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Examining Share Repurchasing and the S&P Buyback Indices in the U.S. Market

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Since 1997, share repurchases have surpassed cash dividends and become the dominant form of corporate payout in the U.S. This paper gives an overview of share repurchases in the U.S., including trends in corporate payouts, major types and motives of share repurchases, as well as the price impact. In the following sections, the performance and attributes of the S&P 500® Buyback Index are discussed, and the study is extended to the S&P MidCap 400® and the S&P SmallCap 600®.

EXECUTIVE SUMMARY

- Over a long-term investment horizon, buyback portfolios have generated positive excess returns over their benchmark indices in the large-, mid-, and small-cap spaces of the U.S. market.
- All of the buyback portfolios tested generated higher average monthly excess returns over their benchmark indices in down markets than in up markets, no matter which weighting schemes were employed in the portfolio construction.
- Compared with dividend investing, buyback portfolios tend to have lower dividend yields, and most of their outperformance comes from capital gains rather than dividend income. Historically, in the U.S., buyback portfolios tend to have more balanced win ratios or excess returns in both up and down markets, which could be a good complement to defensive approaches such as dividend and low-volatility strategies.
- The equal-weighting method employed in the construction of buyback indices can enhance win ratios and excess returns in up markets, potentially making the outperformance of buyback indices more balanced in both up and down markets. The impact of equal weighting is more significant in the large-cap space than in mid- and small-cap spaces.
- Both equally-weighted and market-cap-weighted buyback portfolios were value tilted over the 15-year period that ended Dec. 31, 2015. The overlay of equal weighting may enhance the value tilt and give the portfolios an extra small-cap bias, especially in the large-cap space.

OVERVIEW OF SHARE REPURCHASES

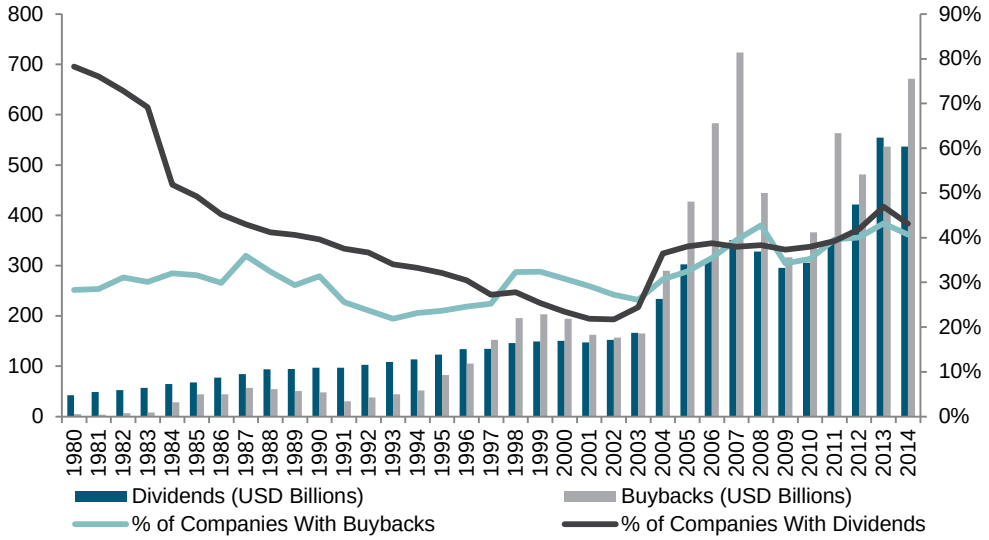
Corporate payout policy has been one of the most studied areas in finance. If a company has limited investment opportunities, it may distribute its excess cash flow, if any, back to shareholders to mitigate the conflicts of interest between management and shareholders.

There has been a structural change in corporate payout policy, in that share repurchases have surpassed cash dividends and become the dominant form of corporate payout in the U.S.

There are different ways to redistribute cash back to shareholders, including cash dividend payouts, share repurchases, or a combination of both. Historically, dividends have been the dominant form of corporate payout. However, there has been a structural change in corporate payout policy, in that share repurchases have surpassed cash dividends and become the dominant form of corporate payout in the U.S.

Since 1997, the total amount of buybacks has exceeded the amount of cash dividends paid by U.S. firms (see Exhibit 1). The proportion of dividend-paying companies decreased to 43% in 2014 from 78% in 1980, while the proportion of companies with share buybacks increased to 41% from 28% during the same time period. The increased use of share repurchases is mainly driven by a few key advantages of this method, including tax benefits and financial flexibility.

Exhibit 1: Aggregate Dividends and Buybacks Paid by U.S. Firms, and the Percentage of Firms With Positive Dividends and Buybacks in the U.S.



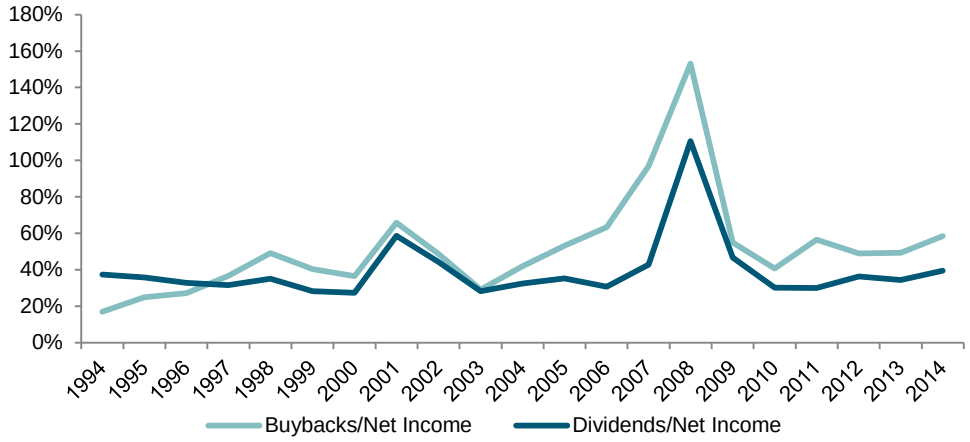
Source: S&P Dow Jones Indices LLC, Compustat. Only listed companies with fundamental data available in Compustat are calculated. Data as of fiscal year end from 1980 to 2014. Dividend and buyback data may include the amount paid for preferred shares. Chart is provided for illustrative purposes.

Exhibit 2 shows annual aggregated dividends and buybacks as a percentage of net income for constituents of the S&P Composite 1500®, which is designed to measure large-, mid-, and small-cap U.S. companies. Between 1994 and 2014, the median percentage of net income for dividends was around 35%, with periods of increases and decreases. On

the other hand, the percentage of net income for buybacks experienced more substantial growth, increasing to 59% in 2014 from 17% in 1994.

The percentage of net income distributed through buybacks has exceeded that of dividend payments since 1997. This finding is consistent with our observation that share repurchases have replaced dividends as the dominant form of corporate payout in the U.S. since that year.

Exhibit 2: Aggregate Dividends and Buybacks as a Percentage of Net Income for S&P Composite 1500 Constituents

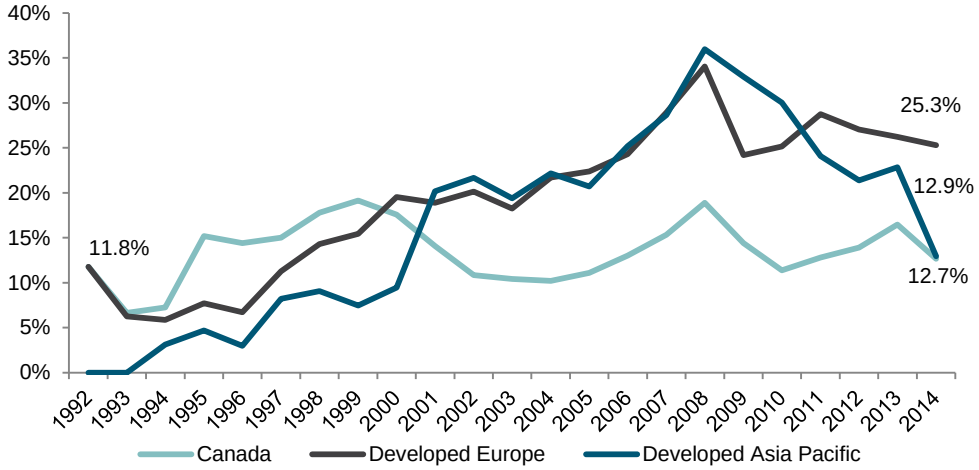


Source: S&P Dow Jones Indices LLC, Compustat, Worldscope. Data as of fiscal year end from 1994 to 2014. Dividend and buyback data may include the amount paid for preferred shares. Only companies with fundamental data available are calculated. Chart is provided for illustrative purposes.

The increased use of share repurchases as an alternative corporate payout method can also be observed in other developed regions.

The increased use of share repurchases as an alternative corporate payout method can also be observed in other developed regions. The percentage of firms with positive buybacks has increased in Canada, developed Europe, and developed Asia Pacific since 1994 (see Exhibit 3).

Exhibit 3: Percentage of Firms With Positive Buybacks



Source: S&P Dow Jones Indices LLC, S&P Capital IQ. Only listed companies with fundamental data available are calculated. Data based on calendar year data from 1992 to 2014. Chart is provided for illustrative purposes.

SHARE REPURCHASES: TYPES AND PURPOSES

There are five types of share repurchases: fixed-price tender offer, Dutch auction tender offer, open-market share repurchases, transferable put right distribution, and targeted stock repurchases.[1] In the U.S., open-market share repurchases have become the dominant form among all repurchasing mechanisms since the early 1980s, partially due to the enactment of Rule 10b-18 in 1982, which provided firms with a safe harbor for open-market share repurchases.[2] Open-market share repurchases have gained popularity in the U.S. and many other countries around the world. Most recently, they were introduced in Austria, France, Germany, Japan, South Korea, the Netherlands, and Norway due to favorable tax provisions or legal reforms (Hseih and Wang 2009; Kim, Schremper, and Varaiya 2013).

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Numerous reports about share repurchases have been focused on firms' decisions regarding corporate payout policy. According to Hsieh and Wang (2009), the most cited motives behind firms' share repurchases include the following.

- **Regulation and Taxes:** The 1982 enactment of Rule 10b-18 provided a safe harbor for open-market share repurchases, which triggered the increase in their use in the U.S. The differing tax rate on capital gains versus that on dividends in history generally favored repurchases. However, even without the favorable tax rate (such as that in the late 1980s and after 2003), repurchases offer additional flexibility because investors can defer taxes and create homemade dividends when needed.
- **Financial Flexibility for Management:** Because it is not mandatory for companies to fulfill announced open-market share repurchases, and investors usually have more adverse reactions to dividend cuts than to postponing or even abandoning the share repurchase program, share repurchases can give management greater financial flexibility.
- **Agency Costs of Free Cash Flows:** Firms tend to repurchase shares in response to accumulated free cash flows and declining growth opportunities.

[1] Fixed-price tender offers, Dutch auction tender offers, and targeted stock repurchases can retire a large portion of shares within a short period, and therefore they are efficient tools for companies to quickly adjust capital structure or fend off an unwanted takeover bid. However, compared to fixed-price tender offers, Dutch auction tender offers and targeted stock repurchases contain less information regarding the valuation of the firm. In an open-market share repurchase, the firm is not obligated to buy back any shares in the market; therefore, it provides more flexibility for management but contains the least amount of information regarding the firm's value. Open-market share repurchases are frequently used by companies to offset the EPS dilution effect of stock option exercises.

[2] Before the enactment of Rule 10b-18 in 1982, firms in the U.S. that engaged in open-market share repurchases could have a potential risk of liability under the anti-manipulation provisions of Sections 9(a)(2) and 10(b) and Rule 10b-5 of the Securities Exchange Act of 1934, which deterred firms from active engagement in open market-share repurchases, despite the tax advantage when compared to dividends.

The most-cited motives behind share repurchases are tax advantages, financial flexibility, signaling for undervaluation, takeover deterrent, earnings management, etc.

- **Signaling and Undervaluation:** The corporate payout method has been long considered as a costly but credible signal for the future prospects of a firm and for undervaluation, since this method is associated with nontrivial costs such as substantial tax liability, costs of external fund seeking, and foregone investment opportunities. Share repurchases can be used to signal the firm's value, and they are believed to deliver greater information content than dividends.
- **Capital Structure:** Share repurchases can be utilized to adjust a firm's capital structure quickly.
- **Takeover Deterrent:** Repurchases are often used to fend off an unwanted bid by enabling control of voting rights, signaling firm value, bolstering stock prices, and changing ownership structure to increase the difficulties and costs of purchasing remaining outstanding shares.
- **Stock Option Grants and Earnings Management:** Managers who are heavily compensated with stock options may have a strong incentive to utilize share repurchases to offset the dilution effect of employee stock option grants, or even purposely to manage earnings for their own benefit.

BUYBACK ACTIVITIES AND MARKET CONDITIONS

Exhibit 4 shows how firms in the S&P Composite 1500 have distributed capital over the past 21 years through capital expenditures, acquisitions, share buybacks, and dividends. From 1994 through 2014, changes in share repurchases and acquisitions were more significant than the other two methods, and this was especially true in 2008 and 2011. In fact, the data shows that share repurchases have followed the economic cycle with increased or decreased activities when the market was up or down. This is not surprising, as free cash flows are often thinner in tough times, and capital expenditures and dividends are usually higher priorities in company spending.

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Exhibit 4: How S&P Composite 1500 Firms' Capital Was Distributed (USD Billions)

Year	Market Cap	Dividends	Buybacks	Acquisitions	Capital Expenditures
1994	12,395	110	56	65	351
1995	11,481	119	87	112	419
1996	13,911	128	117	115	385
1997	19,395	136	170	133	428
1998	20,066	146	195	199	451
1999	13,695	157	215	234	478
2000	12,837	156	196	268	522
2001	11,632	155	172	217	535
2002	9,013	155	168	143	431
2003	11,548	171	177	169	409
2004	12,754	199	257	143	430
2005	13,247	259	388	220	480
2006	14,810	258	532	294	576
2007	14,910	299	673	351	612
2008	9,153	286	395	249	662
2009	11,601	255	300	139	513
2010	13,362	249	337	227	550
2011	13,225	279	525	302	663
2012	14,946	330	446	334	724
2013	19,380	365	522	224	739
2014	21,294	414	613	272	802

Source: S&P Dow Jones Indices LLC, Compustat, Worldscope. Data as of fiscal year end from 1994 to 2014. Dividend and buyback data may include the amount paid for preferred shares. Only companies with fundamental data available are calculated. Table is provided for illustrative purposes.

PRICE IMPACT OF SHARE REPURCHASES

There are three important findings related to the movement of share prices around the time when share repurchase programs are announced (Hseih and Wang 2009).

First, previous publications (Vermaelen [1981] and Ikenberry, Lakonishok, and Vermaelen [1995]) documented that firms usually experience negative price returns before the repurchase announcement.

Second, event studies found that firms engaging in share repurchases generally earn significantly positive announcement returns. For example, Stephens and Weisbach (1998) and Nohel and Tarhan (1998) examined a sample of 591 open-market repurchases from 1981 to 1990 and 242 tender offers between 1978 and 1991, and they reported positive abnormal returns of approximately 2.7% and 7.6%, respectively, over a three-day event window.

Third, buy-and-hold abnormal returns persisted in the years after the announcement. In a study on fixed-price tender offers, Lakonishok and

Vermaelen (1990) found that, on average, prices remained at bargain levels for at least two years following the announcement. Ikenberry, Lakonishok, and Vermaelen (1995) proposed a hypothesis to explain the post-announcement performance drift. In this hypothesis, which they referred to as the "Underreaction Hypothesis," the market treated repurchase announcements with skepticism, which led to the slow price adjustment over time. The delayed market reactions were also observed in other corporate actions such as IPOs, mergers, and spinoffs. By examining a sample of 1,239 open-market repurchases from 1980 to 1990, they reported an average initial market reaction of 3.5%, which is consistent with previous studies that reported an average initial market reaction close to 3.0%. They argued that it does not seem plausible that managers would be able to detect such a small undervaluation and choose to react. If managers are buying back shares because of undervaluation, it is likely that they perceive it to be at a substantial level. Thus, the information conveyed by open-market repurchases is largely ignored by the market, which causes a delayed market reaction. Consistent with the hypothesis, they found an average of 12.1% buy-and-hold abnormal returns for repurchasing firms over the four years following the announcement, and companies with high book-to-market ratios experienced more significant post-pronounced performance drift.

Apart from significantly positive announcement returns, buy-and-hold abnormal returns were found to be persistent in the years after the announcement of share repurchases.

Peyer and Vermaelen extended the study by using more recent and a greater amount of data (3,481 open-market repurchases from 1991 to 2001 and 261 fixed-price tender offers between 1987 and 2001). They found that post-repurchase announcement drift still persists over time for both open-market repurchases and tender offers. In their study, they explored three hypotheses to explain the excess returns following open-market repurchase programs: (1) the Risk Change Hypothesis, proposed by Grullon and Michaely (2004), which argues that repurchases signal a decline in growth prospects that lowers the risk of stocks; (2) the Liquidity Hypothesis, which suggests that the abnormal returns may be the result of priced liquidity, as repurchases reduce liquidity; and (3) the Overreaction Hypothesis, which assumes long-run excess returns are just a correction of an overreaction to bad news prior to the repurchase. In their study, they found strong support for the Overreaction Hypothesis. They discovered that stocks experienced the most significant positive long-term excess returns if the repurchase was triggered by a severe stock price decline during the previous six months and that past performance seems to be a better predictor of undervaluation than other undervaluation measures, such as book-to-market, size, and the stated motivation for the buyback in the press release (Peyer and Vermaelen 2008).

Given the persistence of post-announcement performance drift over time, we will analyze the performance of the S&P 500 Buyback Index, which seeks to track stocks with relatively heavy repurchase activities. In this paper, we will only test the plain vanilla buyback indices screened by the

buyback ratio over the past 12 months. The overlay of undervaluation factors such as book-to-market or price momentum is out of the scope of this paper.

Over the past 20-year period ending Dec. 31, 2015, the S&P 500 Buyback Index outperformed the S&P 500 in 16 out of 20 years, with an annualized excess return of 5.0% and slightly higher volatility.

In the following sections, we will introduce the S&P 500 Buyback Index along with its performance and attributes. Then we will expand the study to the mid-cap and small-cap spaces in the U.S.

THE S&P 500 BUYBACK INDEX

The S&P 500 Buyback Index seeks to track the 100 companies in the S&P 500 with the highest buyback ratio in the trailing 12-month period. The buyback ratio is defined as the monetary amount of cash paid for common share buybacks in the previous four calendar quarters (with interim reports available) divided by the total market capitalization of common shares at the beginning of the 12-month trailing period.

The S&P 500 Buyback Index constituents are weighted equally and reviewed quarterly after market close on the third Friday of January, April, July, and October, with rebalancing reference dates as of the preceding month end.

Risk/Return Characteristics

Over the 20-year period ending Dec. 31, 2015, the S&P 500 Buyback Index outperformed the S&P 500 in 16 out of 20 years, with most significant excess returns recorded from 2000 to 2002, in 2009, and in 2013 (see Exhibit 5). The S&P 500 Buyback Index only underperformed during the late stage of the technology bubble (1998-1999), the early stage of the financial crisis in 2007, and in 2015. For the overall period, the S&P 500 Buyback Index outperformed the S&P 500 by 5.0% per year, with slightly higher volatility (see Exhibit 6).

Because the S&P 500 Buyback Index employs an equal-weighting method, we added the S&P 500 Equal Weight Index in the performance comparison to isolate the alpha generated by buyback ratio stock screening. As shown in the figures, the use of the equal-weighting method is not a dominant factor in the outperformance, as the S&P 500 Buyback Index delivered a significant excess return over the S&P 500 Equal Weight Index.

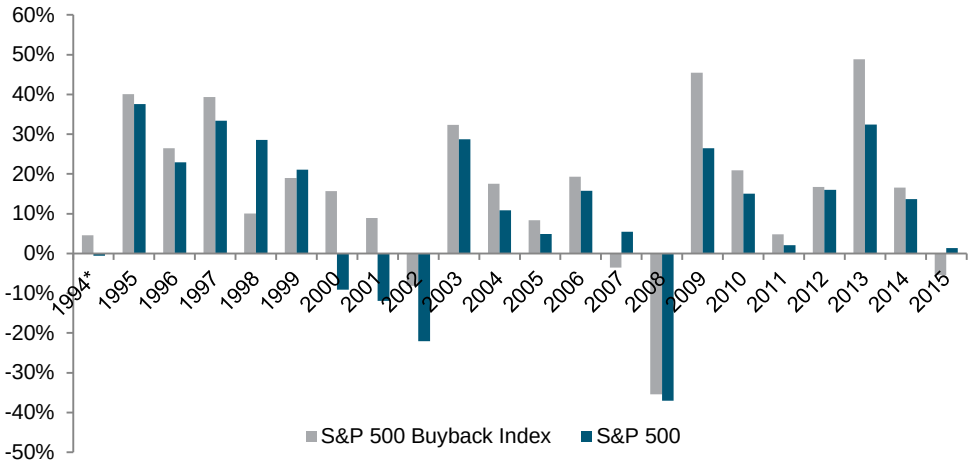
To better understand how the S&P 500 Buyback Index performed differently than companies using alternative ways to distribute excess cash to shareholders (such as cash dividends or a combination of share buybacks and cash dividends), we constructed two hypothetical portfolios: the S&P 500 Dividend Yield Portfolio and the S&P 500 Shareholder Yield Portfolio. The hypothetical portfolios consist of 100 stocks with the highest

12-month trailing dividend yield and shareholder yield,[3] respectively, using the same weighting method and rebalancing schedules as the S&P 500 Buyback Index.

Compared with the S&P 500 Dividend Yield Portfolio, the S&P 500 Buyback Index had higher returns and higher volatility over the periods examined. Surprisingly, however, the S&P 500 Dividend Yield Portfolio recorded a greater maximum drawdown than the S&P 500 Buyback Index. The S&P 500 Shareholder Yield Portfolio, which captures characteristics of both buyback and dividend-paying companies, had a balanced volatility level between the S&P 500 Buyback Index and the S&P 500 Dividend Yield Portfolio.

Compared with the S&P 500 Dividend Yield Portfolio, the S&P 500 Buyback Index had higher returns and higher volatility over the periods examined.

Exhibit 5: Annual Return of the S&P 500 Buyback Index



Source: S&P Dow Jones Indices LLC. Data from Jan. 21, 1994, through Dec. 31, 2015. 1994* refers to the period from Jan. 21, 1994, to Dec. 31, 1994. Index performance is based on total returns in USD. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

[3] Shareholder yield is defined as the monetary amount of cash paid for common dividends and common share buybacks in the trailing four calendar quarters, with interim reports available, divided by the total market capitalization of common shares at the beginning of the 12-month trailing period.

Exhibit 6: Risk/Return Profiles

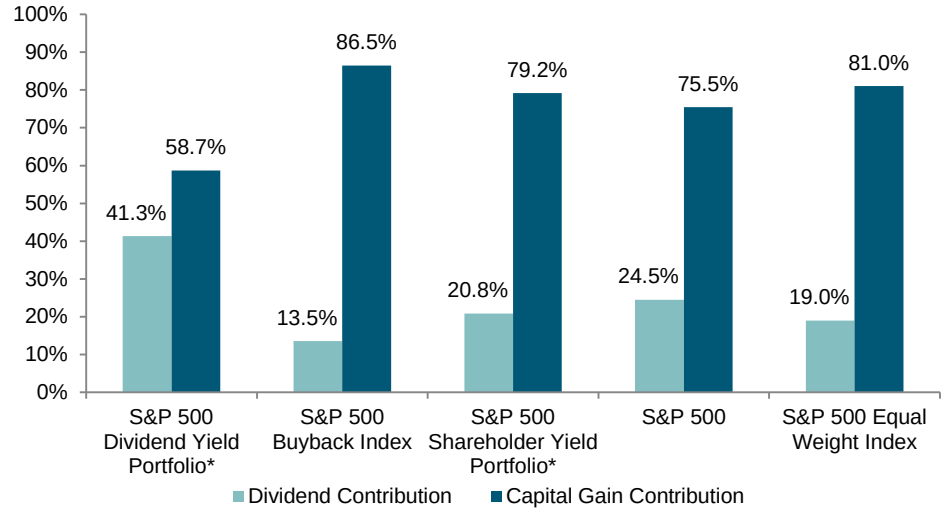
Time Period	S&P 500 Dividend Yield Portfolio*	S&P 500 Buyback Index	S&P 500 Shareholder Yield Portfolio*	S&P 500	S&P 500 Equal Weight Index
Return (Per Year) (%)					
5-Year	13.2	15.0	15.2	12.6	12.4
10-Year	8.1	10.1	10.2	7.3	8.5
15-Year	8.8	10.4	10.7	5.0	8.3
20-Year	10.4	13.1	13.0	8.2	10.2
Standard Deviation (%)					
5-Year	9.5	13.1	12.9	11.7	12.9
10-Year	15.8	17.5	17.1	15.1	17.7
15-Year	14.8	16.1	15.4	15.0	17.5
20-Year	14.9	16.3	15.7	15.3	17.0
Risk-Adjusted Return					
5-Year	1.40	1.14	1.18	1.07	0.96
10-Year	0.51	0.58	0.60	0.49	0.48
14-Year	0.60	0.65	0.69	0.33	0.47
20-Year	0.70	0.81	0.83	0.53	0.60
Maximum Drawdown (%)					
20-Year	-51.0	-46.3	-46.8	-46.4	-50.1

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2015. Index performance is based on total returns in USD. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P 500 Dividend Yield Portfolio and the S&P 500 Shareholder Yield Portfolio are hypothetical portfolios.

The contribution of dividend income to total return is much lower in the S&P 500 Buyback Index than in the S&P 500 Dividend Yield and the S&P 500 Shareholder Yield Portfolios.

Although buybacks and dividends are the two legs of corporate payouts, buyback portfolios have different performance features compared with dividend-yield portfolios. As shown in Exhibits 7 and 8, the S&P 500 Dividend Yield Portfolio had the highest dividend yield, while the S&P 500 Buyback Index had the lowest dividend yield among the three child portfolios based on the S&P 500. As a result, the contribution of dividend income to total return is much lower in the S&P 500 Buyback Index than in the S&P 500 Dividend Yield and the S&P 500 Shareholder Yield portfolios. Over the past 20 years, capital gains and dividend income (dividends and reinvestment) contributed 86.5% and 13.5% to the total return of the S&P 500 Buyback Index, respectively, whereas the hypothetical S&P 500 Dividend Yield Portfolio had a much higher percentage (41.3%) of its total return from dividends.

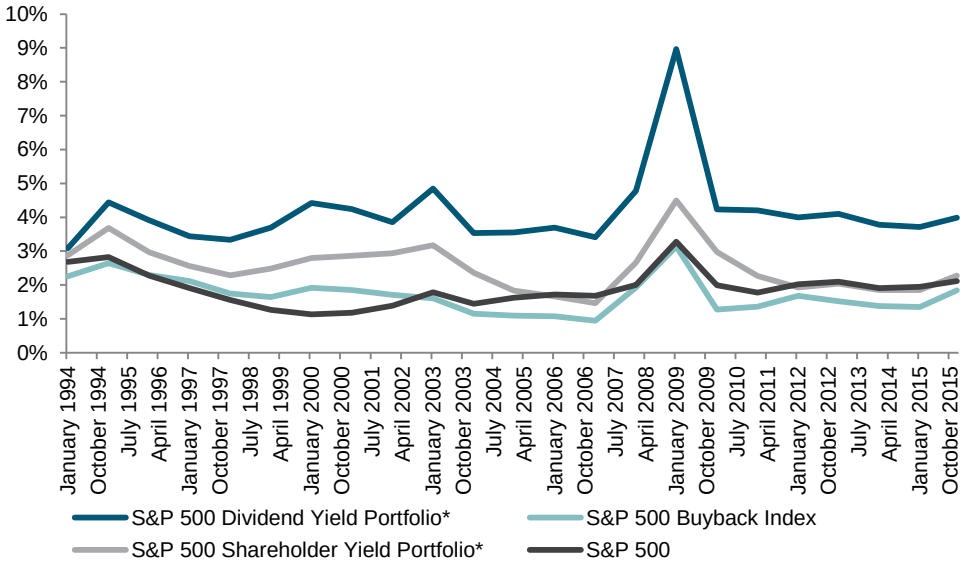
Exhibit 7: Source of Total Returns



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1995, through Dec. 31, 2015. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P 500 Dividend Yield Portfolio and the S&P 500 Shareholder Yield Portfolio are hypothetical portfolios.

The hypothetical S&P 500 Dividend Yield Portfolio tends to outperform in down markets, while the S&P 500 Buyback Index may capture more upside momentum during bull markets.

Exhibit 8: Annual Dividend Yields



Source: S&P Dow Jones Indices LLC, Factset. Data from January rebalancing each year from 1994 through 2015 and December 2015. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P 500 Dividend Yield Portfolio and the S&P 500 Shareholder Yield Portfolio are hypothetical portfolios.

As buybacks tend to follow the economic cycle with increased or decreased repurchase activities in up or down markets, while dividend payouts are normally more stable over time, the hypothetical S&P 500 Dividend Yield Portfolio tends to outperform in down markets, while the S&P 500 Buyback Index may capture more upside momentum during bull markets.

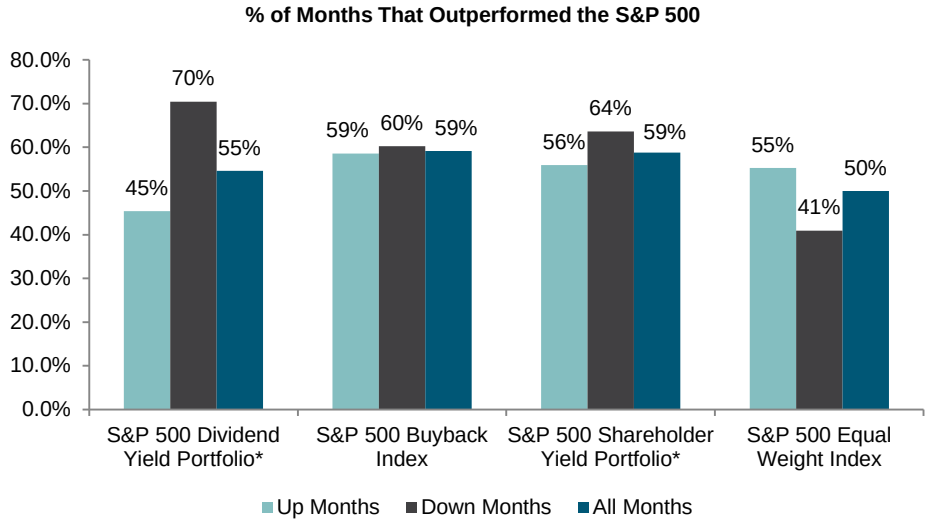
Over the 20-year period ending Dec. 31, 2015, the S&P 500 Buyback Index outperformed the S&P 500 in both up and down months (see Exhibit 9).

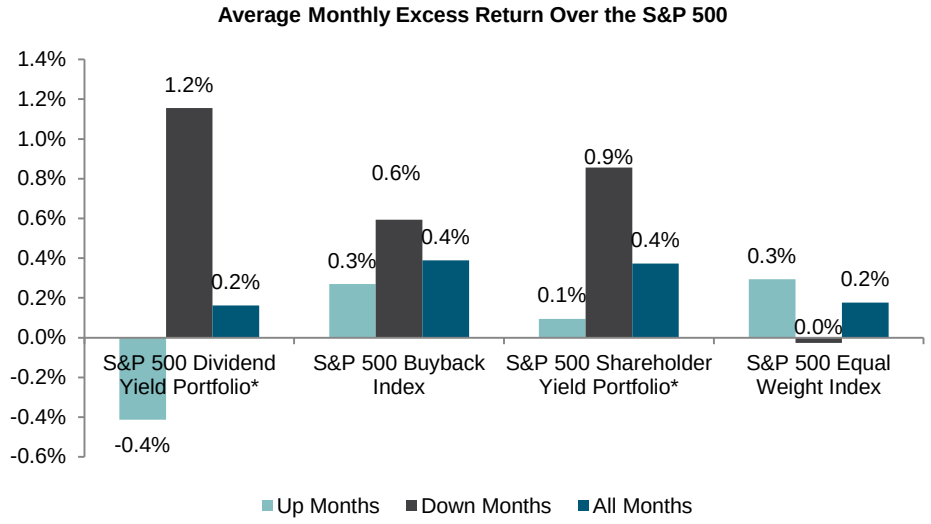
The average monthly excess return over the S&P 500 was higher in down months than in up months.

Compared to the S&P 500 Dividend Yield Portfolio, the outperformance of the S&P 500 Buyback Index was more consistent in both up and down markets, as indicated by its high win ratio and significant excess return in both up and down markets. Furthermore, the S&P 500 Buyback Index generated 0.7% greater average monthly excess returns in up months than the S&P 500 Dividend Yield Portfolio, surpassing the shortfall of 0.6% in down months and explaining why the S&P 500 Buyback Index outperformed the S&P 500 Dividend Yield Portfolio over this period.

Compared to the S&P 500 Dividend Yield Portfolio, the outperformance of the S&P 500 Buyback Index was more consistent in both up and down markets, as indicated by its high win ratio and significant excess return in both up and down markets.

Exhibit 9: Upside and Downside Capture





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Sector Composition

Historically, defensive sectors, such as utilities, telecommunication services, and consumer staples paid more dividends than other sectors among large-cap U.S. companies, as indicated by their higher dividend yields (see Exhibit 10). This is consistent with Hausch and Seward's (1993) belief that firms that generate deterministic cash disbursements are more likely to choose dividends. In contrast, the consumer discretionary, information technology, and financials sectors, which are more cyclical in nature, have had higher buyback ratios, historically.

Therefore, the S&P 500 Buyback Index (which is in the U.S. large-cap space) tends to include more stocks from cyclical than defensive sectors. Among the 100 companies in the S&P 500 Buyback Index as of January 2016, only four of them were from the consumer staples, telecommunication services, and utilities sectors. This cyclical bias of the S&P 500 Buyback Index may contribute to its higher win ratio in up markets when compared with the S&P 500 Dividend Yield portfolio.

The S&P 500 Buyback Index tends to include more stocks from cyclical than defensive sectors.

Exhibit 10: Dividends and Buybacks Ratios by Sector

S&P 500 Sector	Companies With Dividends (%)			Companies With Buybacks (%)			Dividend Yield			Buyback Ratio		
	1999	2014	Median	1999	2014	Median	1999	2014	Median	1999	2014	Median
Energy	92.0	90.7	84.4	64.0	69.8	61.2	2.4	2.6	2.0	0.4	2.8	2.3
Materials	85.7	96.6	91.9	71.4	72.4	70.5	1.9	2.2	2.0	1.3	4.8	1.3
Industrials	87.5	93.8	92.2	81.9	96.9	79.9	1.1	1.9	1.8	2.1	3.5	2.1
Consumer Discretionary	75.6	75.3	75.7	80.0	87.1	81.1	0.7	1.4	1.1	1.0	3.4	2.9
Consumer Staples	95.1	95.0	92.8	85.4	95.0	85.4	2.6	2.4	2.4	1.6	2.3	2.3
Health Care	70.3	61.8	55.1	81.1	85.5	77.6	1.1	1.4	1.5	1.7	2.3	2.2
Financials	95.8	94.1	94.4	93.0	77.6	83.7	1.7	1.7	1.8	2.6	2.2	2.5
Information Technology	32.3	69.2	33.8	59.7	89.2	71.1	0.1	1.4	0.6	0.8	4.1	3.0
Telecom-munication Services	69.2	83.3	67.9	61.5	33.3	52.8	1.8	4.5	4.3	1.0	1.1	0.9
Utilities	92.5	100.0	93.2	60.0	36.7	36.5	4.5	3.2	3.8	2.7	0.1	0.6

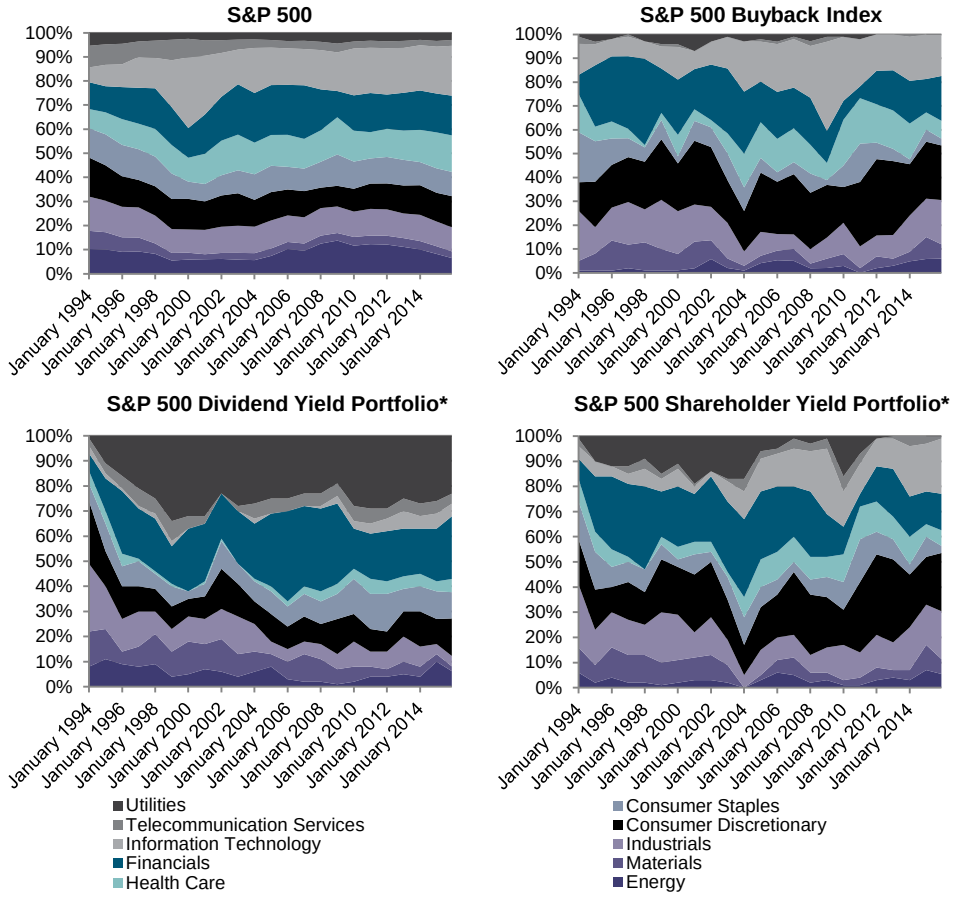
Source: S&P Dow Jones Indices LLC, S&P Capital IQ. Data presented as of the end of each year, from 1999 to 2014. Trailing 12-month data are used with a three-month lag. Table is provided for illustrative purposes.

Historically, the S&P 500 Buyback Index was underweighted in the energy and telecommunication services sectors and overweighted in the consumer discretionary sector. The allocation to information technology, however, changed more dynamically in the 20-year period. Information technology was overweight in the S&P 500 Buyback Index between 2004 and 2010 and was underweight in the index for the rest of the years in the same period. This might be the result of the rapid increase in buyback amounts and buyback ratios of information technology sector companies since 2003, which ceased in 2008 (see Exhibits 11 and 12).

In contrast to the S&P 500 Buyback Index, the S&P 500 Dividend Yield Portfolio overweighted the utilities and financials sectors and underweighted the information technology and health care sectors for most of the period observed. The sector composition of the S&P 500 Shareholder Yield Portfolio is a mix of the two, but it is more tilted toward the S&P 500 Buyback Index. As the buyback amounts for the S&P 500 Buyback Index constituents are generally much larger than the dividend amounts for the S&P 500 Dividend Yield Portfolio members, the buyback stocks are dominant when both dividends and buybacks are combined in the calculation of shareholder yield. This pattern can also be observed in the mid- and small-cap segments of the U.S. market.

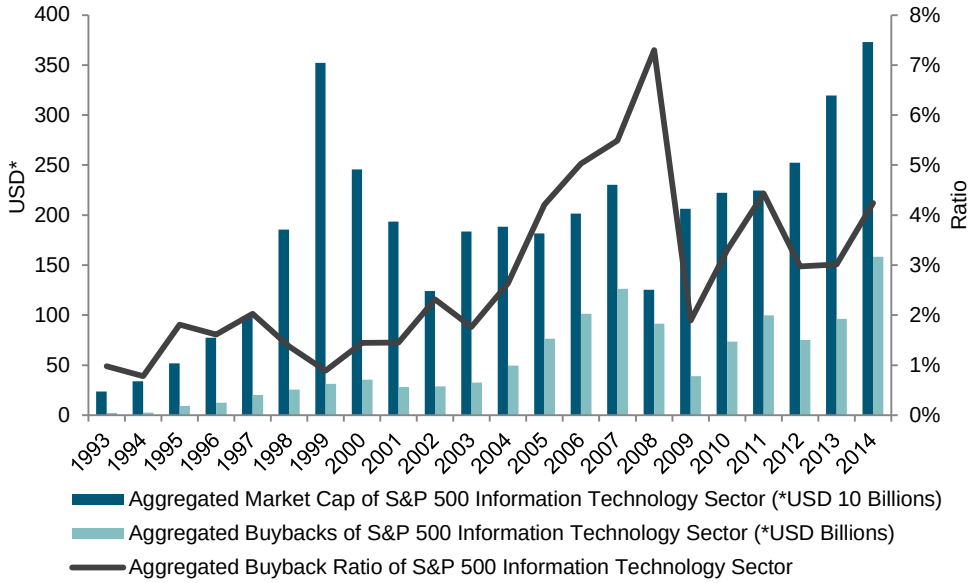
Historically, the S&P 500 Buyback Index consistently underweighted the energy and telecommunication services sectors and overweighted the consumer discretionary sector.

Exhibit 11: Historical Sector Breakdown



Source: S&P Dow Jones Indices LLC. Data from Jan. 21, 1994, through Jan. 17, 2014, and Dec. 31, 2015. Charts are provided for illustrative purposes. *The S&P 500 Dividend Yield Portfolio and the S&P 500 Shareholder Yield Portfolio are hypothetical portfolios.

Exhibit 12: Dynamic Allocation of S&P 500 Buyback Index in the Information Technology Sector



Source: S&P Dow Jones Indices LLC, S&P Capital IQ. Buyback data are as of fiscal year end from 1993 to 2014. Market cap data are as of year end. Chart is provided for illustrative purposes.

Style and Factor Exposure

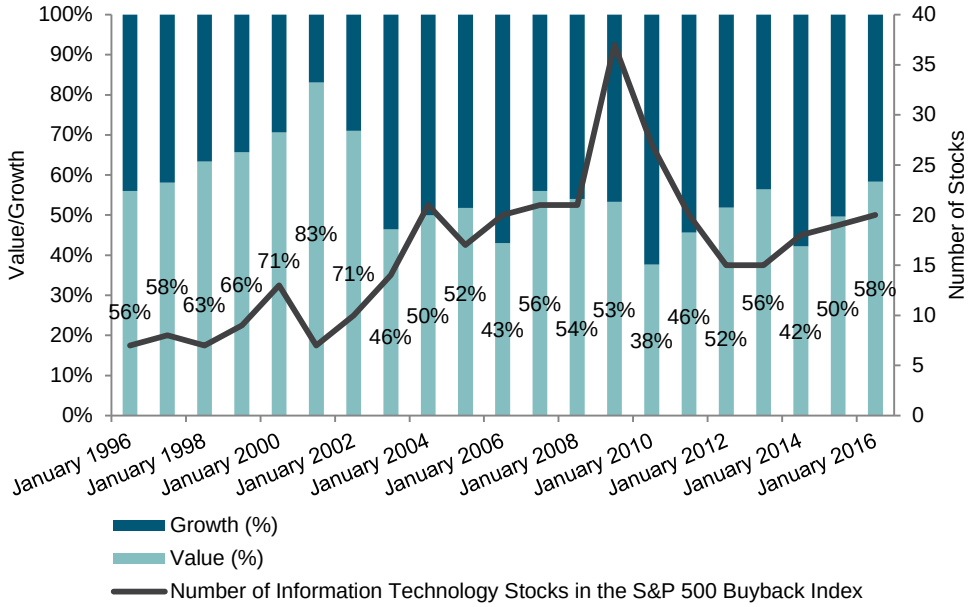
Over the past 15 years, the S&P 500 Buyback Index had value and small-cap tilts against the S&P 500.

If most companies repurchase shares only when their managers perceive their shares as undervalued, then the chosen buyback strategy tends to have a value bias. As shown in the style map in Appendix 1, over the past 15 years, the S&P 500 Buyback Index had value and small-cap tilts against the S&P 500. The small-cap bias may partially stem from the equal-weighting scheme adopted by the S&P 500 Buyback Index.

The historical growth and value composition[4] of the S&P 500 Buyback Index shows that the index had a value tilt before 2003 and has acquired a balance between growth and value since then. This may result from the increase of information technology stocks in the S&P 500 Buyback Index since 2003 (see Exhibit 13).

[4] Growth and value compositions are calculated as the weighted average growth and value weight of index constituents. In the S&P U.S. Style Indices, growth and value weights are assigned to each stock based on its growth or value attributes and are used to allocate stocks' weights between growth and value subindices.

Exhibit 13: Value Composition and Influence of the Information Technology Sector on the Style Composition of the S&P 500 Buyback Index



Source: S&P Dow Jones Indices LLC. Data calculated from Jan. 31, 1996, through Jan.15, 2016. Chart is provided for illustrative purposes.

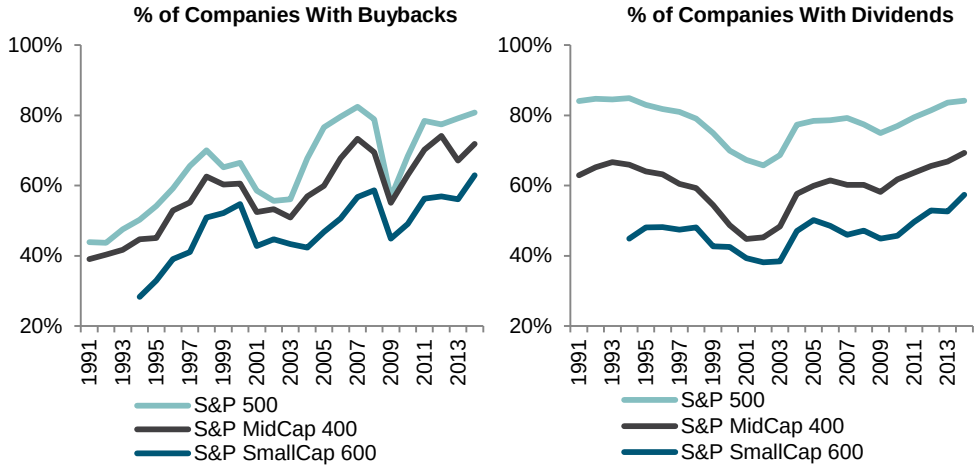
The percent of companies with buybacks have increased from 1994 to 2014 in all market capitalization segments in the U.S.

BUYBACK BEYOND THE S&P 500 IN THE U.S: DOES IT WORK IN THE MID- AND SMALL-CAP SPACES?

As equal weighting and the resulting small-cap bias of the S&P 500 Buyback Index may play a role in the outperformance of the portfolio, we investigated whether the S&P 500 Buyback Index framework also works among the S&P MidCap 400 and the S&P SmallCap 600, which are less influenced by small-cap bias.

First, we checked whether buybacks prevailed in the mid- and small-cap space of the U.S. As indicated in Exhibit 14, the percent of dividend-paying companies in the large-, mid-, and small-cap categories in the U.S. has been relatively stable at around 80%, 60%, and 47%, respectively. However, the percent of companies with buybacks has increased from 1994 to 2014 in all market cap segments, with the large-cap space having the highest buyback participation.

Exhibit 14: Percentage of Firms with Positive Buybacks and Dividends in Large-, Mid-, and Small-Cap Spaces



Source: S&P Dow Jones Indices LLC, Compustat. Fiscal year data from 1991 to 2014. Charts are provided for illustrative purposes.

The S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback Portfolios gained annualized excess returns of 3.6% and 4.6%, respectively, in the 15-year period ending Dec. 31, 2015.

Using the same stock-selection criteria, weighting method, and rebalancing schedule as those of the S&P 500 Buyback Index, we selected 80 and 120 stocks with the highest buyback ratios in the trailing 12-month period from the S&P MidCap 400 and the S&P SmallCap 600, respectively, to form the respective buyback portfolios. For comparison, the hypothetical Dividend Yield and Shareholder Yield Portfolios for each of these indices were constructed in the same way as those based on the S&P 500 in the previous section. The combination of constituents from the S&P 500, the S&P MidCap 400, and S&P SmallCap 600 Buyback Portfolios form the hypothetical S&P Composite 1500 Buyback Portfolio.

As shown in Exhibit 15, the S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback Portfolios gained annualized excess returns of 3.6% and 4.6%, respectively, over the 15-year period ending Dec. 31, 2015. These are significant but lower than the excess return of 5.4% produced by the S&P 500 Buyback Index over the same period. The S&P MidCap 400 and S&P SmallCap 600 Buyback Portfolios outperformed their benchmark indices in 12 and 11 out of 15 years, respectively, from 2001 to 2015.

Exhibit 15: Performance of Buyback Portfolios Compared to Their Benchmarks

Time Period	U.S. Large Cap		U.S. Mid Cap		U.S. Small Cap		Large, Mid, and Small Cap	
	S&P 500 Buyback Index	S&P 500	S&P MidCap 400 Buyback Portfolio*	S&P MidCap 400	S&P SmallCap 600 Buyback Portfolio*	S&P SmallCap 600	S&P Composite 1500 Buyback Portfolio*	S&P Composite 1500
Return (Per Year) (%)								
5-Year	15.0	12.6	14.4	10.7	14.4	11.5	14.8	12.4
15-Year	10.4	5.0	11.9	8.3	13.5	8.9	12.3	5.4
Standard Deviation (Per Year) (%)								
5-Year	13.1	11.7	14.5	13.9	14.4	15.0	13.6	11.9
15-Year	16.1	15.0	17.4	17.2	19.1	18.5	17.2	15.2
Risk-Adjusted Return								
5-Year	1.14	1.07	0.99	0.77	1.00	0.77	1.09	1.04
15-Year	0.65	0.33	0.68	0.48	0.71	0.48	0.71	0.36
Maximum Drawdown (%)								
15-Year	-46.3	-46.4	-42.8	-48.3	-45.8	-47.3	-45.2	-46.6

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2015. Index performance is based on total returns in USD. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P MidCap 400 Buyback Portfolio, the S&P SmallCap 600 Buyback Portfolio, and the S&P Composite 1500 Buyback Portfolio are hypothetical portfolios.

The S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback Portfolios had better absolute and risk-adjusted returns when compared to their corresponding dividend yield portfolios over the past 15-year period.

Like the S&P 500 Buyback Index, the S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback Portfolios had better absolute and risk-adjusted returns when compared to their corresponding dividend yield portfolios over the past 15-year period (see Exhibit 16). Over the same period, these buyback portfolios outperformed their respective equal-weighted benchmark indices by 2.3% and 3.6% per year, respectively.

Exhibit 16: Risk/Return Profile of the S&P MidCap 400 and the S&P SmallCap 600 Buyback Portfolios

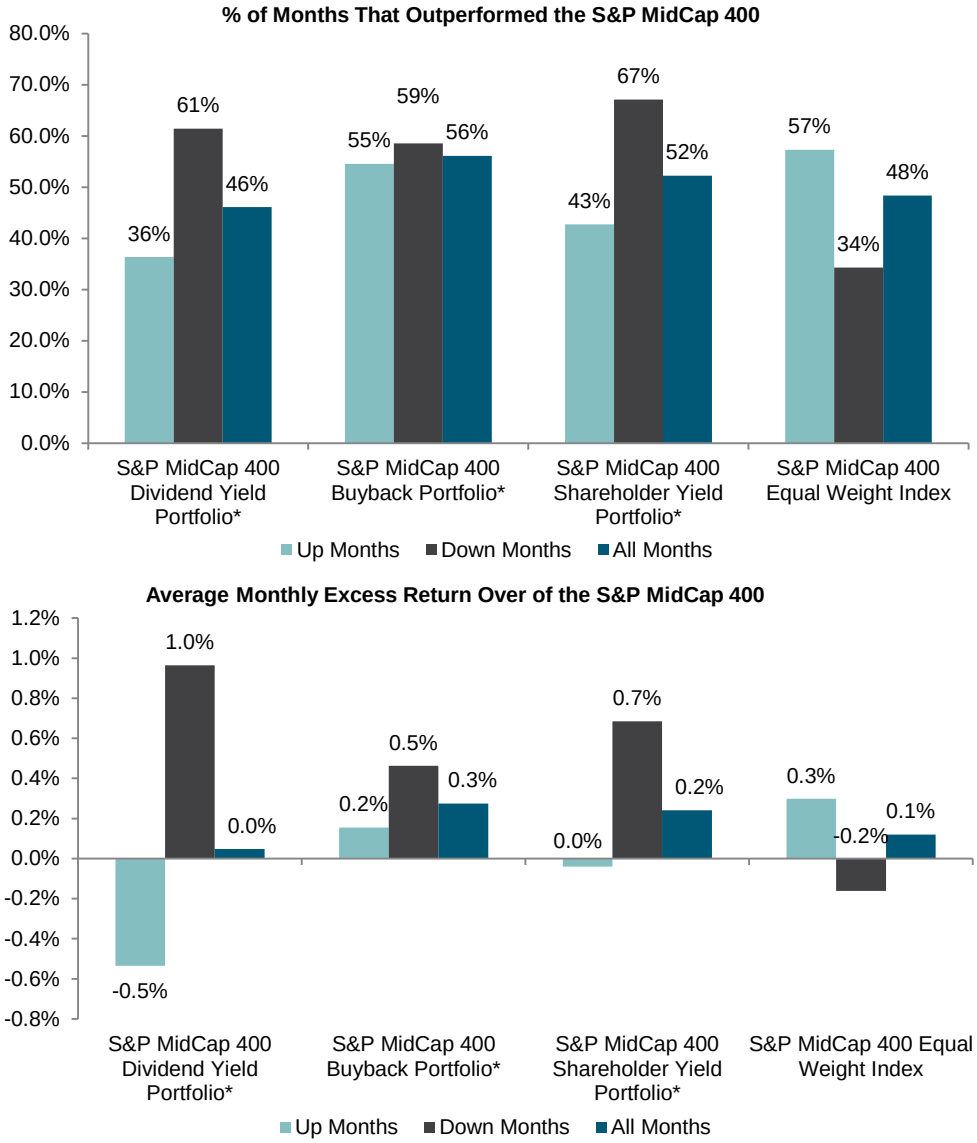
Time Period	U.S. Mid Cap					U.S. Small Cap				
	S&P MidCap 400 Dividend Yield Portfolio*	S&P MidCap 400 Buyback Portfolio*	S&P MidCap 400 Share-holder Yield Portfolio*	S&P Mid-Cap 400	S&P MidCap 400 Equal Weight Index	S&P SmallCap 600 Dividend Yield Portfolio*	S&P SmallCap 600 Buyback Portfolio*	S&P SmallCap 600 Share-holder Yield Portfolio*	S&P Small-Cap 600	S&P SmallCap 600 Equal Weight Index
Return (Per Year) (%)										
5-Year	10.5	14.4	14.4	10.7	9.9	10.2	14.4	12.8	11.5	10.2
15-Year	9.1	11.9	11.5	8.3	9.6	9.5	13.5	11.6	8.9	9.9
Standard Deviation (Per Year) (%)										
5-Year	12.9	14.5	14.2	13.9	14.8	13.8	14.4	14.0	15.0	16.2
15-Year	16.4	17.4	17.0	17.2	18.8	18.2	19.1	18.4	18.5	21.0
Risk-Adjusted Return										
5-Year	0.82	0.99	1.02	0.77	0.67	0.74	1.00	0.92	0.77	0.63
15-Year	0.56	0.68	0.68	0.48	0.51	0.52	0.71	0.63	0.48	0.47
Maximum Drawdown (%)										
15-Year	-47.3	-42.8	-44.8	-48.3	-47.4	-48.4	-45.8	-48.5	-47.3	-48.9

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2015. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P MidCap 400 Dividend Yield Portfolio, the S&P MidCap 400 Buyback Portfolio, the S&P MidCap 400 Shareholder Yield Portfolio, the S&P SmallCap 600 Dividend Yield Portfolio, the S&P SmallCap 600 Buyback Portfolio, and the S&P SmallCap 600 Shareholder Yield Portfolio are hypothetical portfolios.

The S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback Portfolios had win ratios above 50% and produced positive excess returns in both up and down markets over their benchmark indices in the 15-year period.

Similar to their large-cap counterpart, the S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback Portfolios had win ratios above 50% and produced positive excess returns in both up and down markets over their benchmark indices in the 15-year period. The excess returns generated in down markets were larger than the ones produced in up markets. Compared with their corresponding dividend yield portfolios, the S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback Portfolios had more consistent outperformance in both up and down markets, as indicated by more balanced win ratios and average monthly excess returns between up and down markets (see Exhibits 17 and 18).

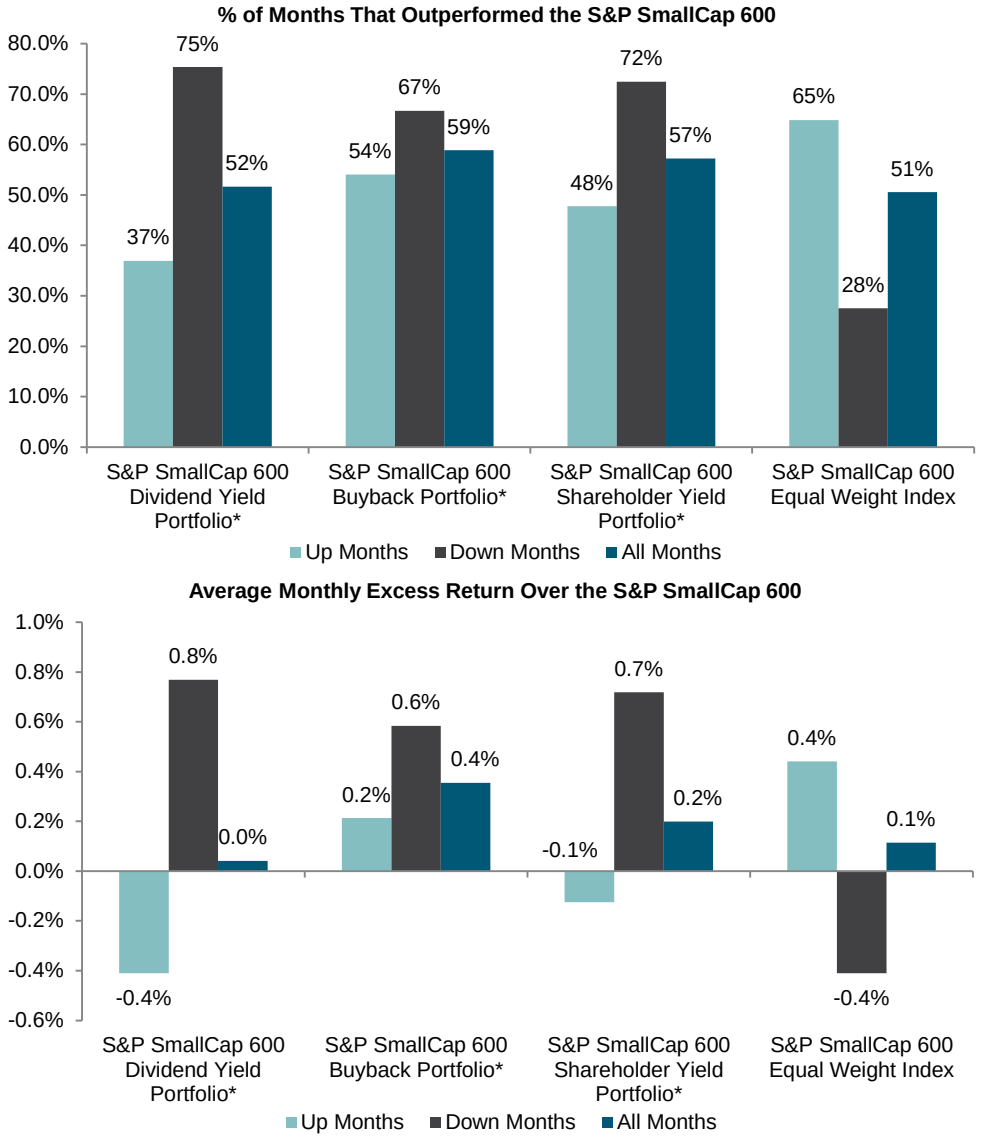
Exhibit 17: Upside and Downside Capture and Average Monthly Excess Return of S&P MidCap 400 Strategy Portfolios



Compared with their corresponding dividend yield portfolios, the S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback Portfolios had more consistent outperformance in both up and down markets.

Source: S&P Dow Jones Indices LLC. Based on monthly total returns in USD. Data from Dec. 29, 2000, to Dec. 31, 2015. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P MidCap 400 Dividend Yield Portfolio, the S&P MidCap 400 Buyback Portfolio, and the S&P MidCap 400 Shareholder Yield Portfolio are hypothetical portfolios.

Exhibit 18: Upside and Downside Capture and Average Monthly Excess Return of S&P SmallCap 600 Strategy Portfolios



Source: S&P Dow Jones Indices LLC. Based on monthly total returns from Dec. 29, 2000, to Dec. 31, 2015. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. *The S&P SmallCap 600 Dividend Yield Portfolio, the S&P SmallCap 600 Buyback Portfolio, and the S&P SmallCap 600 Shareholder Yield Portfolio are hypothetical portfolios.

Both S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback Portfolios are value tilted, with a similar degree of significance over the 15-year period ending Dec. 31, 2015.

Like the S&P 500 Buyback Index, both S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios are value tilted, with a similar degree of significance over the past 15-year period ending Dec. 31, 2015. In contrast, small-cap bias becomes less significant in mid- and small-cap spaces, as equal weighting is less influential among small-cap companies. See the style map in Appendix 1 for details.

THE CONTRIBUTION OF EQUAL WEIGHTING TO EXCESS RETURNS

To investigate further how equal weighting influences buyback portfolio returns, we compared the equal-weighted buyback portfolios with market-cap-weighted buyback portfolios using the same constituents.

Equal weighting improved the win ratios and excess returns of the buyback portfolios in up markets as it increased volatility.

As shown in Exhibit 19, over the 15-year period ending Dec. 31, 2015, all market-cap-weighted buyback portfolios in the U.S. gained positive excess returns, with slightly lower volatility than their respective benchmark indices. However, all of them underperformed their respective equal-weighted buyback portfolios, showing that equal weighting enhanced buyback portfolio returns. All market-cap-weighted buyback portfolios tended to have unfavorable win ratios and excess returns during up markets. With equal weighting, the win ratios and excess returns of the buyback portfolios were improved during up markets, making their outperformance more balanced between up and down markets. At the same time, equal weighting increased return volatility, which is typical for equal-weighting strategies.

Exhibit 19: The Contribution of Equal Weighting in Buyback Portfolios

Portfolio	Return (Per Year) (%)	Standard Deviation (Per Year) (%)	Risk-Adjusted Return	Win Ratio (Up) (%)	Win Ratio (Down) (%)	Average Month Excess Return (Up) (%)	Average Month Excess Return (Down) (%)
S&P 500 Buyback Portfolio*							
Equal Weighted	10.4	16.1	0.65	60.2	59.7	0.4	0.5
Market Cap Weighted	6.3	14.3	0.44	46.0	56.7	-0.2	0.6
Benchmark	5.0	15.0	0.33	-	-	-	-
S&P MidCap 400 Buyback Portfolio*							
Equal Weighted	11.9	17.4	0.68	54.5	58.6	0.2	0.5
Market Cap Weighted	10.8	16.5	0.65	50.9	61.4	0.0	0.5
Benchmark	8.3	17.2	0.48	-	-	-	-
S&P SmallCap 600 Buyback Portfolio*							
Equal Weighted	13.5	19.1	0.71	54.1	66.7	0.2	0.6
Market Cap Weighted	12.5	17.5	0.71	49.5	69.6	-0.1	0.8
Benchmark	8.9	18.5	0.48	-	-	-	-

Source: S&P Dow Jones Indices LLC. Data is based on monthly total returns from Dec. 29, 2000, through Dec. 31, 2015. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance. The S&P 500 Buyback Portfolio, the S&P MidCap 400 Buyback Portfolio, and the S&P SmallCap 600 Buyback Portfolio are hypothetical portfolios.

Market-cap-weighted buyback portfolios were also value tilted over the 15-year period ending Dec. 31, 2015, however with less significance compared to their equal-weighted counterparts in the U.S. market (see Appendix 1).

CONCLUSION

As our results suggest, over a long-term investment horizon, buyback portfolios have generated positive excess returns over their benchmark indices in the U.S. market. Over the past 15 years, all of the buyback portfolios tested generated higher average monthly excess returns over their parent indices in down markets than in up markets, no matter which weighting schemes were employed in the portfolio construction.

The equal-weighting method employed in the construction of buyback indices can enhance index performance in terms of win ratios and excess returns in up markets.

The equal-weighting method employed in the construction of buyback indices can enhance index performance in terms of win ratios and excess returns in up markets, making the outperformance of buyback indices more balanced in both up and down markets. However, the equal-weighting method also boosted the index volatility. In comparison, the market-cap-weighted buyback indices tended to have lower volatility than their benchmark indices. The impact of equal weighting is more significant in the large-cap space than in the mid- and small-cap spaces.

Style analysis indicates that both equal-and market-cap-weighted buyback portfolios have been value tilted over the 15-year period ending Dec. 31, 2015. The overlay of equal weighting may enhance the value tilt and give the portfolios an extra small-cap bias, especially in the large-cap space.

Compared with dividend investing, the buyback investing strategy has several unique features if both employ an equal-weighting method. Buyback portfolios tend to have lower dividend yields, and most of their outperformance comes from capital gains instead of dividend income, which is a significant contrast with dividend yield portfolios. Historically, in the U.S., buyback portfolios have more balanced win ratios or excess returns in both up and down markets, which could be a good complement to defensive approaches such as dividend and low-volatility strategies.

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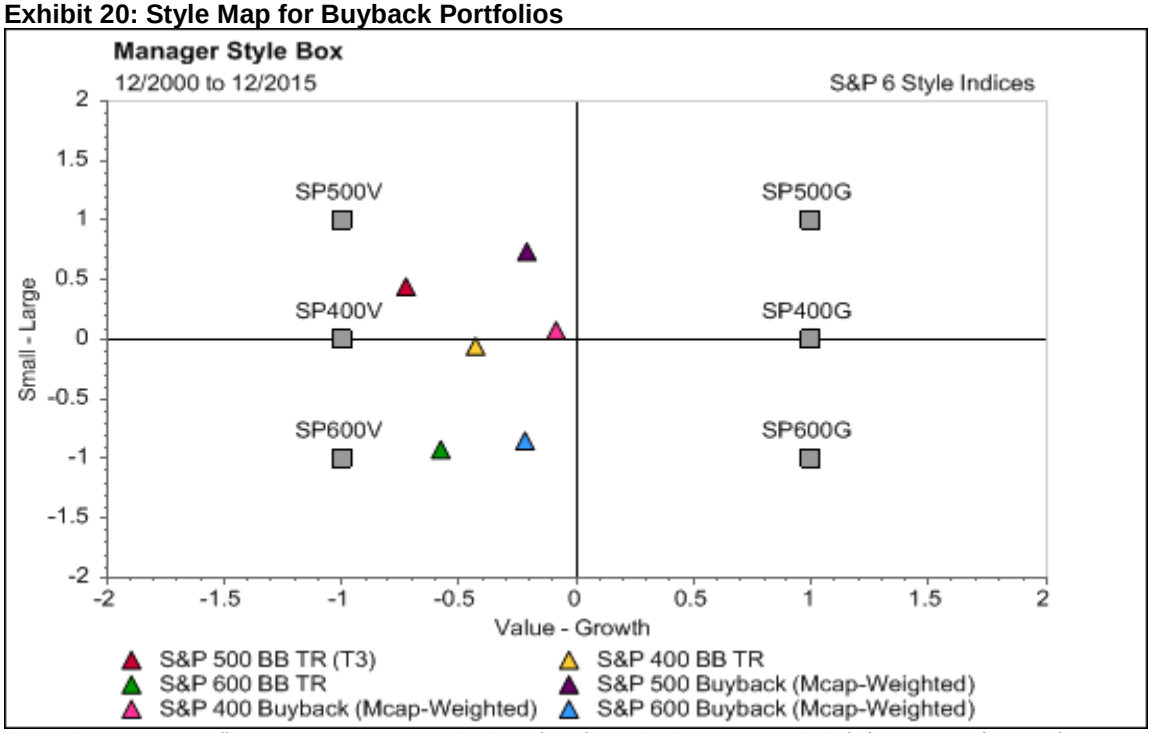
APPENDIX

Exhibit 20: Style Map for Buyback Portfolios



Source: S&P Dow Jones Indices LLC, Factset. Data Dec. 29, 2000, through Dec. 31, 2015 on Factset SP2 platform. Past performance is no guarantee of future results. It is not possible to invest directly in an index, and index returns do not reflect expenses an investor would pay. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

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The S&P 500 Buyback Index was launched on November 29, 2012. The S&P 500 Equal Weight Index was launched on January 8, 2003. The S&P MidCap 400 Equal Weight Index and the S&P SmallCap 600 Equal Weight Index were launched on August 23, 2010. All information for an index prior to its launch date is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect on the launch date. Complete index methodology details are available at www.spdji.com. It is not possible to invest directly in an index.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency on their products. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indicates introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

The Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices LLC maintains the Index and calculates the Index levels and performance shown or discussed, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US $100,000 investment for a 12-month period (or US $10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US $1,650), the net return would be 8.35% (or US $8,350) for the year. Over a three year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US $5,375, and a cumulative net return of 27.2% (or US $27,200).

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