, No. 1, January/February 2003, 70-87.

⁷¹ Jordan Voss, "Why do Firms Repurchase Stock?" *Major Themes in Economics*, Spring 2012.

⁷² See www.sec.gov/divisions/marketreg/r10b18faq0504.htm.

⁷³ Alfred Rappaport and Michael J. Mauboussin, *Expectations Investing: Reading Stock Prices for Better Returns* (Boston, MA: Harvard Business School Press, 2001), 174.

⁷⁴ For details on calculating the rate of returns for buybacks, see Mauboussin and Callahan, "Disbursing Cash to Shareholders."

⁷⁵ Michael C. Jensen, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, Vol. 76, No. 2, May 1986, 323-329.

⁷⁶ Alice A. Bonaimé, Kristine W. Hankins, and Bradford D. Jordan, "The Cost of Financial Flexibility: Evidence from Share Repurchases," *Journal of Corporate Finance*, Vol. 38, June 2016, 345-362. Also, Chao Zhuang, "Share Repurchases, Market Timing, and the Distribution of Free Cash Flow," *Working Paper*, March 10, 2015.

⁷⁷ “CFO Signals™: What North America’s Top Finance Executives Are Thinking—and Doing,” *Deloitte Research*, Second Quarter 2013.

⁷⁸ Jin Wang and Lewis D. Johnson, “Information Asymmetry, Signaling, and Share Repurchase,” *Working Paper*, February 2008.

⁷⁹ Gustavo Grullon and David L. Ikenberry, “What Do We Know about Share Repurchases?” *Journal of Applied Corporate Finance*, Vol. 13, No. 1, Spring 2000, 31-51. For the survey result, see Brav, Graham, Harvey, and Michaely, 2005.

⁸⁰ While buybacks do boost the EPS of individual companies, they don’t enhance value. See Jacob Oded and Allen Michel, “Stock Repurchases and the EPS Enhancement Fallacy,” *Financial Analysts Journal*, Vol. 64, No. 4, July/August 2008, 62-75. Further, buybacks have a negligible impact on the S&P 500 Index. Howard Silverblatt, a senior index analyst at S&P, writes, “The S&P index weighting methodology adjusts for shares, so buybacks are reflected in the calculations. Specifically, the index reweights for major share changes on an event-driven basis, and each quarter, regardless of the change amount, it reweights the entire index membership. The actual index EPS calculation determines the index earnings for each issue in USD, based on the specific issues’ index shares, index float, and EPS. The calculation negates most of the share count change, and reduces the impact on EPS.” See Howard Silverblatt, “Buybacks and the S&P 500® EPS,” *Indexology Blog*, March 7, 2014.

⁸¹ Heitor Almeida, Vyacheslav Fos, and Mathias Kronlund, “The Real Effects of Share Repurchases,” *Journal of Financial Economics*, Vol. 119, No. 1, January 2016, 168-185. Also, Konan Chan, David L. Ikenberry, Inmoo Lee, and Yanzhi Wang, “Share Repurchase as a Potential Tool to Mislead Investors,” *Journal of Corporate Finance*, Vol. 16, No. 2, April 2010, 137-158.

⁸² Gustavo Grullon and Roni Michaely, “Dividends, Share Repurchases, and the Substitution Hypothesis,” *Journal of Finance*, Vol. 57, No. 4, August 2002, 1649-1684.

⁸³ Antti Ilmanen, *Expected Returns: An Investor’s Guide to Harvesting Market Rewards* (Chichester, UK: John Wiley & Sons, 2011), 129.

⁸⁴ For older announcements see David Ikenberry, Josef Lakonishok, Theo Vermaelen, “Market Underreaction to Open Market Share Repurchases,” *Journal of Financial Economics*, Vol. 39, Nos. 2 and 3, October-November 1995, 181-208. For more recent announcements, see Fangjian Fu and Sheng Huang, “The Persistence of Long-Run Abnormal Returns Following Stock Repurchases and Offerings,” *Management Science*, Vol. 62, No. 4, April 2016, 964-984. Also, Theodoros Evgeniou, Enric Junqué de Fortuny, Nick Nassuphis, and Theo Vermaelen, “Share Buyback and Equity Issue Anomalies Revisited,” *INSEAD Working Paper 2016/21/DSC/FIN*, April 7, 2016. In addition, Eugene F. Fama and Kenneth R. French, “Dissecting Anomalies with a Five-Factor Model,” *Review of Financial Studies*, Vol. 29, No. 1, January 2016, 69-103.

⁸⁵ “S&P 500 Buybacks Fall 21% in Q2 2016,” *S&P Dow Jones Indices*, September 28, 2016.

⁸⁶ Michael J. Mauboussin, *More Than You Know: Finding Financial Wisdom in Unconventional Places – Updated and Expanded* (New York: Columbia Business School Publishing, 2008), 64.

⁸⁷ Alfred Rappaport, *Creating Shareholder Value: The New Standard for Business Performance* (New York: Free Press, 1986), 51-55.

⁸⁸ This analysis does not reflect capitalized leases.

⁸⁹ John R. Graham, Campbell R. Harvey, and Manju Puri, “Capital Allocation and Delegation of Decision-Making Authority within Firms,” *Journal of Financial Economics*, Vol. 115, No. 3, March 2015, 449-470.

⁹⁰ Milton Harris and Artur Raviv, “The Capital Budgeting Process: Incentives and Information,” *Journal of Finance*, Vol. 51, No. 4, September 1996, 1139-1174.

⁹¹ Michael J. Mauboussin and Dan Callahan, “Calculating Return on Invested Capital: How to Determine ROIC and Address Common Issues,” *Credit Suisse Global Financial Strategies*, June 4, 2014.

⁹² Bruce Greenwald and Judd Kahn, *Competition Demystified: A Radically Simplified Approach to Business Strategy* (New York: Portfolio, 2005).

⁹³ Michael J. Mauboussin and Dan Callahan, “Economic Returns, Reversion to the Mean, and Total Shareholder Returns,” *Credit Suisse Global Financial Strategies*, December 6, 2013.

⁹⁴ Michael J. Mauboussin and Alexander Schay, "Where's the Bar? Introducing Market-Expected Return on Investment (MEROI)," *Credit Suisse First Boston Equity Research*, June 12, 2001.

⁹⁵ Canice Prendergast, "The Provision of Incentives in Firms," *Journal of Economic Literature*, Vol. 37, No. 1, March 1999, 7-63.

⁹⁶ Michael C. Jensen and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, Vol. 3, No. 4, October 1976, 305-360. For the empirical validity of agency theory, see Kathleen M. Eisenhardt, "Agency Theory: An Assessment and Review," *Academy of Management Review*, Vol. 14, No. 1, January 1989, 57-74.

⁹⁷ Richard A. Lambert and David F. Larcker, "Executive Compensation, Corporate Decision Making, and Shareholder Wealth: A Review of the Evidence," in Fred K. Foulkes, ed., *Executive Compensation: A Strategic Guide for the 1990s* (Boston, MA: Harvard Business School Press, 1991), 98-125.

⁹⁸ John R. Graham, Campbell R. Harvey, and Shiva Rajgopal, "Value Destruction and Financial Reporting Decisions," *Financial Analysts Journal*, Vol. 62, No. 6, November/December 2006, 27-39.

⁹⁹ Brian J. Hall and Jeffrey B. Liebman, "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics*, Vol. 113, No. 3, August 1998, 653-691.

¹⁰⁰ For the negative case see Lucian A. Bebchuk and Jesse M. Fried, "Paying for Long-Term Performance," *University of Pennsylvania Law Review*, Vol. 158, No. 7, June 2010, 1915-1960. For the affirmative case see Steven N. Kaplan, "Weak Solutions to an Illusory Problem," *University of Pennsylvania Law Review*, Vol. 159, 2010, 43-56 and Steven N. Kaplan and Joshua Rauh, "Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?" *Review of Financial Studies*, Vol. 23, No. 3, March 2010, 1004-1050.

¹⁰¹ Florian Hoffmann and Sebastian Pfeil, "Reward for Luck in a Dynamic Agency Model," *Review of Financial Studies*, Vol. 23, No. 9, September 2010, 3329-3345.

¹⁰² James Dow and Gary Gorton, "Stock Market Efficiency and Economic Efficiency: Is There a Connection?" *Journal of Finance*, Vol. 52, No. 3, July 1997, 1087-1129.

¹⁰³ Rappaport, *Creating Shareholder Value*, 148-168.

¹⁰⁴ Frederic W. Cook & Co., "The 2015 Top 250 Report: Long-Term Incentive Grant Practices for Executives," December 2015, see: www.fwcook.com/content/Documents/Publications/FWC_2015_Top_250.pdf.

¹⁰⁵ Tom Hillman and David Matsumura, "The Board Score: Linking Corporate Performance and Valuation to Management Incentives," *Credit Suisse HOLT*, July 2014.

¹⁰⁶ This discussion borrows heavily from Alfred Rappaport, "Ten Ways to Create Shareholder Value," *Harvard Business Review*, September 2006, 66-77.

¹⁰⁷ Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report, 1996*. See <http://www.berkshirehathaway.com/letters/1996.html>.

¹⁰⁸ Alfred Rappaport, *Saving Capitalism from Short-Termism: How to Build Long-Term Value and Take Back Our Financial Future* (New York: McGraw Hill, 2011), 140-142.

¹⁰⁹ Steven Levy, "Jeff Bezos Owns the Web in More Ways Than You Think," *Wired Magazine*, November 13, 2011.

¹¹⁰ McTaggart, Kontes, and Mankins, 239-255.

¹¹¹ We believe that these principles, when coupled with the discussion in part two, are consistent with what Thorndike calls "The Outsider's Checklist." See Thorndike, 218-220.

¹¹² Stephen Hall, Dan Lovallo, and Reiner Musters, "How to Put Your Money Where Your Strategy Is," *McKinsey Quarterly*, March 2012.

¹¹³ McTaggart, Kontes, and Mankins, 243.

¹¹⁴ Research shows that public companies do a better job of allocating capital to growth opportunities than private companies do. See Sandra Mortal and Natalia Reisel, "Capital Allocation by Public and Private Firms," *Journal of Financial and Quantitative Analysis*, Vol. 48, No. 1, February 2013, 77-103. For an academic discussion of the functioning of internal capital markets, see Jeremy C. Stein, "Internal Capital Markets and the Competition for Corporate Resources," *Journal of Finance*, Vol. 52, No. 1, March 1997, 111-133.

¹¹⁵ Meng Ye, "Efficiency of Internal Capital Allocation and the Success of Acquisitions," *University of New Orleans Theses and Dissertations, Paper 1106*, December 20, 2009.

¹¹⁶ Clayton M. Christensen, Stephen P. Kaufman, and Willy C. Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things," *Harvard Business Review*, January 2008, 98-105.

¹¹⁷ Buffett, 1989.

References

Books

Clark, Peter J., and Roger W. Mills, *Masterminding the Deal: Breakthroughs in M&A Strategy and Analysis* (London: Kogan Page, 2013).

Foulkes, Fred K., ed., *Executive Compensation: A Strategic Guide for the 1990s* (Boston, MA: Harvard Business School Press, 1991).

Gaughan, Patrick A., *Mergers, Acquisitions, and Corporate Restructurings – Sixth Edition* (Hoboken, NJ: John Wiley & Sons, 2015).

Greenblatt, Joel, *You Can Be a Stock Market Genius (Even if you're not too smart!): Uncover the Secret Hiding Places of Stock Market Profits* (New York: Fireside, 1997).

Greenwald, Bruce C. N., Judd Kahn, Paul D. Sonkin, and Michael van Biema, *Value Investing: From Graham to Buffett and Beyond* (Hoboken, NJ: John Wiley & Sons, 2001).

Greenwald, Bruce, and Judd Kahn, *Competition Demystified: A Radically Simplified Approach to Business Strategy* (New York: Portfolio, 2005).

Hall, Bronwyn H., and Nathan Rosenberg, eds., *The Handbook of the Economics of Innovation – Volume 2* (Amsterdam: Elsevier, 2010).

Ilmanen, Antti, *Expected Returns: An Investor's Guide to Harvesting Market Rewards* (Chichester, UK: John Wiley & Sons, 2011).

Koller, Tim, Marc Goedhart, and David Wessels, *Valuation: Measuring and Managing the Value of Companies – Sixth Edition* (Hoboken, NJ: John Wiley & Sons, 2015).

Magretta, Joan, *Understanding Michael Porter: The Essential Guide to Competition and Strategy* (Boston, MA: Harvard Business Review Press, 2012).

Mauboussin, Michael J., *More Than You Know: Finding Financial Wisdom in Unconventional Places – Updated and Expanded* (New York: Columbia Business School Publishing, 2008).

Mazzucato, Mariana, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (London: Anthem Press, 2013).

McTaggart, James M., Peter W. Kontes, and Michael C. Mankins, *The Value Imperative: Managing for Superior Shareholder Returns* (New York: Free Press, 1994).

Pettit, Justin, *Strategic Corporate Finance: Applications in Valuation and Capital Structure* (Hoboken, NJ: John Wiley & Sons, 2007).

Pisano, Gary P., *Science Business: The Promise, The Reality, and the Future of Biotech* (Boston, MA: Harvard Business School Press, 2006).

Rappaport, Alfred, *Creating Shareholder Value: The New Standard for Business Performance* (New York: Free Press, 1986).

— — —, *Saving Capitalism from Short-Termism: How to Build Long-Term Value and Take Back Our Financial Future* (New York: McGraw Hill, 2011).

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

Ross, Stephen A., Randolph W. Westerfield, Jeffrey F. Jaffe, *Corporate Finance – Sixth Edition* (Boston, MA: McGraw-Hill/Irwin, 2002).

Sirower, Mark L., *The Synergy Trap: How Companies Lose the Acquisition Game* (New York: Free Press, 1997).

Thorndike, Jr., William N., *The Outsiders: Eight Unconventional CEOs and Their Radically Rational Blueprint for Success* (Boston, MA: Harvard Business Review Press, 2012).

Articles and Papers

Almeida, Heitor, Vyacheslav Fos, and Mathias Kronlund, "The Real Effects of Share Repurchases," *Journal of Financial Economics*, Vol. 119, No. 1, January 2016, 168-185.

Amott, Robert D., and Clifford S. Asness, "Surprise! Higher Dividends = Higher Earnings Growth," *Financial Analysts Journal*, Vol. 59, No. 1, January/February 2003, 70-87.

Asker, John, Joan Farre-Mensa, and Alexander Ljungqvist, "Corporate Investment and Stock Market Listing: A Puzzle?" *European Corporate Governance Institute (ECGI) - Finance Research Paper Series*, January 27, 2014.

Awasthee, Anushree and David Cogman, "Creating Value from M&A—Advantage Asia?" *McKinsey on Finance*, Number 58, Spring 2016, 12-14.

Banerjee, Ryan, Jonathan Kearns, and Marco Lombardi, "(Why) Is Investment Weak?" *BIS Quarterly Review*, March 2015, 67-82.

Bates, Thomas W., "Asset Sales, Investment Opportunities, and the Use of Proceeds," *Journal of Finance*, Vol. 60, No. 1, February 2005, 105-135.

Bates, Thomas W., Kathleen M. Kahle, and René M. Stulz, "Why Do U.S. Firms Hold So Much More Cash than They Used To?" *Journal of Finance*, Vol. 64, No. 5, October 2009, 1985-2021.

Bebchuk, Lucian A., and Jesse M. Fried, "Paying for Long-Term Performance," *University of Pennsylvania Law Review*, Vol. 158, No. 7, June 2010, 1915-1960.

Becker, Bo, Marcus Jacob, and Martin Jacob, "Payout Taxes and the Allocation of Capital," *Journal of Financial Economics*, Vol. 107, No. 1, January 2013, 1-24.

Begenau, Juliane and Berardino Palazzo, "Firm Selection and Corporate Cash Holdings," *Harvard Business School Working Paper*, No. 16-130, May 2016.

Bonaimé, Alice A., Kristine W. Hankins, and Bradford D. Jordan, "The Cost of Financial Flexibility: Evidence from Share Repurchases," *Journal of Corporate Finance*, Vol. 38, June 2016, 345-362.

Boudoukh, Jacob, Roni Michaely, Matthew Richardson, and Michael R. Roberts, "On the Importance of Measuring Payout Yield: Implications for Empirical Asset Pricing," *Journal of Finance*, Vol. 63, No. 2, April 2007, 877-915.

Bower, Joseph L., "Not All M&A's Are Alike—and That Matters," *Harvard Business Review*, March 2001, 92-101.

Brauer, Matthias F., and Margarethe F. Wiersema, "Industry Divestiture Waves: How a Firm's Position Influences Returns," *Academy of Management Journal*, Vol. 55, No. 6, December 2012, 1472-1492.

Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics*, Vol. 77, No. 3, September 2005, 483-527.

Buffett, Warren E., "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 1987.

— — —, "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 1989.

— — —, "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 1996.

— — —, "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 2011.

Chan, Konan, David L. Ikenberry, Inmoo Lee, and Yanzi Wang, "Share Repurchase as a Potential Tool to Mislead Investors," *Journal of Corporate Finance*, Vol. 16, No. 2, April 2010, 137-158.

Chan, Louis K. C., Josef Lakonishok, and Theodore Sougiannis, "The Stock Market Valuation of Research and Development Expenditures," *Journal of Finance*, Vol. 56, No. 6, December 2001, 2431-2456.

Christensen, Clayton M., Stephen P. Kaufman, and Willy C. Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things," *Harvard Business Review*, January 2008, 98-105.

Christofferson, Scott A., Robert S. McNish, and Diane L. Sias, "Where Mergers Go Wrong," *McKinsey on Finance*, Winter 2004, 1-6.

Chung, Kee H., Peter Wright, and Charlie Charoenwong, "Investment Opportunities and Market Reaction to Capital Expenditure Decisions," *Journal of Banking & Finance*, Vol. 22, No. 1, January 1998, 41-60.

Cogman, David, "Global M&A: Fewer Deals, Better Quality," *McKinsey on Finance*, Spring 2014, 23-25.

Cooper, Michael J., Huseyin Gulen, and Michael J. Schill, "Asset Growth and the Cross-Section of Stock Returns," *Journal of Finance*, Vol. 63, No. 4, August 2008, 1609-1651.

Cordis, Adriana S., and Chris Kirby, "Capital Expenditures and Firm Performance: Evidence from a Cross-Sectional Analysis of Stock Returns," *Accounting & Finance*, Forthcoming, 2016.

Cornell, Joe, "Break Up Bonanza," *Forbes*, July 9, 2014.

Cusatis, Patrick J., James A. Miles, and Randall Woolridge, "Restructuring through Spinoffs: The Stock Market Evidence," *Journal of Financial Economics*, Vol. 33, No. 3, June 1993, 293-311.

Damodaran, Aswath, "Research and Development Expenses: Implications for Profitability Measurement and Valuation," *NYU Working Paper No. FIN-99-024*, 1999.

Davies, Ryan, and David Merin, "Uncovering Cash and Insights from Working Capital," *McKinsey & Company*, July 2014.

Davis, Alexa, "Record Year in Reach for Spinoffs Thanks to Activist Appetite, Sluggish Growth," *Forbes*, June 12, 2014.

Desai, Hemang, and Prem C. Jain, "Firm Performance and Focus: Long-Run Stock Market Performance Following Spinoffs," *Journal of Financial Economics*, Vol. 54, No. 1, October 1999, 75-101.

Devos, Erik, Palani-Rajan Kadapakkam, and Srinivasan Krishnamurthy, "How Do Mergers Create Value? A Comparison of Taxes, Market Power, and Efficiency Improvements as Explanations for Synergies," *Review of Financial Studies*, Vol. 22, No. 3, March 2009, 1179-1211.

Dittmar, Amy, and Jan Mahrt-Smith, "Corporate Governance and the Value of Cash Holdings," *Journal of Financial Economics*, Vol. 83, No. 3, March 2007, 599-634.

Dobbs, Richard, Marc Goedhart, and Hannu Suonio, "Are Companies Getting Better at M&A?" *McKinsey on Finance*, Winter 2007, 7-11;

Dow, James, and Gary Gorton, "Stock Market Efficiency and Economic Efficiency: Is There a Connection?" *Journal of Finance*, Vol. 52, No. 3, July 1997, 1087-1129.

Eberhart, Allan C., William F. Maxwell, and Akhtar R. Siddique, "An Examination of Long-Term Abnormal Stock Returns and Operating Performance Following R&D Increases," *Journal of Finance*, Vol. 59, No. 2, April 2004, 623-650.

Eisenhardt, Kathleen M., "Agency Theory: An Assessment and Review," *Academy of Management Review*, Vol. 14, No. 1, January 1989, 57-74.

Evgeniou, Theodoros, Enric Junqué de Fortuny, Nick Nassuphis, and Theo Vermaelen, "Share Buyback and Equity Issue Anomalies Revisited," *INSEAD Working Paper 2016/21/DSC/FIN*, April 7, 2016.

Fama, Eugene F., and Kenneth R. French, "A Five-Factor Asset Pricing Model," *Journal of Financial Economics*, Vol. 116, No. 1, April 2015, 1-22.

Fama, Eugene F., and Kenneth R. French, "Dissecting Anomalies with a Five-Factor Model," *Review of Financial Studies*, Vol. 29, No. 1, January 2016, 69-103.

Fatemi, Ali, and Recep Bildik, "Yes, Dividends are Disappearing: Worldwide Evidence," *Journal of Banking & Finance*, Vol. 36, No. 3, March 2012, 662-677.

Floyd, Eric, Nan Li, and Douglas J. Skinner, "Payout Policy Through the Financial Crisis: The Growth of Repurchases and the Resilience of Dividends," *Journal of Financial Economics*, Vol. 118, No. 2, November 2015, 299-316.

Foley, C. Fritz, Jay C. Hartzell, Sheridan Titman, and Garry Twite, "Why Do Firms Hold So Much Cash? A Tax-Based Explanation," *Journal of Financial Economics*, Vol. 86, No. 3, December 2007, 579-607.

Fu, Fangjian and Sheng Huang, "The Persistence of Long-Run Abnormal Returns Following Stock Repurchases and Offerings," *Management Science*, Vol. 62, No. 4, April 2016, 964-984.

Graham, John R., Campbell R. Harvey, and Shiva Rajgopal, "Value Destruction and Financial Reporting Decisions," *Financial Analysts Journal*, Vol. 62, No. 6, November/December 2006, 27-39.

Graham, John R., Campbell R. Harvey, and Manju Puri, "Capital Allocation and Delegation of Decision-Making Authority within Firms," *Journal of Financial Economics*, Vol. 115, No. 3, March 2015, 449-470.

Graham, John R., Mark T. Leary and Michael R. Roberts, "A Century of Capital Structure: The Leveraging of Corporate America," *Journal of Financial Economics*, Vol. 118, No. 3, December 2015, 658-683.

Grullon, Gustavo, and David L. Ikenberry, "What Do We Know about Share Repurchases?" *Journal of Applied Corporate Finance*, Vol. 13, No. 1, Spring 2000, 31-51.

Grullon, Gustavo, and Roni Michaely, "Dividends, Share Repurchases, and the Substitution Hypothesis," *Journal of Finance*, Vol. 57, No. 4, August 2002, 1649-1684.

Grullon, Gustavo, Bradley Paye, Shane Underwood, and James P. Weston, "Has the Propensity to Pay Out Declined?" *Journal of Financial and Quantitative Analysis*, Vol. 46, No. 1, February 2011, 1-24.

Haleblian, Jerayr, Cynthia E. Devers, Gerry McNamara, Mason A. Carpenter, and Robert B. Davison, "Taking Stock of What We Know About Mergers and Acquisitions: A Review and Research Agenda," *Journal of Management*, Vol. 35, No. 3, June 2009, 469-502.

Hall, Brian J., and Jeffrey B. Liebman, "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics*, Vol. 113, No. 3, August 1998, 653-691.

Hall, Stephen, Dan Lovallo, and Reiner Musters, "How to Put Your Money Where Your Strategy Is," *McKinsey Quarterly*, March 2012.

Harris, Milton, and Artur Raviv, "The Capital Budgeting Process: Incentives and Information," *Journal of Finance*, Vol. 51, No. 4, September 1996, 1139-1174.

Herper, Matthew, "How Much Does Pharmaceutical Innovation Cost? A Look at 100 Companies," *Forbes*, August 8, 2013.

Hillman, Tom, "Linking Corporate Performance and Valuation to Management Incentives," *Credit Suisse HOLT*, July 2014.

Hillman, Tom, and Chris Morck, "Using the HOLT Framework to Assess Acquisition Skill," *Credit Suisse HOLT Research*, July 2014.

Hoffmann, Florian, and Sebastian Pfeil, "Reward for Luck in a Dynamic Agency Model," *Review of Financial Studies*, Vol. 23, No. 9, September 2010, 3329-3345.

Hoskisson, Robert E., and Thomas A. Turk, "Corporate Restructuring: Governance and Control Limits of the Internal Capital Market," *Academy of Management Review*, Vol. 15, No. 3, July 1990, 459-477.

Ikenberry, David, Josef Lakonishok, Theo Vermaelen, "Market Underreaction to Open Market Share Repurchases," *Journal of Financial Economics*, Vol. 39, Nos. 2 and 3, October-November 1995, 181-208.

Jensen, Michael C., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, Vol. 76, No. 2, May 1986, 323-329.

Jensen, Michael C., and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, Vol. 3, No. 4, October 1976, 305-360.

Jose, Manuel L., Carol Lancaster, and Jerry L. Stevens, "Corporate Returns and Cash Conversion Cycles," *Journal of Economics and Finance*, Vol. 20, No. 1, Spring 1996, 33-46.

Kale, Jayant R., Omesh Kini, and Janet D. Payne, "The Dividend Initiation Decisions of Newly Public Firms: Some Evidence on Signaling with Dividends," *Journal of Financial and Quantitative Analysis*, Vol. 47, No. 2, April 2012, 365-396.

Kaplan, Steven N., "Weak Solutions to an Illusory Problem," *University of Pennsylvania Law Review*, Vol. 159, 2010, 43-56.

Kaplan, Steven N., and Joshua Rauh, "Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?" *Review of Financial Studies*, Vol. 23, No. 3, March 2010, 1004-1050.

Kieschnick, Robert, Mark Laplante, and Rabih Moussawi, "Working Capital Management and Shareholders' Wealth," *Review of Finance*, Vol. 17, No. 5, September 2013, 1827-1852.

Kisser, Michael, "The Real Option Value of Cash," *Review of Finance*, Vol. 17, No. 5, September 2013, 1649-1697.

Laamanen, Tomi, and Thomas Keil, "Performance of Serial Acquirers: Toward an Acquisition Program Perspective," *Strategic Management Journal*, Vol. 29, No. 6, June 2008, 663-672.

Lazo, Shirley A., "Another Banner Year for Dividends," *Barron's*, June 7, 2014.

— — —, "Buybacks Surge, Led by Apple," *Barron's*, June 21, 2014.

Lee, Donghum "Don," and Ravi Madhavan, "Divestiture and Firm Performance: A Meta-Analysis," *Journal of Management*, Vol. 36, No. 6, November 2010, 1345-1371.

Levy, Steven, "Jeff Bezos Owns the Web in More Ways Than You Think," *Wired Magazine*, November 13, 2011.

Loughran, Tim, and Anand M. Vijh, "Do Long-Term Shareholders Benefit From Corporate Acquisitions?" *Journal of Finance*, Vol. 52, No. 5, December 1997, 1765-1790.

Lynagh, Connor, "Does the Market Reward Accretive Deals? An Investigation of Acquirer Performance and Earnings per Share Accretion," *Glucksman Institute for Research in Securities Markets Working Paper*, April 1, 2014.

Mauboussin, Michael J., and Alexander Schay, "Where's the Bar? Introducing Market-Expected Return on Investment (MEROI)," *Credit Suisse First Boston Equity Research*, June 12, 2001.

Mauboussin, Michael J., and Dan Callahan, "Measuring the Moat: Assessing the Magnitude and Sustainability of Value Creation," *Credit Suisse Global Financial Strategies*, July 22, 2013.

— — —, "Economic Returns, Reversion to the Mean, and Total Shareholder Returns," *Credit Suisse Global Financial Strategies*, December 6, 2013.

— — —, "What Does a Price-Earnings Multiple Mean? An Analytical Bridge between P/Es and Solid Economics," *Credit Suisse Global Financial Strategies*, January 29, 2014.

— — —, “Disbursing Cash to Shareholders: Frequently Asked Questions about Buybacks and Dividends,” *Credit Suisse Global Financial Strategies*, May 6, 2014.

— — —, “Calculating Return on Invested Capital: How to Determine ROIC and Address Common Issues,” *Credit Suisse Global Financial Strategies*, June 4, 2014.

McConnell, John J., and Chris J. Muscarella, “Corporate Capital Expenditure Decisions and the Market Value of the Firm,” *Journal of Financial Economics*, Vol. 14, No. 3, September 1985, 399-422.

McNamara, Gerry, Jerayr Haleblian, and Bernadine Johnson Dykes, “The Performance Implications of Participating in an Acquisition Wave,” *Academy of Management Journal*, Vol. 51, No. 1, February 2008, 113-130.

Medlyn, Erin, and Alex Granados, “Survey: CFOs Weigh In on Affordable Care Act, Interest Rates, Stock Market Overhang,” *Fuqua School of Business, Duke University Press Release*, September 11, 2013.

Mider, Zachary R., “Tax Inversion: How U.S. Companies Buy Tax Breaks,” *Bloomberg.com*, June 16, 2014.

Mortal, Sandra, and Natalia Reisel, “Capital Allocation by Public and Private Firms,” *Journal of Financial and Quantitative Analysis*, Vol. 48, No. 1, February 2013, 77-103.

Myers, Stewart C., and Nicholas S. Majluf, “Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have,” *Journal of Financial Economics*, Vol. 13, No. 2, June 1984, 187-221.

Nissim, Doron, and Amir Ziv, “Dividend Changes and Future Profitability,” *Journal of Finance*, Vol. 56, No. 6, December 2001, 2111-2133.

Nguyen, Pascal, “The Role of the Seller’s Stock Performance in the Market Reaction to Divestiture Announcements,” *Journal of Economics and Finance*, Vol. 40, No. 1, January 2016, 19-40.

Oded, Jacob, and Allen Michel, “Stock Repurchases and the EPS Enhancement Fallacy,” *Financial Analysts Journal*, Vol. 64, No. 4, July/August 2008, 62-75.

Paul, Steven M., Daniel S. Mytelka, Christopher T. Dunwiddie, Charles C. Persinger, Bernard H. Munos, Stacy R. Lindborg, and Aaron L. Schacht, “How to Improve R&D Productivity: The Pharmaceutical Industry’s Grand Challenge,” *Nature Reviews Drug Discovery*, Vol. 9, March 2010, 203-214.

Porter, Michael E., “Capital Choices: Changing the Way America Invests in Industry,” *Journal of Applied Corporate Finance*, Vol. 5, No. 2, Summer 1992, 4-16.

— — —, “What is Strategy?” *Harvard Business Review*, November-December, 1996, 61-78.

Prendergast, Canice, “The Provision of Incentives in Firms,” *Journal of Economic Literature*, Vol. 37, No. 1, March 1999, 7-63.

Rappaport, Alfred, “Dividend Reinvestment, Price Appreciation and Capital Accumulation,” *Journal of Portfolio Management*, Vol. 32, No. 3, Spring 2006, 119-123.

— — —, “Ten Ways to Create Shareholder Value,” *Harvard Business Review*, September 2006, 66-77.

- Rappaport, Alfred, and Mark L. Sirower, "Stock or Cash? The Trade-Offs for Buyers and Sellers in Mergers and Acquisitions," *Harvard Business Review*, November-December 1999, 147-158.
- Rhodes-Kropf, Matthew and S. Viswanathan, "Market Valuation and Merger Waves," *Journal of Finance*, Vol. 59, No. 6, December 2004, 2685-2718.
- Rockoff, Jonathan D., and Dana Mattioli, "Bid for Allergan Puts Valeant's Research and Development Cuts Under Scrutiny," *Wall Street Journal*, June 10, 2014.
- Saad, Mohsen and Zaher Zantout, "Over-Investment in Corporate R&D, Risk, and Stock Returns," *Journal of Economics and Finance*, Vol. 38, No. 3, July 2014, 438-460.
- Scannell, Jack W., Alex Blanckley, Helen Boldon, and Brian Warrington, "Diagnosing the Decline in Pharmaceutical R&D Efficiency," *Nature Reviews Drug Discovery*, Vol. 11, March 2012, 191-200.
- Seitz, Patrick, "Top Tech Stocks Not Big R&D Spenders, Surprising Study Shows," *Investors.com*, July 7, 2014.
- Shapiro, Alan C., "Corporate Strategy and the Capital Budgeting Decision," *Midland Corporate Finance Journal*, Spring 1985, 22-36.
- Silverblatt, Howard, "Buybacks and the S&P 500® EPS," *Indexology Blog*, March 7, 2014.
- Sirower, Mark L., and Sumit Sahni, "Avoiding the 'Synergy Trap': Practical Guidance on M&A Decisions for CEOs and Boards," *Journal of Applied Corporate Finance*, Vol. 18, No. 3, Summer 2006, 83-95.
- Skinner, Douglas J., "The Evolving Relation Between Earnings, Dividends, and Stock Repurchases," *Journal of Financial Economics*, Vol. 87, No. 3, March 2008, 582-609.
- Skinner, Douglas J., and Eugene Soltis, "What Do Dividends Tell Us About Earnings Quality?" *Review of Accounting Studies*, Vol. 16, No. 1, March 2011, 1-28.
- Sloan, Allan, "Positively Un-American Tax Dodges," *Fortune*, July 21, 2014.
- Slovin, Myron B., Marie E. Sushka, and John A. Polonchek, "Methods of Payment in Asset Sales: Contracting with Equity versus Cash," *Journal of Finance*, Vol. 60, No. 5, October 2005, 2385-2407.
- Stein, Jeremy C., "Internal Capital Markets and the Competition for Corporate Resources," *Journal of Finance*, Vol. 52, No. 1, March 1997, 111-133.
- Thaler, Richard H., "Anomalies: The Winner's Curse," *Journal of Economic Perspectives*, Vol. 2, No. 1, Winter 1988, 191-202.
- Titman, Sheridan, K. C. John Wei, and Feixue Xie, "Capital Investments and Stock Returns," *Journal of Financial and Quantitative Analysis*, Vol. 39, No. 4, December 2004, 677-700.
- Titman, Sheridan, K. C. John Wei, and Feixue Xie, "Market Development and the Asset Growth Effect: International Evidence," *Journal of Financial and Quantitative Analysis*, Vol. 48, No. 5, October 2013, 1405-1432.

Veld, Chris, and Yulia V. Veld-Merkoulova, "Value Creation through Spinoffs: A Review of the Empirical Evidence," *International Journal of Management Reviews*, Vol. 11, No. 4, December 2009, 407-420.

Voss, Jordan, "Why do Firms Repurchase Stock?" *Major Themes in Economics*, Spring 2012.

Wang, Jin, and Lewis D. Johnson, "Information Asymmetry, Signaling, and Share Repurchase," *Working Paper*, February 2008.

Warusawitharana, Missaka, "Research and Development, Profits, and Firm Value: A Structural Estimation," *Quantitative Economics*, Vol. 6, No. 2, July 2015, 531-565.

Watanabe, Akiko, Yan Xu, Tong Yao, and Tong Yu, "The Asset Growth Effect: Insights for International Equity Markets," *Journal of Financial Economics*, Vol. 108, No. 2, May 2013, 259-263.

Woolridge, J. Randall, and Charles C. Snow, "Stock Market Reaction to Strategic Investment Decisions," *Strategic Management*, Vol. 11, No. 5, September 1990, 353-363.

Wurgler, Jeffrey, "Financial Markets and the Allocation of Capital," *Journal of Financial Economics*, Vol. 58, Nos. 1-2, 2000, 187-214.

Ye, Meng, "Efficiency of Internal Capital Allocation and the Success of Acquisitions," *University of New Orleans Theses and Dissertations, Paper 1106*, December 20, 2009.

Zhuang, Chao, "Share Repurchases, Market Timing, and the Distribution of Free Cash Flow," *Working Paper*, March 10, 2015.

Zion, David, Ron Graziano, Ravi Gomatam, and Jason Williams, "Parking Lots of Cash & Earnings Overseas: At Least \$750 Billion in Cash & Nearly \$2.3 Trillion in Earnings," *Credit Suisse Equity Research*, March 11, 2016.

Zweig, Jason, "Peter's Uncertainty Principle," *Money Magazine*, November 1994, 143-149.

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HOLT[®]

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