



**RAY CARROLL, PhD, CFA,**

Chief Investment Officer, Breton Hill

**EVGENY DUNAEVSKY, CFA, CPA, CA,**

Associate Portfolio Manager

## The Pitfalls of Investing in Factor Indices

Investors tend to equate factor indexing with “passive” investing—a theoretically straightforward, set-it-and-forget-it exercise in tracking various swaths of the market. The truth, we find, is far from it: Upon closer inspection, we believe navigating the factor indexing landscape can be a challenging journey with many potential pitfalls.

This paper continues our exploration of the limitations of equity indexation. Earlier installments addressed the opaque and arguably illogical construction methodologies of putatively passive market-capitalization-weighted benchmarks ([here](#)), net-zero-focused benchmarks ([here](#)), and commodity benchmarks ([here](#))—all of which are tracked by hordes of index funds.

In this fourth chapter, we demonstrate a) that factor indices are based on many *active* decisions by index providers, and b) why we think active factor managers have the potential to deliver superior risk-adjusted returns.

## Executive Summary

We find that factor indexing can present many potential pitfalls for investors. Among them:

- Ostensibly similar factor indices can be based on different construction methodologies that may yield significantly different outcomes, thereby putting considerable onus on index investors to select the right index to meet their needs.
- Inherent conflicts of interest between factor index providers and factor investors can, we believe, lead to suboptimal risk-adjusted returns.
- Index construction rulebooks tend to shift over time, implying that factor index providers are being entrusted to make an array of *active* investment decisions while ultimately bearing no fiduciary duty to index fund investors.
- Unlike their market-cap-weighted counterparts, factor indices may not accurately approximate the broader factor strategy they purport to track; in our view, factor index selection is akin to manager selection.

Upon closer examination, we believe skilled active managers can be better suited than factor index funds to deliver attractive long-term, risk-adjusted returns.

## Factor Indices Versus Market Cap Indices

Factor investing has blossomed into a massive enterprise: There are now hundreds of thousands of investable indices<sup>1</sup> based on a blizzard of mechanisms thought to propel asset prices. These include myriad variations of traditional investment-style factors—think size, value and growth—as well as quirkier drivers, such as employee growth and maximum daily return.<sup>2</sup> The factor zoo, as some have called it, has become a roaring, vibrant place—and a veritable goldmine for asset managers ready and willing to offer index funds that faithfully track those benchmarks. According to Morningstar, *total assets managed by factor index funds had reached nearly \$2.1 trillion* at the end of February 2024.

But factor indices are fundamentally different than their traditional, market-cap-weighted brethren—and we believe those differences can have significant implications for investors. Whereas market-cap indices aim to offer a mechanical, hands-off way to track entire swaths of the market (hence their “passive” moniker), a closer examination of factor indices reveals far more “active” decision-making by index providers than meets the eye. This evolution has sown concern among regulators, including Gary Gensler, chairman of the SEC: “The role of these information providers today raises important questions under the securities laws as to when they are providing investment advice rather than merely information.”<sup>3</sup>

While we find that market-cap indices certainly have their flaws (for more on this, see [The Fine Print of Indexation](#)) and no two comparable market-cap-weighted indices are created equal, *the differences between ostensibly similar factor indices can be strikingly large*. We fear these discrepancies can thwart thoughtful and informed index selection and potentially invite suboptimal investment outcomes.

## Names and Weights

Consider the comparison of two sets of market-cap-weighted indices: the S&P 900 Index versus the Russell 1000 Index (shown on the left side of figure 1), and the MSCI USA Investible Market Index versus the Russell 3000 Index (shown on the right). In both examples, the stock weights for the comparable indices lie on a smooth, 45-degree line up to the right. This result reflects the similarities in the constituent companies and their weightings within each comparable index pair. In terms of statistics, over 99% of the variability in weights in the MSCI USA Investible Market Index is predictable if we know the weights in the Russell 3000.

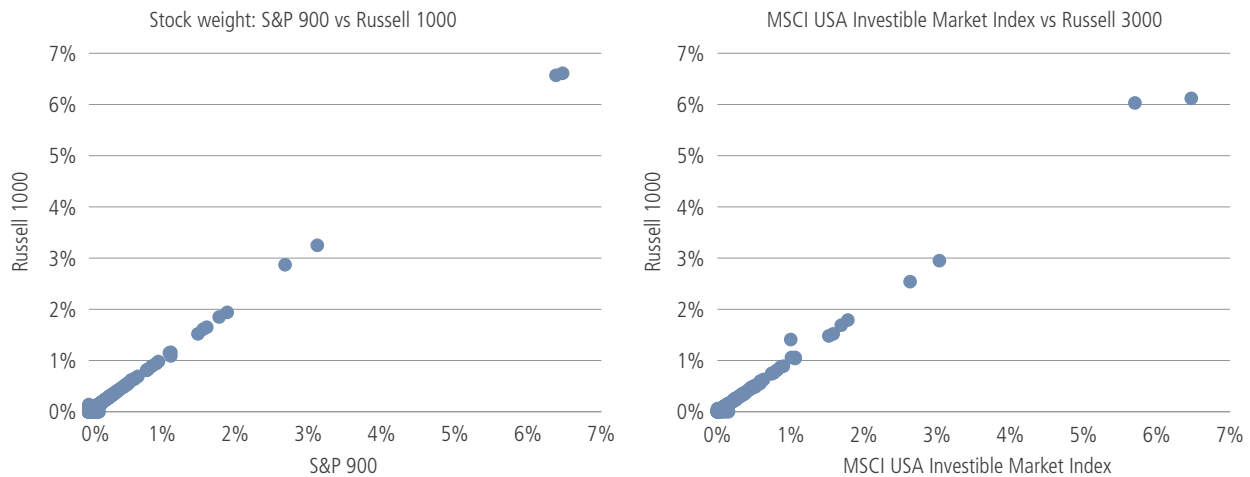
<sup>1</sup> Source: “[Index proliferation ads choice but fuels confusion](#),” *Financial Times*, November 5, 2018.

<sup>2</sup> Source: “[The 300 Secrets\\* to High Stock Returns](#),” *Chicago Booth Review*, May 21, 2018.

<sup>3</sup> Source: [SEC Press Release](#), 2022-109, June 15, 2022.

The modest variability in index construction is also evident when comparing the *active share* differential between the index pairs. (Active share is defined as the sum of the absolute value of the constituents' weight differences, divided by two.) A low differential—measured in percentage terms—means there's not much difference in constituent weightings between two indices. As of December 29, 2023, the active share differential between the S&P 900 Index and the Russell 1000 Index was a modest 4.76%;<sup>4</sup> for the MSCI USA Investible Market Index versus the Russell 3000 Index, it was a mere 2.12%.<sup>4</sup>

**FIGURE 1: SIMILAR MARKET-CAP-WEIGHTED INDICES TEND TO HAVE SIMILAR CONSTITUENTS AND WEIGHTS**



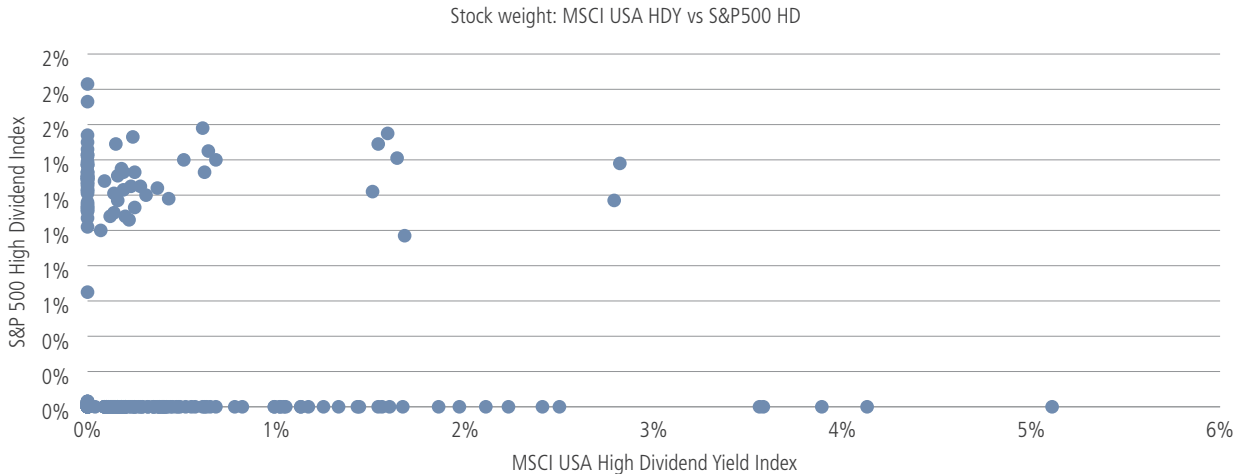
Source: Bloomberg, Neuberger Berman. Nothing herein constitutes a prediction or projection of future events or future market behavior. Due to a variety of factors, actual events or market behavior may differ significantly from any views expressed.

Factor indices, we find, are very different than market-cap-weighted industries in this regard—and in fact they can vary quite a lot across different index providers.

For example, consider a comparison of two income-oriented factor indices, the MSCI USA High Dividend Yield Index and the S&P 500 High Dividend Index, as shown in figure 2. In the chart, the concentration of dots hugging both axes means that some companies are in one index but not in the other (and vice versa), while the randomly scattered dots in the middle correspond to companies held in both indices, but at different weights. In fact, only 1% of the variability of weights in the S&P 500 High Dividend Index is predictable if we know the weights in the MSCI USA High Dividend Yield Index. Suffice to say, it's a far cry from the two smooth-trending charts featuring similar market-cap-weighted indices shown above.

<sup>4</sup> Source: Bloomberg, Neuberger Berman.

**FIGURE 2: SIMILAR FACTOR-BASED INDICES MAY HAVE VERY DIFFERENT CONSTITUENTS AND WEIGHTINGS**



Source: Bloomberg, Neuberger Berman.

Turning to active share, the differential between the two indices, as of December 29, 2023, was a whopping 83.65%.<sup>5</sup> Such disparities between ostensibly similar factor indices may be more common than investors realize: Using two additional examples, the active share differential between the MSCI USA High Dividend Yield Index and the Dow Jones U.S. Select Dividend Index was 79.65%,<sup>5</sup> and between the S&P 500 High Dividend Index and the Dow Jones U.S. Select Dividend Index the differential was 55.56%.<sup>5</sup>

**Tracking Risk**

Significant disparities between comparable factor indices can present a significant index-selection conundrum for passive investors: *Which combination of names and weights should they be tracking?*

If active share differentials are cause for concern, then *tracking risk* is the effect. Tracking risk—sometimes referred to as “Tracking Error” (TE)—captures the variability of return differences between indices.

As shown in figure 3, over the last 10 years the TE between two comparable market-cap weighted benchmarks—the Russell 3000 Index and the MSCI USA Investible Market Gross Total Index—was just 0.17%; by contrast, the TE between two ostensibly similar multifactor indices, and the TE between two income-titled indices, were a vastly wider 3.05% and 8.68%, respectively.

<sup>5</sup> Source: Bloomberg, Neuberger Berman.

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**FIGURE 3: FACTOR INDICES CAN EXHIBIT MORE TRACKING ERROR THAN MARKET-CAP-WEIGHTED INDICES**

<b>Period: 12/31/2013 – 12/31/2023</b>	<b>Tracking Error (TE)*</b>	<b>Biggest calendar year return difference</b>
Russell 3000 Total Return Index vs. MSCI USA Investible Market Gross Total Index	0.17%	0.46% (2021)
MSCI World Diversified Multiple-Factor Index vs. FTSE Developed Comprehensive Factor Net Tax Index	3.05%	1.75% (2021)
MSCI USA High Dividend Yield Total Return Index vs. S&P 500 High Dividend Total Return Index	8.68%	13.28% (2020)

\* TE is the annualized standard deviation of returns: For example, a TE of 0.10% implies that, 95% of the time, the annual difference in returns between two indices will fall within 2 x 0.10%, or 0.2%; at the other extreme, a TE of 10% implies that 95% of the time the annual difference in returns will fall within 2 x 10%, or 20%.

Source: Bloomberg, Neuberger Berman Nothing herein constitutes a prediction or projection of future events or future market behavior. Due to a variety of factors, actual events or market behavior may differ significantly from any views expressed. **Past performance is not indicative of future results.**

### Construction Confusion

We believe market-cap-weighted indices, for all their seemingly straightforward appeal, can suffer from flawed construction methodologies devised to help passive managers accommodate huge asset flows (see [The Fine Print of Indexation](#)). In terms of raw complexity, however, we think many factor indices can put their market-cap counterparts to shame.

A 2021 paper, published by S&P Dow Jones Indices, highlighted just how murky the process of building a multi-factor index can be.<sup>6</sup> The article identified eight broad construction variables, each with its own dizzying subset of considerations. Even precise *factor definitions* are up for debate among different index providers.

One key construction variable is an index's *weighting scheme*: A multi-factor index provider might choose to weight each constituent by its float-adjusted market cap, by its multi-factor score, by multiplying those two figures together, or by getting even more creative—and that weighting decision is further based on an ill-defined “trade-off between liquidity, active risk and factor exposure.”

Another variable is *rebalancing frequency*: S&P Dow Jones Indices says that deciding how often to reselect and reweight index constituents necessitates a “trade-off between factor decay and portfolio turnover.”

How often do factor indices reshuffle their holdings? A lot more often than traditional market-cap-weighted indices do, thereby increasing overall complexity for investors. As of December 31, 2023, the Russell 3000 Total Return Index had an annual turnover of 5%, while MSCI World Diversified Multiple-Factor Index reconstituted its holdings *by more than 40%* (see figure 4).

<sup>6</sup> Source: S&P Dow Jones Indices, LLC, “Exploring Techniques in Multi-Factor Index Construction,” February 2021.

**FIGURE 4: FACTOR INDICES CAN HAVE MUCH HIGHER TURNOVER THAN MARKET-CAP-WEIGHTED INDICES**

Index Name	Index Type	Annual Turnover*
S&P 500 Total Return Index	Market Cap	2%
Russell 1000 Total Return Index	Market Cap	6%
Russell 3000 Total Return Index	Market Cap	5%
MSCI USA IMI Gross Total Return USD Index	Market Cap	2%
MSCI World Net Total Return USD Index	Market Cap	2%
MSCI USA High Dividend Yield Total Return Index	Income Factor	16%
Dow Jones U.S. Select Dividend Index	Income Factor	19%
MSCI World Diversified Multiple-Factor Index	Multi-Factor	40%
RAFI Multi-Factor Developed Total Return Index	Multi-Factor	41%
SciBeta Developed iHFI Diversified Multi-Beta Multi-Strategy Six-Factor Equal Weight USD Gross Total Return Index	Multi-Factor	36%

Note: Data as of December 31, 2023.

Source: Bloomberg, Neuberger Berman. \*All figures rounded to the nearest whole percentage. Nothing herein constitutes a prediction or projection of future events or future market behavior. Due to a variety of factors, actual events or market behavior may differ significantly from any views expressed. Indices are unmanaged and not available for direct investment. **Past performance is not indicative of future results.**

The observation here is that factor indices represent a massive uptick in complexity and variability of outcomes relative to broad-based market cap indices. Therefore, we believe it would be dangerous to assume that benefits associated with passive investing carry over to factor indexing. In the following sections, we will explore some of these pitfalls.

## The Inherent Conflict Between Index Providers and Factor Investors

A potential pitfall for factor index investors, in our view, is the inherent conflict of interest between the indexation complex (which has aggressive growth goals to hit) and index investors (who seek optimal risk-adjusted returns).

### The Tyranny of Taxonomy

Many index providers offer a suite of index products, and sometimes enforce a taxonomy that follows a building-block approach such that various sub-indices can be neatly aggregated to create a parent index. We believe that the desire to fit factor products neatly into non-overlapping “style boxes” over-simplifies the complex interactions between factors, and can invite suboptimal outcomes for investors in factor indices; call it the tyranny of taxonomy.

For example, when MSCI and Russell assemble their factor indices, both providers split the universe of publicly traded companies into two buckets: value and growth. In this two-dimensional framework, the value and growth universes would seem to cleanly correspond to their respective investment styles.

But the true picture is a bit muddier: We find that companies with the poorest growth can get pushed *into* the value index, even if they aren’t particularly cheap on a relative-value basis; likewise, cheaper companies can get pushed *out of* the value index if they demonstrate strong enough growth. We believe this approach can perversely prioritize investment product taxonomies (and thereby aid the marketability of these products) while potentially crimping investors’ risk-adjusted returns.

For example, PayPal Holdings recently traded around 11 times its forward price-to-earnings (P/E) ratio.<sup>7</sup> That’s cheap enough, it would seem, to warrant inclusion in the MSCI USA Value Index, which had a P/E of 19; however, Paypal’s revenues have also been growing, thereby disqualifying it from MSCI’s value index according to MSCI’s rigid style-box taxonomy.

<sup>7</sup> Source: As of February 22, 2024. Please see Disclosures at the end of this document.

On the flip side, Equity LifeStyle Properties—manufacturer of home communities, RVs and campgrounds—has been generating below-average growth and is included in MSCI's Value index, even though its forward P/E was recently 36.<sup>8</sup> This choice makes us wonder: *Why would value investors seek to hold an expensive stock in a company exhibiting a growth decline?*

### Rebalancing Riddles

In addition to taxonomy constraints, we believe index providers can hamper passive investors' risk-adjusted returns in the way they rebalance their high-turnover indices.

As noted above, some factor index providers rebalance their holdings by as much as 40% within one year (compared with 2% to 6% for broader, market-cap weighted indices). In our view, that much turnover not only introduces potential tax consequences for index fund investors, it can also create a demand for liquidity that effectively shifts returns from the investors' pockets to arbitrageurs looking for a quick profit by buying the names being added to an index and selling the ones being ejected.

We believe this potential risk is especially relevant when indices concentrate their rebalances into just a few days (typically two to four times per year), which is the standard originally developed for broader, lower-turnover market cap indices. For example, the MSCI World Diversified Multiple-Factor Index—with 40% annual turnover—rebalances just four times a year (up from twice a year, as of May 2022).

To us, these concentrated reshufflings are like ringing the dinner bell for arbitrageurs: Investors would be better served if MSCI made smaller, more frequent adjustments. In our view, the sheer amount of turnover in this index argues for rebalancing at least biweekly.

### Factor Indices Are Moving Targets

Adding still more potential confusion, index providers can significantly change their rulebooks over time.

While market-cap indices can morph at the margins, we find that factor index construction tends to be more in flux, as MSCI concedes in a May 2023 methodology overview: "As views on style definition and segmentation continued to develop, MSCI's methodology also evolved to ensure that its value and growth indexes remain reflective of the philosophy and state-of-the-art thinking in international style investing."<sup>9</sup> Translation: Factor indices can resemble a moving target.

Take the S&P Dividend Aristocrats Index. An appendix to its December 2023 methodology guidelines reveals that there have been 17 pages worth of changes to the index since 2010.<sup>10</sup> We think many of those changes represent material investment decisions, such as lowering the minimum number of years each index constituent had to have increased its dividend; expanding the number of overall names in the index from 50 to unlimited; and raising the minimum size (market-cap) of each name. The most recent change (on July 31, 2023) required that each constituent not have a weight of more than 30 times its weight in the S&P Composite 1500 index. Moving target, indeed.

By contrast, when combing the rules governing S&P's family of U.S. market-cap-weighted indices, we found far more modest adjustments over time, with many merely related to subtle market operations that don't materially impact the holdings of the index. Compared to factor indices, market-cap indices are relatively stationary targets.

***The implication here:*** *Factor index providers are being entrusted to make an array of active investment decisions while ultimately bearing no fiduciary duty to index fund investors who invest in products that track their benchmarks.*

We argue that index providers—and, in turn, the index managers that mechanically track them—may not be structurally suited to make these active decisions and ultimately deliver optimal risk-adjusted returns.

<sup>8</sup> Source: As of February 24, 2024. Please see Disclosures at the end of this document.

<sup>9</sup> Source: "[MSCI Global Investable Market Value and Growth Index Methodology](#)", May 2023.

<sup>10</sup> Source: "S&P Dividend Aristocrats Indices Methodology", S&P Dow Jones Indices, December 2023.

First, every change to an index requires updating a mountain of documentation, which can potentially add a lag between the index provider making a “state-of-the-art” decision and officially updating their methodologies. We fear this structural challenge can create the worst of both worlds for factor index fund investors: *The changes are too frequent to maintain transparency, and too slow to compete with true active management.*

Second, we think factor investing within an index fund effectively bypasses shareholder protections. After all, if a fund’s objective is to follow an index, and the index provider bears no fiduciary duty, then any changes to an index’s construction methodology are automatically blessed.

Adriana Robertson, professor of business law at the University of Chicago, put it plainly in a recent research paper: “While a mutual fund cannot deviate from its fundamental policies, as stated in its registration statement, without a shareholder vote, there is no restriction on an index’s ability to change its methodology. This asymmetry leaves investors in ‘index’ funds with fewer protections, and potentially facing higher risks, than investors in actively managed mutual funds.”<sup>11</sup>

### Expectations Versus Reality

A main attraction of broad-based, market-cap-weighted index funds is that they are a close proxy for a portfolio diversified across all active investors. In this sense, one could think of a market-cap index as a zero-sum game that encapsulates all the active bets across all market participants. Rather not be bothered trying to choose a skilled manager? Simply buy the index and settle for the returns of the theoretical average manager.

*Factor indices, however, may not be particularly representative of the markets they purport to capture, thereby potentially disappointing investors who invest on that premise.*

We performed an experiment to illustrate this effect in practice. We observed that an asset-weighted portfolio of active managers in the Large Cap Blend category<sup>12</sup> holds substantially more positions in common with the S&P 500 Index than it does with the average individual manager. In terms of active share differentials, the Large Cap Blend portfolio exhibited a modest 33% active share versus the S&P 500 Index, and 64% versus the average individual manager.

In contrast, a portfolio of active value-factor managers<sup>13</sup> does not look more like the S&P 500 Pure Value Index than it does with the average individual value manager. Specifically, the portfolio of active value-factor managers exhibited a large 83% active share versus the S&P 500 Pure Value Index, and 81% versus the average individual value manager.

In other words, this value index is no more representative of the overall value style than we would expect from randomly selecting an active value manager. *In our view, this experiment suggests that factor indices may be more akin to yet another active strategy rather than a short-cut to bypass manager selection.*

Finally, while plenty of active managers have struggled to outperform their market-cap-weighted benchmarks, we find a far greater percentage of active managers following a factor style have been outperforming corresponding factor benchmarks.

Consider that, between January 1, 2014 and December 31, 2023, just 9% of active managers employing “blended” equity strategies (a mix of value and growth) outperformed their respective market-cap-weighted benchmarks, including the S&P 500 Index, Russell 1000 Index and Russell 3000 Index.<sup>14</sup>

<sup>11</sup> Source: “Passive in Name Only: Delegated Management and ‘Index’ Investing”, Yale Journal on Regulation, July 2019.

<sup>12</sup> Source: Data sourced from S&P Capital IQ as of December 31, 2023. We used the “Companies” screener to filter for: Company Type: Public Fund, Mutual Fund; Market Cap Emphasis: Large Cap; Investment Style Managed: Blend; Analysis Type: Fundamental, Broad-Based Fund; Benchmark Indices: Includes S&P 500 Index; Investment Style – Market Cap: Large Cap; Vehicle Types Managed: Exchange Traded Fund, Open Ended Fund, with assets over \$500 million.

<sup>13</sup> Source: Data sourced from S&P Capital IQ as of December 31, 2023. We used the “Companies” screener to filter for: Company Type: Public Fund, Mutual Fund; Market Cap Emphasis: Large Cap; Investment Style Managed: Value; Analysis Type: Fundamental, Broad-Based Fund; Benchmark Indices: Includes S&P 500 Index; Investment Style – Market Cap: Large Cap; Vehicle Types Managed: Exchange Traded Fund, Open Ended Fund, with assets over \$500 million.

<sup>14</sup> Source: Morningstar, as of December 31, 2023. Screened for all managers that have a “large blend” style and are benchmarked to S&P 500 Index, Russell 1000 Index, or Russell 3000 Index with a 10-year track record. Excluded managers that had +/- 5bps of excess returns. Manager returns are net of fees.



By comparison, active managers following a factor style did much better against their appropriate factor index: Over the same ten-year period, 45% of active value managers outpaced their respective value indices (the S&P 500 Value, Russell 1000 Value and Russell 3000 Value)<sup>15</sup>, and 58% of income managers beat the MSCI USA High Dividend Yield Index.<sup>16</sup>

## A Better Way Forward With Factors

We have argued that investing in factor indices invites a number of challenges—from convoluted index construction methodologies and ever-changing rulebooks, to inherent conflicts of interest between index providers and index fund investors. And for those who tend to equate factor indexing with “passive” investing, we hope we have shed some welcome light.

**The key question, then:** *If factor investing requires an array of key decisions that may not be well suited to indexation, then on whom should investors rely to make those decisions?*

Upon closer examination of the potential pitfalls of factor indexation, we believe skilled factor managers can be better suited than factor index funds to deliver superior risk-adjusted returns. Specifically, we see opportunities to deliver effective factor strategies by focusing on the following characteristics:

- *Tailored analysis:* We believe each factor can be specifically customized by sector and geographic region to optimize performance.
- *“Quantamental” insights:* In our view, building quantitative factor models with insights from bottom-up, fundamental research can deliver better performance.
- *Alternative signals:* We think factor managers should look beyond companies’ financial statements to incorporate alternative data sources—for example, by monitoring daily bank transactions or using natural language processing to analyze thousands of earnings calls.
- *Portfolio optimization:* In our view, factor managers should exhibit strong control of the balance between risk and return, after considering turnover and transaction costs. We believe state-of-the-art portfolio optimization is the domain of active managers because it is generally too technical to be articulated in index methodology documents.
- *Disciplined trading and execution:* We believe factor managers should incrementally rebalance their portfolios to control transaction costs. In practice, we find that rebalancing every one to two weeks is sufficient to minimize timing risk and market impact.

**The bottom line:** We believe successful factor investing is the province of skilled active managers who have the incentive and resources to take a truly calibrated and comprehensive approach.

*This is the fourth paper in our series on the potential limitations and hidden costs of indexation. For additional perspective, please see our first three installments: [The Fine Print of Indexation](#), [The Limitations of Passive Investing to Achieve a Net-Zero Outcome](#), and [The Muddy Logic of Passive Commodity Investing](#).*

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<sup>15</sup> Source: Morningstar, as of December 31, 2023. Obtained a list of managers that have a “value” style and are benchmarked to S&P 500 Value Index, Russell 1000 Value Index, or Russell 3000 Value Index with a 10-year track record. Excluded managers that had +/- 5bps of excess returns. Manager returns are net of fees.

<sup>16</sup> Source: eVestment, as of December 31, 2023. Obtained a list of managers that are in a composite of U.S. Dividend Focus Equity with a 10-year track record. Evaluated what % of managers have outperformed the MSCI USA High Dividend Yield Gross Index. Excluded managers that had +/- 5bps of excess returns. Some managers on eVestment report gross of fees while others report net of fees. Therefore, the dataset comingles gross (85% of managers) and net (15% of managers) of fee returns.

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## Index Definitions

The **S&P 500 Index** consists of 500 U.S. stocks chosen for market size, liquidity and industry group representation. It is a market value-weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value.

The **S&P 900 Index** combines the S&P 500 and the S&P MidCap 400 to form an investable benchmark for the mid- to large-cap segment of the U.S. equity market.

The **Russell 1000 Index** measures the performance of the large-cap segment of the U.S. equity universe. It is a subset of the Russell 3000® Index and includes approximately 1,000 of the largest securities based on a combination of their market cap and current index membership. The Index is reconstituted annually to ensure new and growing equities are included

The **MSCI USA Investible Market Index** is designed to measure the performance of the large, mid and small cap segments of the U.S. market. With 2,378 constituents, the index covers approximately 99% of the free float-adjusted market capitalization in the U.S.

The **Russell 3000 Index** measures the performance of the largest 3,000 U.S. companies. The Index is reconstituted annually to ensure new and growing equities are included.

The **MSCI USA High Dividend Yield Index** is based on the MSCI USA Index, its parent index, and includes large and mid cap stocks. The index is designed to reflect the performance of equities in the parent index (excluding REITs) with higher dividend income and quality characteristics than average dividend yields that are both sustainable and persistent. The index also applies quality screens and reviews 12-month past performance to omit stocks with potentially deteriorating fundamentals that could force them to cut or reduce dividends.

The **S&P 500 High Dividend Index** serves as a benchmark for income-seeking equity investors. The index is designed to measure the performance of 80 high yield companies within the S&P 500 and is equally weighted to best represent the performance of this group, regardless of constituent size.

The **Dow Jones U.S. Select Dividend index** aims to represent the U.S.'s leading stocks by dividend yield.

The **MSCI World Diversified Multiple-Factor Index** is based on the MSCI World Index, its parent index, which includes large and mid-cap stocks across 23 Developed Markets (DM) countries.

The **FTSE Developed Comprehensive Factor Net Tax Index** is a benchmark designed to capture exposure to five factors – Quality, Value, Momentum, Low Volatility and Size. These factors represent common factor characteristics for which there is a broad academic and practitioner consensus, supported by a body of empirical evidence across different geographies and time periods.

The **S&P 500 Total Return Index** is different from the standard S&P Index (SPX), which does not include dividend gains. The total return indexes follow a similar pattern in which many mutual funds operate, where all resulting cash payouts are automatically reinvested back into the fund itself.

The **MSCI World Net Total Return USD Index** is a free float-adjusted market capitalization weighted index that is designed to measure the large and mid-cap equity market performance of developed markets. The index covers approximately 85% of the free float-adjusted market capitalization in each country. The MSCI World (Net) Index consists of the following 23 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Net total return indexes reinvest dividends after the deduction of withholding taxes, using (for international indexes) a tax rate applicable to non-resident institutional investors who do not benefit from double taxation treaties.

The **RAFI Multi-Factor Developed Total Return Index**. The RAFI™ Multi-Factor index series offers diversified factor exposures through allocations to value, low volatility, quality, momentum, and size. The Dynamic Multi-Factor strategy takes time-varying exposures to the same five factors. The index uses recent and historical metrics to tilt toward factor portfolios which are particularly attractive on a forward looking basis.

**SciBeta Developed iHFI Diversified Multi-Beta Multi-Strategy Six-Factor Equal Weight USD Gross Total Return** indices are formed by equally weighting six smart factor indices that are designed to efficiently capture the long-term risk premia associated with the well-documented risk factors of size, momentum, value, low volatility, low investment and high profitability.

The **MSCI USA Value index** captures large and mid cap U.S. securities exhibiting overall value style characteristics. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield.

The **S&P Dividend Aristocrats Index** measures the performance of S&P 500 companies that have increased dividends every year for the last 25 consecutive years.

The **S&P Composite 1500 Index** combines three leading indices, the S&P 500, the S&P MidCap 400, and the S&P SmallCap 600, to cover approximately 90% of U.S. market capitalization. It is designed for investors seeking to replicate the performance of the U.S. equity market or benchmark against a representative universe of tradable stocks.

The **S&P 500 Pure Value Index** a style-concentrated index designed to track the performance of stocks that exhibit the strongest value characteristics by using a style-attractiveness-weighting scheme.

The **S&P 500 Value Index** is a float-adjusted market capitalization weighted index that measures value stocks using three factors: the ratios of book value, earnings, and sales to price. The index covers all stocks in the parent index universe, and divides the complete market capitalization of each parent index approximately equally into growth and value indices. The index is a part of the S&P U.S. Style Indices that measures the performance of U.S. equities fully or partially categorized as either growth or value stocks, as determined by style scores for each security.

The **Russell 1000 Value Index** measures the performance of the large cap value segment of the U.S. equity universe. It includes those Russell 1000 companies with relatively lower price-to-book ratios, lower I/B/E/S forecast medium-term (2-year) growth and lower sales per share historical growth (5 years).

The **Russell 3000 Value Index** measures the performance of the broad value segment of the U.S. equity value universe. It includes those Russell 3000 companies with relatively lower price-to-book ratios, lower I/B/E/S forecast medium-term (2-year) growth and lower sales per share historical growth (5 years). The Index is reconstituted annually to ensure the represented companies continue to reflect value characteristics.

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**Neuberger Berman**  
1290 Avenue of the Americas  
New York, NY 10104-0001

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