

Benefits of fundamentally weighted indexes in less efficient markets

Key benefits:

- Historically delivered excess index return over time relative to the market cap-weighted counterpart in all global market segments, with the greatest outperformance in the least-efficient markets.
- Historically achieved improved risk-adjusted index returns and greater upside returns than downside losses, with moderate tracking error relative to the cap-weighted counterpart.
- May serve as a way to diversify index-based investments and complement both cap-weighted indexes and actively managed strategies in investor portfolios.

Fundamentally weighted indexing has emerged in recent years as one of the more widely adopted alternatively weighted “smart beta” strategies. The Russell Fundamental Index Series was developed in collaboration with Research Affiliates[®] and utilizes the Fundamental Index methodology.¹ The Russell Fundamental Index[®] Series offer investors a way to diversify their index-based strategies and can serve in investment portfolios as complements to both traditional market cap-weighted indexes and actively managed portfolio strategies. A wide range of investment products such as exchange-traded funds (ETFs) and mutual funds are based on the Fundamental Index methodology.

The Fundamental Index approach anchors constituent weights to economic measures of company size, such as sales, cash flow and dividends plus buybacks.

¹ A detailed documentation of the construction methodology of the Russell Fundamental Index series is available on the Russell Investments website at <http://www.russell.com/documents/indexes/construction-methodology-fundamental-indexes.pdf>.

This approach breaks the link with price in determining the weights of index constituents and helps avert the systematic overweighting of overvalued securities and underweighting of undervalued securities that represents a potential performance drag for market cap-weighted indexes.

Research conducted by Russell and others has shown that relative to their cap-weighted counterparts, fundamentally weighted indexes have often delivered improved risk-adjusted returns over time while retaining the benefits of indexing such as transparency, diversification, high capacity, liquidity and relatively low implementation costs.² This research has found that fundamentally weighted indexes have delivered excess returns across asset classes, geographies and time periods, with the largest excess returns in the least-efficient market segments, such as small cap and emerging markets.

The first half of this paper examines inefficiencies in small cap and emerging markets and how fundamentally weighted indexes may take advantage of these frictions. The second half examines historical performance characteristics for a handful of the Russell Fundamental Index component indexes relative to those of their cap-weighted counterparts.³

Inefficiencies in small cap and emerging markets

The inclusion of allocations to segments such as small cap and emerging markets in a global multi-asset-class portfolio has been shown to provide diversification and enhanced return benefits over time.⁴ Inefficiencies in these market segments have been exhibited in such characteristics as lower levels of analyst coverage, greater earnings variability, wider dispersion among constituent returns and lower liquidity relative to large cap developed markets.

Along with various behavioral tendencies among investors, such as herding, under- and over-reaction to news reports and other biases, these frictions can lead to inefficiencies in securities pricing. Research has shown that this pricing “noise” represents a performance drag on cap-weighted portfolios and tends to be widest in magnitude in the least-efficient markets.⁵ Fundamentally weighted index methodologies represent a potential alternative and complement to active management for investors seeking to take advantage of these inefficiencies via rules-based-index products.

Lower levels of sell-side analyst coverage leads to less-efficient securities pricing

The numbers of analysts within a sub-segment of the global equity market can indicate the relative strength of opportunities for investors to exploit informational inefficiencies. The greater the number of analysts covering a particular stock or basket of stocks, the less likely it is that an investor will be able to glean unique insights about company or market valuations to the benefit of an equity portfolio.

² Arnott, R., J. Hsu and P. Moore (2005). “Fundamental Indexation,” *Financial Analyst Journal*, March/April; Goodwin, T., 2012, “The Russell Fundamental Index Series, An investment strategy,” *Russell Research*.

³ Our historical analysis takes into account back-tested simulations and actual returns after index inception on Feb. 24, 2011.

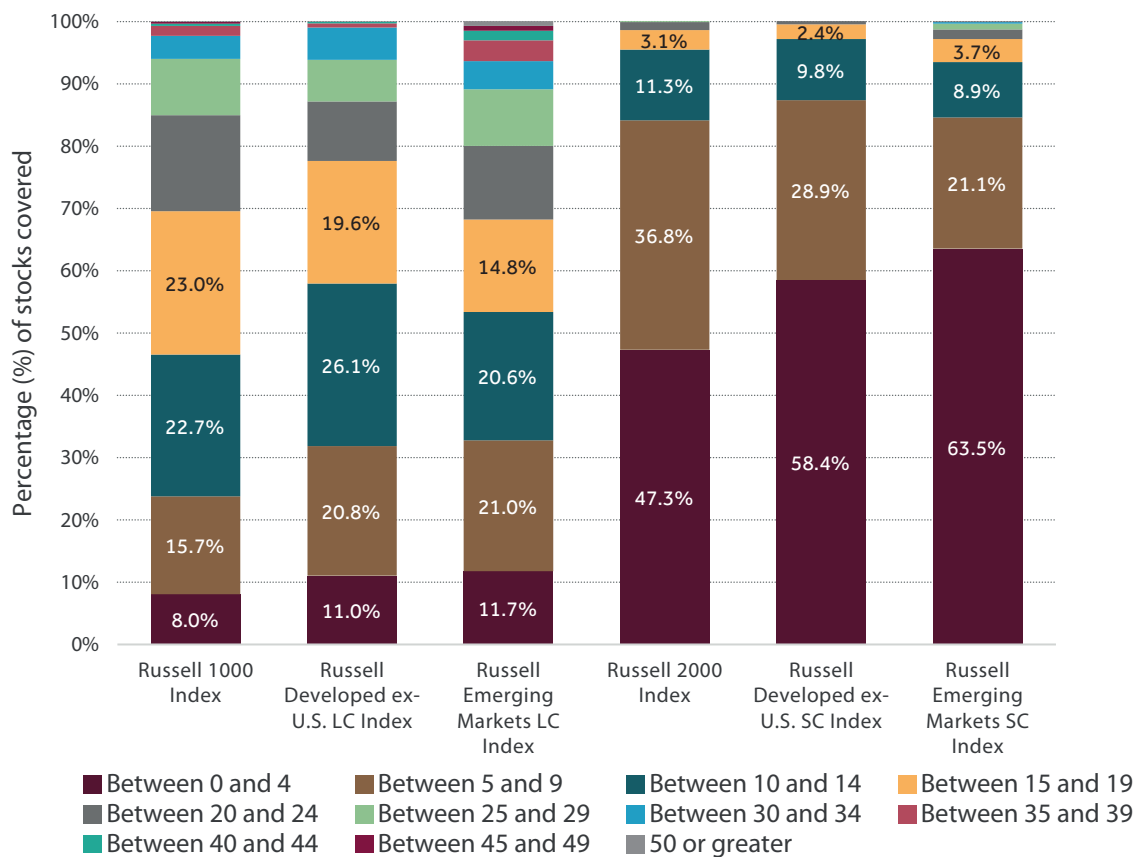
⁴ Fama, French, “The Cross-Section of Expected Stock Returns,” *Journal of Finance*, 1992; Fama, French, “Common Risk Factors in the Returns on Stocks and Bonds,” *Journal of Financial Economics*, 1993; Tokat and Wicas, “Investing in Emerging Stock Markets,” *Journal of Wealth Management*, Fall 2004; Da Silva, “The case for emerging markets and regional versus global management considerations,” *Pensions*, Vol. 14, 2009.

⁵ Arnott, R., S. Shepherd (2010). “The Fundamental Index® Concept in Emerging Markets,” Research Affiliates, LLC.

Figure 1 shows percentages of market segments covered by quintiles of analysts as of late 2013. Global large cap market segments have significantly more analyst coverage than their corresponding small cap segments, suggesting greater informational inefficiencies among small caps. Large caps in emerging markets generally have less analyst coverage than large caps in developed markets.

Lower levels of analyst coverage in many small cap and emerging markets result in more noise and less reliability in securities pricing. If markets are not deemed perfectly efficient and if securities are over- or underpriced, then cap weighting may not always reflect the true value (size) of a company in an index. Investors may “load up” on the most heavily covered companies, leading to overpricing and overweighting of the most visible stocks in the cap-weighted index, while less visible stocks may be underpriced and underweighted. By ignoring valuations when setting constituent weights, fundamentally weighted indexes avoid the tendencies of cap-weighted indexes to overweight overvalued securities and underweight undervalued securities.

Figure 1. Analyst coverage



Sources: FactSet, Russell Indexes as of Nov. 30, 2013

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Relatively higher earnings variability means more potential overreaction to news reports

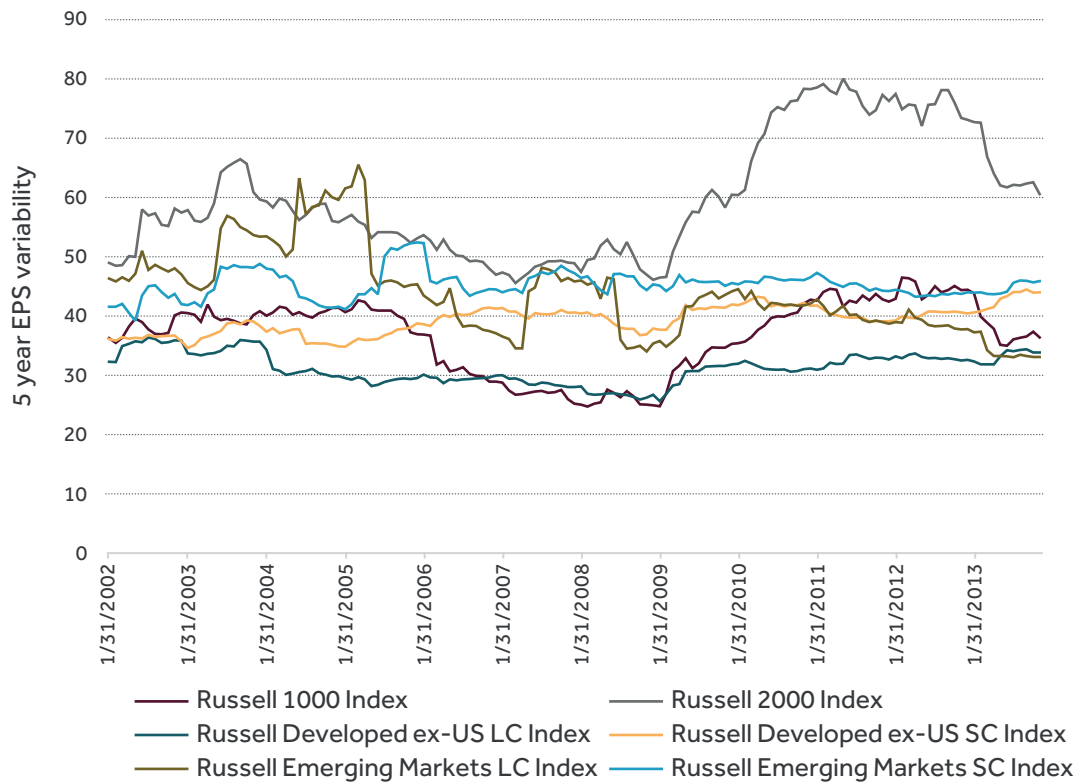
More earnings variability among small caps than among large caps is a trait that persists across regions. As shown in Figure 2, in the U.S., non-U.S. developed

countries and, now, emerging markets, earnings among small cap companies have fluctuated more than those among large cap companies. This makes intuitive sense, as the smaller companies tend to be relatively “younger” in their business life cycles – some are able to respond more nimbly to emerging opportunities, while others fail to readily, or ever, find their footing.

It is both the promise that some high-growth companies will thrive and the risk that some will falter or fail that have historically contributed to a small cap return premium. Emerging markets large cap has also historically exhibited relatively high levels of earnings variability, although that has moderated more recently. Higher earnings variability in small cap and emerging markets means more positive and negative swings in company earnings reports. But as we noted above, there is less analyst coverage to track as investors work to make sense of these changes, with the consequent potential for investor overreaction to news reports – a behavioral factor that in turn increases the potential for mispricing.

By breaking the link with price, fundamentally weighted indexes are designed to take advantage of inefficiencies in the process of price discovery based on incoming news and of mispricings that correct over time. Additionally, the use of five-year averages for sales, cash flows and dividends plus buybacks helps to smooth these fundamental measures thereby avoiding some of the short-term volatility of fundamental characteristics within small cap and emerging markets companies.

Figure 2. Earnings variability



Source: Russell Indexes as of November 30, 2013

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Cross-sectional volatility illustrates the dispersion of stock returns

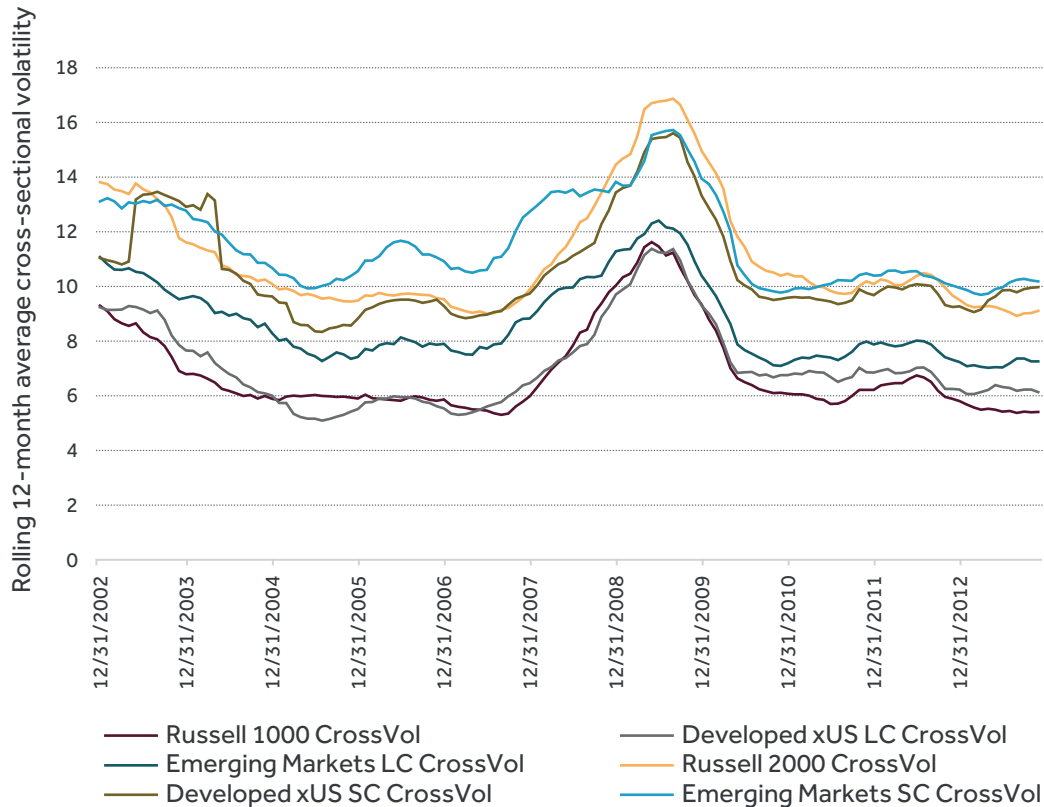
Cross-sectional volatility (CrossVol) measures the dispersion of returns among a group of stocks. That may sound complicated, but CrossVol simply indicates how wide the difference is between the top- and bottom-performing stocks in an index. Higher CrossVol doesn't equate to higher performance, but it measures the opportunity set for stock-selection strategies to add value. When stock returns are spread out, a successful investment strategy has a greater chance of parsing winners and losers. When stock returns are clustered together, it can be harder to select the potential outperformers.⁶

Figure 3 shows the historical rolling 12-month average CrossVol across select equity segments. The U.S. developed and emerging markets small cap segments all exhibit higher CrossVol than their large cap counterparts. This suggests that small caps present greater opportunities for skilled investment strategies to identify and select stocks that have the potential to outperform. Again, among large caps, emerging markets historically exhibited higher dispersion than developed markets.

In these markets, with the greater dispersion among stock returns, the fundamentally weighted index methodology functions to contra-trade against price movements caused by investor herding or overreaction to news (i.e., movements away from intrinsic value). Such opportunities may be greater in emerging markets and small caps than in the developed countries and large cap segments of the global equity market.

⁶ Bouchey, P., M. Fjelstad and H. Vadlamudi. (2010). "Measuring alpha potential in the market: Using the Russell-Parametric Cross-Sectional Volatility Indexes" *Russell Research*. Available at: <http://www.parametricportfolio.com/wp-content/uploads/2010/10/MeasuringAlphaPotential.pdf>.

Figure 3. Rolling 12-month average cross volatility by equity segments



Source: Russell Indexes as of November 30, 2013

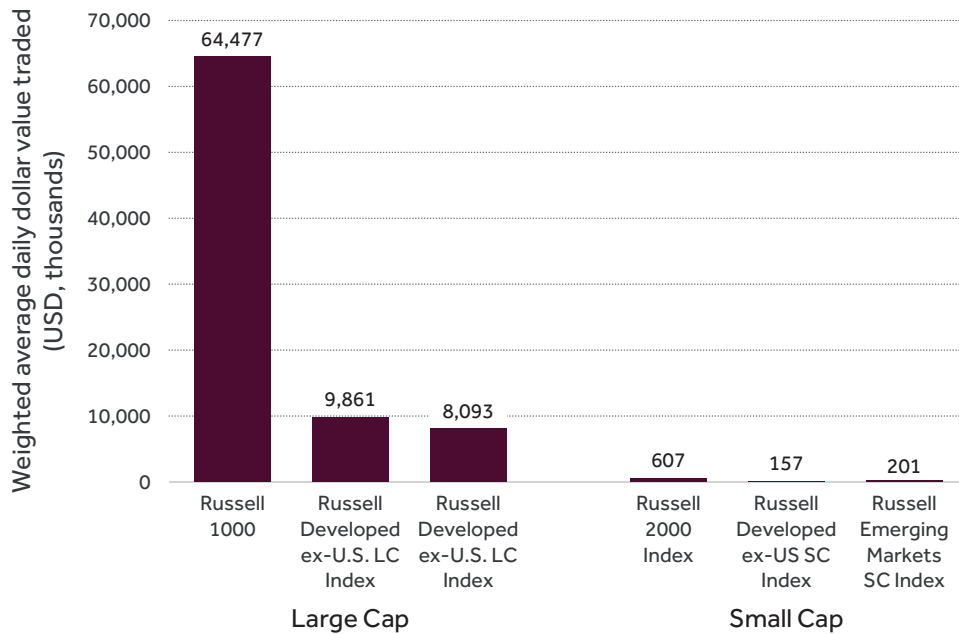
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Lower average daily dollar volume can lead to mispricing due to “liquidity premium”

Liquidity is another primary measure of efficiency that is representative of the cost to trade. Lower levels of liquidity translate to higher trading costs, but also suggest that additional mispricings may be present. Figure 4 presents the rather dramatic drop-off in liquidity between large caps and small caps worldwide. While the relative illiquidity of small caps makes them more expensive to own, it also offers potential in lagged market reaction time when a stock is found to be under- or overvalued – creating an opportunity to harvest more return.

Lower liquidity in small cap and emerging markets can lead to some stocks being overpriced simply because they are liquid, while others may be underpriced because they are illiquid. This can lead to higher concentration at the top end of a cap-weighted index. Additionally, because many institutional investors have strict liquidity restrictions, there can be a tendency for this so-called “liquidity premium” to be bid up well above any differential in trading costs, which can evaporate over time as prices revert to fair value. Fundamentally weighted indexes are designed to anticipate this mean-reversion as it periodically rebalances constituent weightings back to the sizes based on their economic footprints.

Figure 4. Weighted average daily dollar value traded



Sources: FactSet, Russell Indexes annual data as of November 30, 2013

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Fundamentally weighted indexes benefit from inefficiencies

The greater inefficiencies in small cap and emerging markets can result in potential opportunities for active managers to add value through fundamental analysis and security selection. Fundamentally weighted index products may also benefit from the inefficiencies in these market segments by taking advantage of security mispricings via a transparent, rules-based index approach.

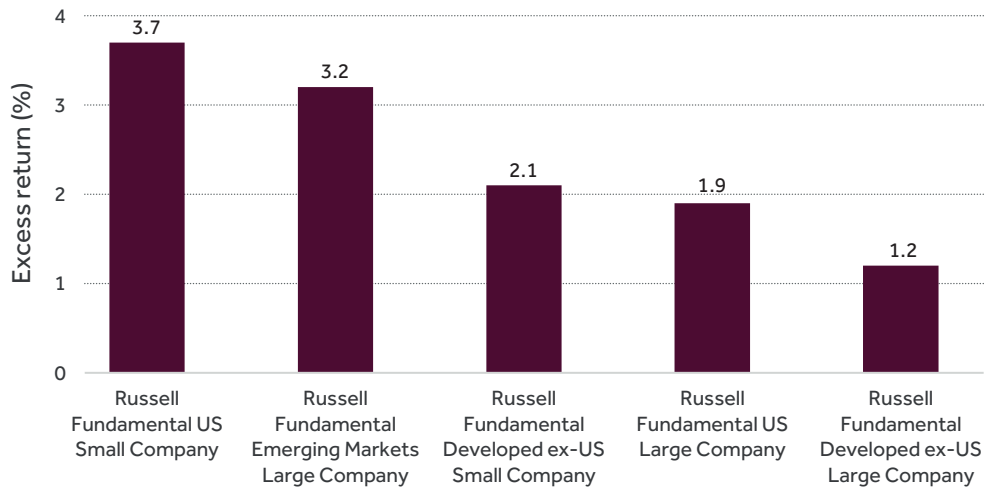
Fundamentally weighted indexes have delivered excess returns over time

As illustrated in Figure 5, each fundamentally weighted index⁷ would have delivered excess return relative to its cap-weighted counterpart in all of the market segments shown over the 10-year period ended Dec. 31, 2013. Excess returns would have ranged from approximately 1% for the Russell Fundamental Developed ex-U.S. Large Company Index to nearly 4% for the Russell Fundamental U.S. Small Company Index.

As might be expected, the largest long-term excess returns would have occurred in the less-efficient segments of small cap and emerging markets as represented by the Russell Fundamental U.S. Small Company Index and the Russell Fundamental Emerging Markets Large Company Index. Investors would have had an opportunity for potentially enhanced returns by including allocations to products based on fundamentally weighted indexes that may compliment actively managed strategies and those based on cap-weighted indexes.

⁷ The inception date of the Russell Fundamental Indexes included in this report is Feb. 24, 2011. The analysis includes a mix of back-tested simulation and actual returns after index inception. Historical index performance is not predictive of future performance.

Figure 5. Annualized excess return vs. market cap-weighted counterpart (Dec. 31, 2003–Dec. 31, 2013)



Source: Russell Indexes as of December 31, 2013

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Short-term leadership may vary, depending on market environment

It is important to note, however, that fundamentally weighted indexes should not be expected always to outperform their cap-weighted counterparts.

Fundamentally weighted indexes may underperform in trending, momentum-driven market environments. This underscores the complementary nature of fundamentally weighted and market cap-weighted indexes.

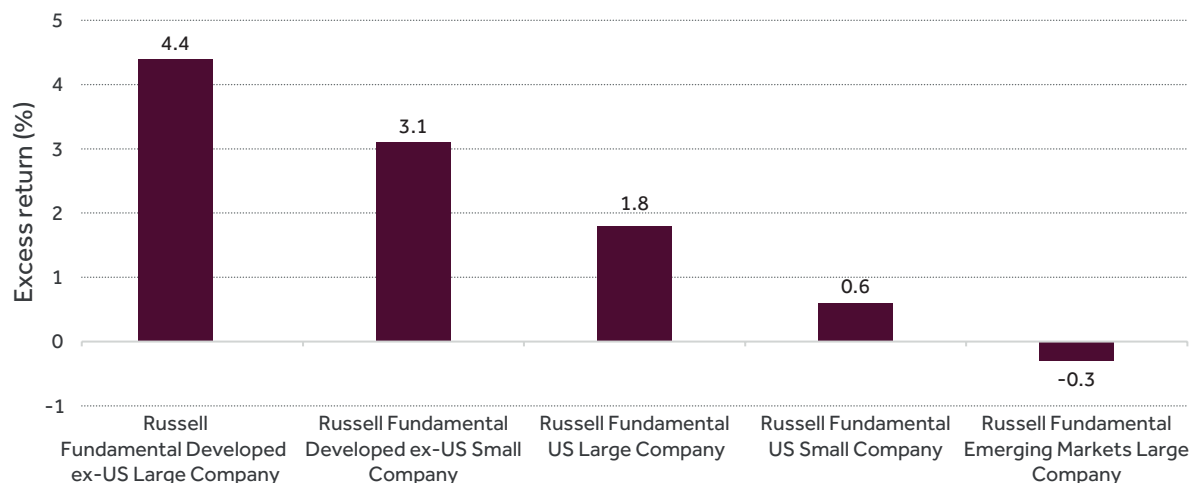
Steadily upward-trending market environments tend to favor cap-weighted indexes as securities whose prices have risen grow larger within the index and then continue to see additional price gains. Because a fundamentally weighted index periodically rebalances back to fundamental weights, it tends to underweight securities exhibiting the most price momentum. By contrast, market environments that don't exhibit a persistent momentum trend, and that may have some volatility, tend to favor fundamentally weighted indexes.

For example, the Russell Fundamental U.S. Large Company Index underperformed the Russell 1000 Index in 1999 at the height of the technology bubble. In the period after the bubble burst, however, the fundamentally weighted indexes historically outperformed their cap-weighted counterparts.

Likewise, 2013 was a year when equity markets, particularly in the U.S., showed an exceptionally strong and persistent uptrend with minimal volatility. By contrast, the developed ex-U.S. markets experienced higher levels of volatility and less trending, momentum-driven behavior. In this environment, the fundamentally weighted developed ex-U.S. indexes saw the greatest outperformance in 2013, as illustrated in Figure 6.

A persistent trend that is downward in direction and that fails to exhibit mean-reversion may also be a potential headwind for fundamentally weighted strategies. For companies with relatively strong fundamentals but steady price weakness, the fundamentally weighted index may suffer as it brings securities whose prices have fallen back up to fundamental weights at each rebalance only to see additional price declines. However, when prices eventually revert to fair value, the fundamentally weighted index would be expected to be positioned to benefit. In emerging markets in 2013, this type of downward-trending market environment contributed to the underperformance of the large cap emerging markets fundamentally weighted index relative to its cap weighted counterpart.

Figure 6. 2013 excess returns vs. market cap-weighted counterpart



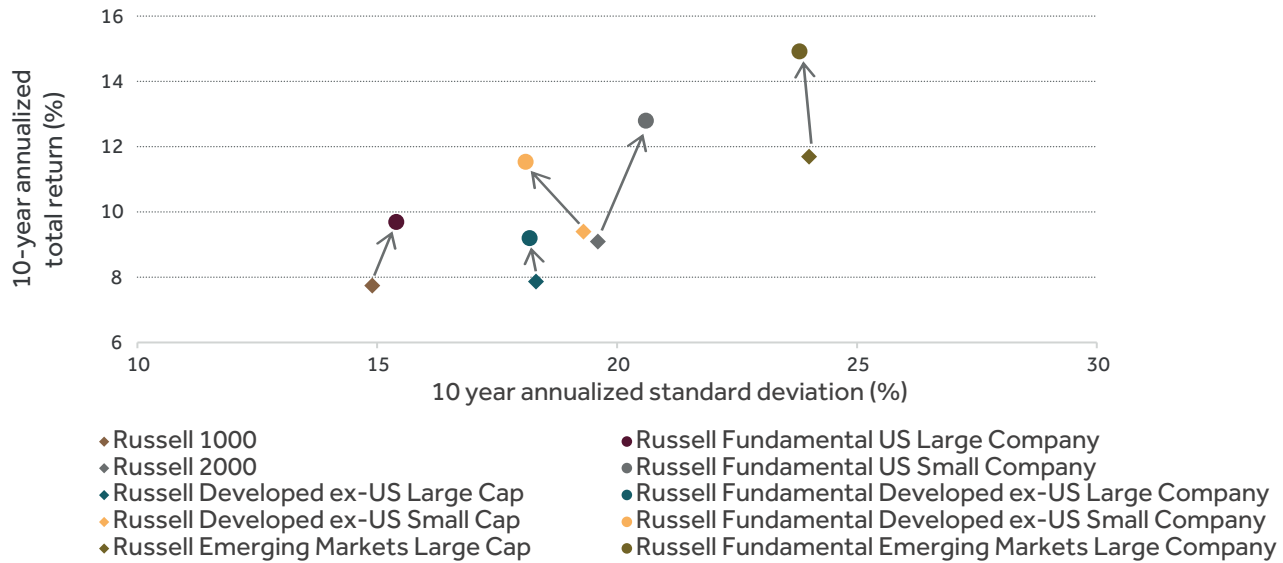
Source: Russell Indexes as of Dec. 31, 2013

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Fundamentally weighted indexes would have delivered improved risk-adjusted returns over time

Despite headwinds in some market segments during 2013, the long-term outperformance and improved risk-adjusted returns that would have been delivered by each of the fundamentally weighted indexes over time is evident in Figure 7. Outperformance would have ranged from 1.2 percentage points to 3.7 percentage points among the indexes studied over the 10-year period ended Dec. 31, 2013. Notably, this outperformance was achieved with similar levels of volatility as each of the cap-weighted counterparts. The standard deviation of each of the fundamentally weighted indexes was within 1 percentage point of its cap-weighted counterpart in the U.S. over the 10-year period, and was actually lower than its cap-weighted counterpart for each of the three international indexes.

Figure 7. Ten-year annualized risk/return (Dec. 31, 2003–Dec. 31, 2013)



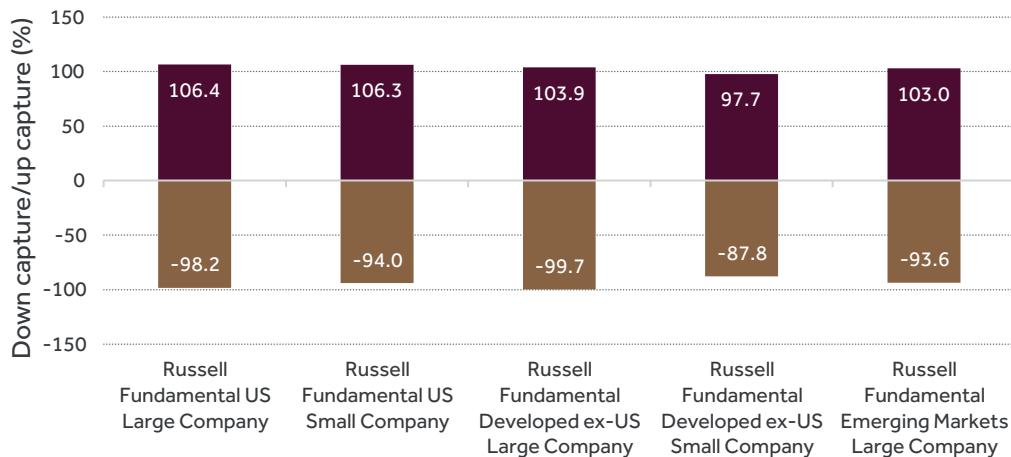
Source: Russell Indexes as of December 31, 2013

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Fundamentally weighted indexes have delivered favorable up/down capture ratios over time

Additionally, each of the fundamentally weighted indexes has historically exhibited greater upside in rising markets and less downside in declining markets than its cap-weighted counterpart, as illustrated in Figure 8. Upside/downside capture ratios indicate how much of the return of the benchmark is captured by an index on days when the benchmark rose vs. days when it declined.

Figure 8. Up/down capture ratios (Dec. 31, 2003–Dec. 31, 2013)



Source: Morningstar Direct, Russell Indexes as of December 31, 2013

Note: Up/down capture ratios are calculated for each fundamentally weighted index relative to its market cap-weighted counterpart. Upside and downside capture ratios measure how closely a fund tracks positive or negative benchmark returns. Each measure is calculated as the annualized return of a fund only on the set of days when the benchmark return was positive (negative) divided by the benchmark's annualized return on the same set of days.

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Long-term performance characteristics

The enhanced return over time, along with relatively comparable volatility as the cap-weighted counterpart, produced improved risk-adjusted returns as measured by the Sharpe ratio⁸ for the fundamentally weighted indexes. As Figure 9 shows, the Sharpe ratio for each fundamentally weighted index was meaningfully higher than for the cap-weighted counterpart. Notably, the improved risk-adjusted returns were also achieved with a beta close to 1 and a moderate tracking error⁹ of about 2% to 4% relative to each cap-weighted benchmark.

Figure 9. Annualized performance characteristics (Dec. 31, 2003–Dec. 31, 2013)

	Annualized total return (%)	Annualized standard deviation (%)	Excess return (%)	Sharpe ratio (arith)	Beta	Tracking error (%)
Russell Fundamental US LC	9.7	15.5	1.9	0.52	1.02	2.43
Russell 1000	7.8	14.9	–	0.41	–	–
Russell Fundamental US SC	12.8	20.7	3.7	0.54	1.03	3.94
Russell 2000	9.1	19.7	–	0.38	–	–
Russell Fundamental Developed ex-US LC	9.1	18.3	1.2	0.41	0.99	2.57
Russell Developed ex-US LC	7.9	18.4	–	0.34	–	–
Russell Fundamental Developed ex-US SC	11.5	18.2	2.1	0.54	0.92	3.63
Russell Developed ex-US SC	9.4	19.3	–	0.40	–	–
Russell Fundamental Emerging Markets LC	14.9	23.9	3.2	0.55	0.98	3.73
Russell Emerging Markets LC	11.7	24.1	–	0.42	–	–

Sources: Morningstar Direct, Russell Indexes as of Dec. 31, 2013

Note: All returns data are compounded or annualized geometric averages. Excess return, beta, up/down capture and tracking error are calculated relative to the market cap-weighted counterpart of each fundamentally weighted index.

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⁸ Sharpe ratio (arithmetic) is calculated as annualized total return minus the annualized return of the risk-free rate, as measured by 3-month U.S. Treasury bills, divided by annualized standard deviation.

⁹ Tracking error is calculated as the standard deviation of excess returns.

Conclusion

Investors have increasingly adopted smart beta indexes and their associated investable products based on methodologies like the Fundamental Index. Smart beta indexing and products may be viewed as complimentary to both traditional market cap-weighted indexes and active investment management. The Fundamental Index methodology blends elements of actively managed strategies like contra-trading away from potentially overvalued stocks with the benefits lower costs and transparency that investors expect from index-based products.

In less-efficient market segments, such as small cap and emerging markets, where mispricing of securities tends to be widest, fundamentally weighted index strategies can offer investors opportunities to exploit various inefficiencies and potentially add value relative to a cap-weighted benchmark. Over our back-tested sample period, fundamentally weighted indexes delivered long-term excess returns and improved risk-adjusted returns in all market segments, with the greatest outperformance occurring in the less-efficient global equity segments, such as small cap and emerging markets.

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EMEA

+44 (0) 20 7866 1810

North America

+1 877 503 6437

Asia-Pacific

Hong Kong +852 2164 3333

Tokyo +81 3 3581 2764

Sydney +61 (0) 2 8823 3521