

Equal weighting the Russell 1000 Index

Equal weight indexes are the simplest type of alternatively weighted indexes. By comparison with the standard index construction method of capitalization weighting, in which constituents' weights are determined by their respective market values, an equal weight index is indifferent to a stock's market value. Instead, constituent weights in an equal weight index are equalized at each rebalancing point. Additionally, equal weighting an index by sector then by constituent has historically produced excess returns.

In this FTSE Russell *Insights* we review some of the theory behind alternative weighting, highlight the recent increase in popularity of equal weighting and outline the innovative equal weighting methodology used for the Russell 1000[®] Equal Weight Index, in which both sector- and stock-specific risks are mitigated. We examine the resulting performance attributes of an equal weight index.

Financial theory and equal weighting

Capitalization-weighted indexes remain the most popular form of index in use by financial practitioners because they are objective, practical and theoretically grounded. They are objective, in that prevailing market prices represent investors' consensus view of the relative values of firms; they are practical, given that constituent weights in the index adjust as prices fluctuate; and they are grounded in two highly influential financial theories introduced in the 1950s and 1960s, the efficient market hypothesis (EMH) and the capital asset pricing model (CAPM).

In its strongest form, EMH states that securities are rationally priced by all investors, and that the price of a stock (and by inference, its market capitalization) reflects the issuing company's true value. The CAPM introduces the concept of the market portfolio—all assets, weighted by their market value—and states that it has the highest level of expected return for its level of risk. In conjunction, these two theories imply that

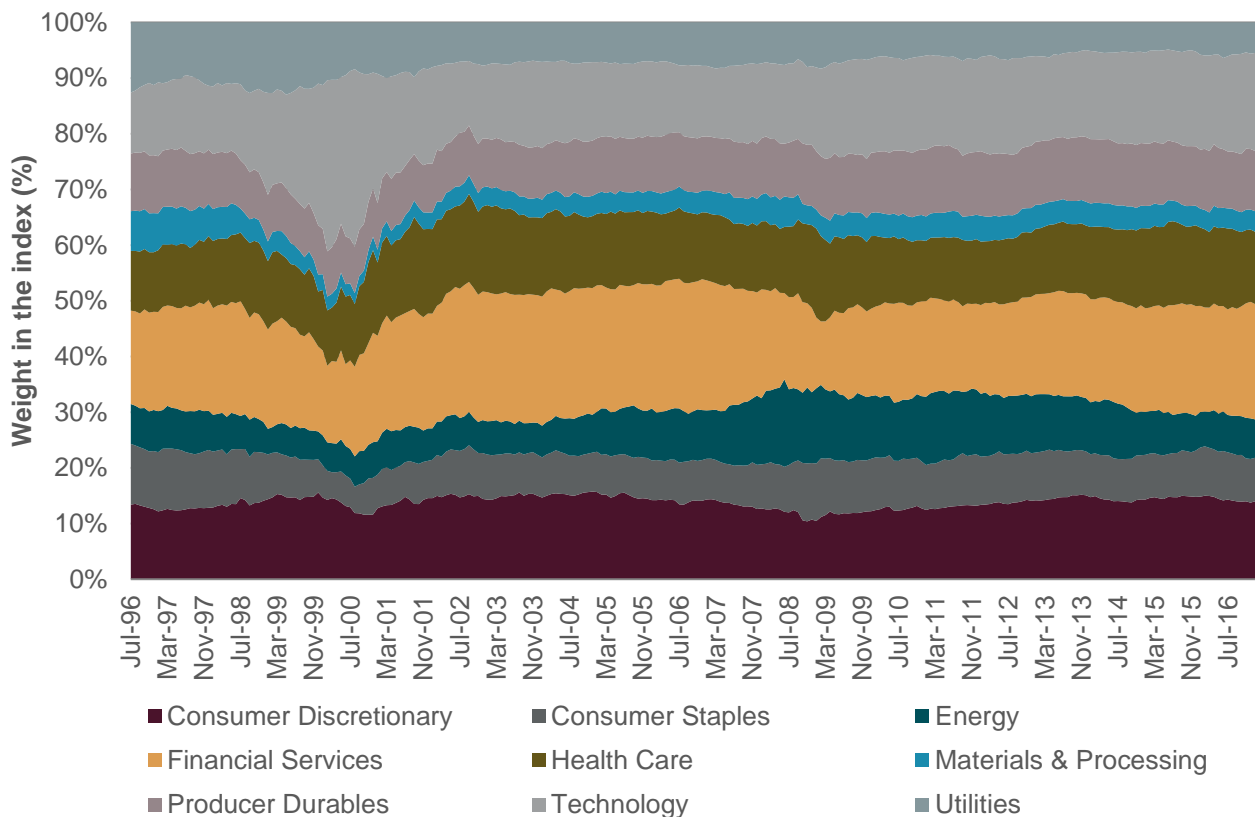
capitalization-weighted indexes are best suited both to measure the performance of active managers and to serve as the underlying performance target of index-tracking (passive) funds.

However, in the last two decades there has been rising interest in alternative index weighting methodologies using non-market cap weighting approaches. This implicitly recognizes some investors' belief that not all the tenets of the EMH and CAPM may be true.

Skepticism about markets' efficiency may be a reaction to past periods of heavy concentration of capitalization-weighted indexes in individual sectors and stocks. For example, the internet bubble of 1999-2000 was followed by a severe bear market. During this period, stocks from the technology sector gained particular prominence (see Figure 1). In its simplest form, equal weighting—an approach in which index constituents are given the same weight, rather than being determined by market values—is a way of addressing concerns about capitalization-weighted indexes' potential security concentration risks in its largest companies.¹

For example, an equal weight approach can be particularly useful in the large-cap size segment (the Russell 1000® Index), where a few companies, such as Apple and Exxon, may tend to dominate a capitalization-weighted index's performance simply because of their size. While these outsized weights may benefit the index when large-cap stocks outperform, they can also hurt index performance when the reverse is true.

Figure 1. Russell 1000® Index historical sector weights



Source: FTSE Russell, data as of February 28, 2017.

¹ For additional information on the Russell Equal Weight Indexes methodology, please refer to the construction and methodology document at <http://www.ftse.com/products/downloads/Russell-equal-weight-indexes.pdf>

The rise in popularity of equal weight indexes

Equal weight index strategies are undergoing a rise in popularity. Roughly half of US financial advisors surveyed by FTSE Russell in 2015 either use or are very likely to use an equal weight investment approach.² Additionally, in a 2016 survey of 250 global asset owners with over US \$2 trillion collectively under management, 14% of respondents indicated that they are currently using or evaluating equal weight index strategies, compared with 9% in a 2014 survey.³

As of December 2016, there are approximately 100 globally-listed ETFs with US \$21.7 billion in assets that track a variation of an equal weight index. These have witnessed almost a doubling of assets over the calendar year, with net one-year inflows reaching US \$9.1 billion.⁴

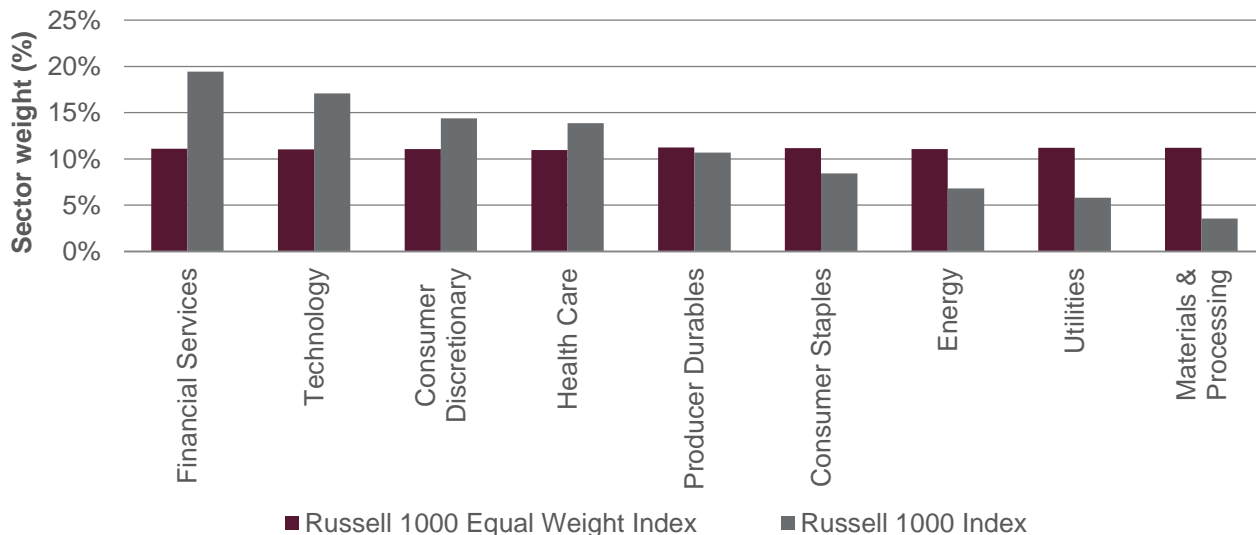
The Russell 1000 Equal Weight Index methodology

In a conventional equal weight index methodology, a weight of $1/n$ is assigned to each security in an index, where n is the number of securities in the index. However, an index with equal weights across all constituents (an approach we call constituent equal weighting) allocates significantly higher weights to some sectors than to others, embedding sector bias into the index.

In the Russell Equal Weight Index Series, this artifact of a simple constituent equal weighting methodology was recognized. Therefore, an additional design step is added before constituent weights are equalized: each of nine equity Russell Global Sectors also receives an equal weighting.

The effect of this design choice is shown in Figure 2. At the end of December 2016, weights in the Financial Services, Technology, Consumer Discretionary and Health Care sectors were lower in the Russell 1000 Equal Weight Index (R1EW) than in the market capitalization-weighted Russell 1000[®] Index. However, sector weights in Producer Durables, Consumer Staples, Energy, Utilities and Materials and Processing were higher in the R1EW than in the Russell 1000.

Figure 2. Equalizing sector weights in the Russell 1000 Equal Weight Index



Source: FTSE Russell, data as of December 31, 2016.

² Source: FTSE Russell, *Smart beta: 2015 survey findings from US financial advisors*.

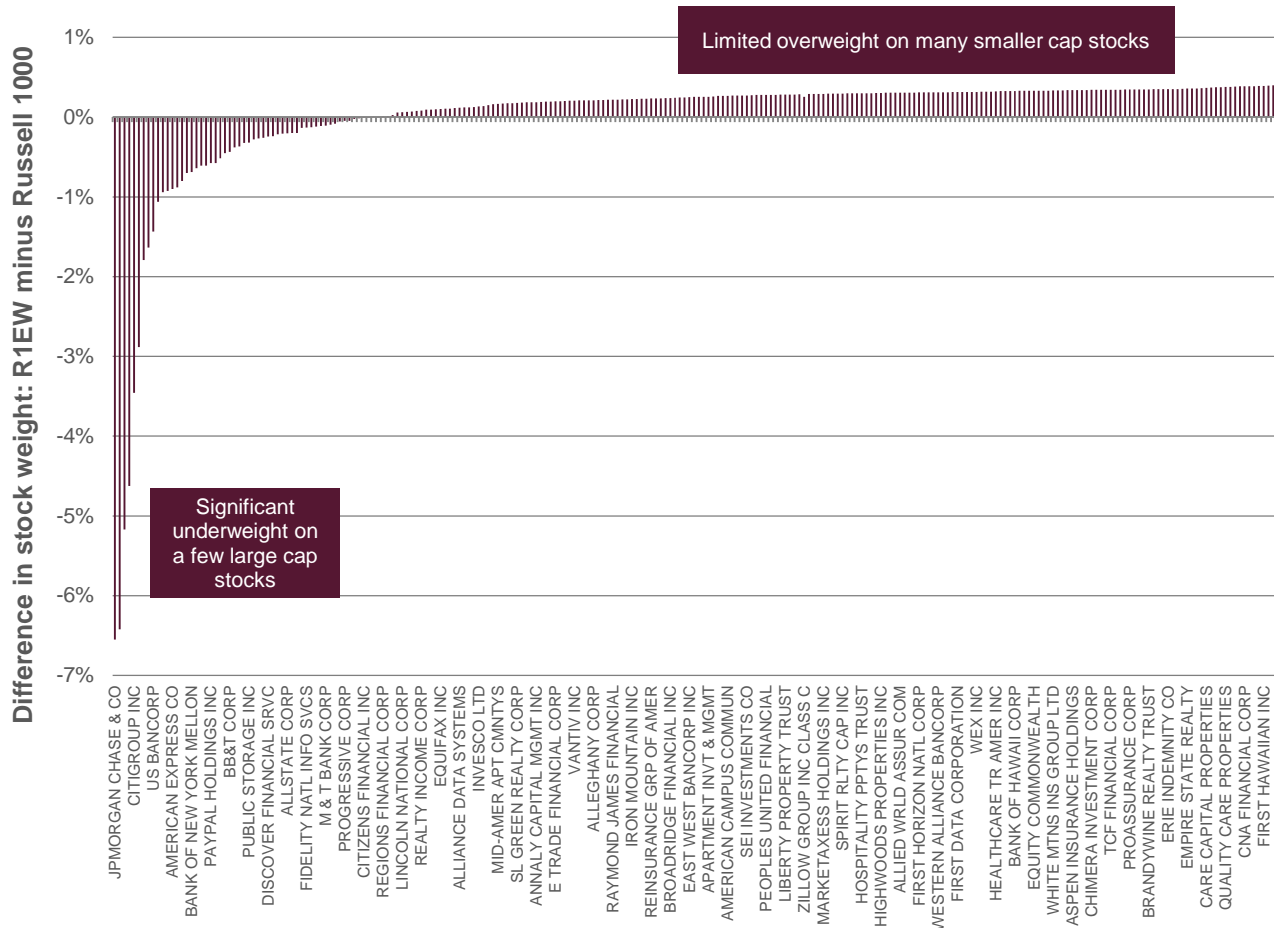
³ Source: FTSE Russell, *Smart Beta 2016 Global Survey Findings from Asset Owners*.

⁴ Source: Morningstar Direct, data as of January 31, 2017. Past performance is no guarantee of future results. Please see the disclaimer for important legal disclosures

After this design step, the Russell Equal Weight Index Series follows the standard procedure of weighting each stock within a single sector equally (allowing one share class per issuing company).

As can be seen in Figure 3, where the Financial Services sector is used as an example, the equal weight methodology results in a significant underweight position (by comparison with the capitalization-weighted reference index, in this case the Russell 1000) in a few large-cap stocks, shown at the left of the chart, beginning with JPMorgan Chase, Berkshire Hathaway and Wells Fargo as of December 2016. However, the relatively long “tail” of smaller cap stocks within the sector, visible on the right of the chart, receives a small weighting boost, led by Donnelley Financial, Square and First Hawaiian as of December 2016.

Figure 3. Weight differences in Russell 1000 Equal Weight Index Financial Services sector



Source: FTSE Russell, data as of December 31, 2016.

Managing index capacity and investability

By comparison with a standard, capitalization-weighted index, the equal weighting methodology has the effect of boosting the weights of a large number of smaller cap stocks. Therefore, index designers have to bear in mind the investable capacity of the constituent stocks in order to ensure its suitability for practical use as a benchmark and as the underlying performance target of index-replicating financial products. This is particularly true if the starting universe of stocks is broad.

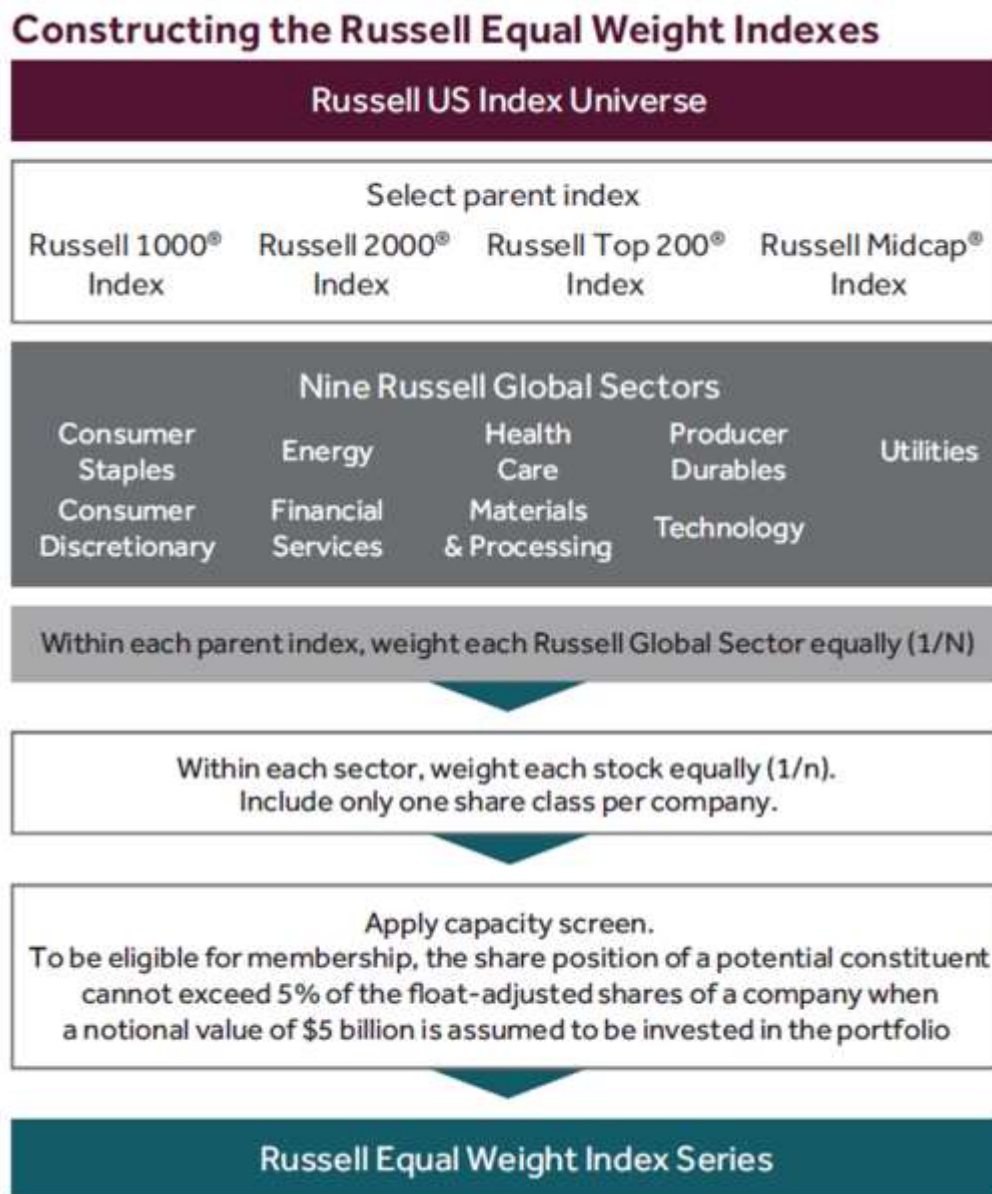
And over time, share price movements cause constituent and sector weights to drift away from the 1/n target. The rebalancing frequency of an equal weight index is therefore also important to consider in index

construction design. The index designer’s decision involves a trade-off: more frequent rebalancing, such as daily rebalancing, ensures that weights stay closer to the target, but this produces higher transaction costs in an index-replicating investment strategy.

The design of the R1EW takes these considerations into account in the following ways: as a capacity screen, index eligibility is restricted to those constituents whose position in a notional portfolio of \$5 billion does not exceed 5% of the float-adjusted shares of the company; and the rebalancing frequency is set as quarterly, representing the best trade-off between turnover and tracking error (with respect to a daily rebalanced equal weight index). Quarterly rebalancing of the index constituents to equal weight also forces a discipline of reducing weights in stocks that have appreciated over the quarter, which in effect results in the index realizing investment gains on these constituents.

The design steps involved in the construction of the Russell Equal Weight Indexes are set out in Figure 4.

Figure 4. Russell Equal Weight Index Series construction steps, implemented quarterly

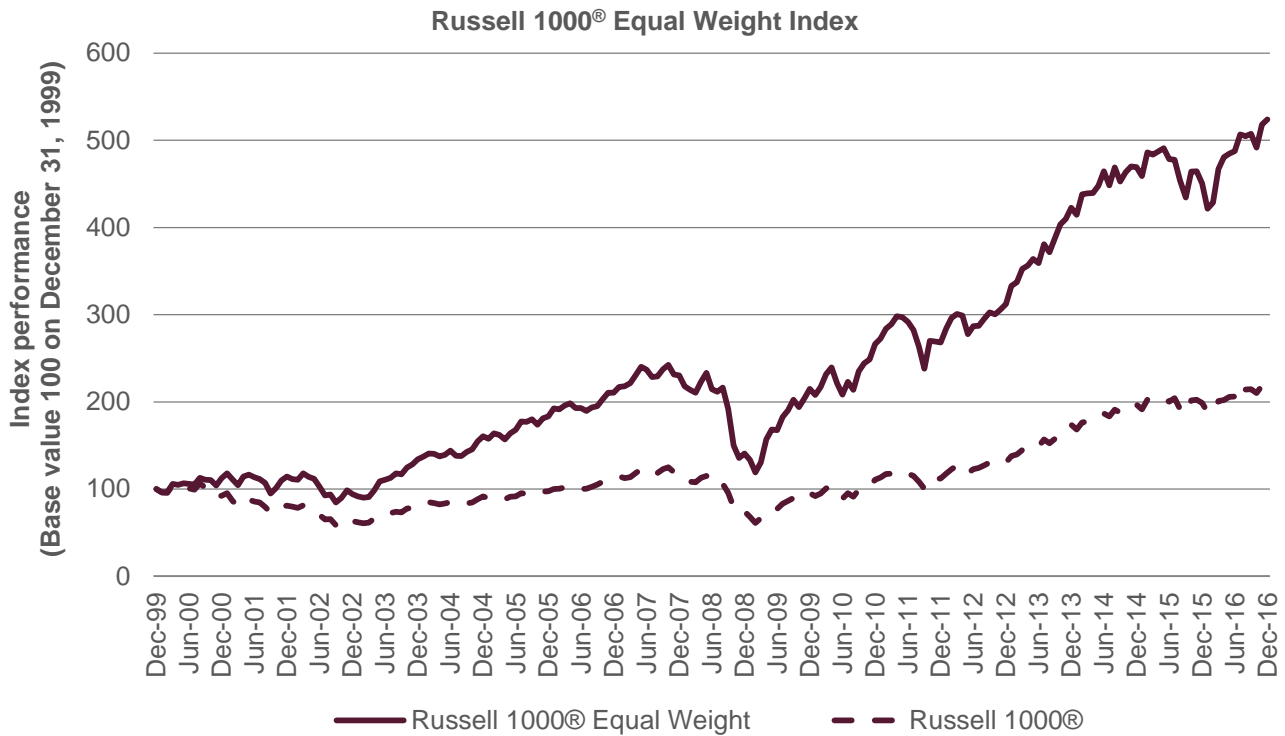


Source: FTSE Russell.

Performance attributes and factor exposures of an equal weight index

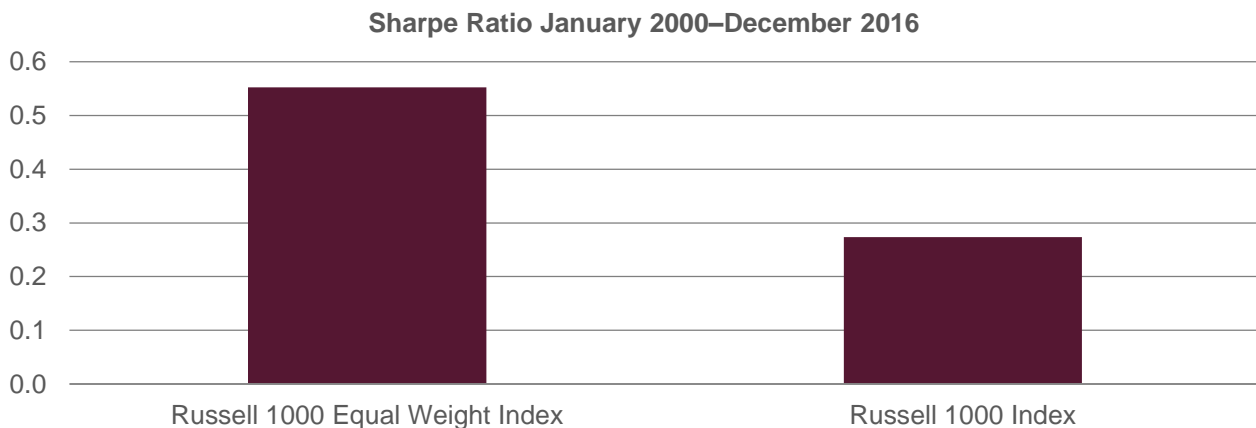
Over the 17-year period from December 1999 to December 2016 the R1EW produced a higher index return than the Russell 1000 both in absolute and in risk-adjusted (Sharpe ratio) terms (see Figures 5 and 6).

Figure 5. Performance comparison–Russell 1000 Equal Weight Index and Russell 1000 Index



Source: FTSE Russell, data as of December 31, 2016. Past performance is not a guarantee of future results. Returns shown may reflect hypothetical historical performance. Please see the disclaimer for important legal disclosures.

Figure 6. Sharpe ratio–Russell 1000 Equal Weight Index and Russell 1000 Index



Source: FTSE Russell, data as of December 31, 2016. Sharpe Ratio calculated over the period January 2000-December 2016 on the basis first dividing the average of monthly excess returns over the 3-month Treasury bill by the standard deviation of those monthly excess returns, then annualizing that number. Past performance is not a guarantee of future results. Returns shown may reflect hypothetical historical performance. Please see the disclaimer for important legal disclosures.

In a study published in 2014,⁵ researchers analyzed the past risk factor exposures of the R1EW using the Axioma US Equity Medium Horizon Fundamental Factor Risk Model. They concluded that the equal weight index had an unsurprising exposure to the size factor—a meaningful small/mid cap bias—relative to its capitalization-weighted parent index, the Russell 1000. However, an ex-post performance attribution demonstrated that the R1EW's excess returns were driven primarily by sector-allocation and stock-selection effects, providing support for equal-weighting the index by both sector and security.

In another study,⁶ conducted in 2010 and using a longer historical back-test period, research observed that between 1979 and 2010 the capitalization-weighted Russell 1000 outperformed the R1EW for a meaningful period of time only once, during the technology bubble of the late 1990s. This was a period when “mega cap” stocks, which receive a much higher weight in a capitalization-weighted than in an equal weight index, produced significant but temporary excess returns.

Conclusion

Equal weight indexes are an increasingly popular and methodologically simple alternatively-weighted index. Rather than assigning index weights to constituents on the basis of the company's market value, equal weight indexes set the same weight for each index constituent (and sector in the case of the Russell Equal Weight Index Series).

The Russell 1000 Equal Weight Index approach has historically resulted in excess absolute and risk-adjusted index returns with respect to the capitalization-weighted index over long periods of time. As a result of their feature of underweighting large cap stocks in the starting index universe and overweighting smaller cap stocks, equal weight indexes have a significant exposure to the size factor. However, historical index performance has been driven primarily by sector and security weights.

The Russell 1000 Equal Weight Index is constructed using an innovative methodology that equalizes sector weights and then constituent weights within each sector. This approach eliminates unwanted sector biases. The methodology includes capacity constraints to help ensure that the resulting index is investable and suitable for practical use as a tool in portfolio management and analysis.

⁵ David Koenig, Mark Paris, “Russell Equal Weight Indexes: Analyzing the drivers of historical outperformance”, November 2014

⁶ Pradeep Velvadapu, “The Russell Equal Weight Indexes: An enhancement to equal weight methodology”, October 2010

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