

## RAFI® Fundamental US Style Index Series

### Introduction

Size, style, and size–style combination indices are popular choices for investors desiring the benefits of passive index investing while seeking to capture empirically observed risk premia associated with size and style index strategies. In this asset allocation approach, an investor with *ex ante* opinions about a certain size or style (or a combination thereof) performance can gain exposure to such size–style tilts by investing in the indices associated with the desired size or style “box.”

Traditionally, the size–style index options have been capitalization-weighted indices. While cap-weighted indices are good representations of market performance, non-price indices such as the Fundamental Index® methodology, have attractive benefits for investors desiring passive exposure to markets or segments of markets.<sup>1</sup> Stocks, just like other assets, are often mispriced. Popular stocks are often overvalued, and stocks that have recently fallen out of favor are often undervalued. If stock prices are the sum of an (unknown) fair value plus an error, then an index that links the weights in the portfolio to stock price will systematically overweight the overvalued stocks and underweight the undervalued stocks. Over a long investment horizon, this systematic over- and underweighting will induce a return drag—the negative returns realized when overvalued (and overweighted) stocks correct, and undervalued (and underweighted) stocks appreciate. Arnott, Hsu, and Moore (2005) show that if stock prices have errors, valuation-indifferent strate-

gies outperform cap-weighted indices. Hsu, Kalesnik, and Surti (2011) find that using a simple non-price-weighted approach to style indices would result in more efficient exposures to the underlying desired style.<sup>2</sup>

Research Affiliates has designed a suite of size–style indices modeled on the Fundamental Index concept. These indices are designed to incorporate the attractive attributes of the Fundamental Index methodology into a pure—that is, without overlap—size–style suite of indices. Our research shows that these indices have attractive investment characteristics. This note summarizes the innovative design and performance characteristics of the new style index series.

### Index Construction

The RAFI Fundamental US Style Index Series partitions the largest 2,500 U.S. companies (as measured by their fundamental weight) into nine style boxes defined by three size tiers and three style groups. The fundamental weights are defined using the Fundamental Index methodology, which selects and weights companies by their economic size or fundamental factors rather than market capitalization. Specifically, five-year moving averages of sales, dividends, and cash flow, and the latest available book value are used to weight companies. Securities which have a substantially different fundamental weight relative to their market cap weight are excluded.

The three size tiers are defined as follows: the bottom 10% are classified as small, the next 20% are classified as mid, and the top 70% are classified as large.

<sup>1</sup>For a review of several non-price weighted methodologies and a summary of their performance characteristics, see Tzee-man Chow, Jason C. Hsu, Vitali Kalesnik, and Bryce Little. 2011. “A Survey of Alternative Equity Index Strategies.” *Financial Analysts Journal*, Forthcoming.

<sup>2</sup>See Jason C. Hsu, Vitali Kalesnik, and Himanshu Surti. 2010. “An Examination of Traditional Style Indices.” *Journal of Index Investing*, vol. 2, no. 2 (Fall):14–23.

The 2,500 companies are also partitioned into three style bins: value, core, and growth. The style bins are defined by style scores.

Style scores are calculated as the difference between a company's composite growth score and its composite value score. The composite growth score is computed for each company as the average of its four factor growth rates. For each company, factor growth rates are computed as the average of the year-on-year percentage changes in sales, cash flow, dividends, and book value (change between latest and previous values only). For example, the sales growth factor is the average of past five-year percentage change in sales. This yields four growth factors for sales, cash flow, dividends, and book value.

The composite value score is computed for each company as the average of its four fundamental ratios. For each company, factor valuation ratios are computed as the five-year averages of the four fundamental factors, with each factor value divided by current equity market value (five-year average sales-to-price, etc.).

A company's final style score is the difference between its composite growth score and its composite value score. Thus, a positive style score denotes a growth stock, whereas a negative style score denotes a value stock, with core stocks toward the middle of this gradient. If a company pays no dividends over the relevant five years, then its composite growth and value scores are computed as the average of the percentile ranks of the other three factors.

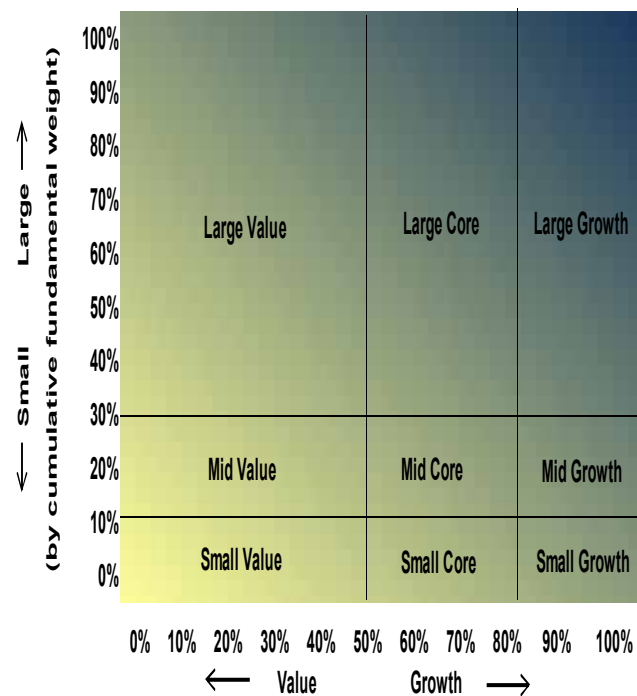
The universe is then sorted by descending style scores. The top 20% of cumulative fundamental weight comprises the growth bin, the next 30% comprises the core bin, and the bottom 50% comprises the value bin. This dual-sorting by size and style yields nine unique indices.

**Figure 1** visually illustrates the size-style apportioning of the indices.

## Performance

The performance of the RAFI Fundamental US Style Index Series relative to the comparable cap-weighted benchmark indices shows value-add consistent with other Fundamental Index series results. In the following comparisons, we compare RAFI style portfolios with Russell style indices as the latter provide the longest history (since 1986) of existing style index series. RAFI style indices parse stocks among value, growth and core portfolios, with no stock appearing in more than one portfolio. In contrast, Russell core portfolios assign growth and value weights to each stock, so the

**Figure 1. RAFI Fundamental US Style Index Construction**



Source: Research Affiliates, LLC.

stock is weighted proportionately in both the growth and value index. Thus, a stock with a 20% weight in a Russell value index will have an 80% weight in the same Russell growth index.<sup>3</sup> As a result, RAFI style portfolios contain fewer holdings, especially for the growth and core portfolios. A summary of the value-add for each of the nine style boxes is presented in **Table 1**.

**Table 2** presents the annual return, annual volatility, and Sharpe ratio statistics for each component of the RAFI Fundamental US Style Index Series versus the benchmark Russell style indices. RAFI portfolios outperform their cap-weighted counterparts with the exception of the large-core portfolio. We attribute the lack of outperformance of the core strategy to differences in the spanned universes: in the RAFI® portfolios, most of the value

<sup>3</sup>Russell U.S. Equity indexes Construction and Methodology." 2011. <http://www.russell.com/indexes/documents/Methodology.pdf>.

**Table 1. Index Value Add vs. Russell Style Portfolios**

	Growth	Core	Value
Large	1.77%	-0.39%	2.62%
Mid	1.17%	0.08%	1.73%
Small	3.93%	4.57%	4.44%

*Note:* Time period 1986-March 2011.

*Source:* Research Affiliates, LLC, based on data from Bloomberg.

stocks have been removed, while they are retained in the respective Russell universes. Value added in the cases of value and growth portfolios are between 1.2% and 2.6% per year for large- and mid-size indices and between 3.9% and 4.4% per year for small ones. The RAFI style indices also enjoy better Sharpe ratios with the exceptions of the core portfolios. However, the core portfolios have slightly lower volatility and, thus, have Sharpe ratios on par with those of traditional style indices.

The relative positions of various style indices along the size and value spectrum are shown in **Figure 2**. Admittedly, from a market-capitalization perspective, a

**Table 2. RAFI Style Portfolios vs. Russell Style Portfolios**

		Large			Mid			Small		
		Growth	Core	Value	Growth	Core	Value	Growth	Core	Value
RAFI Styles	Annual Return	10.9%	9.2%	12.5%	11.9%	12.0%	13.8%	11.2%	13.9%	15.4%
	Annual Volatility	17.2%	14.7%	16.5%	18.9%	17.1%	18.3%	20.9%	18.3%	20.7%
	Sharpe Ratio	0.40	0.35	0.51	0.42	0.46	0.53	0.34	0.54	0.55
Russell Styles	Annual Return	9.1%	9.6%	9.9%	10.7%	11.9%	12.1%	7.2%	9.3%	11.0%
	Annual Volatility	17.5%	15.7%	15.2%	21.4%	17.3%	16.4%	23.4%	20.0%	17.7%
	Sharpe Ratio	0.29	0.35	0.38	0.31	0.45	0.49	0.14	0.26	0.39
RAFI vs. Russell	Value Added	1.8%	-0.4%	2.6%	1.2%	0.1%	1.7%	3.9%	4.6%	4.4%
	Tracking Error	5.9%	5.7%	5.5%	9.4%	5.9%	5.1%	8.1%	6.2%	7.4%
	Information Ratio	0.30	-0.07	0.47	0.12	0.01	0.34	0.48	0.73	0.60

*Note:* Time period 1986-March 2011.

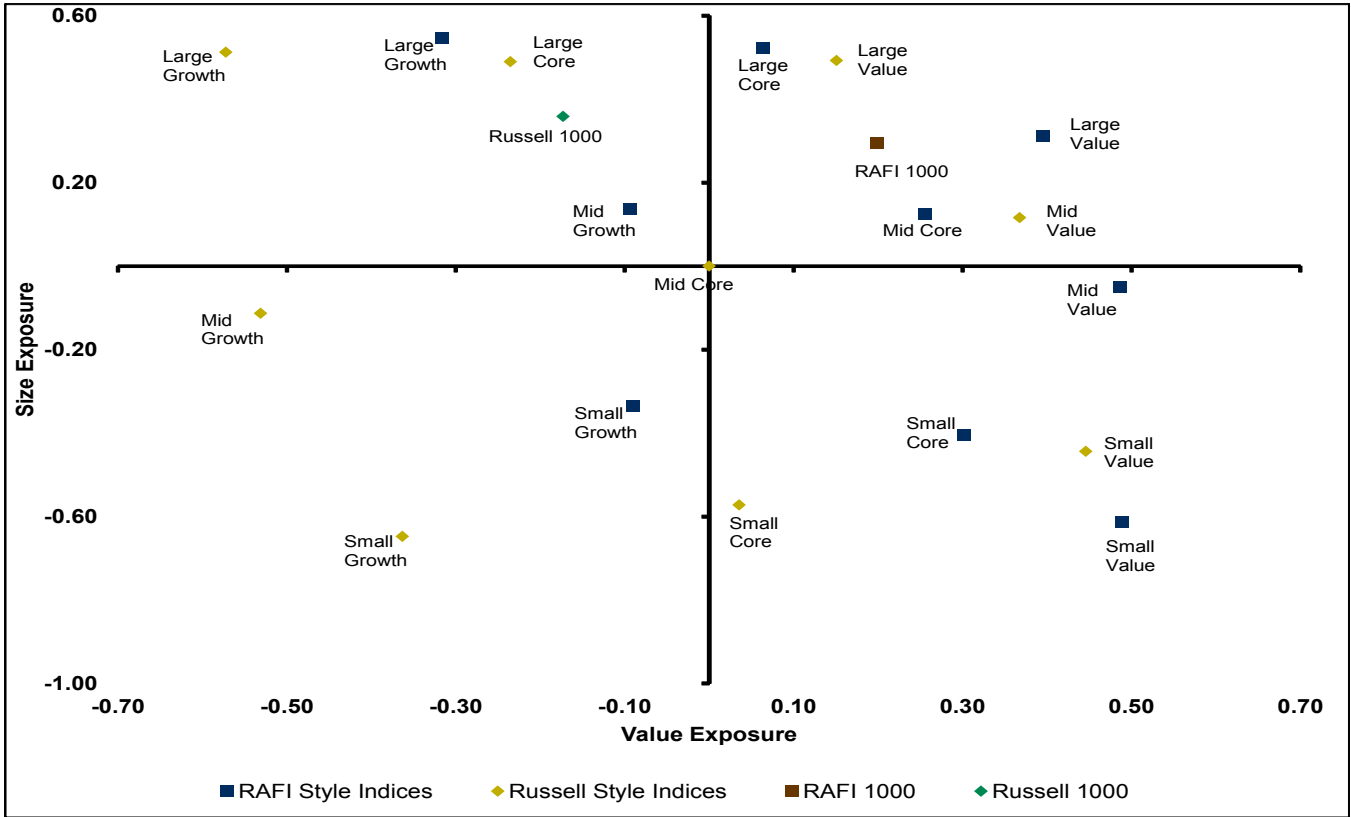
*Source:* Research Affiliates, LLC, based on data from Bloomberg.

RAFI style index has a higher value-tilt compared to its Russell counterpart. Any index construction methodology that weights components by fundamentals instead of market capitalization (price) will naturally show a value tilt. This pronounced value tilt reflects the fact that high P/E stocks will generally get a lower weight, and low P/E stocks will get a higher weight when an index is weighted by economic measures of size rather than by price. Conversely, from a price-independent perspective, it can be argued that cap-weighted style indices exhibit a pronounced growth tilt.

**Conclusion**

Mispricing is the biggest driver of cross-sectional differences in stock performance. Traditional cap-weighted indices overweight overpriced stocks and underweight underpriced stocks. The Fundamental Index methodology removes the link between the prices and portfolio weights. As with our general indices, the RAFI methodology offers a better performing set of style indices than their traditional counterparts. Thus, a non-price-weighted methodology offers improved tools for investors who use style indices for asset allocation purposes.

**Figure 2. Size–Style Chart**



Note: Time period 1986–March 2011.  
 Source: Research Affiliates, LLC.

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