FTSE Russell

Building a better benchmark

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Introduction

Financial market indexes are nearly a century old and their role has evolved over time. Initially, indexes were used as an information tool, primarily as a means of gauging business conditions and market sentiment. In the last few decades, indexes have assumed a central place in the investment business, both as a means of benchmarking investors' performance and as the basis for index-based fund management.

In their role as benchmarks, the leading indexes now play a vital role in the global capital markets. For example, around $10.6 trillion of assets—including over two-thirds of active US equity institutional assets—are benchmarked to the Russell US indexes.

Despite the variety of index choices now available to professional and retail investors, there are some design standards that any market-leading benchmark should follow. In particular, we believe that three important principles help define a good benchmark: **objectivity**, **modularity** and **reliability**.

In this paper we provide a series of examples to illustrate what those principles mean in the context of benchmark construction, and why they matter.

Contents

Benchmarks have many uses

Benchmarks play an important and informative role at every step of the investment process. Economists use them to analyze economic trends and investors make decisions based on economists 'forecasts. Institutional investors use benchmarks to conduct risk analysis, develop investment policies and create asset allocation strategies. Nearly all investors use benchmarks to evaluate the performance of their investment portfolios.

Benchmarks also underlie investable products, such as mutual funds or exchange-traded funds (ETFs) that allow for passive investment in a specific market, market segment or asset class. No matter the use case, it is important to recognize that a benchmark's primary purpose is not to achieve a certain level of performance. At a basic level, a benchmark should measure a market's characteristics and performance. In other words, it should represent effectively and objectively how that market has behaved over time.

Principle 1: Objectivity and accuracy

Delivering an unbiased, complete view of the market

An objective, accurate and transparent benchmark should follow a "naïve" construction methodology. In other words, the rules by which it is put together should not require any exceptional knowledge of a market or its constituents. Equally, the method by which the index constituents are selected should be free of subjectivity.

All benchmarks are not equal in this regard. For example, the Russell 1000 index and the S&P 500 index are both widely used benchmarks of large-capitalization US stocks, but their construction methodologies differ (see Figure 1).

The Russell 1000 index is defined as the largest 1000 stocks in the broader Russell 3000 Index. The Russell 1000 is fully reconstituted each June and includes all eligible securities, ranked by market capitalization. Its market capitalization breakpoints therefore change each year at the June reconstitution and reflect the evolution of the US equity market during the period.

By contrast, the S&P 500 index has market cap ranges that are reviewed from time to time and no regularly scheduled reconstitution process. Contrary to commonly held misperception, the S&P 500 does not include the largest 500 stocks in the US equity markets.

Instead, its constituents are changed on an as-needed basis by a committee consisting of full-time professional members of S&P Dow Jones Indices 'staff.[1] At its monthly meetings, the committee may revise its index policy covering the rules for selecting companies, and the committee may also make changes to the index at their discretion, at times with less than three business days 'notice.

And while the Russell 1000 adds eligible initial public offerings (IPOs) to the index quarterly (including as part of the annual reconstitution in June), the S&P 500 has no regularly scheduled IPO addition process (apart from a rule stating that IPOs must trade for 12 months before becoming eligible for index inclusion).

The eligibility criteria for new additions also vary between the two benchmarks (see Figure 1).

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[1] See https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-brochure.pdf

Figure 1: Differences in benchmark construction—Russell 3000 vs. S&P 1500

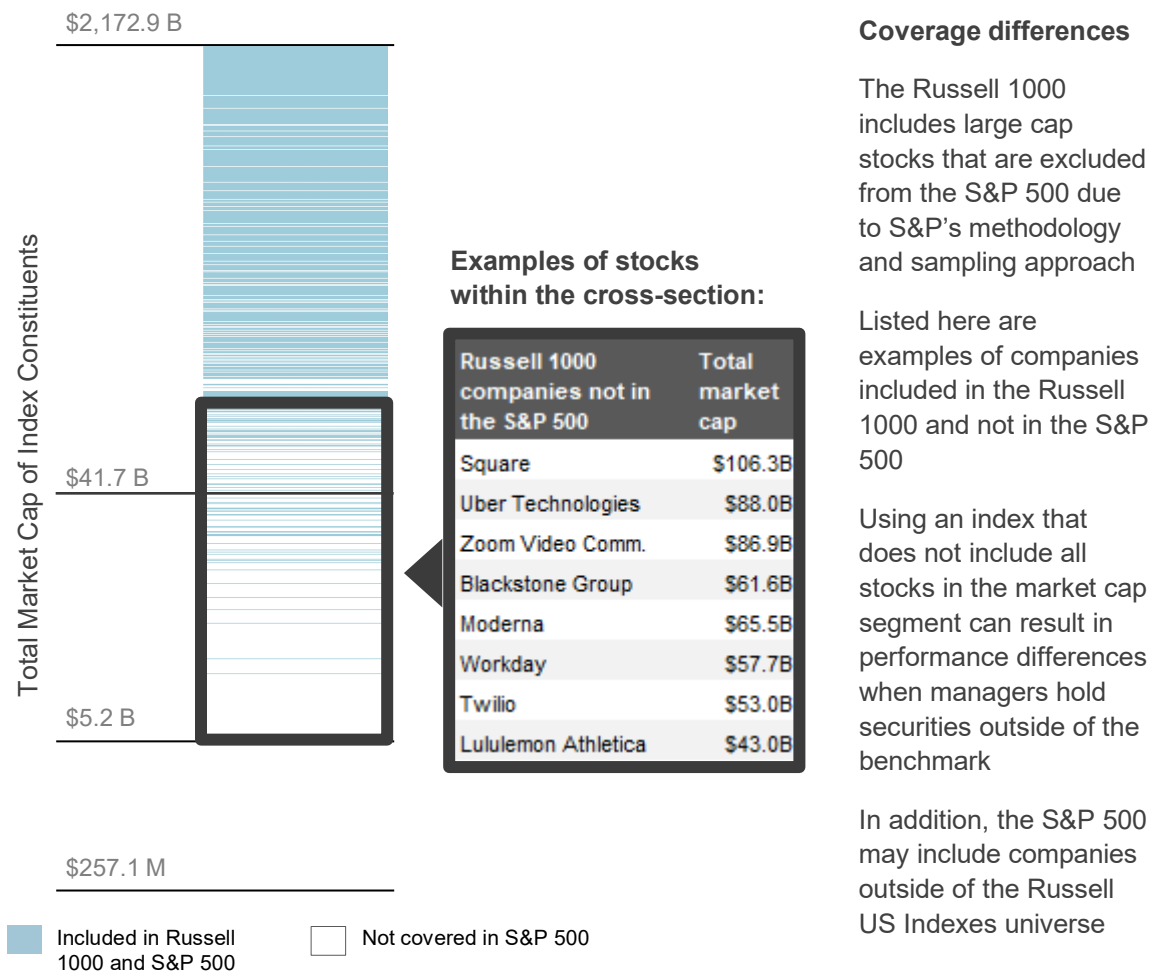|	Russell 1000® Index	S&P 500® Index
Target coverage	The largest 1,000 stocks in the broad market Russell 3000® Index as of the annual reconstitution	500 companies within the S&P Composite 1500 Index that represent large cap companies
Reconstitution	Fully reconstituted annually in June, as of the last Friday in June (or preceding Friday) All eligible securities are ranked by total market cap on rank day in May Stocks ranked #1-1000 are included A 2.5% band above and below the breakpoint mitigates turnover	No regularly scheduled reconstitution process Changes are made on an as-needed basis as determined by the committee, and may be made with less than three business days' notice Stocks may migrate from the S&P 600 or 400 without meeting all standard eligibility criteria
Market cap range	Market cap breakpoints change each year at recon: 2021 range: $5.2B - $2,172.9B (minimum $3.6B with banding)	Market cap ranges are reviewed from time to time, as of May 2021: Large cap: $11.8B or more
Eligibility criteria for new additions	US company based on country of incorporation, headquarters and most liquid US exchange Market cap is within market-adjusted capitalization breaks of Russell 1000 Index as of the latest reconstitution Float or shares available in the marketplace must be greater than 5% Company voting rights greater than 5% in the hands of unrestricted shareholders ADDTV of new share classes greater than the global median as of the latest reconstitution	US company based on 10-K annual reports, greater than 50% US assets and/or revenues, primary listing on eligible US exchanges Stocks must have positive earnings over the sum of the most recent four consecutive quarters, including the most recent quarter Investable weight factor of at least 0.10 Tracking stocks and companies with multiple share class structures are not eligible Ratio of ADVT (based on composite pricing and volume) to float market cap should be at least 1.00, and the stock should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date Sector balanced relative to the S&P TMI
IPOs	Eligible IPOs are added quarterly	No regularly scheduled IPO addition process IPOs must trade 12 months before eligible

Such design differences can have a significant impact on the coverage achieved by different benchmarks with similar stated objectives.

For example (see Figure 2), the committee-driven sampling approach used by the S&P 500 results in the effective exclusion of a number of the large-cap US stocks that are included in the Russell 1000 index.

Measured on a log scale of market capitalization, the blue shading in the column on the left of Figure 2 shows the common ground between the Russell 1000 and S&P 500, as of May 7, 2021 (in other words, where individual US large-cap stocks were included in both indexes). The white gaps in the shading of the column indicate where stocks were included in the Russell 1000 but excluded from the S&P 500.

The box in the center of Figure 2 highlights that several large-cap US stocks—including Square, Uber, Zoom—fell into this category. As of mid-2021, these stocks were present in the Russell 1000 but not the S&P 500.

Figure 2: Differences in coverage—Russell 1000 vs. S&P 500

Examples of stocks within the cross-section:

Russell 1000 companies not in the S&P 500	Total market cap
Square	$106.3B
Uber Technologies	$88.0B
Zoom Video Comm.	$86.9B
Blackstone Group	$61.6B
Moderna	$65.5B
Workday	$57.7B
Twilio	$53.0B
Lululemon Athletica	$43.0B

Y-axis: Total Market Cap of Index Constituents

Labels on column: $2,172.9 B, $41.7 B, $5.2 B, $257.1 M

Legend: Included in Russell 1000 and S&P 500 | Not covered in S&P 500

Coverage differences

The Russell 1000 includes large cap stocks that are excluded from the S&P 500 due to S&P's methodology and sampling approach

Listed here are examples of companies included in the Russell 1000 and not in the S&P 500

Using an index that does not include all stocks in the market cap segment can result in performance differences when managers hold securities outside of the benchmark

In addition, the S&P 500 may include companies outside of the Russell US Indexes universe

The graphic depicts where Russell 1000 stocks may not be included in the S&P 500. This graphic was created by comparing the S&P 500 index holdings to the Russell 1000 index holdings, both ranked by total market cap. Blue indicates securities included in the S&P 500, and white indicates no coverage by the S&P comparison index.

Unsurprisingly, these differences in coverage can have a significant impact on the performance of the respective benchmarks.

In Figure 3, we highlight some of the differences in performance resulting from the fact that the S&P 500 has, in general, tended to add certain large-cap stocks later than their inclusion date in the Russell 1000 index (or Russell 2000 index if the stock was added as a small cap)—in some cases up to a decade later.

This has meant a performance gap. In the case of individual stocks, the cumulative total return between the Russell US equity index inclusion date and the S&P 500 inclusion date ranged from 10 percent to over 17,000 percent.

The coverage differences also impacted the top-level performance of the two indexes. In the case of one stock that was added later to the S&P 500 than the Russell 2000 and subsequently the Russell 1000—Netflix—the index-level performance difference reached 6.7 percent over the period when Russell included it and S&P didn't.

Figure 3: Differences in performance from timing of index additions—Russell 1000 vs. S&P 500

Company	IPO month	Added to Russell 3000 (A)	Added to S&P 500 (B*)	% Cumulative Total Return of the Stock from A to B*	Russell 1000 Cumulative Excess Return over S&P 500 from A to B*	Russell 3000 Cumulative Excess Return over S&P 1500 from A to B*
Apple	Dec 1980	Mar 1981	Nov 1982	30%	-0.7%	N/A*
Microsoft	Mar 1986	Mar 1986	Jun 1994	3,270%	-6.1%	N/A*
Starbucks	Jun 1992	Jun 1993	Jun 2000	523%	-6.0%	N/A*
Amazon.com	May 1997	Jul 1997 (R2) Jul 1998 (R1)	Nov 2005	1,923%	5.6%	-0.8%
Netflix.com	May 2002	Jun 2002 (R2) Jun 2009 (R1)	Dec 2010	2,412%	6.7%	3.3%
Alphabet (Google)	Aug 2004	Sep 2004	Mar 2006	201%	2.5%	1.7%
Tesla	Jun 2010	Sep 2010	Dec 2020	17,192%	6.1%	5.8%
Facebook	May 2012	Jun 2012	Dec 2013	46%	0.8%	0.6%
Square	Nov 2015	Dec 2015	TBD*	1,563%	3.4%	4.1%
Zoom	Apr 2019	Jun 2020	TBD*	39%	2.3%	2.3%
Uber	May 2019	Jun 2019	TBD*	10%	2.4%	3.0%

Source: FTSE Russell, data as of December 31, 2020. Russell 3000 additions are to the Russell 1000 (R1) unless a date is noted for the Russell 2000 (R2). The inception date of the Russell 3000 Index is January 1, 1984. All performance presented prior to the index inception date is back-tested performance. S&P 500 Index inception is 1/31/1995, so index performance is not available prior to this date. If the S&P 1500 has not added the stock yet, performance is as December 31, 2020. Past performance is no guarantee of future returns. See the end for important disclosures.

Principle 2: Modularity

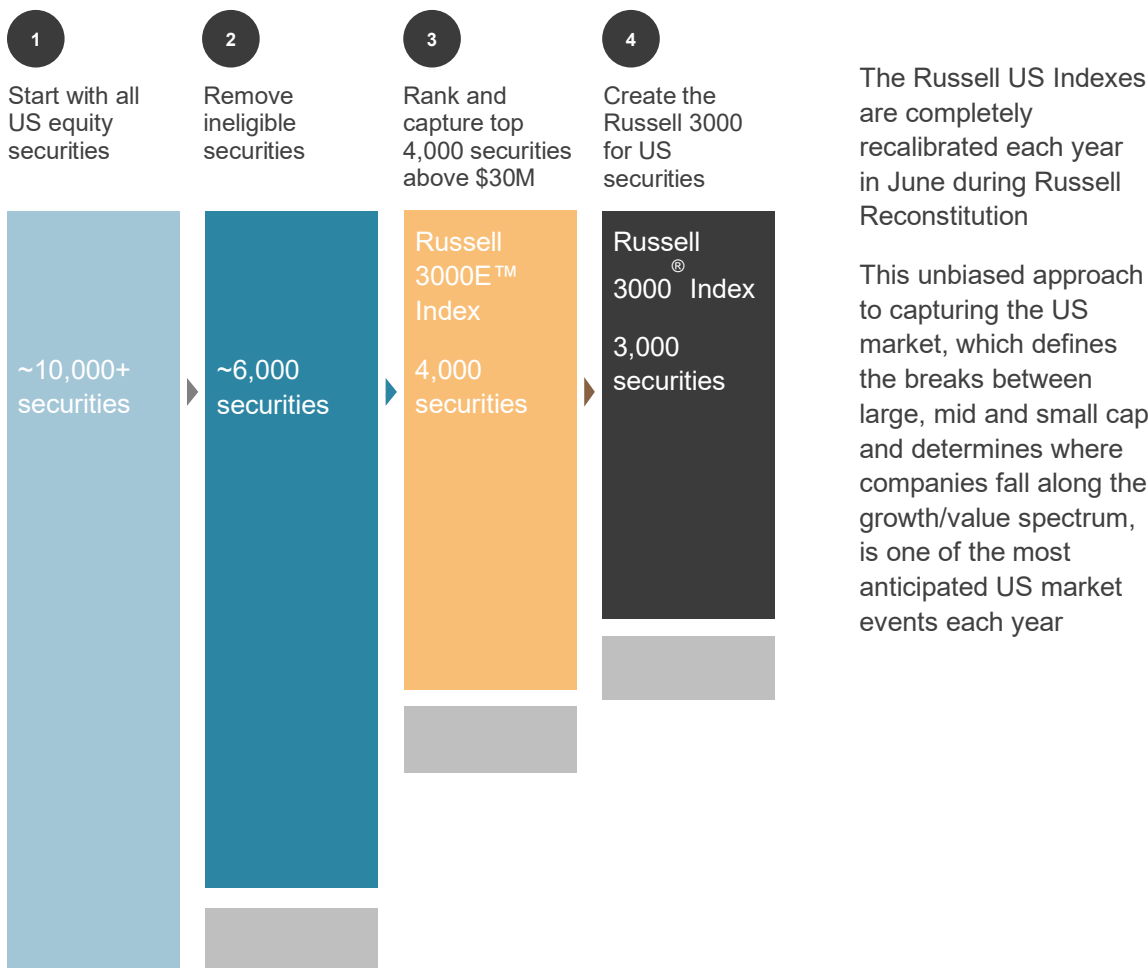## Segment the market using a building block approach

A second important benchmark construction principle is modularity. By this we mean that the broad market index is segmented into modular components (building blocks), that can be utilized separately or in combination, as the investor wishes.

A lack of modularity can produce inadvertent exposures and undermine the intended asset allocation goal. For example, if the lines between small and large cap market segments are blurred, an investor using separate indexes to allocate assets between the two categories may end up with unnecessary overlaps.

Russell's modular approach to US equity benchmark construction consists of two steps. First, we capture the whole US equity market universe at our annual reconstitution (see Figure 4).

Starting with all US equity securities (around 10,000 individual names), we first remove ineligible securities, reducing the list to around 6,000 names. Then, we capture and rank the top 4,000 securities above $30 million in total market cap, the largest 3,000 of which form the Russell 3000 Index.

Figure 4: How Russell captures the US equity market universe

1	**2**	**3**	**4**	
Start with all US equity securities	Remove ineligible securities	Rank and capture top 4,000 securities above $30M	Create the Russell 3000 for US securities	The Russell US Indexes are completely recalibrated each year in June during Russell Reconstitution

Russell 3000E™ Index
4,000 securities

Russell 3000® Index
3,000 securities

~10,000+ securities

~6,000 securities

The Russell US Indexes are completely recalibrated each year in June during Russell Reconstitution

This unbiased approach to capturing the US market, which defines the breaks between large, mid and small cap and determines where companies fall along the growth/value spectrum, is one of the most anticipated US market events each year

Note: If there are fewer than 4,000 eligible companies above $30M in size, the R3000E will contain fewer than 4,000 companies.

Then (see Figure 5), we segment the Russell 3000 into different, modular market cap indexes. The Russell 1000 consists of the largest 1000 equities (by capitalization) in the Russell 3000 Index and the Russell 2000 consists of the remaining 2000 names.

Other indexes (e.g., the Russell Top 50, Russell Top 200, Russell Top 500 and Russell 2500) help create the entire series of Russell US indexes.

A market capitalization banding methodology[2] is applied around the breakpoint between large and small cap segments to reduce unnecessary index turnover, which was introduced in 2007.

The time-tested approach to creating modular market segmentations from the Russell Indexes—with turnover-reducing enhancements along the way—remains as relevant and effective today as it was when the Russell US Indexes were introduced in 1984.

Figure 5: Segmenting the Russell 3000

The Russell 3000E Index is divided into additional market cap segments to create the entire series of Russell US Indexes.
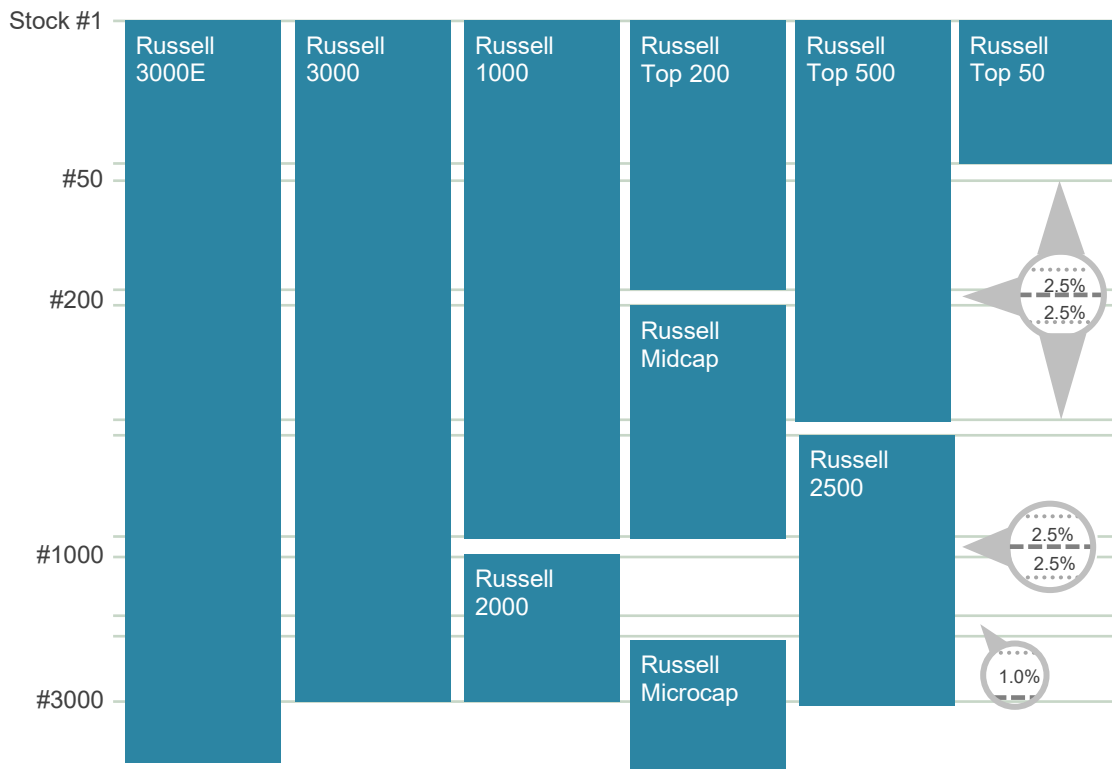
Not all benchmark families follow the same principle of modularity. For example, the S&P Composite 1500 index can be subdivided into the S&P 500 index of large-cap stocks, the S&P MidCap 400 index and the S&P 600 SmallCap index. These indexes all have target market capitalization ranges that do not overlap.

However, although the target market cap ranges are modular by design, the actual market cap ranges of the stocks in the three indexes do overlap (see Figure 6). For example, as at May 2021

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[2] Capitalization banding involves the implementation of a ±2.5% band around the breakpoint. For further information, please refer to the Russell US Indexes construction and methodology document or contact FTSE Russell Client Service.

the target market cap range for the S&P 500 index was $11.8 billion or more, yet it included 42 companies below this target.

And an index user combining the S&P SmallCap 600 index with the S&P MidCap 400 index at the same date had significant coverage of midcap companies as a result of such market cap range overlaps (the largest S&P 600 SmallCap index company had a market cap of $11.4 billion, while the smallest S&P MidCap 400 index company had a market cap of $1.8 billion).

While Russell indexes are reconstituted every year in June, a process during which the breaks between large-, mid- and small-cap US companies are redefined, there is no formal timescale for the resetting of the S&P market cap bands. For example, since March 2017, S&P has increased its market capitalization targets in February 2019, December 2020, March 2021 and June 2021, or after periods of 23, 22, 3 and 3 months, respectively, by 34%, 20%, 20% and 11% for the S&P 500. The S&P 500 has not decreased its market cap threshold since December 2008.

Figure 6: Modular index construction vs. overlapping capitalization segments
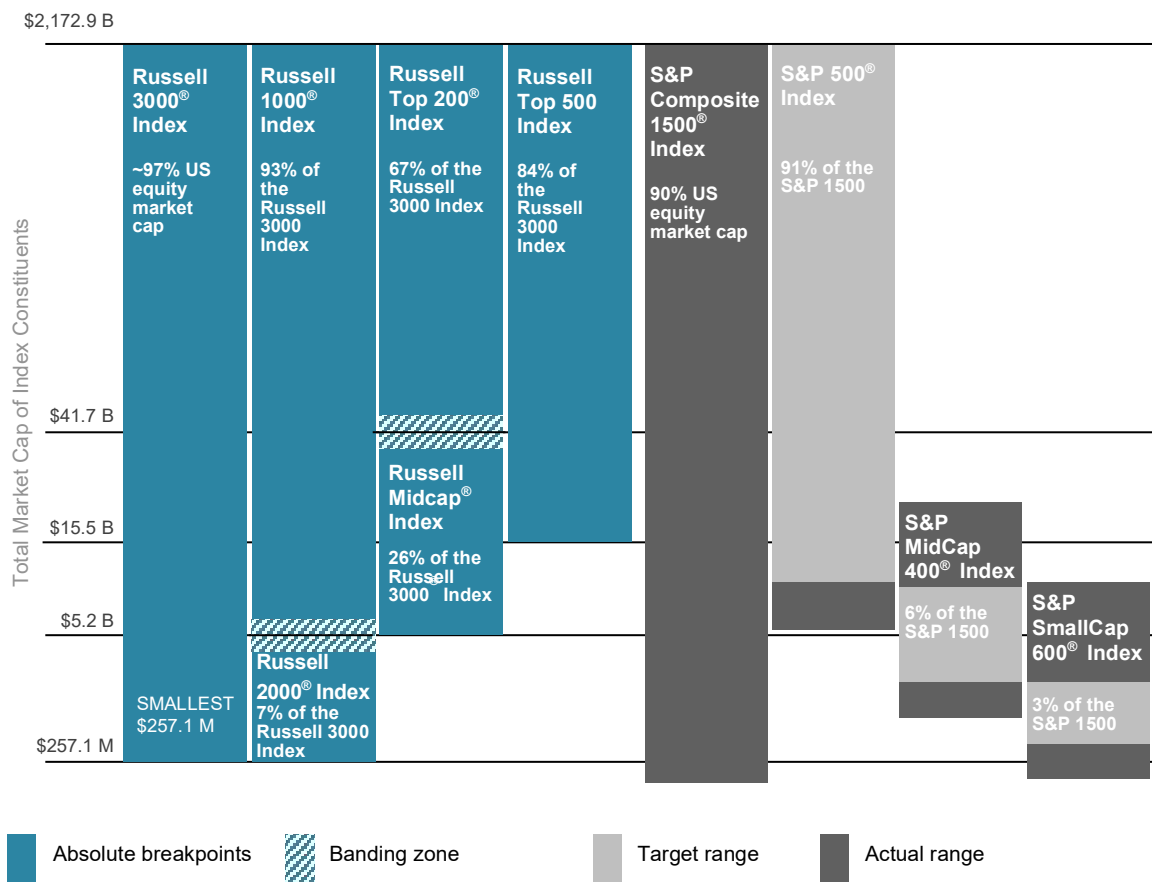
Source: FTSE Russell. As of Russell US index reconstitution rank day May 7, 2021. The market capitalization breakpoints for the Russell US Indexes are based on new additions as of reconstitution. The market capitalization ranges used above are absolute breakpoints for new members and do not include capitalization banding. Capitalization banding involves the implementation of a ±2.5% band around certain breakpoints. For further information, please refer to the Russell US Indexes construction and methodology document or contact FTSE Russell Client Service.

S&P source: iShares S&P 500, 400, 600 ETF holdings https://www.ishares.com/us/; S&P index methodology http://www.standardandpoors.com/indices. Data as of May 7, 2021.

Modularity in Russell US Style Indexes

Russell's building-block approach to benchmark construction extends to the firm's widely used US Style indexes. These indexes, launched in 1987, were the first of their kind and enabled investment professionals to segment the US equity market into growth and value stocks.

The Russell US Style indexes employ a multi-variable approach, using book to price, I/B/E/S 2-year forecast growth and historical 5-year sales per share growth, to determine whether a company is part of the growth or value investment universe.

When company stock characteristics don't allow for absolute style distinction, the Russell Style indexes allocate portions of the firm's market capitalization to both growth and value stocks (this applies to approximately 30% of the Russell 1000 Index market cap).

Therefore, there is no double counting: the Russell 1000 Value index and the Russell 1000 Growth Index sum to the Russell 1000 Index.

Since their introduction more than three decades ago, the modular Russell US Style indexes have served as the foundation for a new ecosystem of investment funds. As of December 2020, out of the $10.6 trillion benchmarked to the Russell Indexes, $7.5 trillion were benchmarked to the Russell Style Indexes.*

* Data as of December 31, 2020 as reported on April 1, 2021 by eVestment for active institutional funds, Morningstar for active retail mutual funds, insurance products, and ETFs, and passive assets directly collected by FTSE Russell. AUM includes blended benchmarks and excludes futures and options. AUM data does not include active and passive assets not reported to a 3rd party source or FTSE Russell. For funds where the AUM was not reported as of December 31, 2020, the previous period AUM was used as an estimate. No assurances are given by FTSE Russell as to the accuracy of the data.

Principle 3: Reliability

Use a disciplined, reliable maintenance process

A third important benchmark design principle is reliability: it is critical for the index to have in place a disciplined, reliable maintenance process that is backed by a well-defined, balanced governance system.

The market is constantly changing as new companies are listed, existing firms are acquired, and companies grow from small to mid or mid to large cap in size. Indexes that lack the maintenance protocols necessary to reflect market changes in a timely manner tend to have unintended sector and/or capitalization biases.

By comparison with benchmarks that allow for subjectivity in the equity selection process, the Russell US indexes follow a consistent set of rules to determine index eligibility (see Figure 7).

Figure 7: Determining Russell US index eligibility

Inclusions	• Companies classified as US • Must trade on eligible US exchanges on rank day in May
Exclusions	• Pink sheet, OTC and bulletin board stocks • Closed-end mutual funds, limited partnerships, royalty trusts • Blank check/SPAC companies, BDCs • Foreign Stocks and American Depositary Receipts (ADRs) • Companies under $30Million in total market capitalization • Companies historically passing UBTI to shareholders* • Stocks trading below $1.00 (average used for the month of May for existing members) • Stocks with less than 5% float adjusted market cap • Companies with less than 5% voting rights
Maintenance	• Stocks removed between reconstitution dates are NOT replaced • Spin-offs and Initial Public Offerings are the only additions between reconstitution dates

A complete set of rules can be found at http://www.ftse.com/products/downloads/Russell-US-indexes.pdf
*and not blocking future UBTI to shareholders

The Russell US indexes then employ a regularly scheduled series of objective, disciplined maintenance processes, summarized below, to ensure that the changes occurring in the equity market are effectively represented.

- **Annual reconstitution**: The Russell US Indexes undergo annual reconstitution each year in June. During this time, a top-to-bottom recalibration of the market occurs and all US companies are assessed for index eligibility and placement. This process includes segmenting companies by size and re-evaluating where they lie along the growth/value style continuum relative to their peers.

- **Quarterly additions of eligible IPOs**: On a quarterly basis, IPOs are evaluated for eligibility and if requirements are met, newly listed companies are added to the Russell US Indexes according to a transparent schedule. This process ensures that new additions to the opportunity set are reflected between the regular annual reconstitutions.

- **Adjustments due to corporate actions**: Corporate actions can have a material impact on an index's representativeness and its resulting performance. The Russell US indexes are adjusted to reflect corporate activity such as mergers, acquisitions, and share adjustments according to a transparent schedule.

Over and above these maintenance processes, a formal governance system helps ensure that the benchmark family responds and adapts to the evolving market. A well-designed governance framework can help ensure that the benchmark's overseers deal in a responsible way with the inevitable trade-offs that come with index design.

For example, consideration must be given to the fact that regular changes to an index's methodology enhancements can be burdensome to the end-investor. The index governance process must weigh the pros and cons of other changes that may have downstream impact on index users.

As is the case with all FTSE Russell Indexes, methodology changes to the Russell US Indexes are reviewed, considered and finally approved within a well-defined governance framework that draws from internal expertise as well as external independent committees of leading market participants.

Balancing representativeness and usability

Prior to the Russell 3000 index's launch in 1984, the incumbent broad-market US index was the S&P 500, a sampled US large cap index managed by a committee. However, there were far more stocks outside of the incumbent benchmark that were bought and held by institutional investors. As a result, the incumbent index was not a fully representative broad US benchmark, particularly for what is now recognized as the small cap segment of the US equity markets.

During its extensive consultation work with institutional investors and investment managers, the Frank Russell Company (Russell) determined that institutional investors could hold shares of roughly the largest 98 percent of US companies. In accordance with this observation, the firm designed the Russell 3000 Index to provide a reasonable representation of the entire, practical investment universe from which most institutional investors were selecting, including a specific US small cap benchmark, the Russell 2000 Index, which was distinct from the large cap Russell 1000 Index.

Furthermore, Russell recognized the importance of available shares, or float, in determining the investable universe, and therefore the Russell 3000 Index has applied float adjustments since its inception date of December 31, 1978. Today, float-adjusting securities held within an index is industry standard.

The Russell 3000 Index continues to this day to capture roughly the same percentage (~98/100) of the investable US equity market, providing effective market representation by capturing the entire practical opportunity set.

Summary

Benchmarks are used by a wide range of market participants, including professional investors across all stages of the investment process. For those market professionals, index performance should be an outcome, not a design objective. The three principles we've outlined—**objectivity**, **modularity** and **reliability**—are essential to a benchmark's ability to represent effectively a market or market segment.

Benchmarks that ignore these principles can undermine an index-tracking portfolio's intended market exposure and impact its risk/return profile. Index users should therefore take the principles into consideration during the benchmark selection process. By selecting a better benchmark, investors can have confidence that they are gaining exposure to the true market opportunity set while avoiding misguided investment decisions and potential unexpected consequences.

About FTSE Russell

FTSE Russell is a leading global provider of benchmarks, analytics and data solutions with multi-asset capabilities, offering a precise view of the markets relevant to any investment process. For over 30 years, leading asset owners, asset managers, ETF providers and investment banks have chosen FTSE Russell indexes to benchmark their investment performance and create investment funds, ETFs, structured products and index-based derivatives. FTSE Russell indexes also provide clients with tools for performance benchmarking, asset allocation, investment strategy analysis and risk management.

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