

# Combining factors to target specific investment outcomes

## The merits of a factor-based approach to portfolio construction.

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### Key Takeaways

- When building portfolios with factors, investors can harness the risk and return characteristics of the individual factors themselves and achieve diversification by combining them.
- A portfolio of six equity factors weighted equally can exhibit compelling results, including positive excess and higher risk-adjusted returns relative to the broader equity market.
- Equity factor allocations may also be fine-tuned to target specific outcomes, such as capital appreciation, downside protection, and income.
- Factor combinations can be used to create a core equity portfolio from the ground up, or to complement existing holdings.

The merits of factor investing, which may include enhancing returns, managing risks, and/or targeting specific investment outcomes, have been supported by academic research and empirical data over the years. We've discussed the potential benefits of equity factors in previous articles (see *Insights Series* article, "An Overview of Factor Investing"), and outline in Exhibit 1 the enhanced risk and return characteristics

#### EXHIBIT 1: Factors have enhanced the risk-and-return profiles of equity portfolios over time.

	Excess Return	Volatility	Information Ratio
Value	3.1%	19.8%	0.61
Dividend Yield	2.0%	17.3%	0.28
Momentum	2.1%	17.2%	0.29
Quality	1.5%	16.8%	0.43
Low Volatility	0.8%	13.4%	0.13
Size	0.6%	23.5%	0.06
Broader Market	–	17.3%	–

Past performance is no guarantee of future results. Chart is for illustrative purposes only and does not represent actual or future performance of any investment option or strategy. See Methodology for details. Excess return relative to the broader market (Russell 1000 Index). Volatility: standard deviation of absolute returns. Information ratio: a measure of risk-adjusted returns. See Glossary for definitions. Period studied: 1986–2018. Source: FactSet, as of June 30, 2018.

of those individual factors including value, dividend yield, momentum, quality, low volatility, and size.

Most factors are not highly correlated with one another—they are driven by different market anomalies and therefore tend to pay off in different environments. And while these well-established factors have been proven to enhance portfolios over time, no single factor works all the time. By combining them, investors can harness the benefits of the individual factors themselves and achieve diversification.

This article explores the potential benefits of combining equity factors and fine-tuning factor allocations to target specific outcomes or investing styles, such as:

- capital appreciation,
- downside protection, and
- income.

### Building an equity portfolio with factor-based strategies

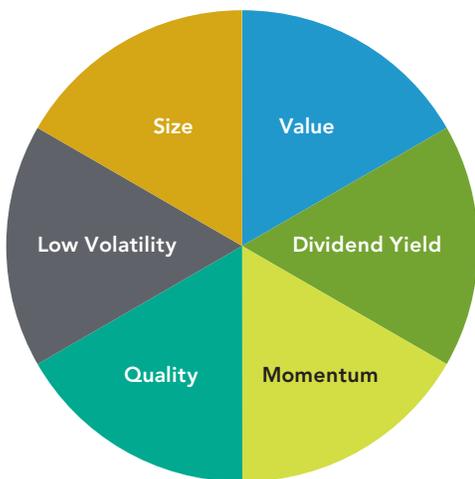
While the proliferation of factor-based investment strategies has been significant over the past 5 to 10 years,

many investors more familiar with a style-box or sector framework still do not use factors as building blocks for creating more diversified portfolios.

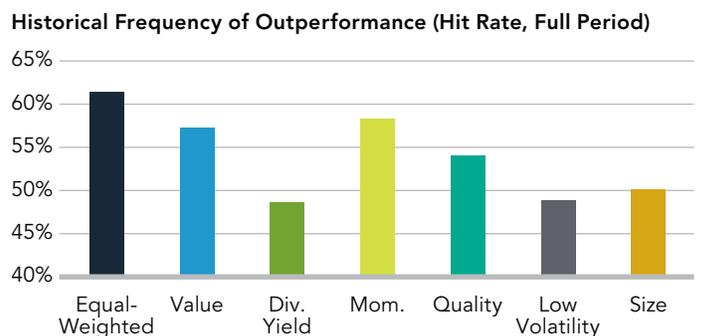
But a portfolio of six factors weighted equally—size, value, quality, momentum, low volatility, and dividend yield—can exhibit compelling results, with positive excess and higher risk-adjusted returns relative to the broader equity market (Exhibit 2). In fact, the portfolio outperformed by nearly 2% on average over the period studied, with a level of volatility almost in line with the broader market. The equal-weighted factor portfolio’s outperformance was also relatively consistent (more so than that of any single factor on its own), as shown by its hit rate, which indicates that the equal-weighted factor portfolio outperformed the market 61% of the time over the period studied. This consistent outperformance results from the characteristics of the six factors themselves as well as the enhanced diversification achieved by combining them.

**EXHIBIT 2: An equal-weighted combination of six factors is one approach to building a core equity portfolio, and has had more consistent returns than any single factor on its own.**

Equal-Weighted Factor Portfolio



	Excess Return	Volatility	Information Ratio
Equal-Weighted	1.9%	17.2%	1.08
Broader Market	–	17.3%	–



Throughout the article, hit rates are calculated monthly over the period studied (1986–2018). Source: FactSet, as of June 30, 2018.

Please see the appendix on page 7 for detailed results of the portfolios shown in Exhibits 2–5.

### Targeting specific investment outcomes with factor combinations

Exhibit 2 suggests that investors may achieve a superior core equity portfolio by simply weighting six factor exposures equally. By further adjusting individual factor allocations, investors can tailor portfolios to their own personal investing styles or desired outcomes. While there are countless ways to combine factors to create portfolios with varying characteristics, in this article we focus on three broad investment objectives, exploring potential factor combinations when targeting capital appreciation, downside protection, and income.

Note that the factor portfolios illustrated below are examples of how investors might consider combining factors, but are not intended to be recommendations of the best or only approaches to achieving those outcomes.

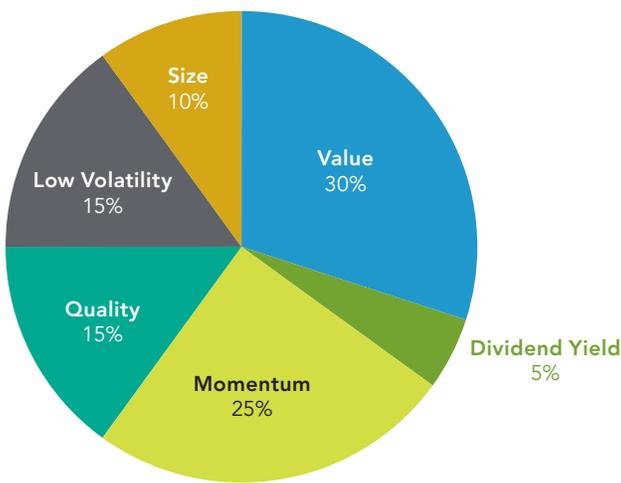
### Capital appreciation

As an example, long-term investors with a goal of capital appreciation may be seeking portfolio returns in excess of the equity market over longer time horizons. However, while higher returns may be the end goal, studies of investor behavior have proven how challenging it can be to withstand short-term portfolio drawdowns. Therefore, rather than targeting high absolute returns, a prudent approach to capital appreciation may be to seek superior risk-adjusted returns—to help investors stay the course during market downturns and ultimately outperform over the long term.

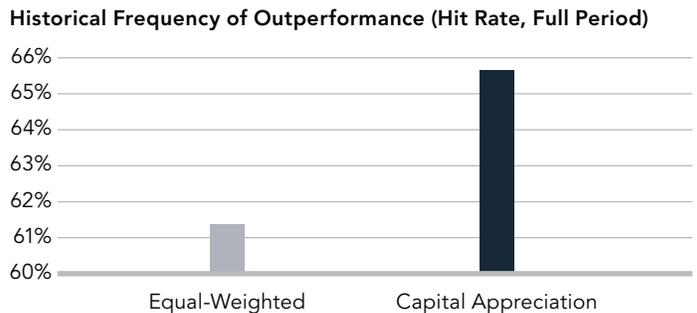
By taking the construction of a factor portfolio one step further, and adjusting the factor allocations to maximize historical risk-adjusted returns (as measured by the information ratio, or “IR”), a capital appreciation portfolio could look something like what is shown in Exhibit 3. This portfolio had higher risk-adjusted and absolute returns than the broader equity market.

**EXHIBIT 3: A combination of factors that targets superior historical risk-adjusted returns may benefit investors seeking capital appreciation.**

Capital Appreciation Portfolio



	Excess Return	Volatility	Information Ratio
Capital Appreciation	2.1%	17.2%	1.31
Broader Market	–	17.3%	–



Capital appreciation factor portfolio built to optimize for superior risk-adjusted returns (information ratio) over the period studied (1986–2018). All combined factor portfolios built using constraints to ensure a minimum 5% allocation to each factor. Source: FactSet, as of June 30, 2018.

Although the excess return is only slightly higher than the equal-weighted portfolio over the period studied, the capital appreciation portfolio's risk-adjusted returns were significantly higher.

Contributing to the portfolio's results were greater allocations to value and momentum, two factors with strong historical absolute and risk-adjusted returns. Combining value and momentum also provides diversification benefits. Because these two factors tend to be negatively correlated, exposure to both can help a portfolio fare better during changing market environments. Meaningful allocations to quality and low volatility—factors that capture companies deemed higher quality, with stable income and cash flows and better profitability—contributed to the portfolio's strong risk-adjusted returns and performance consistency (the portfolio outperformed the broader market nearly 66% of the time over the period studied).

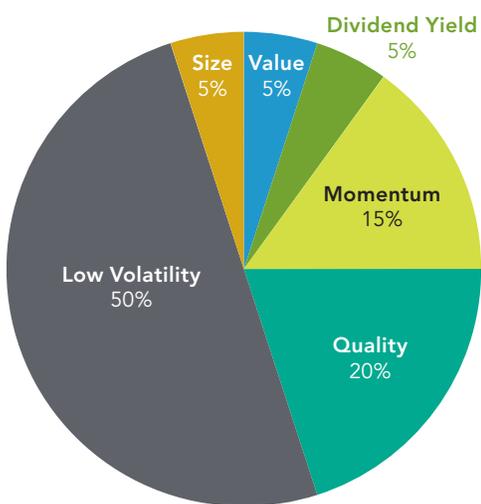
### Downside protection

For investors less willing to tolerate losses in their portfolios, reducing risk may be the driving force behind their investment decisions. Within the context of a multi-asset class portfolio, one important reason to allocate to fixed income is to help protect against equity downside risk. But factor combinations within the equity portion of a portfolio may also be adjusted to help manage risk.

Exhibit 4 illustrates a combined equity factor portfolio that outperformed the broader market during the majority of periods when equity markets were declining. The portfolio also had a higher frequency of outperformance during market downturns than both the capital appreciation and equal-weighted factor portfolios. The downside-protection portfolio has also exhibited lesser drawdowns; its worst 12-month performance over the period studied was -44%, compared with -51% and -50% for the equal-weighted and capital appreciation portfolios, respectively (see Appendix on page 7).

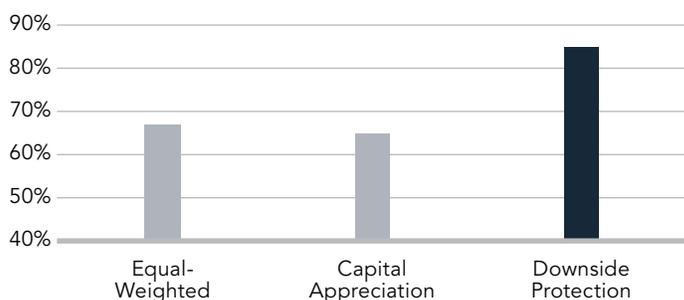
#### EXHIBIT 4: Factor combinations can be used to reduce risk, and create equity portfolios with lower volatility and lesser drawdowns.

Downside-Protection Portfolio



	Excess Return	Volatility	Information Ratio
Downside Protection	1.4%	15.2%	0.44
Broader Market	-	17.3%	-

#### Historical Frequency of Outperformance (Hit Rate, Down Periods)



Downside protection factor portfolio built to optimize for outperformance during months with negative stock market returns over the period studied (1986–2018). Source: FactSet, as of June 30, 2018.

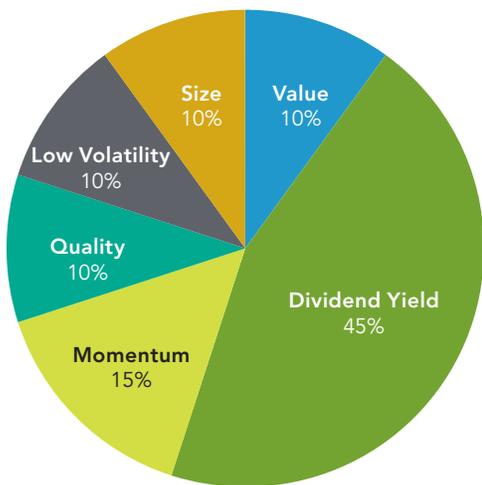
The increased allocations to the low-volatility and quality factors are noteworthy shifts from the capital appreciation and equal-weighted portfolios. As mentioned previously, exposure to stocks that have exhibited less historical volatility, with stable income and cash flows and higher profitability, tends to reduce the overall level of risk in an equity portfolio. Momentum provides some counterbalancing effects to the low-volatility and quality allocations, resulting in a more diversified portfolio. Note also that in addition to having lower volatility than the broader market (15.2% vs. 17.3%), the downside protection portfolio still outperformed over the long term.

**Income**

When investors enter retirement, their need to generate income from their portfolios often increases. Although not a “traditional” factor exposure used to enhance returns or reduce risk, high dividend yield is a characteristic of stocks often targeted by factor-based strategies.

**EXHIBIT 5: By combining factors, investors can build a dividend-income-producing portfolio that has also boasted strong absolute and risk-adjusted returns over time.**

Income Portfolio



Income factor portfolio built to optimize for realized dividend yield over the period studied (1986–2018). Source: FactSet, as of June 30, 2018.

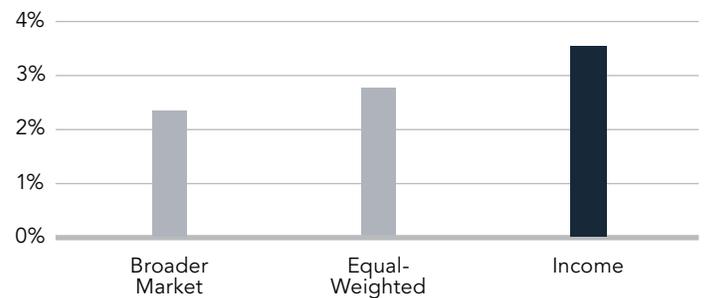
The income portfolio shown in Exhibit 5 was created to maximize realized dividend yield over the period studied. The portfolio had a markedly higher yield than both the broader market and the equal-weighted portfolio. A significant allocation to the dividend yield factor understandably increased the portfolio’s overall yield and also contributed to strong historical returns. The addition of momentum and size add diversification to the portfolio, and thus improve the portfolio’s risk-adjusted outcome (IR of 0.60), compared to both the broader market and the dividend yield factor alone (IR of 0.28).

**With factors, investors can build portfolios from the ground up or complement their existing holdings**

Academic research and empirical data support the merits of factors as portfolio building blocks. When combined, factors can help investors achieve a strong core portfolio or target specific outcomes. Factor combinations may also be

	Excess Return	Volatility	Information Ratio
Income	2.0%	17.1%	0.60
Broader Market	–	17.3%	–

**Dividend Yield**



used to complement an existing equity or multi-asset class portfolio. For example, investors may consider enhancing their portfolios by adding combinations of factors designed to improve risk-adjusted returns, reduce risk, or earn a

higher dividend yield. Factor combinations can be powerful portfolio construction tools to help investors target a variety of desired outcomes.

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## Appendix

	Full Period				Up Periods			Down Periods			Average Dividend Yield	Worst 12-Month Return
	Excess Return	Hit Rate	Volatility	Information Ratio	Excess Return	Hit Rate	Information Ratio	Excess Return	Hit Rate	Information Ratio		
Value	3.1%	57%	19.8%	0.61	5.9%	63%	1.21	-1.4%	47%	-0.27	2.8%	-58%
Dividend Yield	2.0%	49%	17.3%	0.28	-2.5%	42%	-0.41	9.0%	60%	1.07	5.2%	-57%
Momentum	2.1%	58%	17.2%	0.29	0.3%	58%	0.04	3.9%	59%	0.58	1.8%	-48%
Quality	1.5%	54%	16.8%	0.43	-0.1%	50%	-0.03	3.7%	60%	1.04	2.1%	-46%
Low Volatility	0.8%	49%	13.4%	0.13	-7.6%	27%	-1.58	14.4%	86%	2.88	2.8%	-38%
Size	0.6%	50%	23.5%	0.06	9.3%	60%	0.97	-11.1%	32%	-1.8	2.2%	-57%
Equal-Weighted	1.9%	61%	17.2%	1.08	0.9%	58%	0.69	3.0%	67%	1.33	2.8%	-51%
Capital Appreciation	2.1%	66%	17.2%	1.31	1.5%	66%	1.15	2.6%	65%	1.26	2.5%	-50%
Downside Protection	1.4%	55%	15.2%	0.44	-3.2%	37%	-1.10	8.3%	85%	2.93	2.6%	-44%
Income	2.0%	55%	17.1%	0.60	0.2%	50%	0.08	4.4%	64%	1.08	3.6%	-53%

Period studied: 1986–2018. Up (down) periods: months of positive (negative) stock market returns. Source: FactSet, as of June 30, 2018.

### Methodology

All factor portfolio returns shown are equal-weighted and sector neutral. Factor portfolios and indexes assume the reinvestment of dividends and exclude fees and other implementation costs. **Size** (small cap) returns are annualized returns of the equal-weighted bottom quintile (by market capitalization) of the Russell 1000 Index. **Value** composite returns shown are annualized returns of a combined average ranking of stocks in the equal-weighted top quintile (by book/price ratio) and stocks in the equal-weighted top quintile (by earnings yield) of the Russell 1000 Index. **Momentum** returns are annualized returns of the equal-weighted top quintile (by trailing 12-month returns) of the Russell 1000 Index. **Quality** returns are annualized returns of the equal-weighted top quintile (by return on equity) of the Russell 1000 Index. Return on equity is a measure of profitability that calculates how many dollars of profit a company generates with each dollar of shareholders' equity. **Low-volatility** returns are annualized returns of the equal-weighted bottom quintile (by standard

deviation of weekly price returns) of the Russell 1000 Index. Standard deviation is a measure of return dispersion. A portfolio with a lower standard deviation exhibits less return volatility. **Dividend yield** returns are annualized returns of the equal-weighted top quintile (by dividend yield) of the Russell 1000 Index.

### Glossary

**Excess return:** Return relative to the broader market (in this case, the Russell 1000 Index). A positive excess return denotes outperformance.

**Standard deviation:** A statistical measure of how much a portfolio's return varies over an extended period of time. The more variable (volatile) the returns, the higher the standard deviation.

**Information ratio:** A measure of risk-adjusted return that assesses a portfolio's returns in excess of a benchmark compared to the volatility of those returns. A higher information ratio denotes better risk-adjusted returns.



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**Investing involves risk, including risk of loss.**

**Past performance is no guarantee of future results.**

**Diversification and asset allocation do not ensure a profit or guarantee against loss.**

All indexes are unmanaged. You cannot invest directly in an index.

#### **Index definitions**

The Russell 1000 Index is a market capitalization-weighted index designed to measure the performance of the large cap segment of the U.S. equity market.

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