EXECUTIVE SUMMARY

We find persistent performance disparities when comparing three leading benchmarks for U.S. small cap equity, with the MSCI U.S. Small Cap 1750 and the S&P Small Cap 600 outperforming the Russell 2000. Analysis suggests that differences in benchmark construction are the drivers of these disparities. When compared to the Russell, arguably the "purest" of the small cap benchmarks, the MSCI tilts into the midcap range, while the S&P only includes issues with recent positive earnings, introducing a quality screen. As the Russell is the most representative of the U.S. small cap equity space, it should remain the "default" benchmark, unless investors believe that their small cap manager will tilt toward quality, in which case the S&P provides a better fitting benchmark that historically has also imposed a higher hurdle for active managers to beat. Finally, because we expect that a quality-biased index should outperform an index lacking such a tilt, we would recommend passive investors to utilize a product tracking the S&P.

INTRODUCTION

Investors would be wise to consider holding a dedicated position in small cap equity as a component in their policy asset allocation. This portfolio construction approach is grounded in theory—small caps provide a distinct and diversifying exposure that is only partially correlated to large caps, small firms have greater opportunity to grow compared to their larger counterparts, and the relative inefficiency of small cap equity markets offers active managers more opportunities to add value—and is supported by historical evidence over the long term.[1]

As with any other investment, it is important to select an appropriate benchmark. Passive investors seeking the return stream of the asset class will utilize a product designed to track that benchmark, whereas active investors seeking to outperform will compare their returns to those of the benchmark. For U.S. small cap equity, there are three leading benchmarks: the MSCI U.S. Small Cap 1750 ("MSCI"), the Russell 2000 index ("Russell"), and Standard & Poor's SmallCap 600 index ("S&P").

Since these three indices are all passive and all track the same investment asset class, one would expect similar return streams, but historically they have diverged. Specifically, over their 22 years of common history, the S&P and the MSCI have delivered higher returns with less volatility than the Russell, which presents a puzzle worth investigating. This paper has three objectives: (1) to describe the construction and the characteristics of the three benchmarks, (2) to understand the performance difference and its drivers, and (3) to help investors choose which benchmark is appropriate for them, either as the target for a passive product to replicate or as the hurdle for an active product to surpass.

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[1] Examples of such studies include: Banz, Rolf W., 1981, "The Relationship between Return and Market Value of Common Stocks," Journal of Financial Economics 9, 3-18. Fama, Eugene F. and Kenneth R. French, 1992, "The Cross-Section of Expected Stock Returns," Journal of Finance 47:2, 427-465. Baker, Matthew S., Peter Carman, and Richard S. Pzena, 1993, "Small Cap Stocks: Investment and Portfolio Strategies for the Institutional Investor," Probus Publishing: Chicago.

BENCHMARK CONSTRUCTION

All three benchmarks listed above are capitalization-weighted indices that attempt to capture a broadly representative sample of the universe of U.S. small cap equities, but they differ in the details of their construction.

The Russell is perhaps the most straightforward. Each year, as of the last trading day of May, U.S. equities are ordered by market capitalization. The Russell 2000 comprises those equities ranked #1001 through #3000. (Those ranked #1 through #1000 compose the Russell 1000 large-cap index.) Russell follows a disciplined annual reconstitution process, promoting or relegating constituents for which changes in market cap would put them above or below the ranking breakpoints. However, there are narrow "capitalization bands" around the breakpoints that allow constituents to remain in the index if the change in market cap is relatively modest—specifically, if they exceed the upper breakpoint or fall below the lower breakpoint by less than 2.5%.

The MSCI uses a similar practice, ordering U.S. equities by market cap semiannually and selecting those 1750 issues ranked #751 through #2500. Like the Russell, it also sets "buffer zones" that slow the turnover of names when changes to market cap ranks would otherwise force them to rotate out of the small cap index. These buffer zones are much wider than the Russell's capitalization bands, extending to 50% above the upper breakpoint for market cap and 33% below the lower breakpoint.

The S&P selects constituents based upon market cap dollar size: at initial inclusion they must fall between $400m and $1.8b. It applies additional criteria for its constituents in terms of liquidity, public float, and profitability metrics, which makes its construction the least transparent among the three benchmarks. Most notably, companies need positive earnings for both the most recent quarter and the sum of the trailing four quarters to be included. Thus the S&P comprises a highly inclusive but not comprehensive sample of U.S. small cap equities, which is reconstituted throughout the year in response to corporate actions.

BENCHMARK CHARACTERISTICS

The three benchmarks are intended to represent the same small cap equity universe, but differences in construction methodology cause them to vary substantially in several characteristics, as detailed in Table 1.

Table 1. Comparative Benchmark Characteristics

As of 12/31/2015

Characteristic	MSCI	Russell	S&P
Number of Holdings	1,746	1,986	601
Price / Book	2.03	2.09	1.94
Price / Earnings (TTM)	30.47	37.63	23.66
Dividend Yield	1.84%	1.61%	1.62%
Market Cap ($mm): $-weighted mean	1,690	1,080	1,190
Market Cap ($mm): median	1,280	784	1,050
Market Cap ($mm): largest	9,070	4,970	4,640
Market Cap ($mm): smallest	16	16	85

PERFORMANCE DIFFERENCES

The Russell was launched on December 31, 1986; the S&P on December 31, 1993; and the MSCI on March 27, 2003—although MSCI provides back-tested data since May 29, 1992. Taking December 31, 1993 as the start of the longest period of common history (and as the "since inception" date), the three indices' returns have diverged considerably, as shown in Table 2 and Chart 1. In nearly every standard measurement period ending December 31, 2015, both the S&P and the MSCI have outperformed the Russell in both absolute and risk-adjusted terms, with lower volatility, and hence a higher Sharpe ratio. Since their joint inception, their annualized excess return over the Russell has *been just shy of 200 basis points*. Additionally, for the 22 calendar years of their joint existence, the S&P and the MSCI have performed best in 11 and 10 years, respectively, while the Russell's returns led only once, in 2006.

Table 2. Returns, Volatility, and Sharpe Ratios

Periods Ending 12/31/15

Annualized Returns	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)	20 Year (%)	Since Inception 12/31/1993
MSCI	-4.1	12.3	10.2	7.8	10.0	10.3
Russell	-4.4	11.7	9.2	6.8	8.0	8.4
S&P	-2.0	13.6	11.5	8.0	10.1	10.2

Volatility of Monthly Returns	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)	20 Year (%)	Since Inception 12/31/1993
MSCI	13.6	13.2	15.3	19.7	19.3	18.7
Russell	14.5	14.2	15.9	19.8	19.9	19.3
S&P	13.3	13.4	15.0	19.1	18.9	18.4

Sharpe Ratio[2]	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)	20 Year (%)	Since Inception 12/31/1993
MSCI	*	0.95	0.71	0.42	0.47	0.49
Russell	*	0.85	0.63	0.38	0.37	0.38
S&P	*	1.02	0.80	0.44	0.48	0.48

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[2] The Sharpe ratio calculation utilizes the monthly returns of the three-month Treasury bill as the risk-free rate. Negative Sharpe ratios are considered not meaningful and are denoted by an asterisk (*).

Chart 1. Calendar Year Total Returns

1994–2015
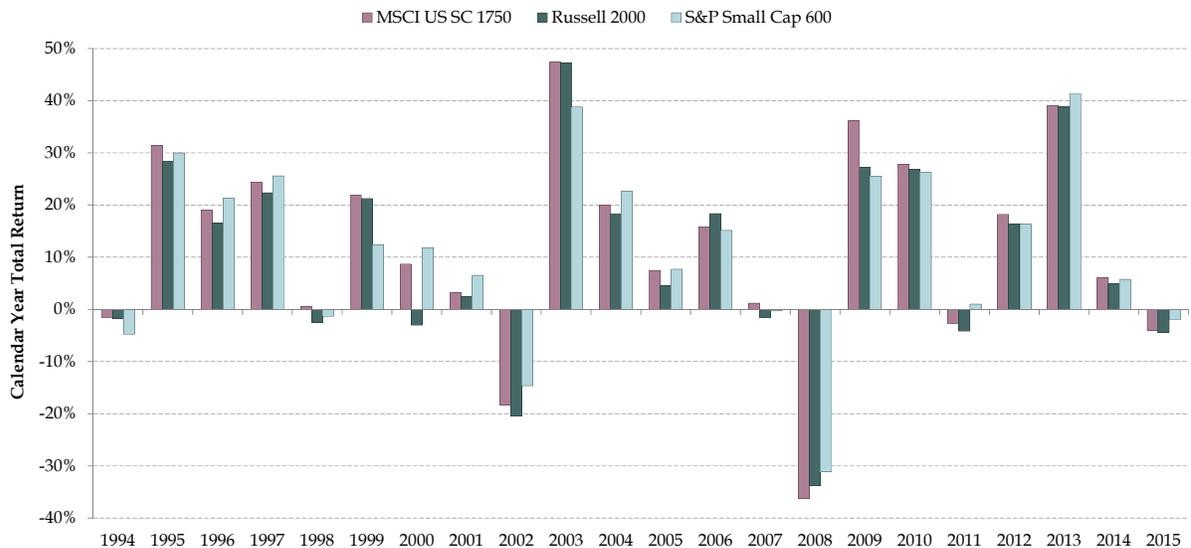
PERFORMANCE DRIVERS

Various studies have attempted to account for these long-term performance disparities across the benchmarks. Two of the leading explanations proposed are (1) the impact of the annual reconstitution of the Russell, and (2) differences in factor exposures among the indices.

Annual Reconstitution

In the Russell 2000, outperformers at the high end of the cap spectrum are annually promoted out of the index into the Russell 1000, while underperformers at the bottom of the Russell 1000 are relegated to the Russell 2000. This forces fund managers tracking the Russell 2000 to sell winners and buy losers, which creates downward price pressure on the index.

A 2009 study (Soe and Dash) [3] hypothesized that, as this turnover occurs predictably at the end of June, one should expect to see depressed returns for the Russell in July when compared with other months. Indeed, this impact was found to be statistically significant over the 15-year period (1994–2008) studied and to account for 49% of the underperformance versus the S&P.

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[3] Soe, Aye M., and Srikant Dash, 2009, "A Tale of Two Benchmarks," Standard & Poor's, *www.standardandpoors.com.*

However, Russell began taking steps prior to the 2009 study to mitigate the impact of annual reconstitution. Specifically, in 2004 Russell began to incorporate appropriately-sized IPOs into the index quarterly, and in 2007 instituting the capitalization bands described above. Our follow-on analysis, which used the methodology of the 2009 study and extended the timeframe through 2015, found that these changes appear to have had the intended effect: in the last seven years the effect of reconstitution on relative performance had all but disappeared and was no longer statistically significant. Thus we have good reason to believe that a major cause for the underperformance of the Russell no longer exists and hence will not be a drag on relative returns in the future.

Factor Exposures

Following work by Fama and French (1993),[4] equity returns can be explained as the result of exposures to multiple factors, each of which represents a risk premium. We modeled the three benchmarks since inception by running a multiple regression of their monthly excess returns over the risk-free rate on four such factors: broad equity market risk, a size premium, a value premium, and a quality premium.[5] The resultant betas measure the return sensitivities to each factor.

We found that the regressions explained 95% or more of the benchmarks' variation in returns. For the MSCI, the Russell, and the S&P, the equity risk betas were approximately equal to each other and to that of the market (at 1.06, 1.00, and 1.02, respectively), and the value betas were also approximately equal (at 0.16, 0.14, and 0.16, respectively).

The size and quality betas did show statistically-significant distinctions across the indices, however. The MSCI's small size beta was 0.64, substantially less than those of the Russell (0.79) and the S&P (0.80), which indicates that the MSCI has less of a small cap tilt than the Russell and the S&P. Based upon the indices' construction, this makes sense given that the MSCI has a higher market-cap cutoff for its largest holdings and a wider buffer in which issues that have grown to midcap size can remain in the index for a grace period.

As for the quality stock risk premium, the Russell's quality beta did not differ significantly from zero, but those of the MSCI and the S&P were significant at 0.07 and 0.24, respectively. We interpret this as a modest tilt toward quality stocks in the MSCI and a much more substantial quality tilt in the S&P. Again this ties with index construction, as the S&P's screen for recent positive quarterly earnings would tend to favor high-quality over low-quality equities.

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[4] Fama, Eugene, and Kenneth French, 1993, "Common Risk Factors in the Returns on Stocks and Bonds," Journal of Financial Economics 33:1, 3-56.

[5] Equity risk premium: the excess return from investing in equities vs. a risk-free asset. Size premium: the excess return from investing in small cap vs. large-cap. Value premium: the excess return from investing in value vs. growth. Quality premium: the excess return from investing in high-quality vs. low-quality. The data source is Ken French's website: *http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html*.

Table 3. Factor Regression Key Results

12/31/1993 — 12/31/2015

	Adjusted R²	Intercept	Equity Risk β	Size β	Value β	Quality β
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	Adjusted R²	Intercept	Equity Risk β	Size β	Value β	Quality β
MSCI	0.97	**(0.39)**	**1.06**	**0.64**	**0.16**	**0.07**
Russell	0.98	**(0.48)**	**1.00**	**0.79**	**0.14**	(0.03)
S&P	0.95	**(0.47)**	**1.02**	**0.80**	**0.16**	**0.24**

Regression Coefficients (**bold** = significant with P-value < 0.05)

PASSIVE PRODUCT IMPLEMENTATION

Indices themselves are not investable, but passive products are available that closely track many indices. One commonly-used type of vehicle is mutual funds, which provide daily liquidity, and which in their institutional share-classes often offer low fees in exchange for a high minimum investment.

Both the Russell and the S&P are tracked by low-cost institutional share class mutual funds that utilize full replication. For example, Vanguard offers the VRTIX (Russell 2000) and VSMSX (S&P 600) funds, respectively, which both have a 0.08% expense ratio and no loads for a $5m minimum investment. However, we have not yet identified a provider who offers a mutual fund that tracks the MSCI, although such a strategy could be provided via a separate account.

CONCLUSION

The three leading benchmarks for U.S. small cap equity demonstrate a persistent and sizeable performance difference, with both the MSCI 1750 and the S&P 600 delivering higher returns with lower volatility than the Russell 2000. Our analysis indicates that the MSCI has done so by tilting toward a higher market cap than its peers, whereas the S&P has done so by tilting toward higher-quality constituents. While these tilts have delivered outperformance during this particular 22-year timeframe, i.e., midcap has beaten small cap (contrary to expectations of a small-cap premium) and quality has beaten junk, there is no guarantee that these trends will persist.

It is debatable what market capitalization range "truly" represents the small cap segment of the U.S. equity universe. Even so, compared to the other indices, a reasonable case can be made that the Russell appears to have the "purest" expression of size-based segmentation to select a representative sample of the U.S. small cap equity universe. Therefore, it serves as an appropriate benchmark against which active management of U.S. small cap equity mandates may be measured, provided that the active managers are not expressing other tilts.

Yet, if investors expect that the active U.S. small cap equity managers they are utilizing will have a bias toward quality, the S&P would be a more appropriate benchmark. Moreover, we

expect that it may well outperform the Russell in the long term due to its quality bias and, hence, would potentially provide a higher hurdle than the Russell.

Finally, for investors seeking a passive exposure to small cap, because we expect that a quality-biased index should outperform an index lacking such a tilt, we would recommend utilizing a product tracking the S&P.