Insights

The Russell 1000 Equal Weight Index:
Reduced concentration risk and enhanced diversification

There is growing interest in alternative weighting methods which seek to reduce concentration. Concentration risk can arise when a handful of large mega cap stocks or a minority of sectors come to dominate standard market cap weighted indexes. Equal weighting is the oldest of these alternative weighting methods and it has had staying power for good reason.[1] The Russell 1000® Equal Weight Index had less drawdown during both the dotcom bust and global financial crisis with shorter times to full recovery than its cap weighted counterpart, as we show in this paper. In this Insights we will explore the attributes of equal weighting and explore FTSE Russell's enhanced methodology, which has an added benefit over simple constituent equal weighting by enhancing sector diversification.

Why equal weighting?

Many investors utilize products that replicate market cap indexes in their portfolios. Low cost, transparency, and exposure to a large number of stocks are among the benefits of such a passive approach. But there may be less diversification in this approach than first meets the eye, as many cap weighted and sector indexes are dominated by mega cap stocks and a few heavily weighted sectors. Often, as go the mega caps, so goes the performance of the whole index. This concentration risk means that a cap weighted index actually may provide the diversification equivalence of only a fraction of the number of stocks in the index, as we will show.

Moreover, by reducing the impact of mega caps, an equal weighted approach shifts exposures down to midcap stocks. Midcap stocks may provide an additional layer of diversification as they can have different return patterns from mega caps. Midcaps are where some of the most innovative companies can be found. Some of them may be the mega caps of tomorrow, providing the investor with upside return potential.

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[1] The first equal weighted index was created by Wells Fargo Bank in 1970. See Moroz and Kose (2014) "The High Cost of Equal Weighting" *Research Affiliates*.

The Russell 1000 Equal Weight Index enhancement: Equal weighted sectors

Cap weighted indexes allow market value capitalizations to dictate their sector allocations. This means the index is most exposed to sectors that have performed well in the past. They are not necessarily those that will perform well in the future.

But an index that equally weights all constituents in the index has a different problem: sector allocations are left to fall where they may. This means that sector weights in a hypothetical constituent equal weighted version of the Russell 1000® Index would vary from 5% to 26% based on nothing more than the number of names in the sector.[2] It is hard to find much merit in that. To remedy this, the Russell 1000® Equal Weight Index first equally weights all sectors and then equally weights all stocks within the sector. The removal of this kind of sector risk, we argue, is much more in the spirit of equal weighting to achieve greater diversification.

In Exhibits 1, 2, and 3 we present the historical sector weights of the Russell 1000 Equal Weight (R1EW), the hypothetical Russell 1000 constituent equal weight index (CEW), and the Russell 1000 Index (R1K) for each reconstitution date from June 2001 through December 2016, respectively. As can be seen, while there remains a fairly consistent weighting for the R1EW, both the CEW and the R1K have consistently disproportionate weights in several sectors. For example, the CEW index has a persistently large percentage of Financial Services and Consumer Discretionary holdings. On the other hand, the CEW has historically had a fairly small allocation to Consumer Staples. That being said, consistent and stable equal allocations to sectors offered by the R1EW allow a more neutral approach.
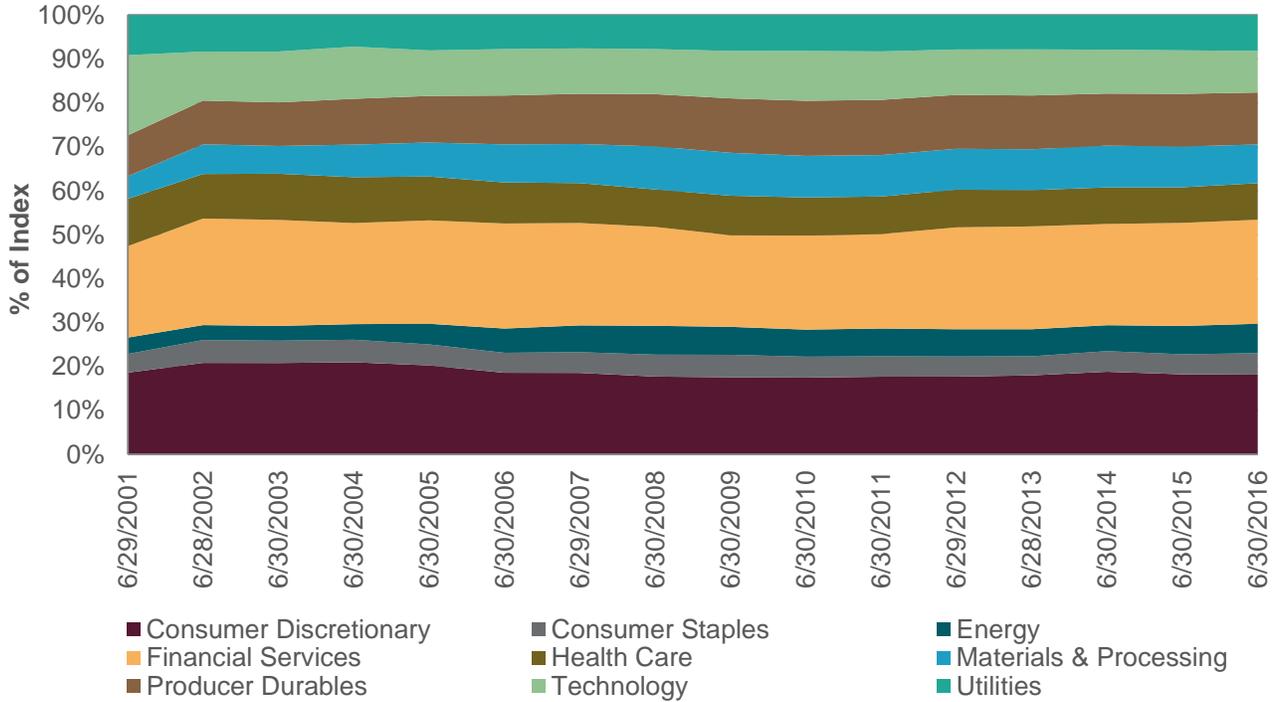
Exhibit 1. Historical sector weights of the R1EW, June 2001 through June 2016
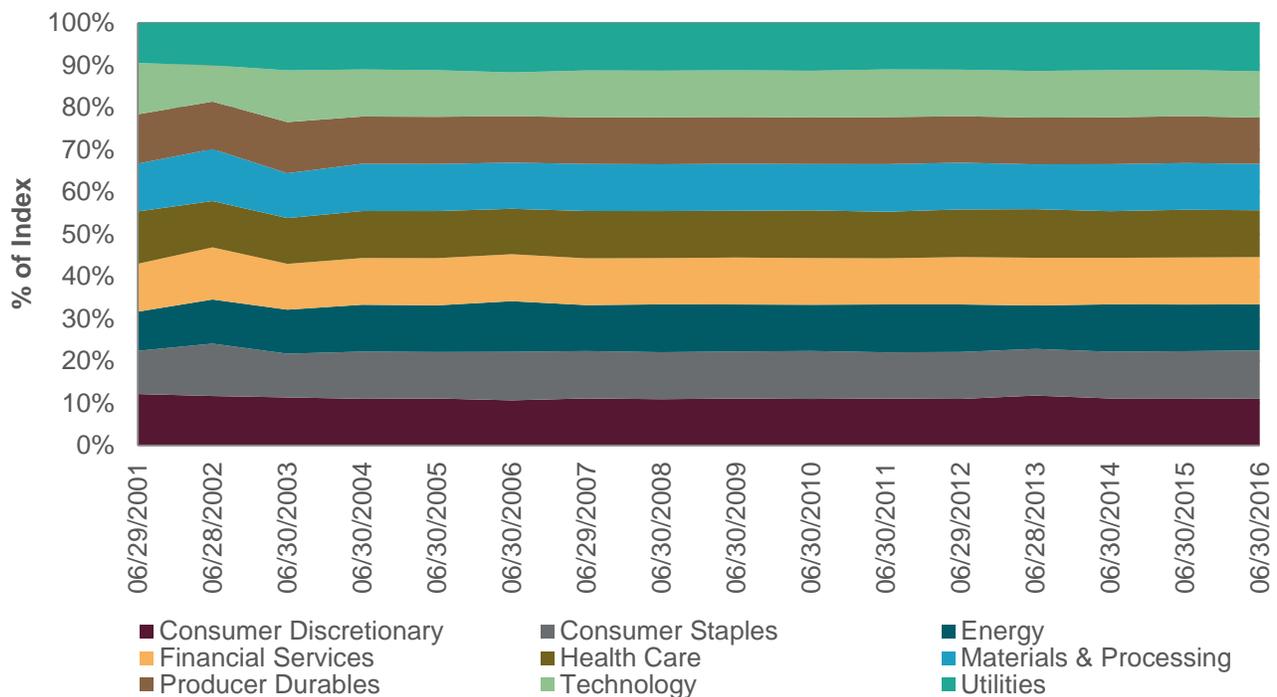
Source: FTSE Russell. Data June 29, 2001 through December 31, 2016. All live data. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

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[2] Source: FTSE Russell. Data as of December 31, 2016.

Exhibit 2. Historical sector weights of hypothetical CEW, June 2001 through June 2016

Source: FTSE Russell. Data June 29, 2001 through December 31, 2016. The Russell 1000 constituent equal weight index is a hypothetically created index and is not is not a FTSE Russell index. The data is for illustrative purposes and the returns shown reflect hypothetical historical performance. Please see the end for important legal disclosures.

Exhibit 3. Historical sector weights of the R1K, June 2001 through June 2016
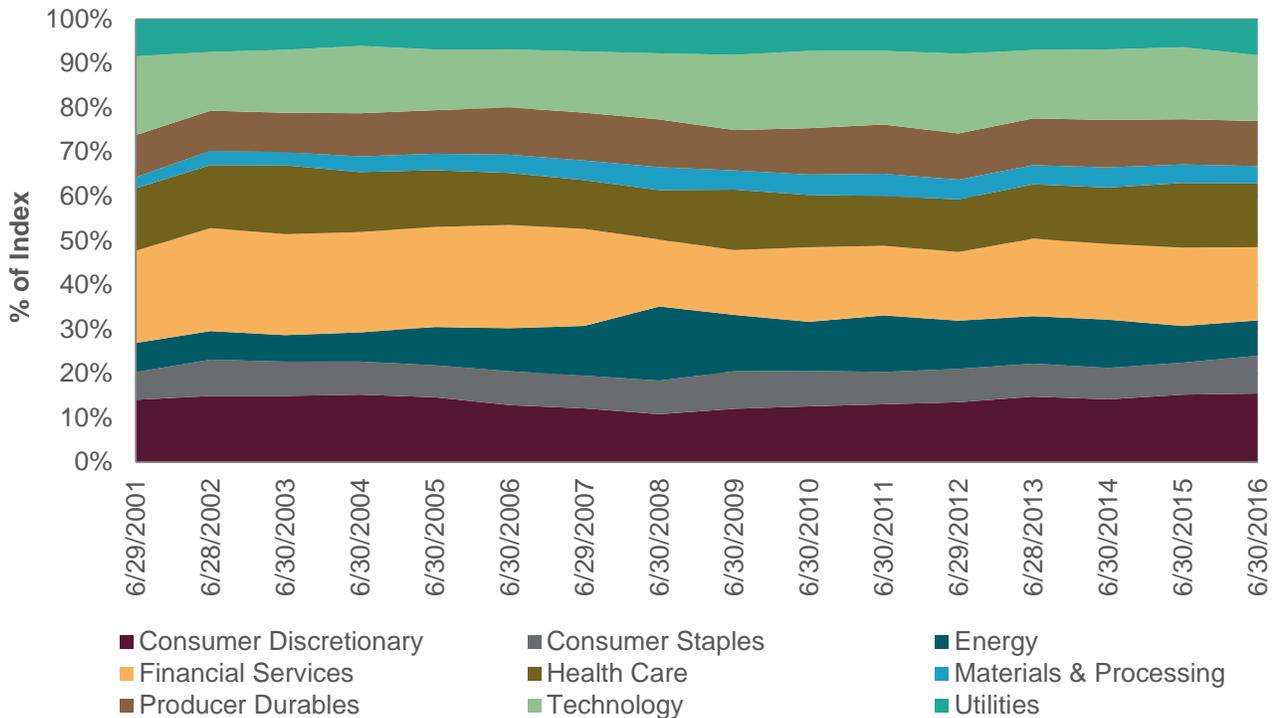
Source: FTSE Russell. Data June 29, 2001 through December 31, 2016. All live data. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Equal-weighting stocks within a sector further enhances diversification

The R1EW methodology takes the diversification attributes of equal-weighting sectors a step further by equal-weighting the constituents within each sector. This prevents any sector from being dominated by mega caps. For example, the Technology sector of the R1K contains 109 constituents but tends to be dominated by just four mega cap stocks: Microsoft, Apple, Facebook, and Alphabet (Google). These stocks have amassed a total of 43% of the Technology sector capitalization weight.[3] In the R1EW, however, these companies would occupy just 4% of the same sector, allowing the many innovative midcap tech companies to have an equal impact.

A precise method of quantifying the degree of diversification that an index offers is by the calculation of its effective number of securities, commonly called the "Effective N."[4] This measure can be interpreted as the equivalent number of stocks that, for all practical purposes, drive the historic risk and return of the index. In the case of the R1K Technology sector, the cap-weighted sector's Effective N is only approximately 15 compared to an Effective N of 109 for the R1EW Technology sector.[5] (The R1EW Technology sector's Effective N of 109 reflects the exact number of constituents in it--every stock in R1EW is equally effective in impacting risk and return.)

Exhibit 4 shows the trend toward higher concentration in the R1K Technology sector with the Effective N metric. The cap weighted Tech sector has become more concentrated (lower Effective N) over the last 10 years as the mega cap tech stocks have grown, leading to a reduction in Effective N from more than 20 to less than 15. This contrasts with Effective N for the R1EW Technology sector, which has varied between 96 and 108 based mostly on additions and deletions of stocks within the sector.

Exhibit 4. R1K and R1EW Indexes - Technology Sector Effective N
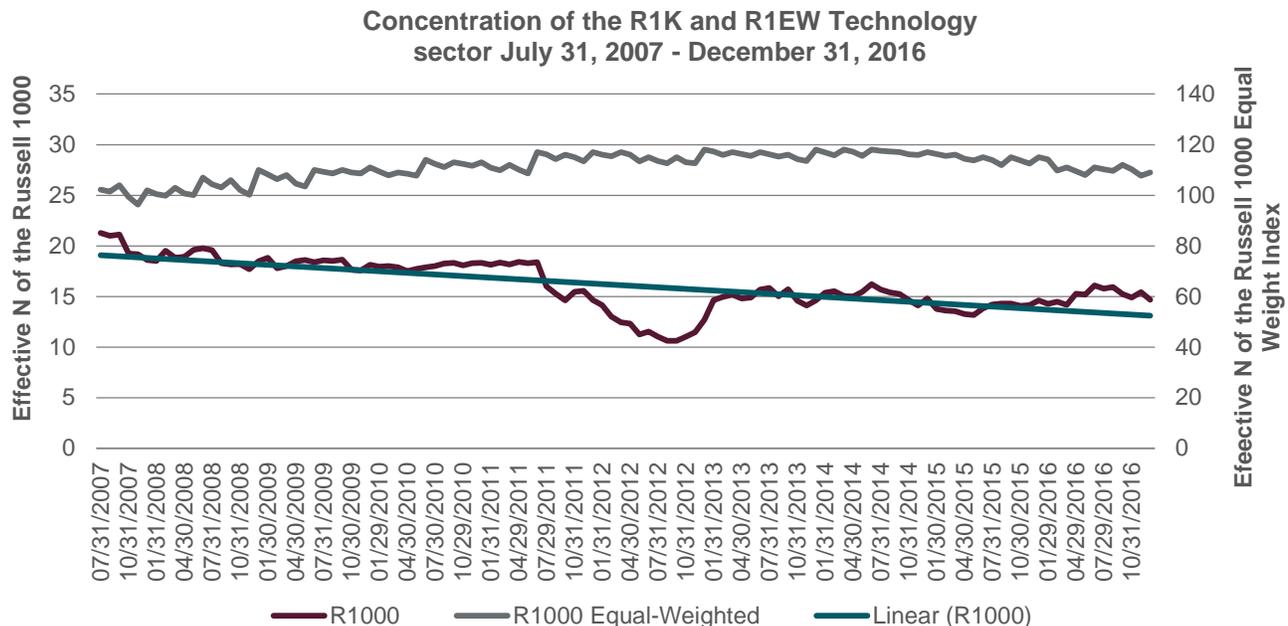
Source: FTSE Russell. Data July 31, 2007 through December 31, 2016. All live data. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

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[3] Source: FTSE Russell. Data as of December 31, 2016.

[4] Technically, Effective N is calculated as the inverse of the Herfindahl-Hirschman index. The H-H index was originally used by economists and anti-trust regulators to measure the degree of competitiveness in an industry.

[5] Source: FTSE Russell. Data as of December 31, 2016.

Risk and drawdown reduction with the Russell equal weight methodology

The dotcom bust of 2000-2002 and the global financial crisis (GFC) of 2007-2009 were major market events that sent many market participants looking for alternatives to highly concentrated cap weighted indexes with high concentrations in specific sectors. Exhibit 5 compares drawdown and recovery for the R1EW, the hypothetical CEW, and the R1K during both episodes. The R1EW had less drawdown during the crisis than either the CEW or the R1K and shorter time to full recovery than the R1K. This was driven in part by the R1EW's smaller exposure to technology going into the dotcom bust and smaller exposure to financials going into the GFC, a direct result of the methodology.

Exhibit 5. Drawdown and recovery statistics of the R1EW, CEW and R1K during the dotcom bust and the GFC

	Drawdown period	Drawdown	Drawdown months	Date of full Recovery	Months to full Recovery
Dotcom bust					
R1EW	Aug-00 - Sep-02	-24.8%	26	July 2003	36
CEW	Aug-00 - Sep-02	-32.9%	26	Dec 2003	41
Russell 1000	Aug-00 - Sep-02	-45.1%	26	Oct 2006	75
Global financial crisis					
R1EW	Oct-07 - Feb-09	-50.8%	17	Oct 2010	37
CEW	Oct-07 - Feb-09	-53.2%	17	Apr 2010	31
Russell 1000	Oct-07 - Feb-09	-51.1%	17	Mar 2012	54

Source: FTSE Russell. Data as of December 31, 2016. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. The Russell 1000 constituent equal weight index (CEW) is a hypothetically created index and is not a FTSE Russell index. The data is for illustrative purposes. Please see the end for important legal disclosures.

The down market capture ratio (DMCR) is another way to look at the risk mitigation behavior of an index. It is a performance measurement of an index relative to market downturns. A DMCR of less than 100% means that the index had higher performance relative to "the market" (here the R1K) when it was in a downturn. Conversely, a DMCR of greater than 100% indicates an index had a lower performance than that of the market. Exhibit 6 presents the drawdown statistics on a reverse scale to indicate that a lower percentage DMCR is less down market capture and so a higher excess return. The exhibit illustrates that the R1EW has resulted in less down market capture than the hypothetically constructed CEW for 14 of the last 16 years.

Exhibit 6. Down market capture ratio R1EW and hypothetical CEW Indexes December 2001 – December 2016
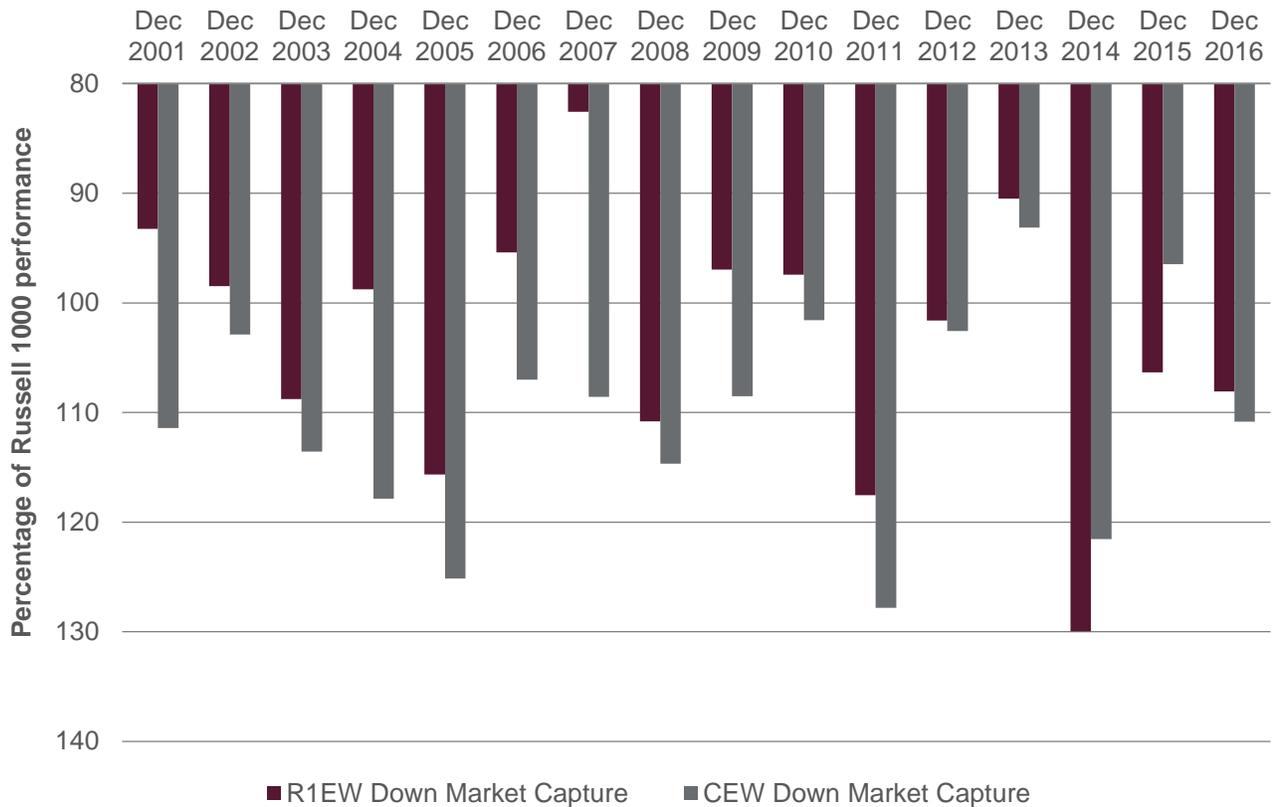
Source: FTSE Russell. Data December 31, 2001 through December 31, 2016. Past performance is no guarantee of future performance. Returns shown may reflect hypothetical historical performance. The Russell 1000 constituent equal weight index (CEW) is a hypothetically created index and is not a FTSE Russell index. The data is for illustrative purposes. Please see the end for important legal disclosures.

The potential to limit both drawdowns and down market capture has resulted in a reduced risk profile of the R1EW relative to the CEW. Exhibit 7 compares the volatility profiles for the R1EW, CEW and R1K. Equal weighted indexes typically will have higher volatility than their cap weighted counterparts because equal weighted indexes have larger weights on midcap stocks, which tend to be more volatile than large cap stocks. But note the fact that the R1EW has, for many time periods, exhibited the same or lower volatility than the hypothetical CEW. This is notable in periods of 2000-2002 and 2008-2010, when the trailing volatility was reflecting the effect of the market turmoil during the dotcom bust and the GFC.

Exhibit 7. 24 month rolling volatility, R1EW, CEW, and R1K

24 Month rolling volatility (annualized standard deviation)
February 2000 - December 2006
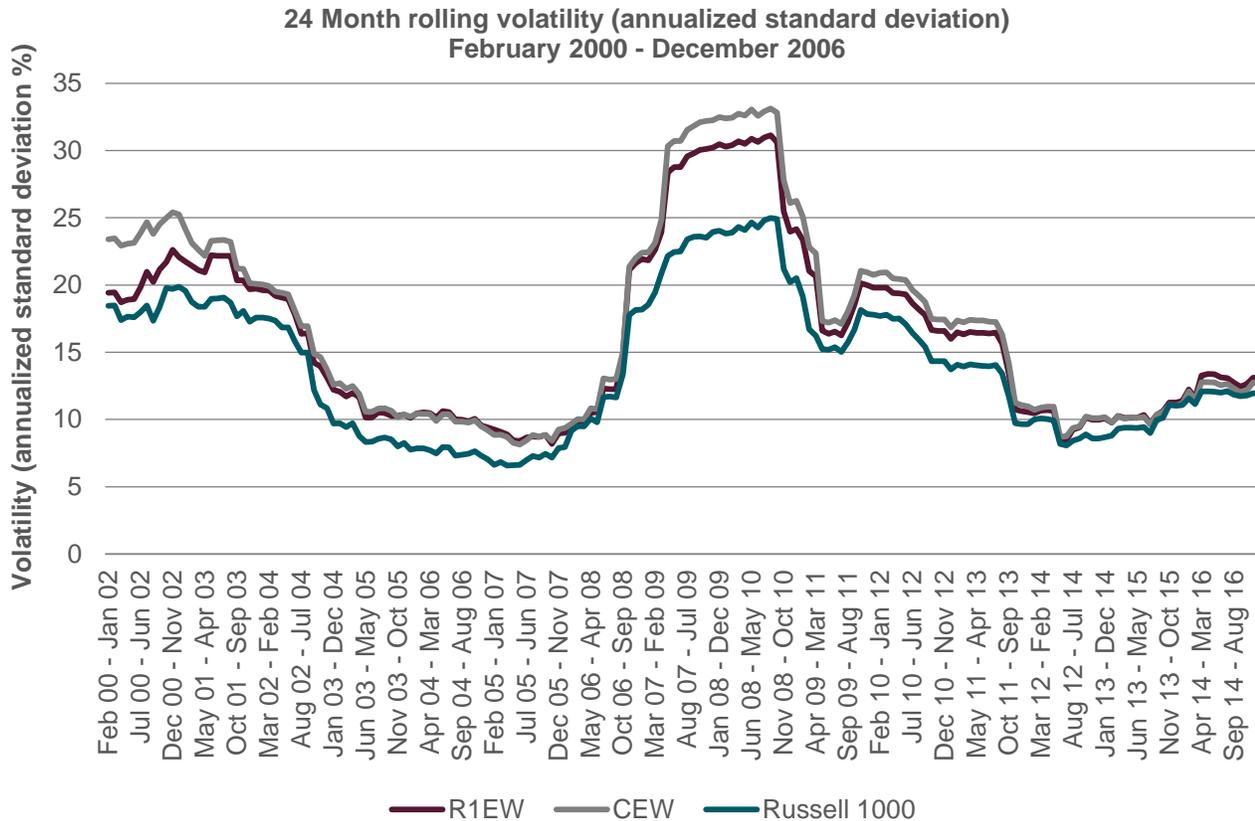
Source: FTSE Russell. Data February 29, 2000 through December 31, 2016. Past performance is no guarantee of future performance. Returns shown may reflect hypothetical historical performance. The Russell 1000 constituent equal weight index (CEW) is a hypothetically created index and CEW is not a FTSE Russell index. The data is for illustrative purposes. Please see the end for important legal disclosures.

The factor "signature" of the R1EW

Performing a factor analysis on portfolios and indexes is increasingly becoming part of a standard report. FTSE Russell has been a leader in the area of factor indexes and measuring factor exposures, so a factor analysis of the R1EW is somewhat natural for us. In Exhibit 8 we show the highest "active exposures" of three standard factors based on the FTSE Russell factor methodology.[6] By active exposures we mean exposure to a factor that is greater or smaller than the factor exposures in the underlying cap weighted benchmark, which in this case is the R1K. The units are "Z-scores," which are the number of standard deviations from a mean of zero.

Exhibit 8 shows what might be viewed as the factor "signature" of an equal weighted index. The first thing to notice is the large exposure to a "small size" factor compared to the R1K. This is actually a strong tilt to midcap stocks since the R1K has no small cap stocks. This exposure to midcap stocks relative to the R1K is a key driver of the performance characteristics of the R1EW.

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[6] For details on the methodology, see The FTSE Global Factor Series Methodology Overview.
http://www.ftse.com/products/downloads/FTSE_Global_Factor_Index_Series_Methodology_Overview.pdf

Midcap stocks often get less attention from analysts and investors than well-known mega cap companies such as Apple, Google, or Facebook. For example, according to the data vendor I/B/E/S, as of December 30, 2016, the mega cap stocks had on average 23.5 analysts forecasting 12 month forward earnings estimates, versus 14.7 analysts forecasting for midcap stocks. As a result, midcap companies may benefit from being able to operate more autonomously, a bit more under the radar, expanding through organic growth and the acquisition of smaller companies over time. Midcap companies may also benefit as they grow from small cap companies into larger companies and migrate from being constituents of small cap indexes into the constituents of larger cap indexes.

The exposures to the other two factors shown in Exhibit 8 are modest and therefore are not key drivers of the risk/return profile of the R1EW. For example, the positive exposure to value over a cap weighted benchmark is largely because equal weighting avoids some of the herding behavior around expensive growth stocks. The negative exposure to low volatility is just another way to measure the higher volatility that equal weighted indexes have because of the tilt to higher volatility midcap stocks.

Exhibit 8. Active exposures of the R1EW
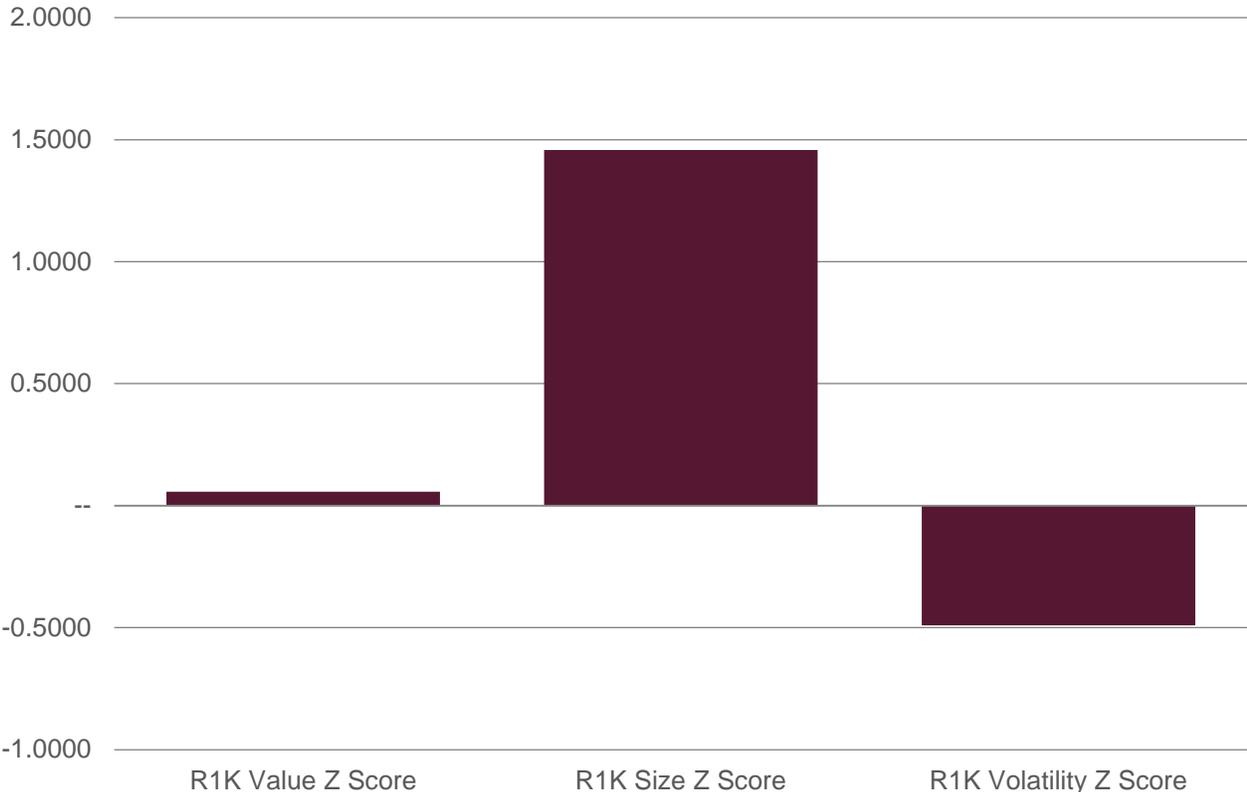
Source: FTSE Russell. Data as of December 31, 2016. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Capacity and rebalancing

Current liquidity in the R1EW is assured by drawing from the R1K universe, as all the constituents have already passed a rigorous liquidity screen. However, another concern with equal weighting is that the tilt toward the lower portion of the cap spectrum may result in large stakes in the holdings of some companies if a lot of assets pour into products replicating the R1EW. This could pose a liquidity risk down the road. As a result, the R1EW methodology applies an additional screen prior to the construction of the index, which is designed to remove securities that are liquid now, but might become illiquid in the future. To be eligible for

membership, the share position of a potential constituent cannot exceed 5% of the float-adjusted shares of a company when a notional value of $5 billion is assumed to be invested in the portfolio.

At rebalance, the weights of the R1EW are trued-up to match the methodology. That results in contrarian trading against whatever stocks and sectors have been trending up or down and thus provides the market participant with a disciplined contrarian approach. A perfect implementation of the methodology would require sectors and constituents to rebalance daily. Daily rebalancing would require selling and buying constituents' shares every day to keep the weights constant, and thus bring about high transaction costs for replicated portfolios. Thus, a trade-off exists between timely representation of the methodology and turnover. Our research has determined that quarterly rebalancing strikes a reasonable balance between keeping turnover down while enforcing a contrarian market discipline.

Performance

Finally, the analysis would be incomplete without assessing the overall long term performance of the R1EW. Exhibit 9 shows the growth of the R1EW Index since December 31, 1999, compared with its cap weighted counterpart and the hypothetical CEW.

Exhibit 9. Cumulative performance of the R1EW, CEW and R1K

The R1EW compared to the R1K and CEW
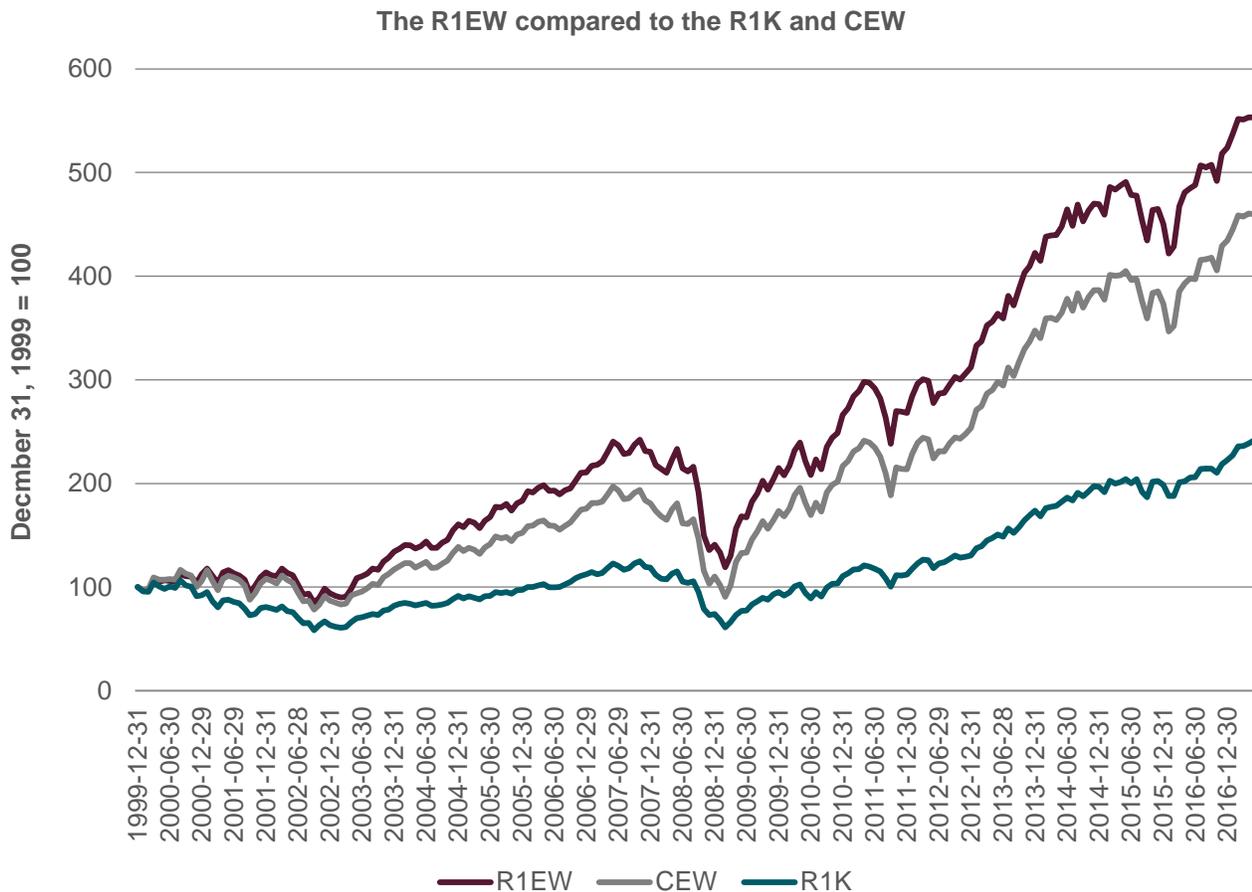
Source: FTSE Russell. Data December 31, 1999 through December 31, 2016. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. CEW is not a FTSE Russell index. Please see the end for important legal disclosures.

Summary

Equal weighted indexes are one of the earliest examples of "smart beta" indexes. They have been popular for a long time because of their ability to diversify the mega cap dominance inherent in cap weighted indexes. As well, trading at rebalance causes the index to add weight to stocks that have recently declined and reduce weight in stocks that have recently risen. This contrarian trading is a key part of the equal weighting methodology.

Equal weighting by constituents, however, replaces the sector risk inherent in a cap weighted index with another kind of sector risk based on the number of names in a particular sector. The equal weighting of sectors eliminates this risk. This was illustrated clearly during the periods of the dotcom bust and the GFC when both the cap weighted R1K and a hypothetical constituent weighted CEW underperformed the R1EW in part because both had overweights in sectors that had recently done well – those same sectors led the way in the market correction. They were the Technology sector during the dotcom bust and Financial Services sector during the GFC.

For more information about our indexes, please visit ftserussell.com.

About FTSE Russell

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