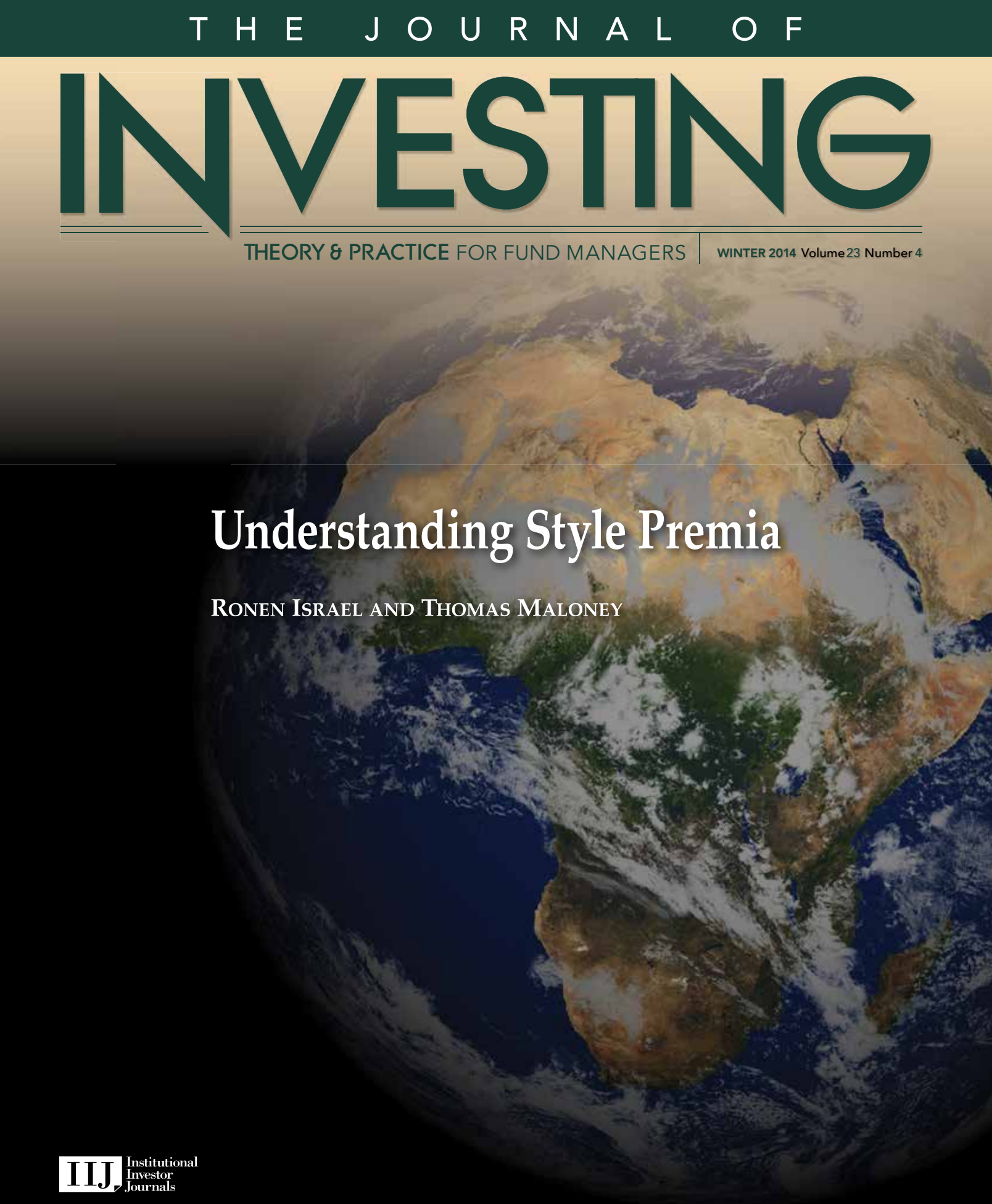
THE JOURNAL OF

INVESTING

THEORY & PRACTICE FOR FUND MANAGERS | WINTER 2014 Volume 23 Number 4



Understanding Style Premia

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Most portfolios, including the traditional global 60% stocks/40% bonds allocation, are dominated by equity risk. This proved especially painful during the 2008 global financial crisis as a typical 60/40 portfolio suffered a loss of more than 30%. Further, at current valuations, most investors recognize that traditional sources of returns, such as stocks and bonds, may not do as well in the future as they have in the past. Many investors have thus turned their attention to alternative sources of returns, specifically those with low correlations to traditional assets.

In this article, we focus on a set of alternative sources of returns we call "styles." A style is a disciplined, systematic method of investing that can produce long-term positive returns across markets and asset groups, backed by robust data and economic theory.[1]

Style investing has been most widely studied in stocks, with a classic example being the influential work of Eugene Fama and Kenneth French, who describe the cross-section of U.S. stock returns through two main styles, in addition to the market equity risk premium: value and size. Subsequent research by others added two more, namely momentum and low-beta (or low-risk). Research on value, momentum, and low-beta has been extended to international stocks as well as to other asset groups that include bonds, currencies, commodities, derivatives and REITS, with similarly strong results.[2] The last style, carry, was first applied in currencies as a powerful investment tool and more recently has been shown effective in many other contexts.

Why a market-neutral, multi-strategy approach? Style exposure can be achieved in a long-only portfolio, by overweighting securities with positive style attributes[3] (e.g., value stocks), and for many investors this approach is beneficial. However, we believe *a market-neutral portfolio is an even more efficient way to isolate the diversification benefits of these styles*. A multi-strategy approach seeks to offer further diversification benefits and saves on costs by incorporating any offsetting effects before trading.

PART I: WHAT ARE STYLE PREMIA?

Exhibit 1 lists four classic styles that have delivered persistent long-term performance across multiple, unrelated asset groups, in different markets, and in out-of-sample tests.

Value is probably the best-known of the four styles, especially in individual equities. For 30 years, value investing in stocks has been studied extensively, but implementation has generally been long-only, meaning investors were also directly exposed to equity market risk (in fact, market risk usually dominated the portfolio).

The market-neutral implementation of the value style can be straightforward. Take a set of stocks and sort them by some measure of fundamental value to price. Go long the stocks that are relatively cheap, and short the ones that are relatively expensive. A market-neutral value strategy applied across many assets can capture the aggregate return to value investing while seeking to diversify away the risk associated with individual stocks as well as market beta. The traditional choice of value measure is the ratio of the book value of a company relative to its price (B/P), but other measures can be used. For example, investors can also look at earnings, cash flows and sales relative to price. It is our view that more measures provide for more robust portfolios.

Applying these measures to equity country selection is straightforward: for example, an aggregate measure of B/P for the entire market can be used. Extending the value concept to bonds, currencies and commodities requires the use of measures that are not derived from accounting statements, but still retain the notion of fundamentals-to-price. For global bonds, a measure of real bond yields can be used, defined as the yield of a 10-year government bond minus forecasted inflation for the next 12 months. The "value style" in this case would be a portfolio that is long high real-yielding bonds and short low real-yielding ones. In the case of currencies and commodities, measures of purchasing power and 5-year price reversals, respectively, are related to value.

Academics still debate why value strategies have worked. Some explanations are rooted in investor behavior, such as over-extrapolating growth trends. Others are risk-based, like the possibility that value assets have greater default risk. Both sets of theories accord with economic intuition. Regardless of school of thought or explanation of the underlying intuition, the empirical evidence is powerful.

Momentum investing is an almost equally well-known style, supported by evidence that is as robust and pervasive as that behind value investing. Momentum investors buy recently outperforming assets and sell or go short recent underperformers. Since being documented in academia in the early 1990s among U.S. stocks, momentum has been studied extensively in many geographies and asset groups. The typical approach is to look at the past 12 months of returns for a universe of assets, going long the ones that have outperformed their peers and short the underperformers. By being long and short, the resulting portfolio can have little correlation to the market.

Similar to value investing, momentum investing does not need to be confined to a single measure. It has been shown that measures of fundamental momentum, such as earnings momentum, changes in profit margins, and changes in analysts' forecasts for stocks may also be useful in forming profitable portfolios.

As with value, there are risk-based and behavioral theories for why momentum investing has worked. Behavioral theories are the more persuasive, arguing that investor underreaction to news due to anchoring or inattention, subsequent overreaction to price moves, and herding may be prominent sources of momentum. In addition, the disposition effect, which is the tendency for investors to sell winners too soon and hold on to losers too long, may contribute to momentum.[4]

Carry investing is perhaps best known among currency traders. Carry is based on investing (lending) in higher-yielding markets or assets and financing the position by shorting (borrowing) in lower-yielding markets.

EXHIBIT 1

Four Classic Investment Styles

Value	*The tendency for relatively cheap assets to outperform relatively expensive ones*
Momentum	*The tendency for an asset's recent relative performance to continue in the near future*
Carry	*The tendency for higher-yielding assets to provide higher returns than lower-yielding assets*
Defensive	*The tendency for lower-risk and higher-quality assets to generate higher risk-adjusted returns*

Source: AQR.

A simplified description of carry is the return an investor receives (net of financing) if prices remain the same. The classic application in currencies—going long currencies of countries with the highest interest rates and short those with the lowest—has been a profitable strategy over several decades. Likewise, carry strategies in fixed income and commodity futures (where backwardation, or the slope of the futures price curve, is exploited) have also been profitable over time. For stocks, carry is the dividend yield, which is closely related, but not identical, to value. Moreover, carry is meaningfully different than value in other asset groups.

The economic intuition behind carry is that it balances out supply and demand for capital across markets. High interest rates can signal an excess demand for capital not met by local savings; low rates suggest an excess supply. Traditional economic theory would argue that, in the case of currencies, these rate differentials would be offset by currency appreciation or depreciation, such that investor returns would be the same across markets, but the evidence suggests otherwise. This may be due to the presence of non-profit-seeking market participants, such as central banks and corporate hedgers, introducing inefficiencies to currency markets and interest rates.

The strategy is not without risk, as there can be instances when capital flees to low-yielding "safe havens." The positive performance over the long term could be compensation for these potential losses in bad economic environments. However, and importantly, those risks can be mitigated in a portfolio where carry is applied across many asset groups. The concept of carry, when applied more broadly across asset groups beyond currencies, is a clear example of how diversified style investing can potentially generate more attractive risk and return characteristics.

Defensive or low-risk strategies have experienced a resurgence in recent years. The concept dates back to Fischer Black, who in 1972 noticed that high-risk assets didn't offer high-enough returns relative to low-risk peers.

In the case of stocks, one can sort by forecasted betas and go long the stocks with the lowest betas and short the ones with the highest betas. By holding somewhat smaller short positions in the higher-beta stocks to equalize the short portfolio's beta with the long side, a portfolio should retain its market neutrality, while seeking to capture the tendency for lower-beta stocks to offer a better risk-adjusted return than the higher-beta stocks.

Defensive strategies may extend the low-risk concept more broadly to include more fundamental measures of risk—or conversely "quality"—by seeking high profitability, low leverage, and stable earnings among stocks. Subsequent research suggests that this phenomenon can be extended to markets and asset groups beyond stocks. For example, in fixed income, one defensive strategy is to buy short-duration bonds and offset the interest rate exposure by selling long-duration bonds.

There are a number of theories for why lower-risk assets may offer higher risk-adjusted returns. We believe the most compelling is that lower-risk assets require leverage to raise the overall risk and return expectations. Since most investors are leverage-averse or leverage-constrained, they typically choose to hold the higher-risk assets, thereby lowering the prospective returns for those assets. As a result, an investor who is willing to take the other side of that trade and hold the levered, lower-risk asset may be well-rewarded in the long run.[5]

PART II: THE EVIDENCE FOR STYLE PREMIA

In this section we present evidence for style premia during the period January 1990 to June 2013 (evidence for individual styles can be found much further back, where data allows). We apply market-neutral style strategies across six different asset groups, as shown in Exhibit 2. Stock selection strategies are applied both within and across industries. Asset group weights are chosen to balance breadth, capacity and liquidity considerations. The investment universe is chosen to maximize diversification benefits while focusing exclusively on liquid assets, leaving out illiquid segments of traditional assets (e.g., small-cap stocks and non-government bonds).

For each style strategy we develop a set of measures that define the style in a straightforward manner. For example, in the case of stocks, we use five well-known measures of value: book-to-price, earnings-to-price, forecasted earnings-to-price, cash flow-to-price and sales-to-enterprise value (an adjusted measure of price). In other asset groups and for other styles we similarly use several intuitive measures for the sake of robust-

ness. The choices are intended to achieve the purest measures of each style, while maintaining transparency and clarity.

Exhibit 3 presents the performance results of simulations of the diversified style premia portfolios, highlighting the positive risk-adjusted returns (Sharpe ratios ranging from 0.9 to 1.3) and ability to diversify away from equity-directional risk (correlations to global equities ranging from approximately -0.1 to 0.2). All strategies are scaled to 10% volatility for ease of comparison. Each style is a composite measure of various indicators of that style, applied across the six asset groups we consider.

Exhibit 3 also presents the correlations of the various style premia to each other. Note that the styles provide a significant amount of diversification to each other. In particular, the correlation between value and momentum is −0.6, indicating the two styles are powerful diversifiers of each other while still both having long-term positive risk-adjusted returns. The other correlations are very close to zero, with the most-positive correlation, between momentum and carry, of only 0.22.[6]

Exhibit 4 presents the Sharpe ratios of the styles broken out by asset group as well as a composite that combines the groups by the weights shown in Exhibit 2.[7] The Sharpe ratios largely range from 0.3 to 0.9, with only two being slightly negative. As the table shows, there is pervasive evidence across many asset groups of the efficacy of these four styles.

PART III: BUILDING A STYLE PREMIA PORTFOLIO

Although the intuition behind the styles is relatively straightforward, considerable judgment and experience are required to implement a portfolio that both efficiently captures returns and effectively manages risk.

Diversification is one of the key elements in style premia portfolio design: the styles naturally diversify each other, which can help provide stronger and more consistent performance. While some style-asset pairs appear stronger than others over our sample period, we believe that the long-term efficacy of the composite styles is sufficiently similar that our aim is to build a well-balanced, diversified portfolio and not to strategically over- or under-weight certain styles. In our view, the decision to over- and under-weight styles must be weighed against the real danger of data mining.

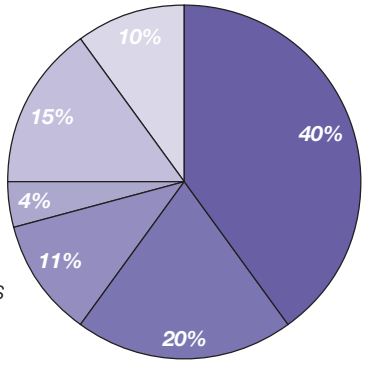
Beyond diversification, skillful portfolio construction and cost-effective execution are critical. When combining the building blocks, we employ portfolio design features including diversification by risk, so that no single style contributes disproportionately; and volatility targeting, reacting to changes in market volatility so that the amount of risk taken from month to month is more consistent.

Additional risk management tools include drawdown control, which seeks to cut risk systematically when the portfolio suffers drawdowns and/or the short

EXHIBIT 2

Investment Universe and Asset Group Weights[8]

Stocks & Industries	1,500 stocks across major markets
Country Equities	20 indices from developed and emerging markets
Bonds	10-year bond futures in 6 markets
Interest Rate Futures	Short-term interest rate futures in 5 markets
Currencies	19 currencies in developed and emerging markets
Commodities	8 commodity futures

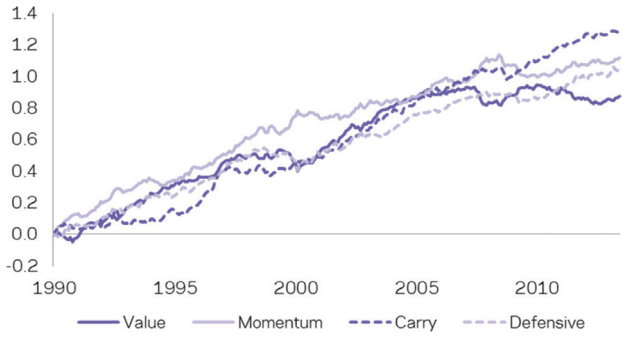


Source: AQR.

EXHIBIT 3

Market-Neutral Style Simulations 1990–2013[9]

	Value	Momentum	Carry	Defensive
Annual Excess Return	9.1%	11.5%	13.0%	10.8%
Volatility	10.0%	10.0%	10.0%	10.0%
Sharpe Ratio	0.91	1.15	1.30	1.08
Correlation to Equities	0.02	–0.05	0.22	–0.15
Cross Correlations				
Value	1.00			
Momentum	–0.59	1.00		
Carry	–0.10	0.22	1.00	
Defensive	–0.04	0.12	–0.02	1.00



Source: AQR. Graph reports cumulative returns.

EXHIBIT 4

Potential Benefits of Diversifying Across Asset Groups

Hypothetical Sharpe Ratios by Asset Group 1990–2013.

	Value	Momentum	Carry	Defensive
Stocks & Industries	0.74	1.03		1.03
Equity Country Selection	0.56	0.46		0.41
Bond Country Selection	0.36	–0.01	0.85	0.12
Interest Rate Futures	0.64	0.84	0.57	
Currencies	0.39	0.66	0.76	
Commodities	–0.03	0.78	0.75	
Composite	**0.91**	**1.15**	**1.30**	**1.08**

Source: AQR.

term tail-risk of the portfolio increases. Importantly, drawdown control is a discipline that works both ways: as performance recovers, portfolio risk systematically returns to long-term targets. Finally, style investing takes a dynamic approach, so efficient implementation is key. In practice, investors may seek to control costs by combining signals before trading (so opposite trades from offsetting styles are not executed unnecessarily), avoiding excessive turnover and trading using algorithms that seek to provide rather than demand liquidity.[10]

To illustrate the potential benefits of diversification and skillful portfolio construction, we simulate a portfolio that is roughly equally weighted (in risk terms) across the four styles, following the weighting scheme in Exhibit 2 for asset groups. Exhibit 5 presents summary statistics for this multi-style composite portfolio, showing the attractive, uncorrelated returns that can be obtained by combining all four styles into one portfolio.

The performance shown in the first column (Sharpe ratio in excess of 2) is likely too high to be the basis of return expectations.[11] The second column represents a more realistic portfolio that applies conservative estimated transaction costs and further heavily discounts the Sharpe ratio to adjust for any upward biases that might be present in the results. This more realistic portfolio maintains the characteristics of the four style premia and the composite, historically still providing attractive risk-adjusted returns (Sharpe ratio close to 1) with little correlation to traditional assets.

PART IV: STYLE PREMIA AS A PORTFOLIO DIVERSIFIER

The broad style portfolio itself is highly diversified, but it is more important to many investors that it serves as an effective diversifier for their own portfolios. We examine the correlation of the market-neutral style premia portfolio to traditional portfolios as well as to alternatives such as hedge funds. The correlation between the style premia portfolio and a traditional 60/40 portfolio in global stocks and bonds is 0.02 on average—essentially zero.[12] The correlation between the style premia portfolio and the Credit Suisse Hedge Fund Index is higher, but still only 0.16 on average. Hence, style premia can provide low correlations to both traditional portfolios and other alternative investments, making them an attractive diversifier to most existing traditional—and alternative—portfolios.

To illustrate the potential benefits of style investing as a diversifier, Exhibit 6 shows the impact of allocating pro-rata away from the 60/40 portfolio into the style adjusted composite (net of trading costs and discounting). As the exhibit shows, the Sharpe ratio rises sharply as more style exposure is added, suggesting that an allocation to a broad style composite

EXHIBIT 5

Style Premia Composite Simulations 1990–2013[13]

	Raw Composite	Adjusted Composite
Annual Excess Return	25.9%	10.2%
Volatility	10.0%	10.0%
Sharpe Ratio	2.59	1.02
Correlation to Equities	–0.03	0.01

Source: AQR.

EXHIBIT 6

Hypothetical Impact of Adding a Style Premia Portfolio to Global 60/40 1990–2013

	Global 60/40	+10% Styles	+20% Styles	+30% Styles
Annual Return	6.7%	7.4%	8.1%	8.8%
Volatility	9.5%	8.6%	7.9%	7.3%
Sharpe Ratio	0.34	0.46	0.59	0.73

Source: AQR. Global 60/40 is 60% MSCI World Index, 40% Barclays Global Aggregate Hedged Index.

may improve performance and may reduce risk exposure significantly.

CONCLUSION

Although equity and bond premia are often considered to be the most reliable sources of long-run returns, we believe most investors over-rely on them. In a world with multiple sources of returns, we believe there are better ways to construct portfolios. We believe the most reliable way to sustained investment success involves cost-effectively harvesting multiple, independent return sources, including long-only market premia (such as stocks and bonds), style premia, and other forms of alternative risk premia (including hedge fund risk premia).

Although the evidence in favor of styles has existed in academia for some time, styles have rarely been pursued in their purest form, and as multi-asset, market-neutral, multi-strategy investments. As a result, investors often view each style premium separately and may chase returns across styles as their performance varies, failing to appreciate the potential diversification benefits of combining different styles (and often overpaying in costs and fees for investments that may offset each other). Just as multi-strategy alternatives seek to benefit from diversification across strategies to provide investors more consistent out-performance, so can a combination of styles.

We believe that styles can provide what many investors are looking for: a source of returns that is largely independent of traditional risk factors and still diversifying to classic alternative strategies. With the advent of market-neutral style daily-liquidity strategies, investors may have another tool for reaching their return objectives.

ENDNOTES

The views and opinions expressed herein are those of the authors and do not necessarily reflect the views of AQR Capital Management, LLC and its affiliates.

We thank Cliff Asness, Jennifer Buck, April Frieda, Georgi Georgiev, Marco Hanig, Antti Ilmanen, Sarah Jiang, Bryan Johnson, David Kabiller, Johnny Kang, John Liew, Jason Mersey, Tobias Moskowitz, Rodney Sullivan, and Dan Villalon for helpful comments and suggestions.

[1]For a more in-depth study of style investing, see Asness, Ilmanen, Israel, and Moskowitz (2014) and Ilmanen, Israel, and Moskowitz (2012).

[2]Size, on the other hand, has not proven as robust, can't be easily applied across other asset groups, and often entails betting on illiquid securities.

[3]See Frazzini, Israel, Moskowitz, and Novy-Marx (2013).

[4]See Moskowitz (2010).

[5]Frazzini and Pedersen (2011a).

[6]Exhibit 3 shows correlations between style strategies applied across asset groups. Low correlations are also evident between styles within each asset group, and between asset groups (not shown).

[7]The five empty spaces in the table are due to either extreme overlap with other strategies or difficulty in applying the style concept. For example, dividend yield strategies apply the carry concept to equities, but because these strategies are so similar to equity value strategies, we decided to exclude them. The lack of defensive strategies for interest rate futures, currencies, and commodities is because it is difficult to apply the low-beta or quality concepts in these markets.

[8]Universe includes approximately 1500 stocks across Europe, Japan, U.K., and U.S. markets; equity index futures for Australia, Brazil, Canada, China, Eurozone, France, Germany, Hong Kong, India, Italy, Japan, Netherlands, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, U.K., and U.S.; government bond futures for Aus-

tralia, Canada, Germany, Japan, U.K., and U.S.; interest rate futures for Australia, Canada, Europe (Euribor), U.K., and U.S.; currency forwards for Australian Dollar, Brazilian Real, British Pound, Canadian Dollar, Euro, Indian Rupee, Japanese Yen, Mexican Peso, New Taiwan Dollar, New Zealand Dollar, Norwegian Krone, Polish Zloty, Russian Rouble, Singapore Dollar, South Korean Won, Swedish Krona, Swiss Franc, Turkish Lira and U.S. Dollar; commodity futures for Silver, Copper, Gold, Crude, Brent Oil, Natural Gas, Corn, and Soybeans.

[9]Each strategy shown in Exhibit 3 and Exhibit 4 is designed to take long positions in the assets with the strongest style attributes and short positions in the assets with the weakest style attributes, while seeking to ensure the portfolio is market-neutral. Results are presented gross of fees and transaction costs. Strategies are scaled to 10% volatility for ease of comparison.

[10]See Frazzini, Israel, and Moskowitz (2012).

[11]Even if every researcher individually is careful about not overfitting, or data mining, the general field of study may still contain some overfitting biases due to the focus on studies that yield the most significant results. Apart from overfitting concerns, it may be argued that when factors become well known, or the costs of accessing them fall, their prospective returns decline.

[12]This correlation would be meaningfully higher, and thus less diversifying, in a long-only strategy which tilted towards styles.

[13]Raw composite is based on simulations that are gross of fees and transaction costs. Adjusted composite is based on simulations that are net of estimated transaction costs and discounted to adjust for any upward biases. Strategies are scaled to 10% volatility for ease of comparison.

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