

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

### Contributors

#### Liyu Zeng

Director

Global Research & Design

[liyu.zeng@spglobal.com](mailto:liyu.zeng@spglobal.com)

#### Priscilla Luk

Managing Director

Global Research & Design

[priscilla.luk@spglobal.com](mailto:priscilla.luk@spglobal.com)

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 U.S., including trends in corporate payouts, major types of and motives behind share repurchases, and the price impact. In the following sections, the performance and attributes of the [S&P 500® Buyback Index](#) is discussed, and the study is extended to the mid- and small-cap spaces in the U.S.

### EXECUTIVE FINDINGS

- Over a long-term investment horizon, buyback portfolios generated positive excess returns over their benchmark indices in the large-, mid-, and small-cap segments of the U.S. market.
- All buyback portfolios generated higher average monthly excess returns over their benchmark indices in down markets than in up markets, regardless of weighting methods.
- Compared with dividend portfolios, buyback portfolios tended to have lower dividend yields and most of their outperformance was driven by capital gains rather than dividend income. Buyback portfolios achieved more balanced win ratios and excess returns in both up and down markets, which is a good complement to defensive portfolios that focus on strategies such as dividends and low volatility.
- The equal-weighting method employed in the construction of our buyback indices enhances win ratios and excess returns in up markets, 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 the mid- and small-cap spaces.
- Both equal-weighted and market-cap-weighted buyback portfolios were tilted toward high earning yield in the past 20 years that ended Dec. 31, 2019. The overlay of equal weighting gives the portfolios an extra small-cap bias, especially in the large-cap space.

## OVERVIEW OF SHARE REPURCHASES

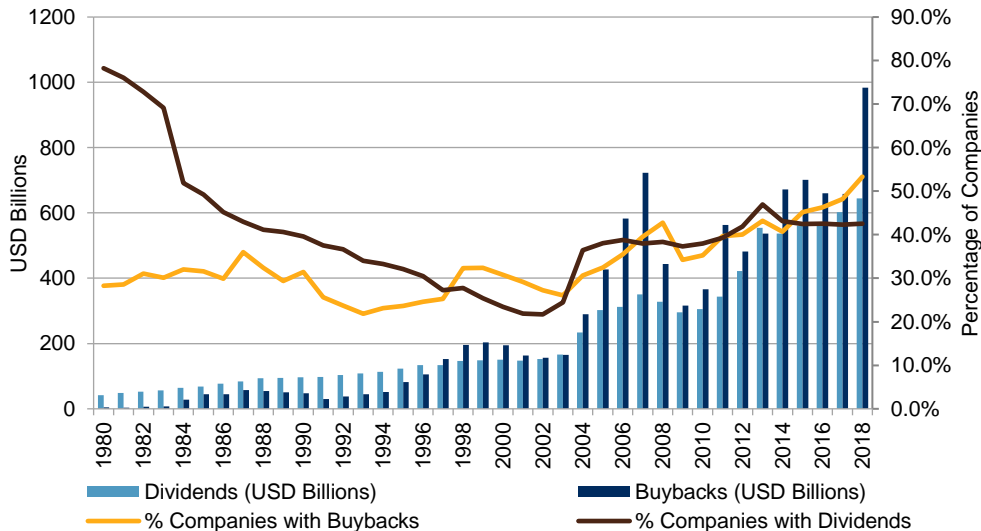
Corporate payout policy has been one of the most studied areas in finance literature. If a company has limited investment opportunities, it may distribute its excess cash flow, if any, back to shareholders to mitigate the conflicts of interest between management and shareholders.

There 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 cash dividends paid by U.S. firms (see Exhibit 1). The proportion of dividend-paying companies decreased to 43% in 2018 from 78% in 1980, while the proportion of companies with share buybacks increased to 53% from 28% during the same time period. The increased use of share repurchase is mainly driven by some key advantages of this method, including tax benefits and financial flexibility.

*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.*

**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.**



*The increased use of share repurchase is mainly driven by some key advantages of this method, including tax benefits and financial flexibility.*

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 2018. Dividend and buyback data may include the amount paid for preferred shares. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

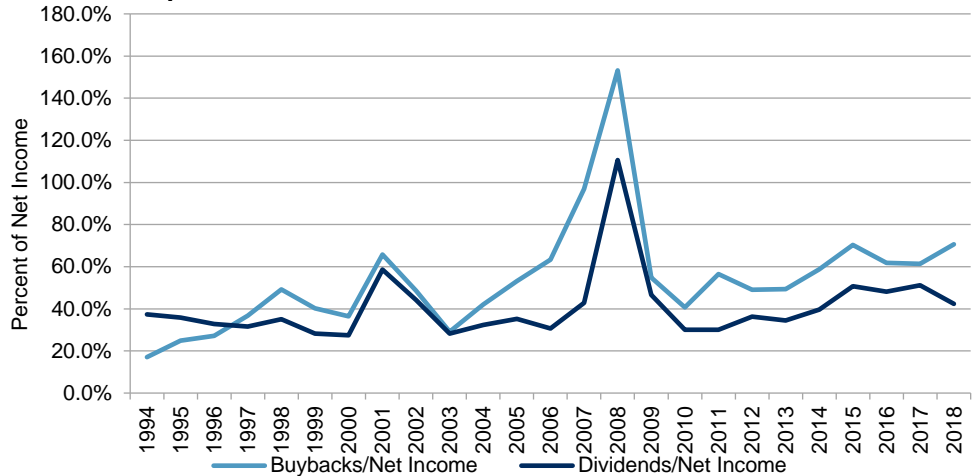
Exhibit 2 shows annual aggregated dividends and buybacks as a percentage of net income for constituents of the [S&P Composite 1500®](#), which consists of large-, mid-, and small-cap U.S. companies. Between 1994 and 2018, the median percentage of net income for dividends was around 36%, with periods of increase and decrease. On the other hand,

the percentage of net income for buybacks experienced more substantial growth, increasing to 71% in 2018 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.

*The percentage of net income distributed through buybacks has exceeded that of dividend payments since 1997.*

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

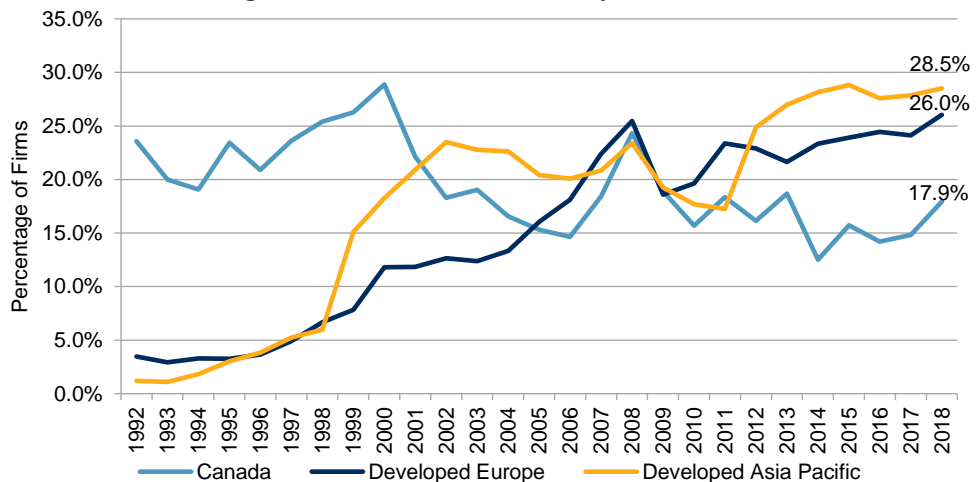


Source: S&P Dow Jones Indices LLC, Compustat. Data as of fiscal year-end from 1994 to 2018. Dividend and buyback data may include the amount paid for preferred shares. Only companies with fundamental data available are calculated. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

The increased use of share repurchases as an alternative corporate payout method is also observed in other developed regions. The percentage of firms with positive buybacks has increased in developed Europe and developed Asia Pacific since 1992 (see Exhibit 3).

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

**Exhibit 3: Percentage of Firms with Positive Buybacks**



Source: S&P Dow Jones Indices LLC, Factset, Compustat, Worldscope. Data as of fiscal year-end from 1992 to 2018. Dividend and buyback data may include the amount paid for preferred shares. Only local listed companies with fundamental data available are calculated. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

## SHARE REPURCHASE: TYPES AND PURPOSES

*There are different types of share repurchases. In the U.S., open market share repurchases have become the dominant form among all repurchasing mechanisms since the early 1980s.*

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.<sup>1</sup> 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.<sup>2</sup> Open market share repurchases have gained popularity not only in the U.S., but also in many other countries around the world. Most recently, they were introduced in Austria, France, Germany, Japan, Korea, the Netherlands and Norway due to favorable tax provisions or legal reforms (Hsieh and Wang 2009; Kim, Schremper and Varaiya 2013).

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 are the following.

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

- **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. since the mid-1980s. The differing tax rate on capital gains versus that on dividends in history generally favors repurchases. However, even without the favorable tax rate (as that in the late 1980s and after 2003), repurchases offer additional flexibility because investors can defer taxes and create home-made 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 give management greater financial flexibility.
- **Agency Costs of Free Cash Flows:** Firms repurchase shares in response to accumulated free cash flows and declining growth opportunities.
- **Signaling and Undervaluation:** The corporate payout method has been long considered as a costly but credible signal for the future

<sup>1</sup> Fixed price tender offers, Dutch auction tender offers, and targeted stock repurchases can retire a large portion of shares within a short period, and they therefore 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 contents 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 information content regarding the firm's value. Open market share repurchases are frequently used by companies to offset the EPS dilution effect of stock option exercises.

<sup>2</sup> Before the 1982 enactment of Rule 10b-18, 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.

prospects of the firm and for undervaluation, since it 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 quickly a firm's capital structure.
- **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 Earning 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.

*Share repurchases can be utilized to adjust quickly a firm's capital structure.*

## **BUYBACK ACTIVITIES AND MARKET CONDITIONS**

Exhibit 4 shows how firms in the S&P Composite 1500 have distributed capital over the past 25 years through capital expenditures, acquisitions, share buybacks, and dividends. From 1994 through 2018, 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, share repurchases follow the economic cycle with increased or decreased activities when the market is 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.

*From 1994 through 2018, changes in share repurchases and acquisitions were more significant than the other two methods, and this was especially true in 2008 and 2011.*

*Share repurchases follow the economic cycle with increased or decreased activities when the market is up or down.*

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

YEAR	MARKET CAP	DIVIDENDS	BUYBACKS	ACQUISITIONS	CAPITAL EXPENDITURE
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	21,219	411	608	274	791
2015	20,755	457	633	268	746
2016	22,423	467	600	451	699
2017	22,293	492	590	349	719
2018	24,034	525	875	505	823

Source: S&P Dow Jones Indices LLC, Compustat. Data as of fiscal year-end from 1994 to 2018. Dividend and buyback data may include the amount paid for preferred shares. Only companies with fundamental data available are calculated. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

*Apart from significantly positive announcement returns, buy-and-hold abnormal returns were found persisted over the years after the announcement of share repurchases.*

## 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 a positive abnormal return of around 2.7% and 7.6%, respectively, over a three-day event window.

*The information conveyed by open market repurchases is largely ignored by the market, which causes the delayed market reaction.*

*Post-repurchase announcement drift still persists over time for both open market repurchases and tender offers.*

*Past performance seems to be a better predictor of undervaluation than other undervaluation measures.*

Third, buy-and-hold abnormal returns persisted over 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. 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 of 3.5% initial market reaction, 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 the 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-announced performance drift.

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; (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 Buyback Indices, which seek to

track stocks with relatively heavy repurchase activities. In this paper, we will only test the plain vanilla buyback indices screened by buyback ratio in the last 12 months. The overlay of undervaluation factors such as book-to-market or price momentum is out of the scope of this paper.

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- and small-cap spaces in the U.S.

*The S&P 500 Buyback Index tracks the 100 companies in the S&P 500 with the highest buyback ratio in the trailing 12-month period.*

## 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 ends.

### Risk/Return Characteristics

*Over the past 20 years, the S&P 500 Buyback Index outperformed the S&P 500 in 17 out of 20 years, with an annualized excess return of 5.5% and slightly higher volatility.*

In the past 20 years that ended Dec. 31, 2019, the S&P 500 Buyback Index had outperformed the S&P 500 in 16 out of 20 years, with most significant excess returns recorded from 2000 to 2002, 2009, and 2013 (see Exhibit 5). The S&P 500 Buyback Index only underperformed during the early stage of the financial crisis in 2007, 2015, and 2018. For the overall period, the S&P 500 Buyback Index outperformed the S&P 500 by 5.5% 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 and a combination of share buyback and cash dividends), we constructed two hypothetical portfolios, the S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio, which consist of 100 stocks with the highest 12-month trailing

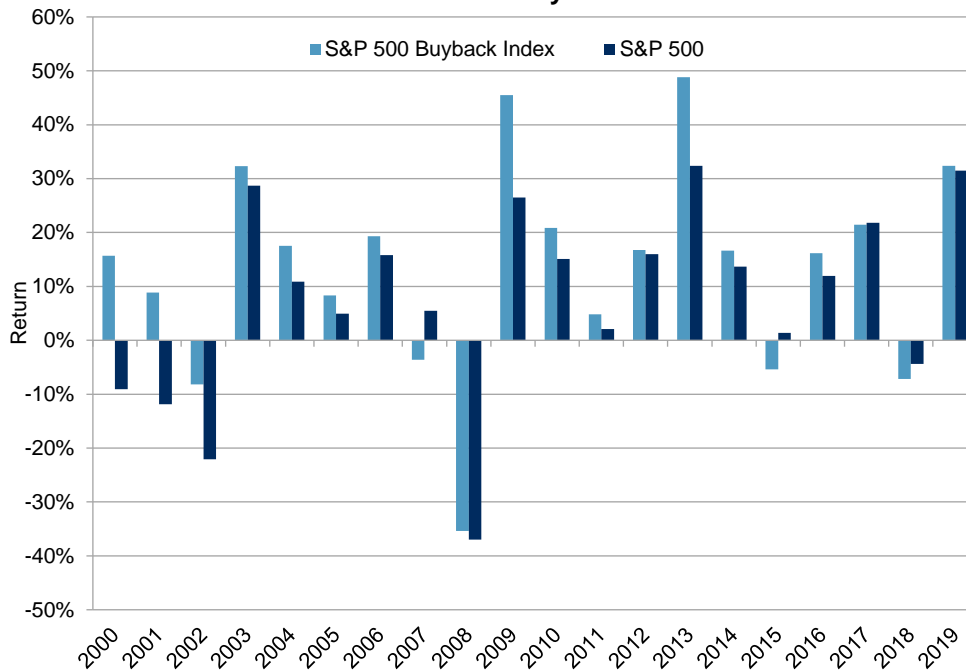


dividend yield and shareholder yield,<sup>3</sup> respectively, using the same weighting method and rebalancing schedules as the S&P 500 Buyback Index.

*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.*

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 recorded slightly higher return and lower volatility than the S&P 500 Buyback Index over the same period. However, it only outperformed the S&P 500 in 15 out of 20 years.

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



*The S&P 500 Shareholder Yield portfolio recorded slightly higher return and lower volatility than the S&P 500 Buyback Index.*

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2019. Index performance is based on total returns in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

<sup>3</sup> 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.

<b>Exhibit 6: Risk/Return Profile of the S&amp;P 500 Buyback Index</b>					
<b>TIME PERIOD</b>	<b>S&amp;P 500 DIVIDEND YIELD PORTFOLIO</b>	<b>S&amp;P 500 BUYBACK INDEX</b>	<b>S&amp;P 500 SHAREHOLDER YIELD PORTFOLIO</b>	<b>S&amp;P 500</b>	<b>S&amp;P 500 EQUAL WEIGHT INDEX</b>
<b>RETURN (PER YEAR) (%)</b>					
5-Year	9.7	10.4	10.5	11.7	9.8
10-Year	13.7	15.5	15.8	13.6	13.5
15-Year	9.1	11.2	11.6	9.0	9.7
20-Year	9.9	11.5	12.1	6.1	9.3
<b>STANDARD DEVIATION (%)</b>					
5-Year	11.9	14.8	14.9	13.4	13.5
10-Year	13.3	15.4	15.3	14.8	15.7
15-Year	19.5	19.5	19.3	18.4	20.1
20-Year	18.9	19.2	18.8	18.9	20.0
<b>RISK-ADJUSTED RETURN</b>					
5-Year	0.81	0.70	0.71	0.87	0.72
10-Year	1.04	1.00	1.03	0.92	0.86
14-Year	0.47	0.58	0.60	0.49	0.48
20-Year	0.52	0.60	0.64	0.32	0.46
<b>MAXIMUM DRAWDOWN (%)</b>					
20-Year	-57.5	-51.7	-51.6	-51.5	-55.4

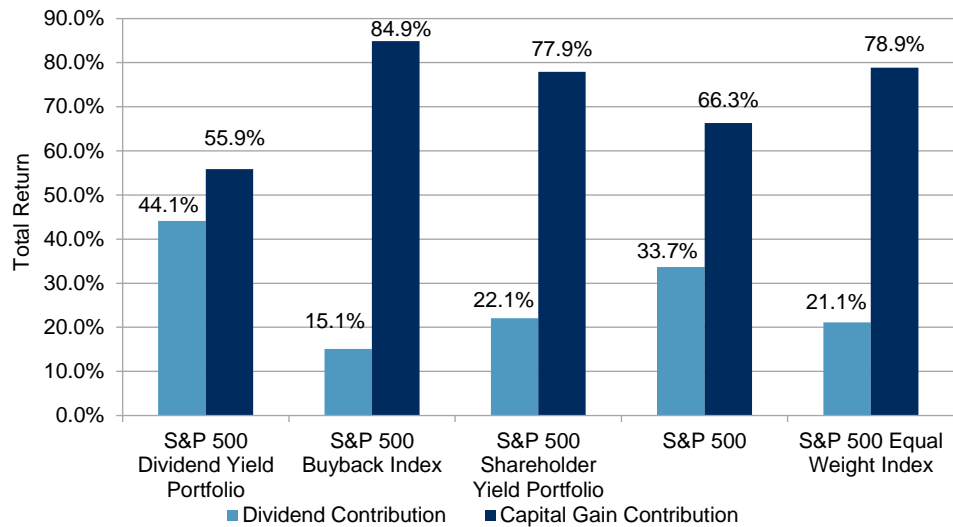
The S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio are hypothetical portfolios.

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2019. Index performance is based on total returns in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

*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 to 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. In the past 20 years, capital gain and dividend income (dividends and reinvestment) contributed 84.9% and 15.1% of the total return of the S&P 500 Buyback Index, respectively, whereas the S&P 500 Dividend Yield portfolio had a much higher percentage (44.1%) of its total return from dividends.

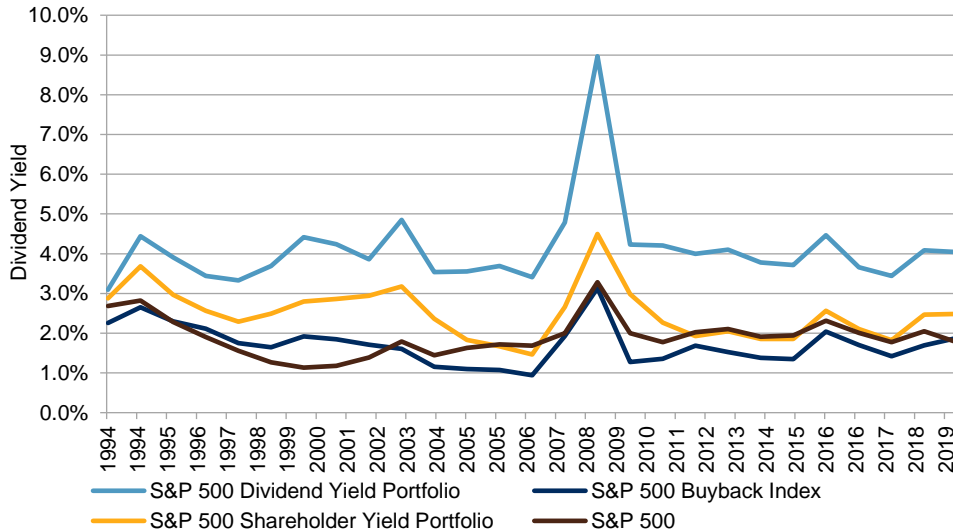
**Exhibit 7: Source of Total Returns**



*The 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.*

The S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio are hypothetical portfolios. Source: S&P Dow Jones Indices LLC. Data is from Dec. 31, 1999, through Dec. 31, 2019. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

**Exhibit 8: Annual Dividend Yields**



The S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio are hypothetical portfolios. Source: S&P Dow Jones Indices LLC, Factset. Data is from January rebalancing each year from 1994 through 2019 and Dec. 31, 2019. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Past performance is no guarantee of future results. Please see the Performance Disclosures at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

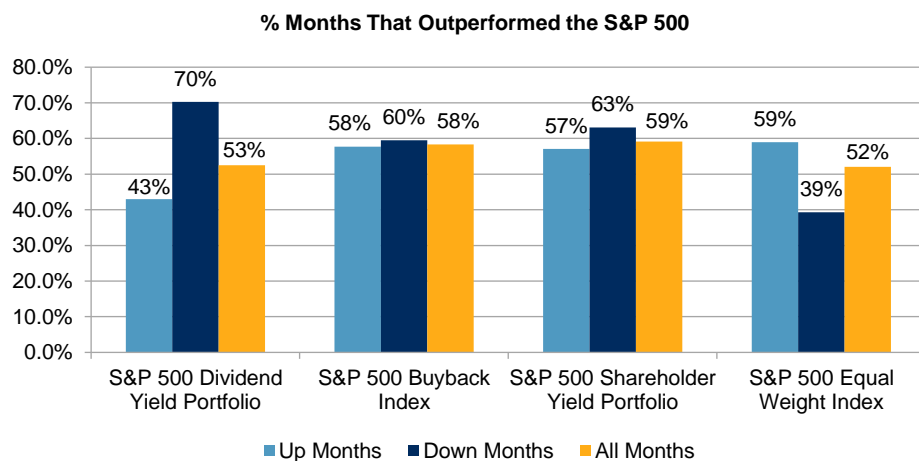
As buybacks tend to follow the economic cycle with increased or decreased repurchase activities in up or down markets while dividend payouts are normally more stable over time, the S&P 500 Dividend Yield portfolio tends to outperform in down markets, while the S&P 500 Buyback Index may capture more upside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

In the past 20 years that ended Dec. 31, 2019, 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 it was in up months.

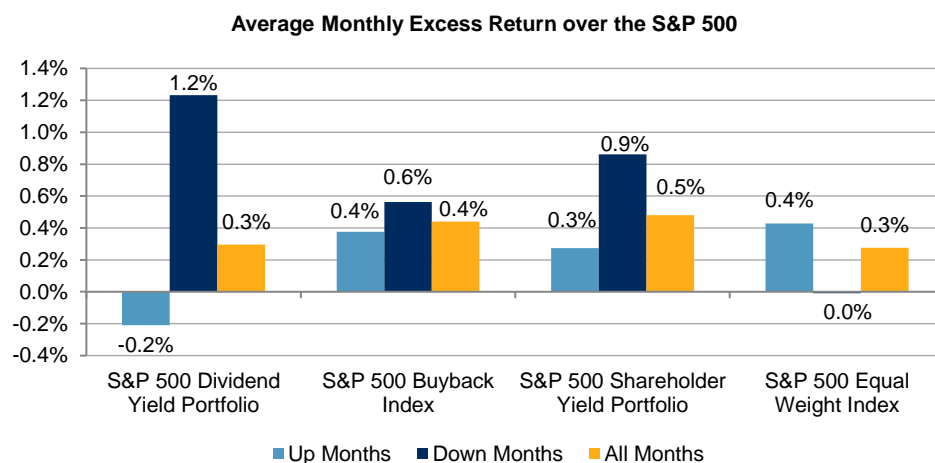
*Over the past 20 years, the S&P 500 Buyback Index outperformed the S&P 500 in both up and down months.*

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 0.6% greater average monthly excess returns than the S&P 500 Dividend Yield portfolio in the past 156 up months, cumulatively surpassing the average shortfall of 0.7% in the past 84 down months and explaining why the S&P 500 Buyback Index outperformed the S&P 500 Dividend Yield portfolio over this period.

**Exhibit 9: Upside and Downside Capture**



*The outperformance of the S&P 500 Buyback Index was more consistent in both up and down markets.*



The S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio are hypothetical portfolios.

Source: S&P Dow Jones Indices LLC. Index performance is based on total returns. Data is from Dec. 31, 1999, through Dec. 31, 2019. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

## Sector Composition

Historically, defensive sectors (such as Utilities, Communication Services, and Consumer Staples) and Real Estate 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 2020, only four of them were from Consumer Staples, Communication Services, and Utilities companies. This cyclical bias of the S&P 500 Buyback Index may contribute to its higher win ratio in up markets compared with the S&P 500 Dividend Yield portfolio.

**Exhibit 10: Dividends and Buybacks Ratios by Sector**

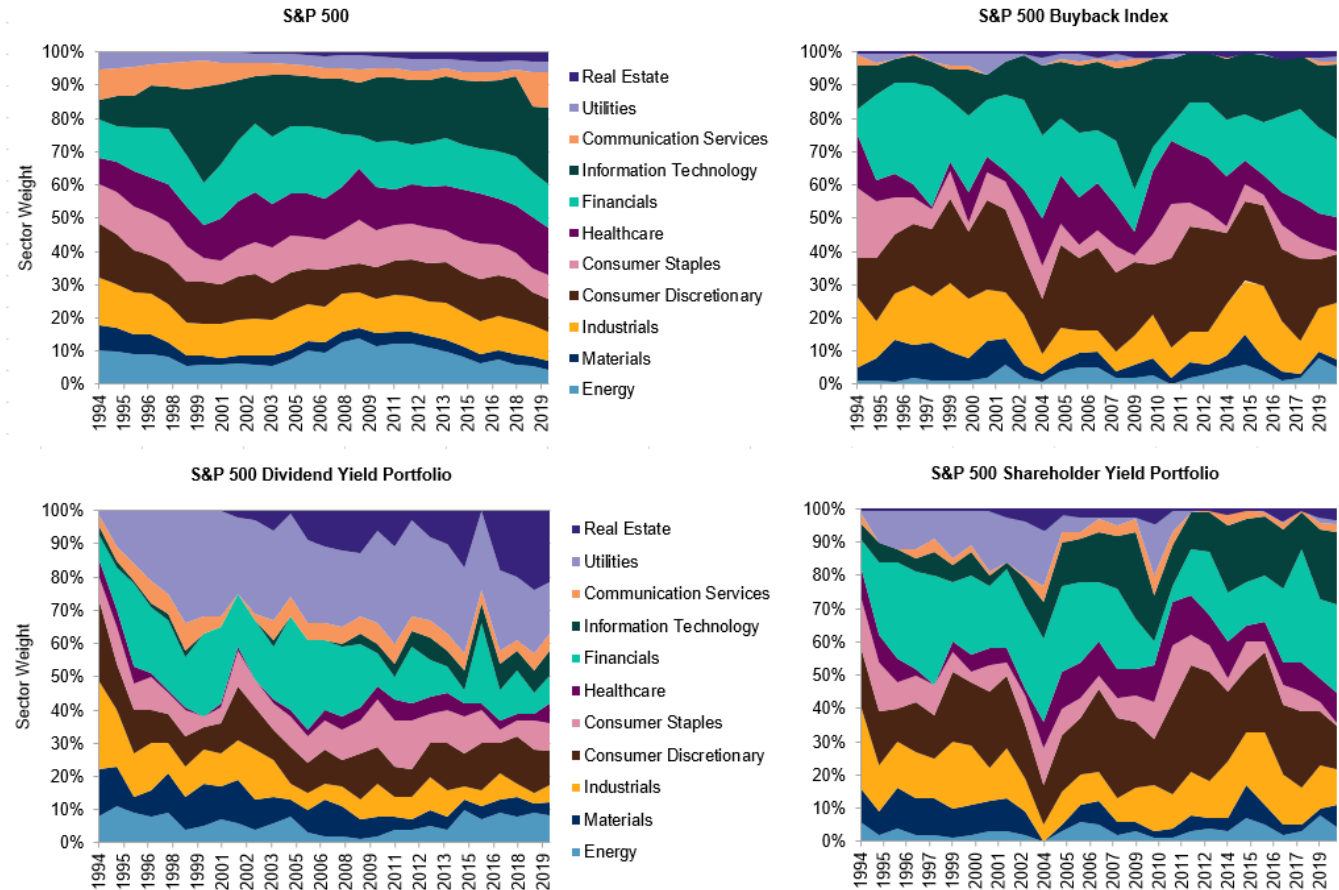
S&P 500 SECTOR	COMPANIES WITH DIVIDENDS (%)			COMPANIES WITH BUYBACKS (%)			DIVIDEND YIELD			BUYBACK RATIO		
	1999	2018	MEDIAN	1999	2018	MEDIAN	1999	2018	MEDIAN	1999	2018	MEDIAN
Energy	92.0	93.3	85.9	64.0	83.3	59.8	2.4	3.5	2.0	0.4	2.3	2.1
Materials	85.7	100.0	93.4	71.4	88.0	71.9	1.9	2.2	2.1	1.3	2.0	1.5
Industrials	87.5	91.3	91.0	81.9	89.9	82.3	1.1	2.3	1.9	2.1	3.3	2.3
Consumer Discretionary	75.6	75.4	76.0	80.0	92.3	86.0	0.7	1.4	1.3	1.0	3.1	3.1
Consumer Staples	95.1	97.0	94.1	85.4	84.8	85.4	2.6	3.1	2.6	1.6	2.0	2.3
Healthcare	70.3	54.1	56.0	81.1	88.5	80.4	1.1	1.7	1.5	1.7	2.8	2.5
Financials	95.8	94.1	94.4	93.0	97.1	87.5	1.7	2.2	1.8	2.6	4.7	2.7
Information Technology	32.3	67.6	39.3	59.7	97.1	79.2	0.1	1.7	0.8	0.8	5.5	3.2
Communication Services	69.2	53.8	69.6	61.5	57.7	52.8	1.8	1.6	4.3	1.0	2.3	0.9
Utilities	92.5	100.0	95.8	60.0	39.3	38.6	4.5	3.3	3.6	2.7	0.3	0.5
Real Estate	NA	93.8	94.1	NA	68.8	52.6	NA	3.5	3.4	NA	0.5	0.4

Source: S&P Dow Jones Indices LLC, S&P Capital IQ. Data presented as of year-end each year, from 1999 to 2018. Trailing 12-month data are used with a three-month lag. Table is provided for illustrative purposes. Past performance is no guarantee of future results.

Historically, the S&P 500 Buyback Index was consistently underweight in the Energy and Communication Services sectors, and overweight in the Consumer Discretionary sector. The allocation to Information Technology, however, changed more dynamically over the past 20 years. 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. 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 was overweight in Utilities and Real Estate and underweight in Information Technology and Health Care for most of the period observed. 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 is also observed in the mid- and small-cap segments of the U.S. market.

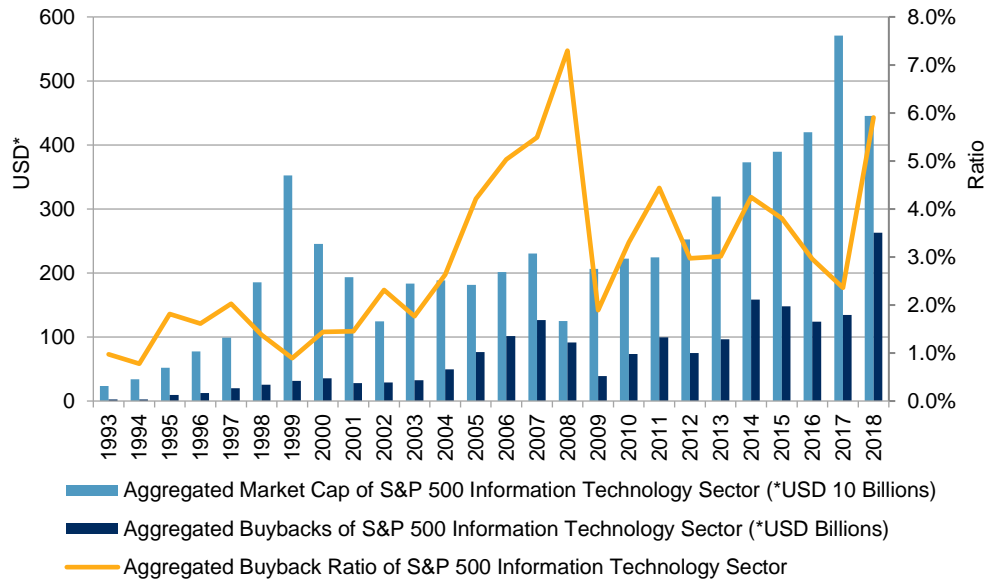
**Exhibit 11: Historical Sector Breakdown**



The S&P 500 Dividend Yield portfolio and the S&P 500 Shareholder Yield portfolio are hypothetical portfolios.

Source: S&P Dow Jones Indices LLC. Data is from Jan. 21, 1994, through Jan. 18, 2019 and Dec.31, 2019. Past performance is no guarantee of future results. Charts are 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.

**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 2018. Market cap data are as of year end. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

*Over the past 20 years, the S&P 500 Buyback Index had value and small-cap tilts against the S&P 500.*

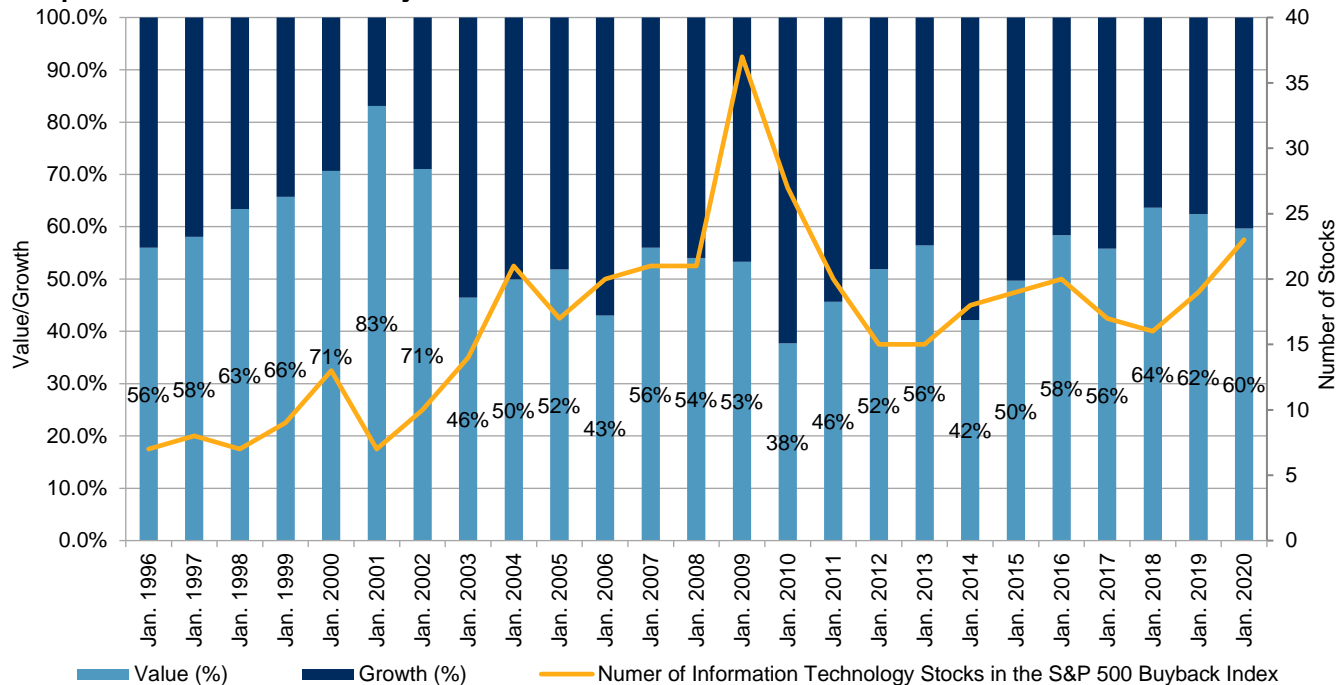
**Style and Factor Exposure**

If most companies repurchase shares only when their managers perceive their shares as undervalued, the chosen buyback strategy tends to have a value bias. As shown in Exhibit 20 in the Appendix, over the past 20 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<sup>4</sup> of the S&P 500 Buyback Index shows that the index had a value tilt before 2003, and it 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).

<sup>4</sup> Growth and value compositions are calculated as the weighted average growth and value weight of index constituents. In 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: The 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. 17, 2020. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

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

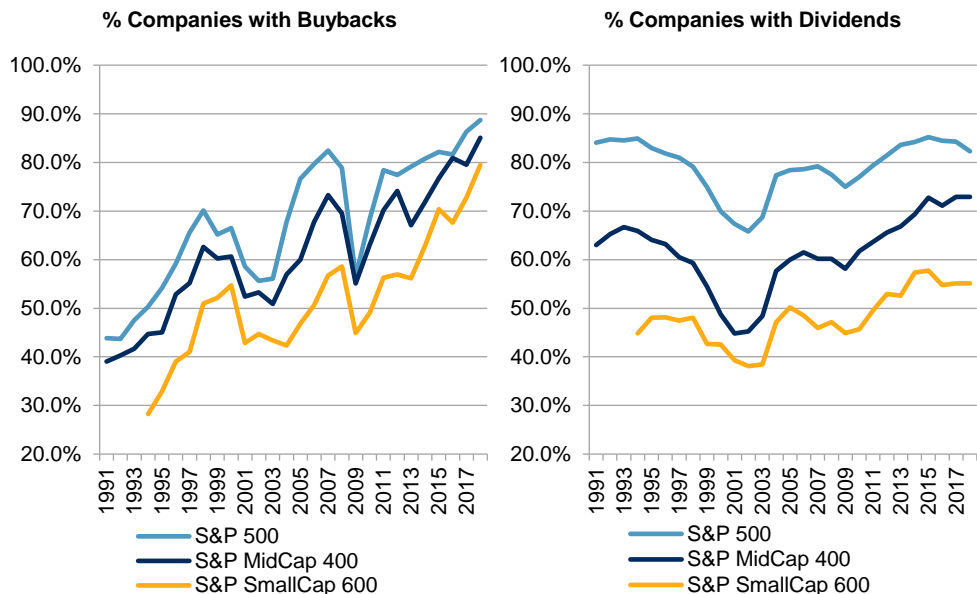
As equal weighting and the resulting small-cap bias of the S&P 500 Buyback Index may play a role in the outperformance of the portfolio, we investigated whether the S&P 500 Buyback Index framework also works among the S&P MidCap 400 and the S&P SmallCap 600, which are less influenced by small-cap bias.

First, we checked whether buybacks prevailed in the mid- and small-cap space of the U.S. As indicated in Exhibit 14, the percentages of dividend-paying companies in the large-, mid-, and small-cap categories in the U.S. have been relatively stable at around 80%, 60%, and 48%, respectively. However, the percentages of companies with buybacks have increased from 1994 to 2018 in all market capitalization 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**

*The percentages of companies with buybacks have increased from 1994 to 2018 in all market capitalization segments in U.S.*



Source: S&P Dow Jones Indices LLC, Compustat. Fiscal year data from 1991 to 2018. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

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 months 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 the S&P 500 in the previous section. The combination of constituents from the S&P 500 Buyback Index and the hypothetical S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios form the hypothetical S&P Composite 1500 Buyback portfolio.

*Over the past 20 years, the S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios posted annualized excess returns of 3.3% and 3.7%, respectively.*

As shown in Exhibit 15, the S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios posted annualized excess returns of 3.3% and 3.7%, respectively, in the past 20 years that ended Dec. 31, 2019. These are significant but lower than the excess return of 5.5% for the S&P 500 Buyback Index over the same period. The S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios outperformed their benchmark indices in 17 and 15 out of 20 years, respectively, from 2000 to 2019.

Exhibit 15: Performance of the S&P MidCap 400 and the S&P SmallCap 600 Buyback Portfolios								
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
<b>RETURN (PER YEAR)(%)</b>								
5-Year	10.4	11.7	11.1	9.0	8.8	9.6	10.0	11.5
20-Year	11.5	6.1	12.8	9.5	13.5	9.8	12.8	6.4
<b>STANDARD DEVIATION (PER YEAR)(%)</b>								
5-Year	14.8	13.4	15.7	14.3	16.9	16.1	15.4	13.4
20-Year	19.2	18.9	20.3	20.9	21.5	22.3	19.9	19.0
<b>RISK-ADJUSTED RETURN</b>								
5-Year	0.70	0.87	0.71	0.63	0.52	0.59	0.65	0.85
20-Year	0.60	0.32	0.63	0.45	0.63	0.44	0.65	0.34
<b>MAXIMUM DRAWDOWN (%)</b>								
20-Year	-51.7	-51.5	-49.5	-54.2	-54.2	-54.2	-52.1	-51.7

The S&P MidCap 400 Buyback, the S&P SmallCap 600 Buyback, and the S&P Composite 1500 Buyback portfolios are hypothetical portfolios. Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2019. Index performance is based on total returns in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

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 20 years (see Exhibit 16). Over the same period, these buyback portfolios outperformed their respective equal-weighted benchmark indices by 2.5% and 3.2% per year, respectively.

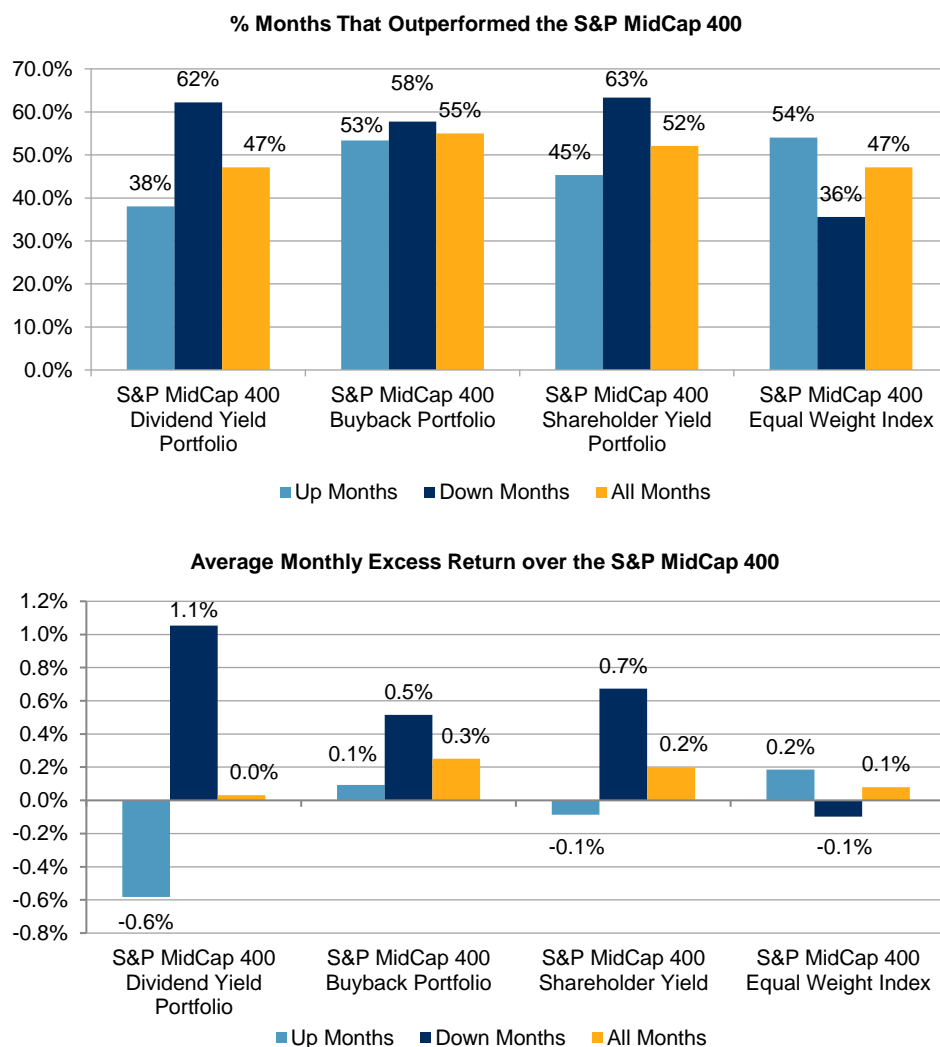
Exhibit 16: Risk/Return Profile of the S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback Portfolios										
TIME PERIOD	U.S. MID CAP					U.S. SMALL CAP				
	S&P MIDCAP 400 DIVIDEND YIELD PORTFOLIO	S&P MIDCAP 400 BUYBACK PORTFOLIO	S&P MIDCAP 400 SHAREHOLDER YIELD PORTFOLIO	S&P MIDCAP 400	S&P MIDCAP 400 EQUAL WEIGHT INDEX	S&P SMALLCAP 600 DIVIDEND YIELD PORTFOLIO	S&P SMALLCAP 600 BUYBACK PORTFOLIO	S&P SMALLCAP 600 SHAREHOLDER YIELD PORTFOLIO	S&P SMALL CAP 600	S&P SMALL CAP 600 EQUAL WEIGHT INDEX
<b>RETURN (PER YEAR)(%)</b>										
5-Year	6.7	11.1	8.2	9.0	7.7	7.0	8.8	7.1	9.6	7.8
20-Year	10.1	12.8	12.1	9.5	10.3	9.8	13.5	11.8	9.8	10.3
<b>STANDARD DEVIATION (PER YEAR)(%)</b>										
5-Year	13.4	15.7	15.5	14.3	15.2	14.8	16.9	15.7	16.1	17.1
20-Year	20.8	20.3	20.4	20.9	21.5	22.7	21.5	21.5	22.3	23.3
<b>RISK-ADJUSTED RETURN</b>										
5-Year	0.50	0.71	0.53	0.63	0.51	0.47	0.52	0.45	0.59	0.45
20-Year	0.48	0.63	0.60	0.45	0.48	0.43	0.63	0.55	0.44	0.44
<b>MAXIMUM DRAWDOWN (%)</b>										
20-Year	-56.3	-49.5	-52.3	-54.2	-54.0	-59.8	-54.2	-56.4	-54.2	-57.1

The S&P MidCap 400 Dividend Yield, the S&P MidCap 400 Buyback, the S&P MidCap 400 Shareholder Yield, the S&P SmallCap 600 Dividend Yield, the S&P SmallCap 600 Buyback, and the S&P SmallCap 600 Shareholder Yield portfolios are hypothetical portfolios. Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2019. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

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 over the past 20 years. The excess returns generated in down markets were larger than the ones produced in up markets. Compared to 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).

*Compared to 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.*

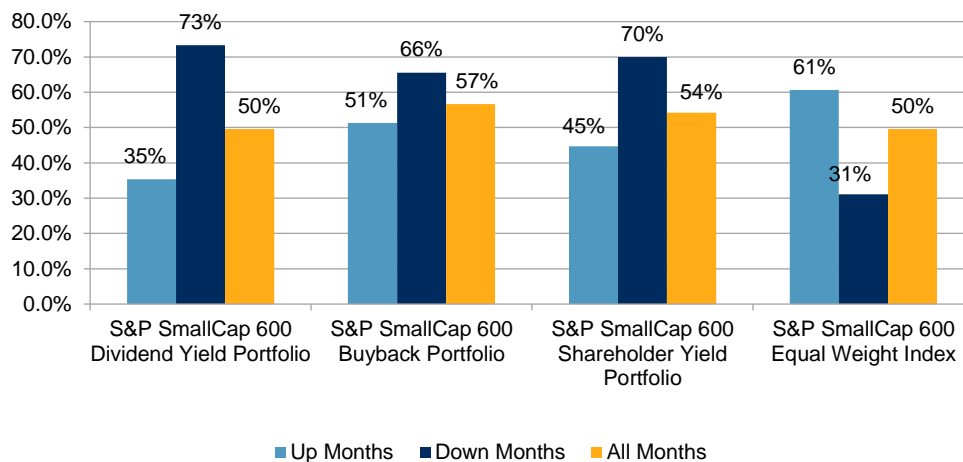
**Exhibit 17: Upside and Downside Capture and Average Monthly Excess Return of S&P MidCap 400 Strategy Portfolios**



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. Source: S&P Dow Jones Indices LLC. Based on monthly total returns from Dec. 31, 1999, to Dec. 31, 2019. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

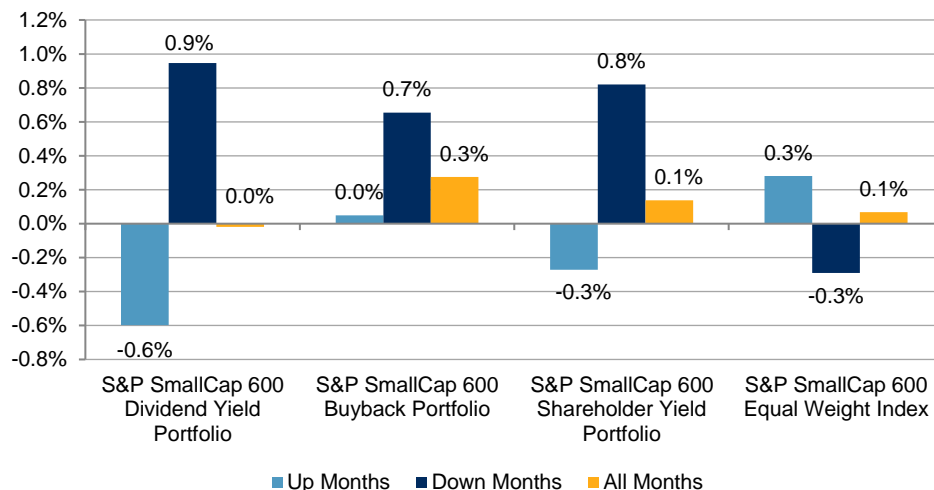
**Exhibit 18: Upside and Downside Capture and Average Monthly Excess Return of S&P SmallCap 600 Strategy Portfolios**

**% Months That Outperformed the S&P SmallCap 600**



*Both S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios were tilted to high earning yield in the past 20 years.*

**Average Monthly Excess Return over the S&P SmallCap 600**



*Small-cap bias becomes less significant in mid- and small-cap spaces, as equal weighting is less influential among smaller-cap companies.*

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. Source: S&P Dow Jones Indices LLC. Based on monthly total returns from Dec. 31, 1999, to Dec. 31, 2019. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Like the S&P 500 Buyback Index, both S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios were tilted to high earning yield, with a less degree of significance in the past 20 years that ended Dec. 31, 2019. In contrast, small-cap bias becomes less significant in mid- and small-cap spaces, as equal weighting is less influential among smaller-cap companies. Different from the S&P 500 Buyback Index, both S&P MidCap 400 Buyback and S&P SmallCap 600 Buyback portfolios had extra tilts to low volatility, low beta, and high ROE. See Exhibit 20 in the Appendix for details.

## THE CONTRIBUTION OF EQUAL WEIGHTING TO EXCESS RETURNS

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

As shown in Exhibit 19, over the past 20 years that ended Dec. 31, 2019, all market-cap-weighted buyback portfolios in the U.S. gained positive excess returns. 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, 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 ER (UP) (%)	AVERAGE MONTH ER (DOWN) (%)
<b>S&amp;P 500</b>							
Equal Weighted	11.5	19.2	0.60	57.7	59.5	0.4	0.6
Market Cap Weighted	8.5	19.2	0.44	51.3	53.6	0.0	0.5
Benchmark	6.1	18.9	0.32	-	-	-	-
<b>S&amp;P MIDCAP 400</b>							
Equal Weighted	12.8	20.3	0.63	53.3	57.8	0.1	0.5
Market Cap Weighted	11.8	19.5	0.60	52.0	62.2	-0.1	0.5
Benchmark	9.5	20.9	0.45	-	-	-	-
<b>S&amp;P SMALLCAP 600</b>							
Equal Weighted	13.5	21.5	0.63	51.3	65.6	0.0	0.7
Market Cap Weighted	13.0	21.1	0.61	47.3	66.7	-0.1	0.8
Benchmark	9.8	22.3	0.44	-	-	-	-

The S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback portfolios are hypothetical portfolios.

Source: S&P Dow Jones Indices LLC. Data is based on monthly total returns from Dec. 31, 1999, through Dec. 31, 2019. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Market-cap-weighted buyback portfolios were also tilted toward high earning yield in the past 20 years that ended Dec. 31, 2019 (see Exhibit 20 in Appendix).

## CONCLUSION

*Over a long investment horizon, buyback portfolios generated positive excess returns over their parent indices in the U.S. market.*

As our results suggest, over a long investment horizon, buyback portfolios generated positive excess returns over their parent indices in 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.

The equal-weighting method employed in the construction of buyback indices enhances the 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. The impact of equal weighting is more significant in the large-cap space than in mid- and small-cap spaces.

Style analysis indicates both equal-weighted and market-cap-weighted buyback portfolios were tilted to high earning yield in the past 20 years that ended Dec. 31, 2019. The overlay of equal weighting gives the portfolios an extra small-cap bias, especially in the large-cap space.

*The buyback strategy has several unique features if both employ an equal-weighting method.*

Compared with dividend investing, the buyback 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 gain instead of dividend income, which is a significant contrast with dividend yield portfolios. In the U.S., buyback portfolios have tended 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.

## APPENDIX

Exhibit 20: Characteristics of the S&amp;P Buyback Portfolios

CHARACTERISTICS TILTS	S&P 500 BUYBACK PORTFOLIOS		S&P MIDCAP 400 BUYBACK PORTFOLIOS		S&P SMALLCAP 600 BUYBACK PORTFOLIOS	
	EQUAL WEIGHTED	MARKET CAP WEIGHTED	EQUAL WEIGHTED	MARKET CAP WEIGHTED	EQUAL WEIGHTED	MARKET CAP WEIGHTED
Market Capitalization	-12.17	-2.16	-2.61	0.90	-6.05	-0.31
12M MPT Volatility	1.61	-0.84	-2.36	-3.43	-1.20	-3.22
36M MPT Volatility	2.02	-0.20	-1.45	-2.62	-1.53	-3.20
36M MPT Beta	0.36	0.14	-6.17	-7.06	-5.61	-6.28
Price to Book	-1.31	-0.22	1.78	2.70	0.23	2.08
Dividend Yield	-2.64	-1.24	-0.30	-0.65	-0.31	-0.80
Price to Earnings	-2.47	-3.36	-0.81	-0.74	-0.82	-1.29
Price to Sales	-4.12	-2.06	-1.01	0.55	-1.85	-0.71
Hist 3Yr Sales Growth	-2.55	-1.21	-3.13	-2.38	-2.02	-0.72
Hist 3Yr EPS Growth	0.63	1.30	-1.49	-0.87	0.63	1.97
ROE	0.03	1.96	2.45	3.37	1.53	3.52

The S&P MidCap 400 Buyback and the S&P SmallCap 600 Buyback portfolios are hypothetical portfolios.

Source: S&P Dow Jones Indices LLC, FactSet Characteristics Tilt Report. Average characteristic tilts of the buyback portfolios are calculated as the weighted Welch's T-test relative to the respective benchmark index as of quarterly rebalances between October 1999 to October 2019. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Red numbers indicate favorable factor biases, and blue numbers indicate unfavorable factor biases.

## REFERENCES

- Grullon, Gustavo, and Roni Michaely. 2004. "The Information Content of Share Repurchase Programs." *Journal of Finance* 59:2, 651–680.
- Hausch, Donald, and James Seward. 1993. "Signaling with Dividends and Share Repurchases: A Choice between Deterministic and Stochastic Cash Disbursements." *Review of Financial Studies* 6:1, 121–154.
- Hsieh, Jim and Qinghai Wang. 2009. "Stock Repurchases: Theory and Evidence."
- Ikenberry, David, Josef Lakonishok, and Theo Vermaelen. 1995. "Market Underreaction to Open Market Share Repurchases." *Journal of Financial Economics* 39:2/3, 181–208.
- Kim, Jaemin, Ralf Schremper, Nikhil Varaiya. 2013. "Survey on Open Market Repurchase Regulations: cross-country examination of the ten largest stock markets."
- Lakonishok, Josef and Theo Vermaelen. 1990. "Anomalous price behavior around repurchase tender offers." *Journal of Finance* 45, 455-477.
- Nohel, Tom, and Vefa Tarhan. 1998. "Share Repurchases and Firm Performance: New Evidence on the Agency Costs of Free Cash Flow." *Journal of Financial Economics* 49:1, 187–222.
- Peyer, Urs and Theo Vermaelen. 2008. "The Nature and Persistence of Buyback Anomalies." *Review of Financial Studies*.
- Stephens, Clifford, and Michael Weisbach. 1998. "Actual Share Reacquisitions in Open Market Repurchases Programs." *Journal of Finance* 53:1, 313–333.
- Vermaelen, Theo. 1981. "Common Stock Repurchases and Market Signaling: An Empirical Study." *Journal of Financial Economics* 9:1, 139–183.



<b>S&amp;P DJI RESEARCH CONTRIBUTORS</b>		
Sunjiv Mainie, CFA, CQF	Global Head	<a href="mailto:sunjiv.mainie@spglobal.com">sunjiv.mainie@spglobal.com</a>
Jake Vukelic	Business Manager	<a href="mailto:jake.vukelic@spglobal.com">jake.vukelic@spglobal.com</a>
<b>GLOBAL RESEARCH &amp; DESIGN</b>		
<b>AMERICAS</b>		
Sunjiv Mainie, CFA, CQF	Americas Head	<a href="mailto:sunjiv.mainie@spglobal.com">sunjiv.mainie@spglobal.com</a>
Laura Assis	Analyst	<a href="mailto:laura.assis@spglobal.com">laura.assis@spglobal.com</a>
Cristopher Anguiano, FRM	Analyst	<a href="mailto:cristopher.anguiano@spglobal.com">cristopher.anguiano@spglobal.com</a>
Smita Chirputkar	Director	<a href="mailto:smita.chirputkar@spglobal.com">smita.chirputkar@spglobal.com</a>
Rachel Du	Senior Analyst	<a href="mailto:rachel.du@spglobal.com">rachel.du@spglobal.com</a>
Bill Hao	Director	<a href="mailto:wenli.hao@spglobal.com">wenli.hao@spglobal.com</a>
Qing Li	Director	<a href="mailto:qing.li@spglobal.com">qing.li@spglobal.com</a>
Berlinda Liu, CFA	Director	<a href="mailto:berlinda.liu@spglobal.com">berlinda.liu@spglobal.com</a>
Lalit Ponnala, PhD	Director	<a href="mailto:lalit.ponnala@spglobal.com">lalit.ponnala@spglobal.com</a>
Maria Sanchez	Associate Director	<a href="mailto:maria.sanchez@spglobal.com">maria.sanchez@spglobal.com</a>
Hong Xie, CFA	Senior Director	<a href="mailto:hong.xie@spglobal.com">hong.xie@spglobal.com</a>
<b>APAC</b>		
Priscilla Luk	APAC Head	<a href="mailto:priscilla.luk@spglobal.com">priscilla.luk@spglobal.com</a>
Arpit Gupta	Senior Analyst	<a href="mailto:arpit.gupta1@spglobal.com">arpit.gupta1@spglobal.com</a>
Akash Jain	Associate Director	<a href="mailto:akash.jain@spglobal.com">akash.jain@spglobal.com</a>
Anurag Kumar	Senior Analyst	<a href="mailto:anurag.kumar@spglobal.com">anurag.kumar@spglobal.com</a>
Xiaoya Qu	Senior Analyst	<a href="mailto:xiaoya.qu@spglobal.com">xiaoya.qu@spglobal.com</a>
Yan Sun	Senior Analyst	<a href="mailto:yan.sun@spglobal.com">yan.sun@spglobal.com</a>
Tim Wang	Senior Analyst	<a href="mailto:tim.wang@spglobal.com">tim.wang@spglobal.com</a>
Liyu Zeng, CFA	Director	<a href="mailto:liyu.zeng@spglobal.com">liyu.zeng@spglobal.com</a>
<b>EMEA</b>		
Andrew Innes	EMEA Head	<a href="mailto:andrew.innes@spglobal.com">andrew.innes@spglobal.com</a>
Leonardo Cabrer, PhD	Senior Analyst	<a href="mailto:leonardo.cabrer@spglobal.com">leonardo.cabrer@spglobal.com</a>
Andrew Cairns	Senior Analyst	<a href="mailto:andrew.cairns@spglobal.com">andrew.cairns@spglobal.com</a>
Jingwen Shi	Analyst	<a href="mailto:jingwen.shi@spglobal.com">jingwen.shi@spglobal.com</a>
<b>INDEX INVESTMENT STRATEGY</b>		
Craig J. Lazzara, CFA	Global Head	<a href="mailto:craig.lazzara@spglobal.com">craig.lazzara@spglobal.com</a>
Chris Bennett, CFA	Director	<a href="mailto:chris.bennett@spglobal.com">chris.bennett@spglobal.com</a>
Fei Mei Chan	Director	<a href="mailto:feimei.chan@spglobal.com">feimei.chan@spglobal.com</a>
Tim Edwards, PhD	Managing Director	<a href="mailto:tim.edwards@spglobal.com">tim.edwards@spglobal.com</a>
Anu R. Ganti, CFA	Director	<a href="mailto:anu.ganti@spglobal.com">anu.ganti@spglobal.com</a>
Sherifa Issifu	Analyst	<a href="mailto:sherifa.issifu@spglobal.com">sherifa.issifu@spglobal.com</a>

## PERFORMANCE DISCLOSURES

The S&P 500 Buyback Index was launched on May 14, 2013. The S&P MidCap 400 Equal Weight Index and the S&P SmallCap 600 Equal Weight Index were launched on August 23, 2010. The S&P 500 Equal Weight Index January 8, 2003. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at [www.spdji.com](http://www.spdji.com). 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.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. 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 indices 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.

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](http://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 generally 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).

## GENERAL DISCLAIMER

Copyright © 2020 S&P Dow Jones Indices LLC. All rights reserved. STANDARD & POOR'S, S&P, S&P 500, S&P 500 LOW VOLATILITY INDEX, S&P 100, S&P COMPOSITE 1500, S&P MIDCAP 400, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, S&P TARGET DATE INDICES, GICS, SPIVA, SPDR and INDEXOLOGY are registered trademarks of Standard & Poor's Financial Services LLC, a division of S&P Global ("S&P"). DOW JONES, DJ, DJIA and DOW JONES INDUSTRIAL AVERAGE are registered trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other investment product or vehicle. S&P Dow Jones Indices LLC is not a tax advisor. A tax advisor should be consulted to evaluate the impact of any tax-exempt securities on portfolios and the tax consequences of making any particular investment decision. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.