TAKING STOCK

Share Buybacks and Shareholder Value

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CONTENTS

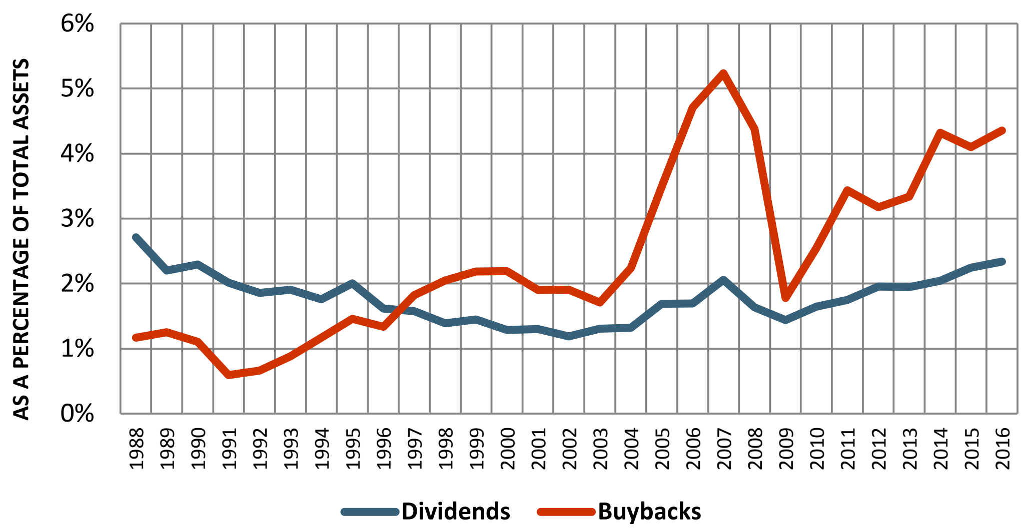
EXECUTIVE SUMMARY

1. Share buybacks have become the favored means for distributing cash to investors among large-cap U.S. companies, exceeding cash dividends every year since 1997 at 388 of the 610 companies (63.6%) we studied.
2. A majority of the companies we observed bought back shares when prices were high rather than low, as buybacks have replaced dividends as the dominant way of returning cash to investors at many companies.
3. Contrary to concerns expressed by many observers, we found no compelling evidence of a negative impact from share buybacks on long-term value creation for investors overall. In each of the areas we examined, beginning with MSCI ESG Ratings but also including CAPEX, R&D, new debt issues, and, most importantly, value creation, the companies that were most actively distributing cash to their investors were also the strongest companies.
4. Companies where index investors were the largest shareholders included a much wider range of buyback impacts, good and bad, than companies where the largest shareholders were buy-and-hold investors: total returns for the buy-and-hold investor companies were 18% higher, on average, than for the index investor companies from 2007 to 2016.

BACKGROUND

Prior to 1982, share buybacks were virtually non-existent in U. S. equity markets due to regulations aimed at limiting the potential for share price manipulation. The U.S. Securities and Exchange Commission reconsidered its position in 1982, adopting Rule 10b-18, which established a safe harbor for companies wishing to distribute cash to investors via share buybacks. Both the frequency and amount of share buybacks began to rise almost immediately, eventually superseding dividends as the primary means of distributing corporate profits to investors. At the 610 MSCI USA Index constituents[1] we studied, total buybacks have exceeded total dividend payments every year since 1997.

Exhibit 1: Dividends and Buybacks 1988-2016



Annual cash dividends and share buybacks as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016. Source: MSCI ESG Research, based on Thomson Reuters data.

The decision to buy back shares is one of the most important strategic decisions a corporate board can make. Share buybacks are an integral part of a company's overall capital management, which requires the continual balancing of operating costs, capital expenditures (CAPEX) and research and development (R&D) against revenues and tax obligations. Buybacks are a key element of a company's corporate governance, i.e., the

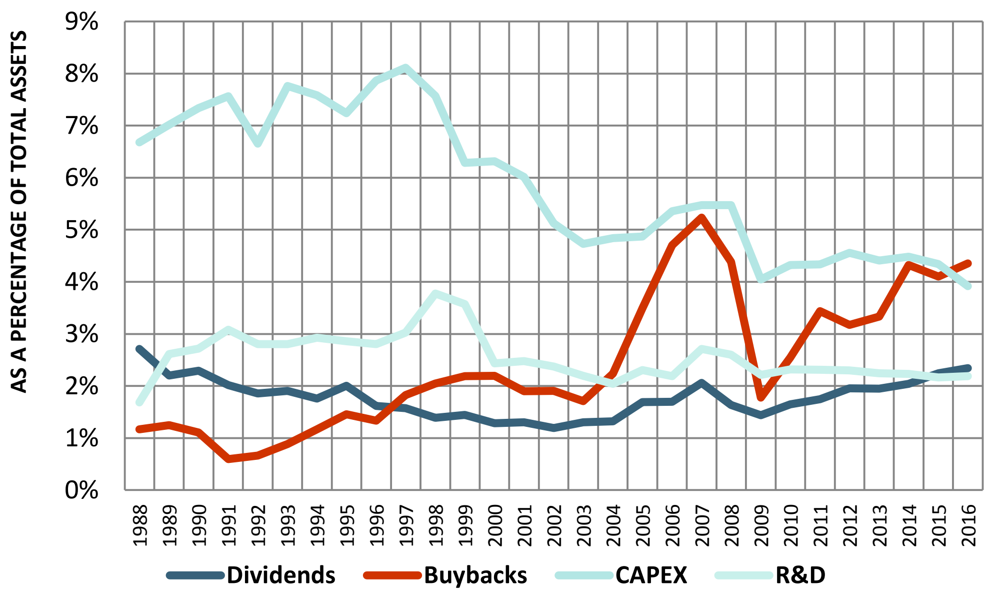
[1] As of Dec. 31, 2016.

primary means by which a company may create and preserve value on behalf of its investors.

As a means for returning value to investors, buybacks offer companies and investors greater flexibility than dividends: Companies can more easily manage their tax liabilities and market expectations on both the timing and amount of buybacks. Investors may also prefer buybacks over dividends because they can facilitate more frequent reallocation of existing capital.

But some investors worry that companies might prioritize buybacks over either long-term capital investments or R&D.[2] In fact, both CAPEX and R&D spending at our sample companies has declined in almost every year since 1997, with total buybacks exceeding total CAPEX for the first time in 2015.

Exhibit 2: Dividends and Buybacks versus CAPEX and R&D



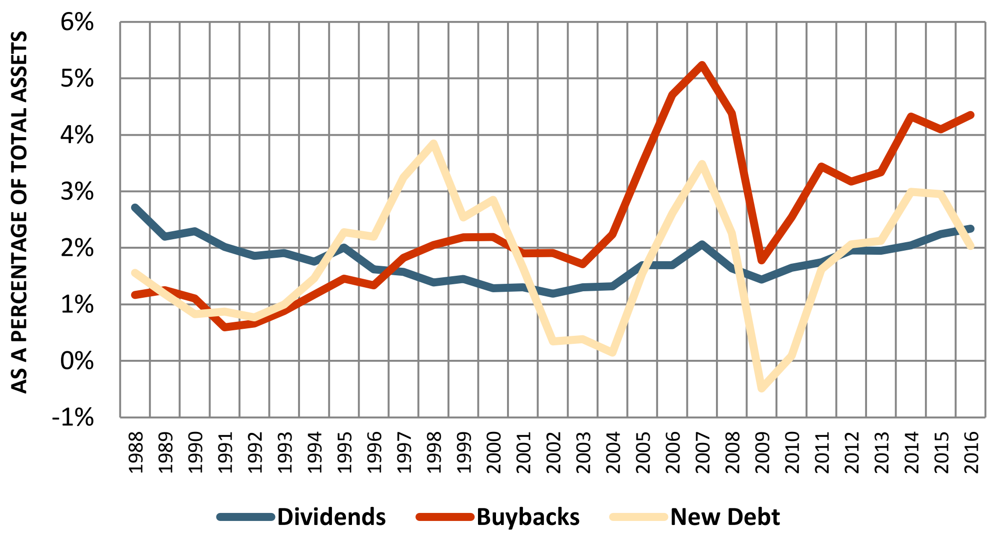
Annual cash dividends and share buybacks vs. CAPEX and R&D as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016. Source: MSCI ESG Research, based on Thomson Reuters data.

[2] "Share Buybacks and their Governance Implications." (2017). International Corporate Governance Network.

Of these 610 companies, 554 (91%) bought back shares at some time during our study period, while 499 (82%) paid cash dividends. Eighty-nine bought back shares but paid no dividends, while 34 paid dividends but did not buy back shares.

Some companies have also borrowed to buy back shares, raising concerns that some firms might over-leverage their balance sheets. Among the companies we studied, aggregate new debt issues appear to have closely tracked aggregate share buybacks since about 2003, as shown in Exhibit 3.

Exhibit 3: Dividends and Buybacks vs. New Debt Issues



Annual cash dividends and share buybacks vs. new debt issues as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016. Source: MSCI ESG Research, based on Thomson Reuters data.

Some observers fear that the corporate embrace of share buybacks reflects a dearth of new ideas among CEOs and boards,[3] or favors short-term gains over long-term sustainability.[4] Others have lamented the possible use of share buybacks by CEOs to enhance their own

[3] Ayres, R. and M. Olenick. (2017). "Secular Stagnation (Or Corporate Suicide?)." INSEAD Working Paper.

[4] Lazonick, W. (2014). "Profits Without Prosperity." *Harvard Business Review.*

equity-based pay gains, particularly at those companies where pay has not always been well aligned with long-term investment returns.[5]

Surprisingly, there has been very little pushback from investors regarding the growing use of share buybacks. Further, buybacks have continued to rise even as many of these companies were achieving record high valuations, contradicting the long-standing assertion that companies should buy back shares only when their shares are under-valued.[6] A majority of these companies have repeatedly bought back shares at prices that reflected possible over- rather than under-valuation,[7] and in addition to rather than as a substitute for cash dividends.

Brav et al. (2005),[8] who surveyed 384 corporate financial executives, wrote that "...many of those firms that pay dividends wish they did not, saying that if they could start all over again, they would not pay as much in dividends as they do ... many of these firms would prefer to pay out in the form of buybacks."

We looked to the U.S. to better understand buyback activity. While we found evidence of share buyback activity in virtually every market globally between 1988 and mid-2017, the dollar value totals in the U.S. market (particularly among U.S. large caps) dwarfed other markets.[9] Global dividend and buyback activity is shown in Appendix 1.

We ultimately identified 610 companies for deeper analysis. All of these companies were constituents of the MSCI USA Index as of Dec. 31, 2016. We then narrowed our focus to the most recent 15-year period (ending December 2016) for which sufficient buyback and other financial data was available.

Over this 15-year period, these 610 MSCI USA constituents paid over $3.86 trillion in cash dividends, and repurchased just under $5.19 trillion of their own shares. Excluding financial companies, which report total assets differently, the combined total payout was equal to 48.6% of total 2016 constituent assets, or $3.2 trillion in dividends, and $4.4 trillion in buybacks, as shown in Exhibit 4.

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[5] Edmans, A., V.W. Fang and K. A. Lewellen. (2017). "Equity Vesting and Investment." *The Review of Financial Studies*, Vol. 30, No. 7, pp. 2229–2271.

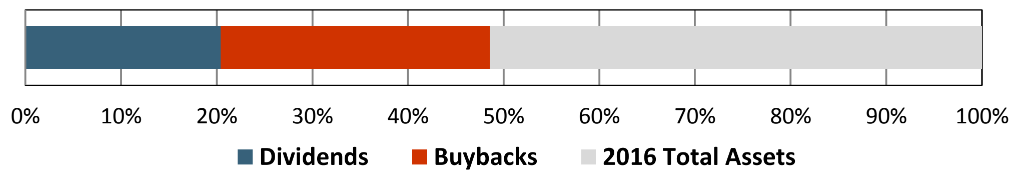
[6] For one of the more frequently cited versions of this advice, see Buffet, W. E. (2012). "Annual Letter to Berkshire Hathaway Shareholders." Berkshire Hathaway.

[7] See Liu, H. and E. P. Swanson. (2016). "Is Price Support a Motive for Increasing Share Repurchases?" *Journal of Corporate Finance*, Vol. 38, pp. 77-91, for an examination of one possible explanation for this behavior, which is beyond the scope of the current analysis.

[8] Brav, A., J. R. Graham, C. R. Harvey and R. Micaely. (2005). "Payout Policy in the 21st Century." *Journal of Financial Economics,* Vol. 77, No. 3, pp. 483-527.

[9] Unless otherwise noted, all financial reporting figures used in this report were obtained from Thomson Reuters.

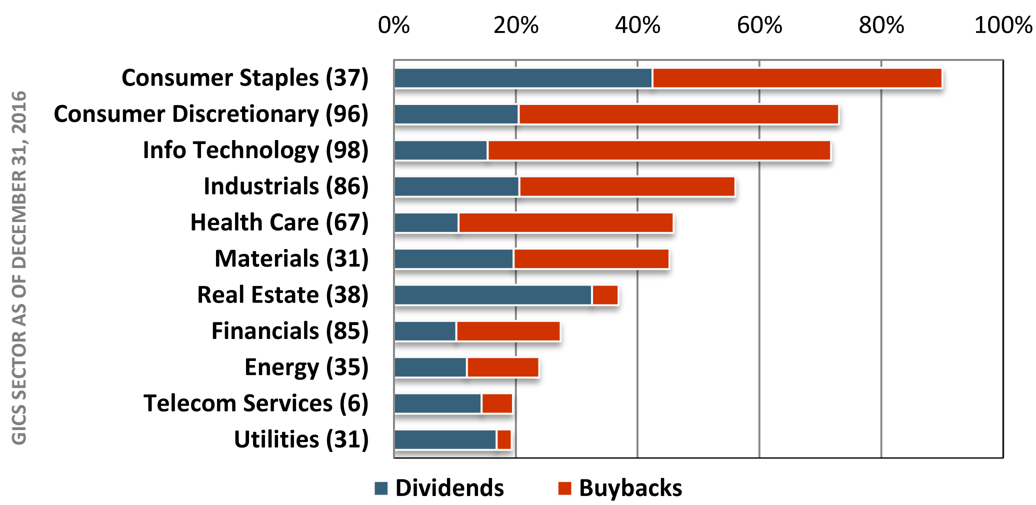
Exhibit 4: Cumulative Dividends and Buybacks 2002-2016 vs. 2016 Total Assets



Total cumulative cash dividends and share buybacks vs. 2016 total assets for 525 constituents of the MSCI USA Index as of Dec. 31, 2016, excluding GICS Financials. Source: MSCI ESG Research, based on Thomson Reuters data.

During this period, 140 of these companies paid out the equivalent of more than 50% of their total 2016 assets on buybacks; 53 of these companies repurchased shares equivalent to more than 100% of their 2016 assets. In comparison, only 37 companies paid out more than 50% of 2016 assets in dividends, while 24 paid no dividends at all.

Exhibit 5: Dividend and Buyback Variations by GICS sector

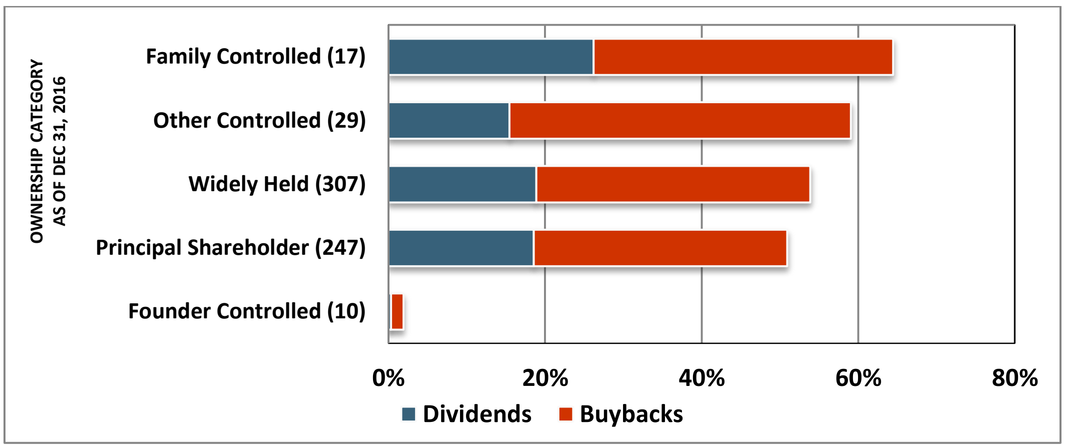


Total cumulative cash dividends and share buybacks as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by GICS sector. The number of companies per sector group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

As shown in Exhibit 5, both dividends and buybacks varied considerably between GICS®[10] sectors: Buybacks were highest among info tech and consumer discretionary/staples sectors, and lowest among telecom, real estate and utilities. Such differences were even greater at the GICS industry group level, with three groups (food & restaurants, specialized finance and household products) on average exceeding 100% of 2016 assets in total payouts.[11] These differences were not surprising, as some industries were simply more profitable during this period, while others struggled to such a degree that even dividends could only be funded using borrowed capital, leaving little scope to repurchase shares.

We also found differences when we looked at company ownership. Family-controlled firms paid more in cash dividends than other ownership groups, on average, though they also participated heavily in share buybacks, as did nearly all other controlled companies. But founder-controlled companies, such as Alphabet, Inc. or Facebook, Inc., allocated very little capital to either, as shown in Exhibit 6.

Exhibit 6: Dividend and Buyback Averages by Ownership Category



Total cumulative cash dividends and share buybacks as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by MSCI ownership category. The number of companies per ownership group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

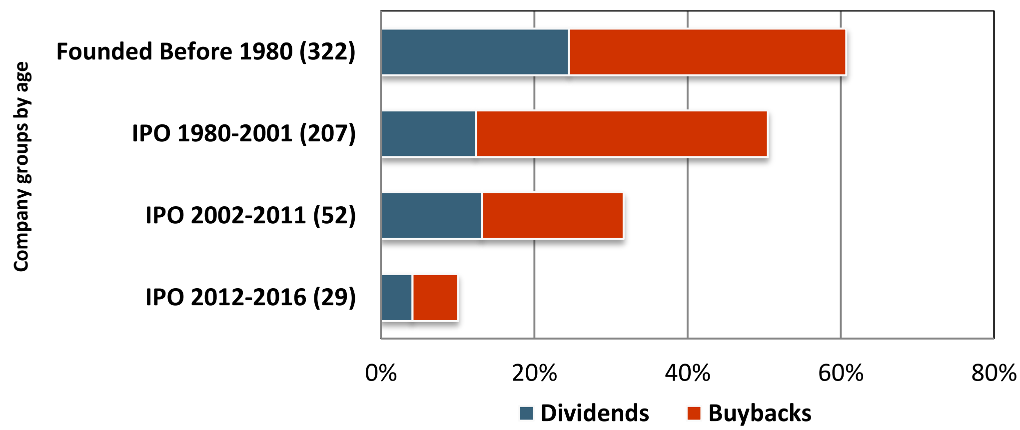
These sector- and ownership-based differences were closely related, and in many cases overlapping. So were the differences we observed based on company age and maturity. The most active repurchasers were companies that first listed from 1980 to 2001; such older,

[10] The GICS industry classifications system is maintained jointly by MSCI and S&P Global.

[11] The GICS classification uses four levels of increasing specificity: sector, industry group, industry and sub-industry.

more established companies paid more in dividends, on average, while still actively buying back shares, which resulted in even higher total payouts. These differences are shown in Exhibit 7.[12] [13]

Exhibit 7: Dividend and Buyback Averages by Company Age and Maturity



Total cumulative cash dividends and share buybacks as a percentage of total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by company age. The number of companies per group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

BUYBACKS AND MANAGING FOR THE LONG TERM

First we wanted to determine whether the companies in our sample that were most actively engaged in share buybacks were doing so at the expense of managing for the long term. We started by looking at these companies' ESG Ratings, as ESG Ratings aim to capture how well companies are positioned to manage financially relevant ESG risks and opportunities. In previous research, MSCI has shown that MSCI ESG Ratings have signaled risks that may materialize over a longer-term time frame.[14]

[12] Nearly half of the companies we studied (48%) were first listed after 1980, and 13.5% were first listed after 2002.

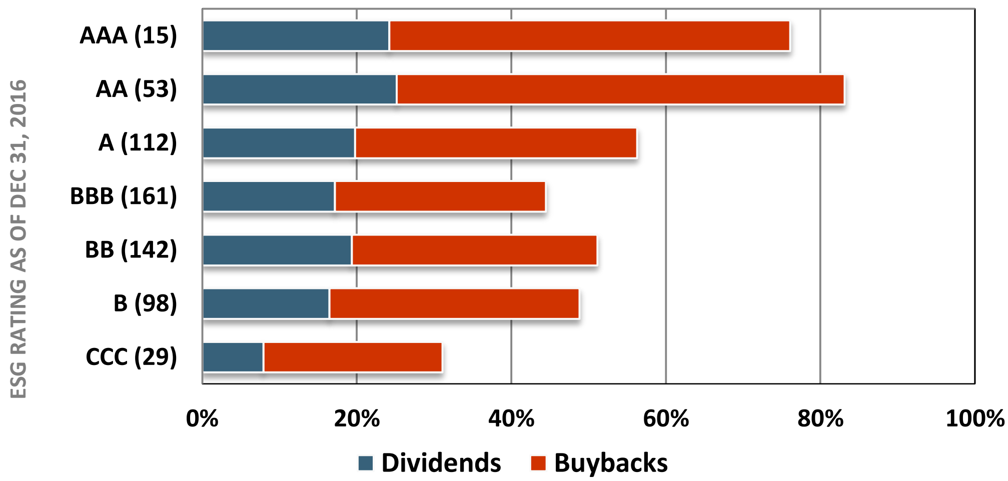
[13] While it was not included in our sample, our own firm, MSCI, Inc. has actively engaged in share buybacks since 2008, and paid dividends since 2014.

[14] Giese, G., L.-E. Lee, D. Melas, Z. Nagy and L. Nishikawa. (2017). "Foundations of ESG investing, Part 1: How ESG affects Equity Valuation, Risk and Performance." MSCI Research Insight.

BUYBACKS AND ESG RATINGS

The companies in our sample that were most active in buying back shares during this period and made the highest total payouts, were also, on average, the most highly rated, based on their MSCI ESG Ratings[15] as of the end of 2016. The least active companies were also the lowest rated.

Exhibit 8: Dividends and Buybacks by MSCI ESG Rating



Total cumulative cash dividends and share buybacks as a percentage of 2016 total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by MSCI ESG Rating group. The number of companies per group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

Why would there be such a strong alignment between MSCI ESG Ratings and total payouts in general, and share buybacks in particular? We sought to answer this question by examining other aspects of these companies' capital management, specifically their CAPEX and R&D spending. Were these allocations also aligned with our ESG Ratings?

CAPEX AND R&D

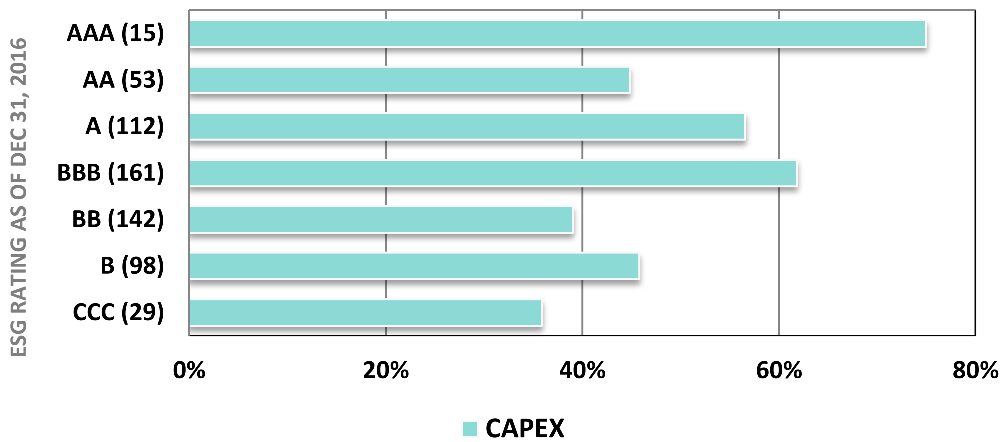
Consistent with the theory of competitive corporate life cycles first proposed by Stigler in 1951,[16] we expected that more recently listed companies, and particularly those with still

[15] See MSCI ESG Ratings Methodology document for more details on the design of the ESG Ratings.

[16] Stigler, G. (1951). "The Division of Labor is Limited by the Extent of the Market." *Journal of Political Economy*. Vol. 59, No. 3, pp. 185-193.

active founders at the helm, would invest more heavily in their own futures and would be less inclined to buy back their own shares, while older, more mature and established companies would be more likely to distribute value to their investors. This did turn out to be the case. Some of the decline in CAPEX spending we found could be attributed to the relative overall maturity of U.S. large-cap equities.

Exhibit 9: CAPEX Spending by MSCI ESG Ratings Group

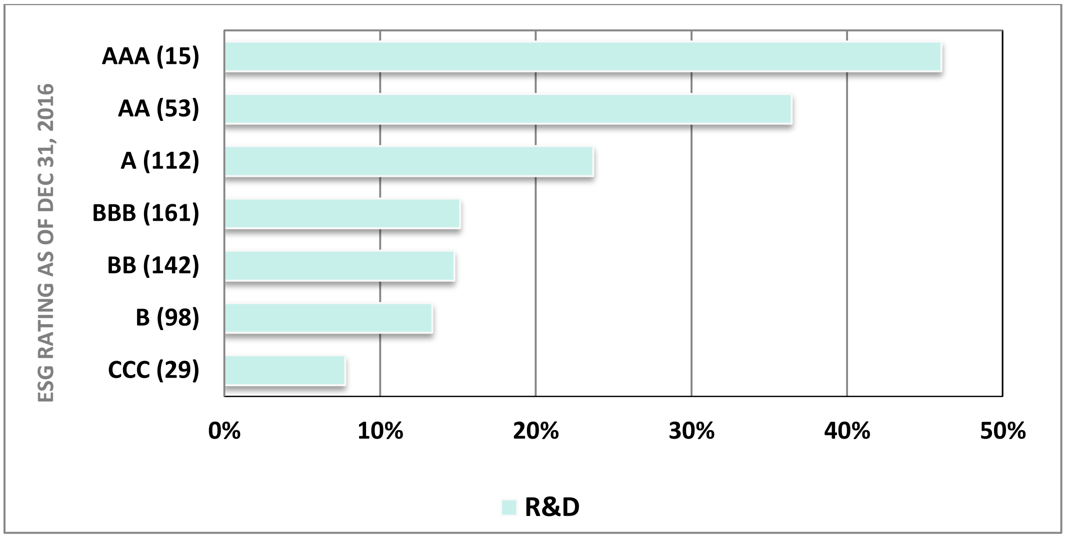


Average cumulative CAPEX spending for the period 2002-2016 as a percentage of 2016 total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by MSCI ESG Ratings group. The number of companies per group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

The highest and lowest rated companies were also the highest and lowest investors in CAPEX, respectively, as shown in Exhibit 9. The aggregate decline in CAPEX spending we observed, as shown in Exhibit 2, could also be tied to other changes in the U.S. economy, where the emphasis has been shifting steadily away from manufacturing and production. Companies in some industries have benefitted from increased productivity, and many companies have elected to achieve growth via acquisition, which could also lower capital expenditures. But nearly all of the companies that either paid cash dividends or bought back shares also reported some level of regular CAPEX spending. We did not find any compelling evidence to indicate that these companies elected to buy back shares to the exclusion of investing in their own futures.

Research and development spending, however, was very strongly aligned with our ratings, as shown in Exhibit 10.

Exhibit 10: R&D Spending by MSCI ESG Ratings Group



Average cumulative CAPEX spending for the period 2002-2016 as a percentage of 2016 total assets for 610 constituents of the MSCI USA Index as of Dec. 31, 2016, by MSCI ESG Rating group. The number of companies per group is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

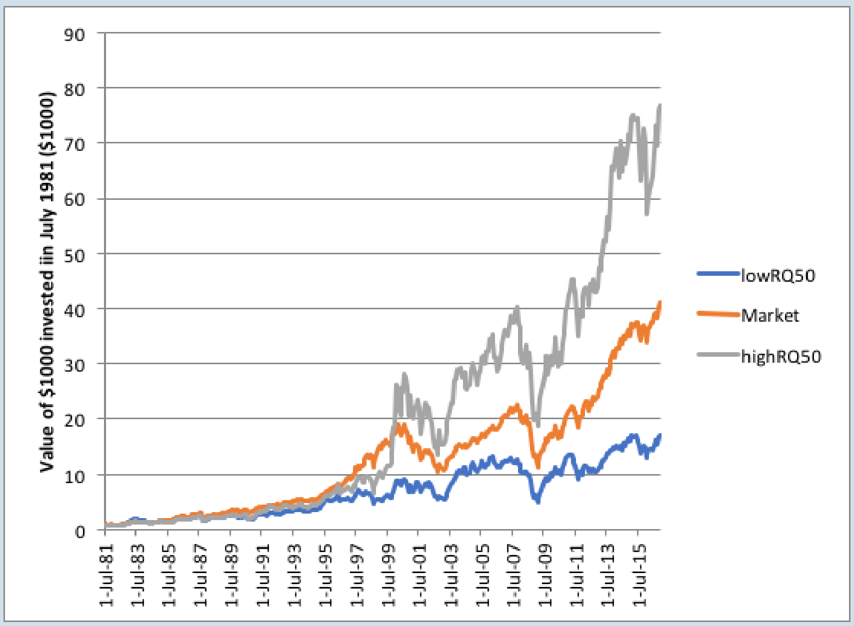
OPTIMAL R&D?

Research and development investments offer corporate managers in certain industries ways to invest in their company's future, potentially creating value for investors.

We consulted with Professor Anne Marie Knott at Washington University's Olin Business School on the importance of R&D spending, based on her experience in developing her Research Quotient (RQ) Ratings model, as described in her book, *How Innovation Really Works: Using the Trillion-Dollar R&D Fix to Drive Growth* (McGraw-Hill, 2017).

According to Prof. Knott, a 10% boost in R&D increased revenues, on average, by 1%. Companies that invested heavily in R&D, and measured high on the RQ Ratings scale, returned better than that, and companies who were weak R&D investors, with low RQ Ratings, performed worse, as can be seen in Exhibit 11.

Exhibit 11: R&D / RQ and Long-term Investment Returns



Investment returns for companies with high/low RQ scores vs. the market, 1981-2015. July 1, 2015 values for these three groups were $76,700 for the High RQ 50 group, versus $42,038 for the market average group and $17,095 for the Low HQ 50 group. Source: Anne Marie Knott

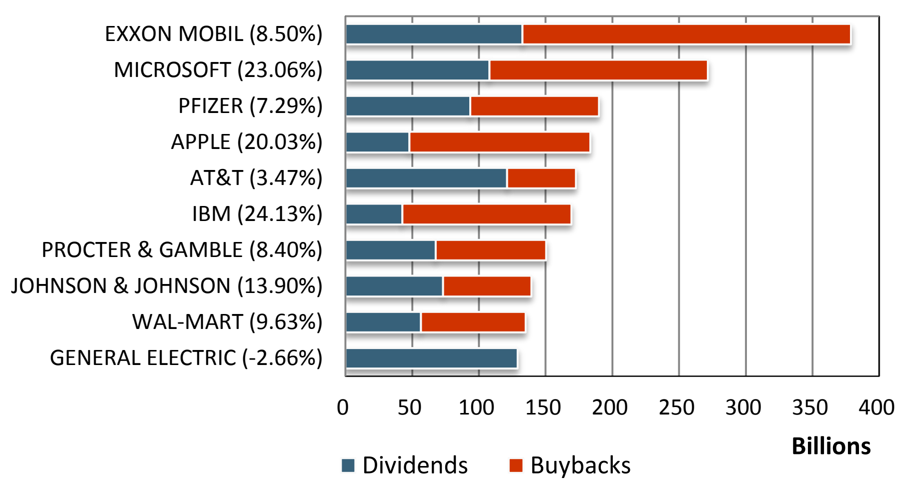
Companies who were best at R&D over the past 35 years returned approximately double the market return. Those who were weak at R&D substantially underperformed.

BUYBACKS AND VALUE CREATION

As noted previously, many observers, including Warren Buffet, have asserted that companies should buy back their shares when they are selling at a discount to their intrinsic value. But many of the companies in our sample repeatedly bought back shares at prices that exceeded their book value. [17]

We focused instead on value creation, which is of particular importance to long-term investors, such as those who focus on Environmental, Social and Governance (ESG) criteria. To determine which companies' total payouts were aligned with gains in shareholder value, we calculated the average 10-year spread between return on invested capital (ROIC) and cost of capital (COC).[18] We call this measure the "economic spread." Where ROIC exceeded the cost of capital, the company created value for their investors, while those experiencing a negative spread lost value.

Exhibit 12: Top 10 Non-financial Companies by Total Dollar Value Payouts



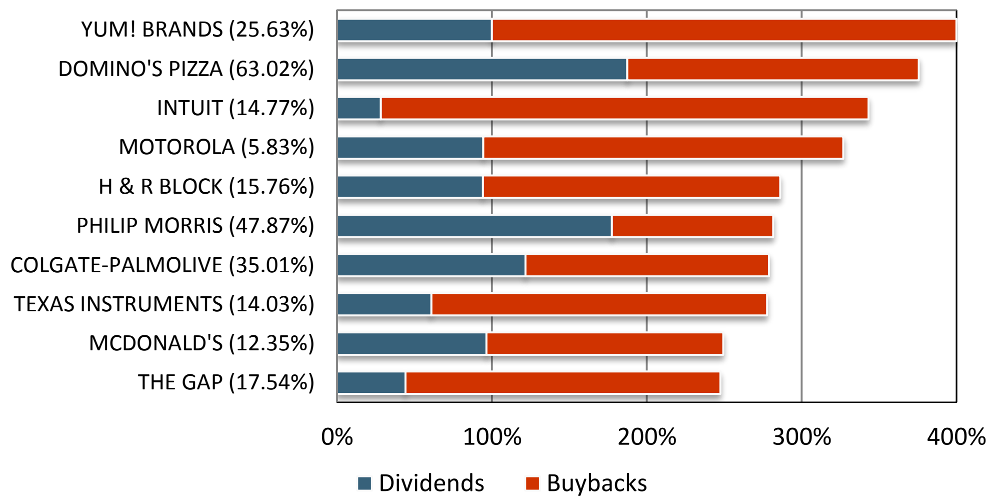
The top 10 companies by total 15-year dollar value payouts (total combined cash dividends plus share buybacks), from 2002-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year economic spread for each company is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

[17] See Liu, H. and E. P. Swanson. (2016). "Is Price Support a Motive for Increasing Share Repurchases?" *Journal of Corporate Finance*, Vol. 38, pp. 77-91, for an examination of one possible explanation for this behavior, which is beyond the scope of the current analysis.

[18] For purposes of this study, we determined each company's "economic spread" by calculating the average 10-year return on invested capital (ROIC), for the period from 2007-2016, as a percentage of the weighted average cost of capital (WACC), as of the end of 2016. The resulting figures were used throughout this analysis.

Indeed, nine of the top 10 non-financial companies by total payout amounts experienced value creation, as shown in Exhibit 12. The stacked bars show the proportional contribution of dividends versus buybacks for each company.

Exhibit 13: Top 10 Non-financial Companies by Total Payouts (Percentage of 2016 Assets)



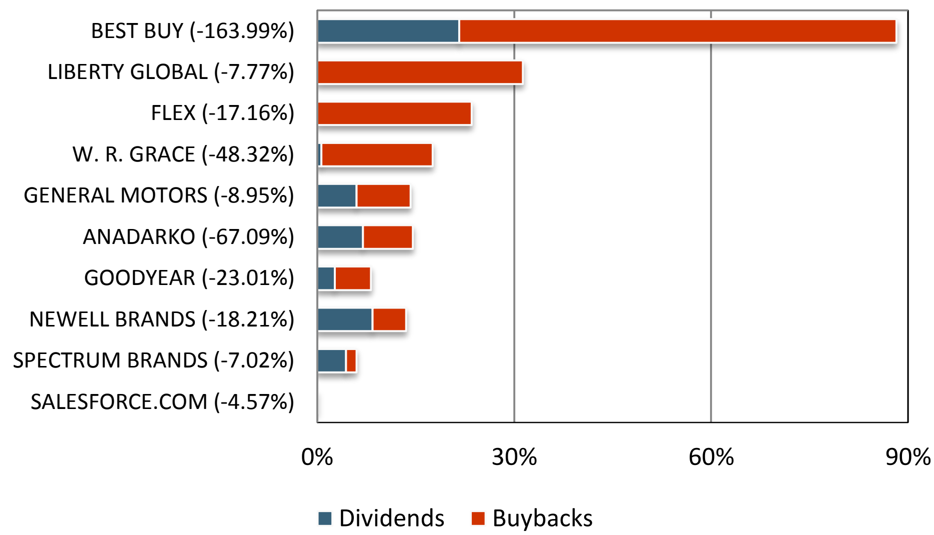
The top 10 companies by total 15-year payouts (total combined cash dividends plus share buybacks) as a percentage of total 2016 assets, from 2002-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year economic spread for each company is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

When we adjust for company size, we get a completely different group of companies. Exhibit 13 lists the top 10 companies by total payouts as a percentage of total 2016 assets. All of these companies were strong value creators.

We see a different picture when we examine the 10 non-financial companies with the worst 10-year economic spreads (Exhibit 14). All of these companies experienced a decline in shareholder value. Most of these companies spent far less on share buybacks, as a percentage of their 2016 assets, and one company, Salesforce, didn't buy back shares at all. The major exception to this was Best Buy, which experienced the highest loss of value while still actively buying back shares. But Best Buy was one of the relatively few companies included in our sample that bought back shares when prices were at their lowest, signaling a strong commitment on the part of management to turn around a severely ailing company.

Of the 512 companies for which we were able to calculate 10-year economic spreads, 74 experienced a negative spread, or loss of value. But buyback activity was much more conservative among these companies, only 12 of which exhibited total payouts in excess of 50% of their 2016 total assets. Buybacks exceeded dividends at only five of those companies, namely Best Buy, Agilent, CBS, Juniper Networks and Corning.

Exhibit 14: Lowest 10 Non-financial Companies based on 10-year Economic Spread



The 10 lowest companies based on 10-year spread between ROIC and COC, from 2007-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year economic spread for each company is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

In short, we did not find evidence that companies might be diverting resources to buybacks instead of reinvesting in their companies. In each of the areas we examined, beginning with MSCI ESG Ratings but also including CAPEX, R&D, and, most importantly, value creation, the strongest companies were also the companies that were the most actively distributing cash to their investors.

BUYBACKS AND INVESTOR DIFFERENCES

Yale University finance professor emeritus Roger Ibbotson[19] treats dividends and buybacks as alternative means to the same end, namely the distribution of corporate profits to investors. He refers to the combination as "total payouts." We have followed that approach here, tracking both dividends and share buybacks as if they were essentially the same.

But we also recognize that the two are not identical, and may be experienced differently by different types of investors. In the second part of our study, we seek a better understanding of these differences, in part because index investors were the largest group invested in our sample companies, but also because reinvested yield accounts for much of the long-term premium attributed to equity investments.[20]

Ibbotson defined three different types of investors, and described the differences in their response to share buyback programs, as explained in Exhibit 15.

Exhibit 15: How Different Investor Types Respond to Buyback Programs

Buy-and-hold Investor	Pro Rata Investor	Cap-Weighted Index Investor
E.g., founders, families, corporates and sovereign investors. Holds constant number of shares. Ends up with a larger percentage of the company, and at a higher price per share. Invests in specific companies, is focused primarily on long-term growth.	*E.g., short-term investors, activist funds, and other opportunistic investors. Tenders proportional number of shares. Ends up with a smaller number of shares, and a smaller percentage of the company, but with cash to invest elsewhere. Focused primarily on short-term growth and yield.*	*E.g., index funds. Maintains a constant percentage of shares. Ends up with fewer shares, but at a higher price per share. Invests in the broader market, is focused primarily on long-term yield.*

Per Ibbotson total payout model

In theory, share buybacks should have equal value for all three types of investors. In reality, this is not the case. To better understand the long-term impact of the preference for buybacks over dividends we observed on the different types of investors, we sorted the companies in our sample based on the type of investor holding the largest positions at each company, using the same methodology used to study ownership categories in the MSCI ESG

[19] Ibbotson, R. G. and P. U. Straehl. (2016). "The Long-Run Drivers of Stock Returns: Total Payouts and the Real Economy." *Financial Analysts Journal*, Vol.73, No.3, pp. 32-52. https://www.cfapubs.org/doi/abs/10.2469/faj.v73.n3.4

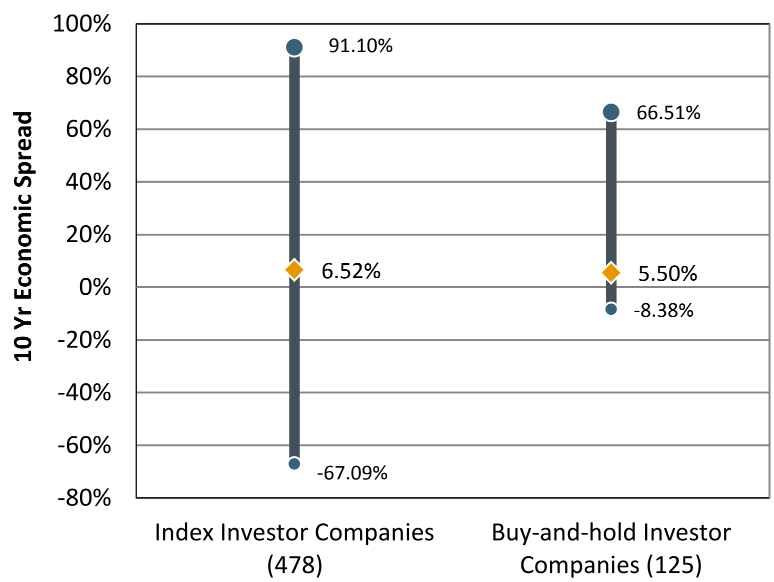
[20] See Dimson, E., P. Marsh and M. Staunton. (2018). Credit Suisse Global Investment Returns Yearbook, Credit Suisse. The long-term equity premium calculated was almost entirely based on the reinvestment of dividends.

Ratings corporate governance assessments.[21] We treated most controlled companies as falling into the buy-and-hold investor category, and most widely held companies, absent a highly influential founder, family, state or corporate lead investor, as falling into the index investor category. We reserved the pro rata or opportunistic investor category to just those companies where the interests of the lead investor were known to be short term.

Using this methodology, we identified 125 companies where buy-and-hold investors were the largest investors. More than three-quarters (479 companies, or 79%) were widely held companies where index investors were the largest investors. Only six companies fell into the pro rata group, which we felt was too small to yield definitive results.[22]

Exhibit 16 compares the average economic spread and its range for the two larger groups. The average economic spread for the index investor companies was 6.5% – a full percentage point higher than 5.5% for the buy-and-hold investor companies. But the overall range was considerably larger, and the index investor companies included a much wider range of spreads, both positive and negative.

Exhibit 16: Economic Spreads at Index and Buy-and-hold Investor Companies



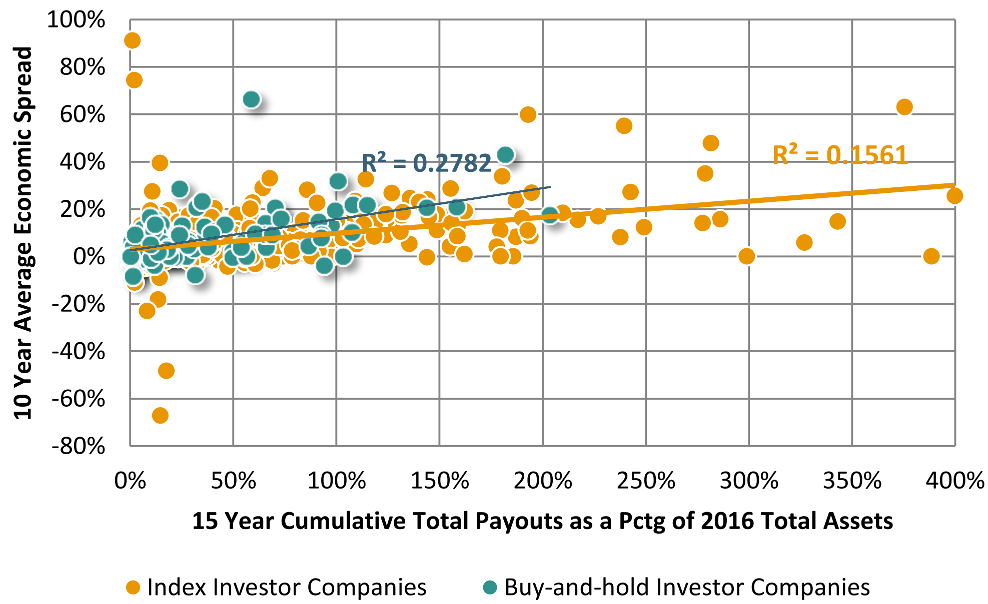
Source: MSCI ESG Research, based on Thomson Reuters data

[21] For a detailed exploration of these ownership categories, see Marshall, R. "Ownership Forms and Governance Control." (2015). MSCI.

[22] Best Buy was excluded from these groupings because it was an extreme outlier.

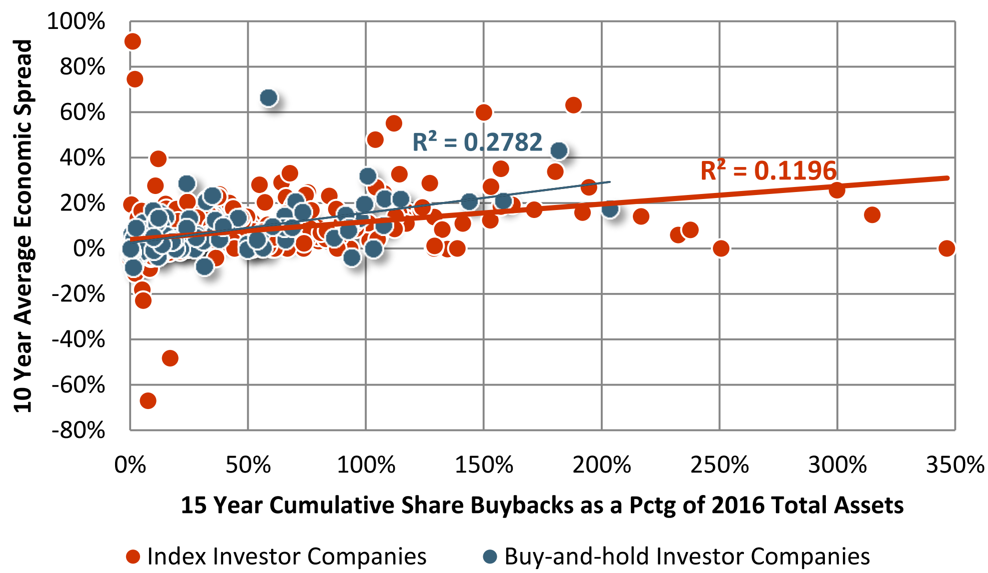
The next two exhibits illustrate how this data played out at individual companies. Exhibit 17 portrays the relationship between total payouts and economic spreads at both buy-and-hold and index investor companies, while Exhibit 18 plots share buybacks alone. In both instances, the correlation with economic spread was much stronger for the buy-and-hold companies, and buybacks by these companies were more tightly clustered. Nearly all of the outliers in each of these two exhibits were widely held companies where index investors held the largest positions.

Exhibit 17: Total Payouts vs. Economic Spreads by Investor Type



Source: MSCI ESG Research, based on Thomson Reuters data

Exhibit 18: Share Buybacks vs. Economic Spreads by Investor Type

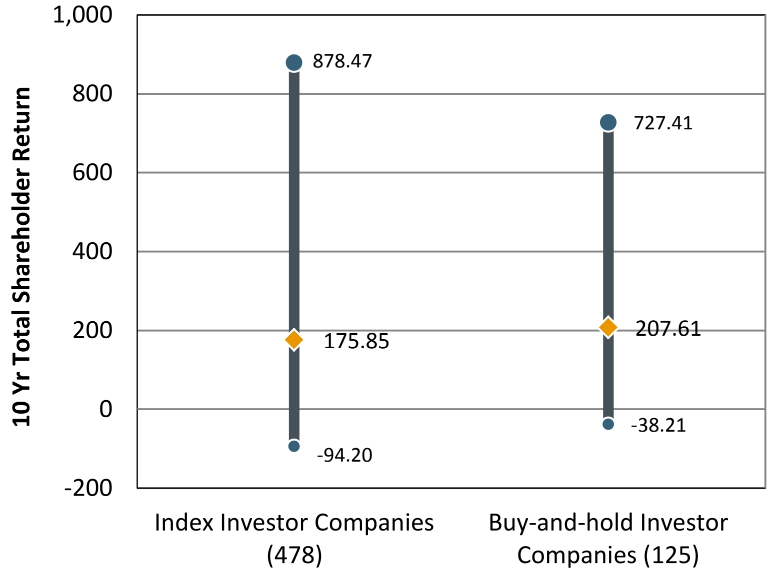


Source: MSCI ESG Research, based on Thomson Reuters data

Logically, the companies that distributed the most cash to investors by buying back shares should be the companies that created the most value, but this was often not the case. The index investor companies included nearly all of the companies where the relationship between cumulative buyback activity and value creation was most extreme, as indicated in Exhibit 18.

The differences in long-term total shareholder return (TSR) ranges for these two groups were not as dramatic, but the buy-and-hold companies outperformed the index investor companies by 18%, on average, for the 10-year period studied, from 2007 to 2016 (Exhibit 19).

Exhibit 19: 10-yr Total Shareholder Returns at Index and Buy-and-hold Investor Companies



Range of total shareholder returns for the period 2007-2016. Source: MSCI ESG Research

CONCLUSION

In the first part of our study, we confirmed that share buybacks have become the favored means for distributing cash to investors among large U.S. companies, exceeding cash dividends overall every year since 1997.

We found a strong sector bias in the level of both buybacks and total payouts during the 15-year period we studied, which was also linked to company age and ownership. Relatively few of these companies bought back shares when prices were low during this period, even as buybacks have replaced dividends as the dominant way of returning cash to investors at many companies.

But when we looked at individual companies, we found no compelling evidence of a negative impact from share buybacks on long-term value for investors. The companies that most actively distributed cash to their investors were also strongest in each of the key areas we examined, including MSCI ESG Ratings, CAPEX and R&D spending, and value creation as measured by the economic spread between ROIC and cost of capital.

In the second part of our study, we explored differences in the impact of share buybacks between companies that were primarily held by index investors and those primarily held by buy-and-hold investors. We found that companies mainly held by index investors showed a much wider range of buyback impacts, including more buyback outliers: Economic spreads for these companies ranged both higher and lower, and so did 10-year TSRs. While these largely index investor-held companies exhibited slightly higher economic spreads, on average, total returns for the buy-and-hold investor companies were 18% higher than for the index investor companies from 2007 to 2016.

APPENDIX 1: GLOBAL SHARE BUYBACK ACTIVITY

The following exhibits explore buyback trends across global markets.

Exhibit A1: Share Buyback Activity by Region – 1988-2017

GICS SECTOR	Asia Pacific	Emerging Markets*	Japan	North America	Western Europe
Consumer Discretionary	18.91%	21.61%	63.35%	64.42%	24.00%
Consumer Staples	18.20%	17.82%	68.33%	68.27%	24.39%
Energy	18.21%	11.76%	77.89%	38.35%	21.66%
Financials	24.64%	17.17%	82.93%	65.88%	25.37%
Health Care	19.38%	29.46%	61.36%	45.95%	21.39%
Industrials	16.09%	20.93%	63.57%	62.88%	25.50%
Info Technology	23.82%	26.89%	58.67%	59.40%	21.05%
Materials	16.81%	21.14%	67.82%	45.34%	26.32%
Real Estate	16.17%	0.00%	35.19%	42.52%	21.82%
Telecom Services	23.30%	17.71%	53.33%	52.39%	30.56%
Utilities	21.32%	11.11%	63.64%	31.15%	15.93%
ALL SECTORS	18.66%	20.73%	64.02%	55.58%	23.88%

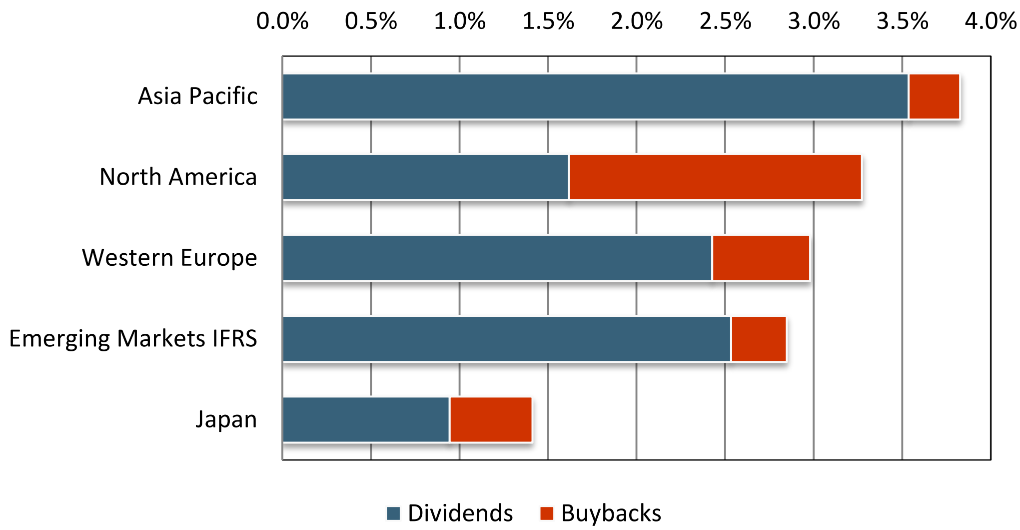
*Based on data for all companies in each region for which data was available, for the period Jan.1,1988 – July 1, 2017. *All figures shown for emerging market companies are based on IFRS reporting standards rather than local GAAP. Source: MSCI ESG Research, based on Thomson Reuters data.*

Exhibit A1 shows the percentage of companies in each region that reported share buybacks, per available reporting periods. Japan was the most active region overall, followed closely by North America.

Once we adjusted for size, based on each company's total reported assets at the end of 2016 (the last full period for which data was available), Japan fell to the bottom, as shown in Exhibit A2. The Asia-Pacific region also reversed positions, but this reversal was based primarily on cash dividends, which have been added to this exhibit in order to chart total payouts. Once adjusted for company size, North America emerged as the leading proponent of share buybacks, led mainly by U.S. companies.

We also found that larger companies more frequently bought back shares than smaller companies, across all markets, with the differential again being strongest in the U.S. These differences supported our decision to focus exclusively on large-cap U.S. companies for the remainder of our analysis.

Exhibit A2: Total Payouts as a Percentage of 2016 Total Assets over All Periods

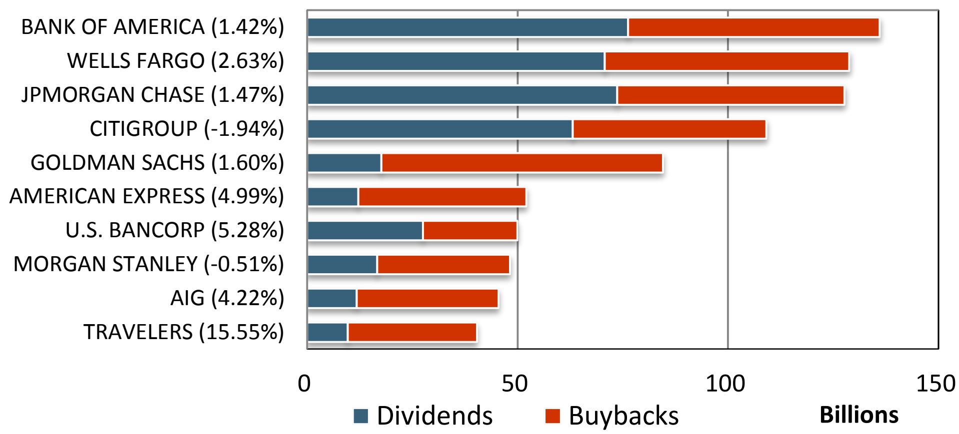


Based on data for all companies in each region for which data was available, from Jan. 1, 1988 – July 1, 2017. These percentages were calculated as the total of each company's cumulative cash dividends and share buybacks relative to its 2016 total reported assets. All figures shown for emerging market companies are based on IFRS reporting standards rather than local GAAP. Source: MSCI ESG Research, based on Thomson Reuters data

APPENDIX 2: FINANCIAL SECTOR ANALYSIS

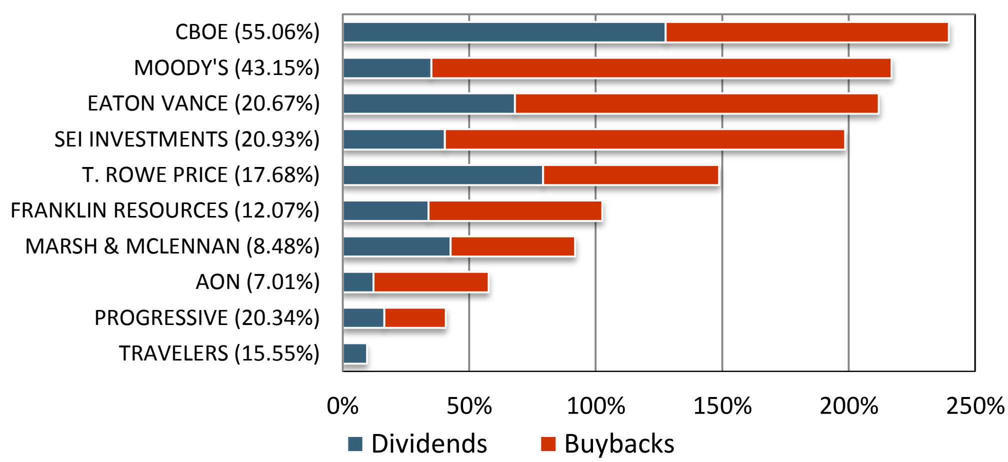
These exhibits repeat the analysis shown in Exhibits 8-10 for the GICS financial sector.

Exhibit A3: Top 10 Financial Companies by Total Dollar Value Payouts



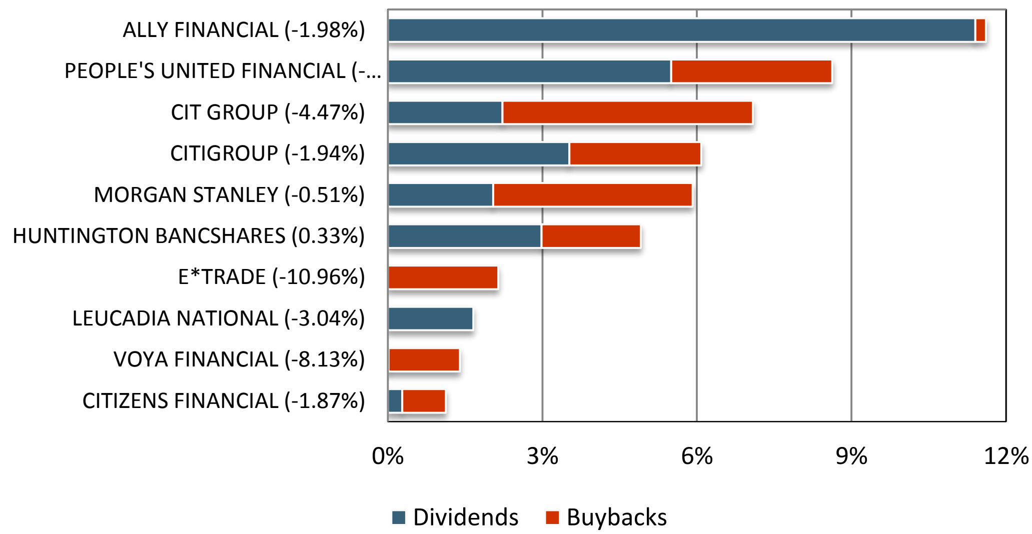
The top 10 financial companies by total 10-year dollar value payouts (total combined cash dividends plus share buybacks), from 2002-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year spread between ROIC and COC for each company is shown in parentheses.

Exhibit A4: Top 10 Financial Companies by Total Payouts as a Percentage of 2016 Assets



The top 10 financial companies by total 10-year payouts (total combined cash dividends plus share buybacks) as a percentage of total 2016 assets, from 2002-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year economic spread between ROIC and COC for each company is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data.

Exhibit A5: Lowest 10 Financial Companies based on 10-year Economic Spread



The lowest 10 companies based on 10-year spread between ROIC and COC, from 2002-2016, based on the 610 constituents of the MSCI USA Index as of Dec. 31, 2016. The 10-year economic spread between ROIC and COC for each company is shown in parentheses. Source: MSCI ESG Research, based on Thomson Reuters data

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