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## **INNOVATIONS IN INDEX INVESTING**

From Single Strategy to Multi-Factor

*By Rolf Agather, CFA®*



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## INNOVATIONS IN INDEX INVESTING

# From Single Strategy to Multi-Factor

By Rolf Agather, CFA®

Index investing is a relatively new phenomenon. When Charles Dow created what is now known as the Dow Jones Industrials index in the late 1800s, he was trying to create a measure of the U.S. stock market that could be calculated easily with a pencil and paper. The notion of investing in the stock market as a whole took almost a century to come into practice.

Innovations in stock market indexes were made possible by increases in computing power during the 20th century. In the 1920s, S&P created its first composite index, which consisted of 90 stocks; ultimately this was the precursor to the S&P 500, which launched in 1957. As computing power increased, so did the coverage of the indexes. In 1984, Frank Russell company launched the Russell 3000 (the 3,000 largest U.S. stocks), which covered more than 98 percent of the investable U.S. equity market. Still, the primary purpose of indexes was as an informational tool, i.e., a proxy for describing the stock market or as a benchmark for active mutual funds. It wasn't until 1975 that the first passive index mutual fund was created and what we now know as the passive fund industry was born.

Today, indexes serve a number of roles in the overall asset management process. They are informational tools used to measure asset classes and serve as investment manager benchmarks, and they are used as the basis for index-linked investment products such as mutual funds and exchange-traded

Table 1

**GLOBAL ASSETS BENCHMARKED AND INDEXED AS REPORTED BY MAJOR INDEX PROVIDERS AS OF DECEMBER 31, 2016**

Index Provider	Benchmarked Assets	Indexed Assets	Total Assets
FTSE Russell	15	3	18
MSCI	11	Not reported	11+
S&P/Dow Jones	7.5	4.2	11.7

funds (ETFs). As table 1 shows, as of December 31, 2016, more than \$40 trillion in global assets under management (AUM) was following indexes from the three major index providers.

Benchmarked assets are usually active strategies that have selected an index to be used as a performance benchmark, but the assets are not directly tracking the index. Indexed assets represent investment products that are tied directly to an index such as index mutual funds and ETFs. Although indexed assets are still only a small percentage of overall global equity assets, they are growing rapidly. The majority of passive assets continue to follow traditional broad market indexes such as the S&P 500 and the Russell 2000; in recent years there has been tremendous innovation in smart beta indexes and investment products linked to them, and that growth is expected to continue. A recent FTSE Russell survey of institutional asset owners (pension plans, insurance companies, etc.) showed that 46 percent of them had made some sort of investment in smart beta strategies and 69 percent expected to increase allocations to these types of strategies in the coming year.

### WHY INVEST IN INDEX FUNDS?

Although equity market indexes have been in existence for more than 100 years, it wasn't until the latter part of the 20th century that indexes were used as actual vehicles for investment. Before that, indexes were used primarily as an informational tool, either as proxies to represent the U.S. equity market or as benchmarks to evaluate active strategies. As with many innovations, the notion of using market indexes as the basis of an investment strategy was first suggested in the academic literature. The efficient market hypothesis (EMH) became prominent in the mid-1960s as increasing computing power allowed stock market participants to process more information faster. EMH basically posited that the stock market was an efficient mechanism for translating public information about a company into its stock price and that it would be difficult for an individual to possess better information that would allow superior buying and selling decisions in order to beat the market. Whether the stock market is perfectly efficient is still debated, but research continued to advance the idea of investing in the market as a whole. The research of William Sharpe and others on the capital asset pricing model

provided a model that showed how investors could achieve broad diversification and return for any given level of risk by simply combining a market portfolio with a risk-free asset. At that time, the concept of a market portfolio, however, was still theoretical. The introduction of the first index mutual fund by Jack Bogle, founder of the Vanguard Group, enabled investors to buy the market at a lower cost than traditional active mutual funds.

As a practical matter, index funds provide a number of desirable features for investors. They follow a pre-determined set of rules for how they will be constructed and managed on a daily basis. For some investors this may be appealing because it means they are immune to some of the behavioral mistakes that even professional investors can make from time to time. The index rules and constituents are also transparent; they generally are made available to all investors either from the index providers or the investment product providers. So investors have the ability to know which securities are being included in their funds and potentially why they were included. This distinguishes them from active investment funds, where the portfolio holdings and the exact rules for including securities are not disclosed because the source of an active manager's value-added is unique information not possessed by others. Perhaps most importantly, index funds are generally lower cost than active funds and their expense ratios are substantially lower. Many index funds also have low turnover, which can reduce transaction costs. As such, index funds have a built-in advantage when assessing after-fee performance.

When comparing index investing to more-active investment strategies, investors must be aware of some key trade-offs. A broad market index fund delivers just that—broad market performance. By definition, an index fund is not designed to beat the market, and investors need to acknowledge that by

investing in an index fund they may be foregoing any potential upside that an active strategy could provide. If the market goes down, investors must accept this outcome. Of course, the active strategy may underperform, and investors generally are happy to receive the market return, especially if it comes at lower cost.

In addition to being the basis for traditional investment vehicles such as mutual funds and ETFs, indexes also are used as the basis for other investment vehicles such as derivatives and swaps. These are also relatively new developments; the first index futures contracts were created in 1982, and the first index options were created in 1983. These types of products generally are available on exchanges, but it is important to recognize that a number of vehicles also are available off-exchange as well. Index-linked swaps, insurance accounts, structured products, and collective investment trusts are additional examples of over-the-counter (OTC) products available from a number of providers. The broad range of index-linked investment products provides investors with a powerful tool kit that can be used to create desired investment outcomes.

### ETF-DRIVEN INDEX INNOVATION

Besides the creation of the first index mutual fund, perhaps no other development has done more to stimulate innovation and growth in the index

industry than the introduction of the ETF in the early 1990s.

Considerable assets already were being managed against index-related products before the introduction of ETFs. Institutions had access to separate accounts, commingled funds, and even institutional mutual funds based on indexes. Individual investors had access to a wide variety of index mutual funds. There were considerable volumes in index derivatives such as futures and options as well as OTC vehicles such as swaps. ETFs, however, provide a number of key features that appeal to institutional and individual investors alike: they can be traded in real-time on an exchange like any other security, and they have potential tax advantages compared to mutual funds.

Perhaps most importantly, ETF shares can be created or redeemed in exchange for a known basket of stocks, so they require full transparency into their holdings. Because market indexes are by definition transparent baskets of stocks, they are a natural fit for portfolios that underlie ETFs. The early days of the ETF industry were very much a gold rush. The initial ETFs that quickly came to market licensed many of the existing indexes that were available from traditional index providers. Table 2 shows some of the index categories that initial ETFs were based on in the decade after the first ETF was created.

Table 2 INITIAL ETF PRODUCT LAUNCHES

Index Category	First ETF launched
S&P 500	1993
Single countries	1996
Dow Jones Industrial Average	1998
U.S. sectors	1998
Nasdaq 100	1999
Style Box (Russell, S&P)	2000
Regional equity	2000
Non-U.S. equity (EAFE)	2001
Fixed Income	2002
Emerging Markets	2003

By the end of 2003, 140 ETFs were trading on U.S. exchanges, with just more than \$150 billion in AUM. Today approximately 2,000 ETFs are trading on U.S. exchanges with more than \$3 trillion in AUM, and the original 140 ETFs account for about half (\$1.6 trillion) of that amount. This rapid expansion of the ETF industry drove innovation in the index space, which required entirely new types of indexes to be conceived and brought to market.

### THE FUNDAMENTAL INDEX CREATES A NEW CATEGORY OF INDEX: SMART BETA

For the first 10 years of their existence, ETFs were based on market capitalization-weighted (cap-weighted) indexes, meaning that the members of the underlying index were weighted according to their size, as measured by market capitalization (shares × price). This was consistent with much of the academic research, which suggested that market prices were the best estimate of a company's value and using company size for weighting produced the optimal portfolio for the average investor. It was established convention that indexes were always cap-weighted and any other form of constituent weighting was an active strategy. This notion was challenged in 2005 when Rob Arnott, the founder of Research Affiliates, launched the Fundamental Index™, which promoted the notion of weighting index members by characteristics other than their size. The Fundamental Index was promoted as a substantial improvement over traditional market-cap weighting; it was touted as a better benchmark and a better investment strategy.

Proponents of fundamental weighting argue that cap-weighting overweights overvalued stocks and underweights undervalued stocks, so as valuations normalize (i.e., overvalued stocks become less valued and undervalued stocks become more valued) performance is negatively affected. Fundamental weighting uses other

measures of company size, such as sales, book value, and cash flows, that are not directly related to the share price but are still meaningful measures of company size. The historical simulated results of fundamental weighting show that it generally outperformed its cap-weighted counterpart, i.e., a broad market index of large companies as defined by fundamental characteristics outperformed a broad market index of companies using cap-weighting.

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*These smart beta indexes include alternatively weighted indexes as well as an even newer category known as “factor indexes,” which provide additional types of exposures.*

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Regardless, the concept of fundamental weighting polarized the industry. Academics challenged the notion that non-cap-weighted strategies could be considered an “index” and questioned whether it was superior to market-cap weighting. Many ETF and index providers saw it as an opportunity to create new products and achieve investment outcomes other than basic market exposure. Nevertheless, in 2005 the first ETF was launched on the Fundamental Index and today billions of dollars in AUM is tracking alternatively weighted strategies, of which fundamental weighting is still the most popular. More than 10 years after its creation, most of the original controversy around the Fundamental Index no longer exists. More importantly, it spawned an entirely new category of non-cap-weighted indexes that we now refer to as smart beta. These smart beta indexes include alternatively weighted indexes as well as an even newer category known as “factor indexes,” which provide additional types of exposures.

### SMART BETA AND FACTORS

The concept of investing in factors, however, did not start with index investing. The academic community began identifying systematic drivers of security returns starting with market beta in the 1960s. Research describing the existence and behavior of size, value, and momentum factors was published in the 1990s, and research on low-volatility and quality factors followed. Active investors have been either implicitly or explicitly investing in factors for decades. Benjamin Graham's books *Security Analysis* (1934, with David Dodd) and *The Intelligent Investor* (1949) described an investment approach that we now call “value investing.” Similar to the evolution of traditional market indexes, the academic community first constructed “factor indexes” as a means to analyze security returns as well as active portfolios.

The global financial crisis of 2008–2009 also generated considerable interest in the low-volatility factor as investors looked for ways to potentially avoid considerable drawdowns and reduce the volatility of their portfolios. Similar to the research that identified the size, value, and momentum factors, academic research showed that low-volatility stocks historically had provided excess return over the broad market, which was contrary to the notion that investors had to take more risk to achieve additional return. Indeed, the “low-volatility anomaly” appears to be a free lunch; it is possible to construct a portfolio of stocks that has lower volatility than the broad market but historically has achieved excess returns. The first low-volatility index and subsequent ETF were launched in 2011. Even though global equity markets have experienced one of the longest bull markets in history, interest in low-volatility strategies has remained strong.

One critique of active strategies is that they are ultimately just providing exposure to commonly known factors such as size, value, etc., rather than adding value through superior stock picking as

promised. In some cases these factor exposures may be unintentional, but investors should be aware of the factor exposures in their portfolios and manage them intentionally. Single-factor index products can provide the ability to manage individual factor exposures directly: An investor can use single-factor index products to increase exposure (“I want more value”) or decrease exposure (“I have too much momentum”). The availability of single-factor index products allows a wide variety of investment preferences to be implemented.

### MULTI-FACTOR INVESTING

Within the past few years, the passive fund industry has moved rapidly from focusing on single-factor products to multi-factor investing. Individual factors have been shown to produce excess returns over long periods of time, but they can suffer extended periods of underperformance. Academic research and investor experience suggest that, although it’s not impossible, timing factors can be difficult and requires extensive discipline. Some investors may be willing to bear the risk of investing in individual factors or believe they have sufficient skill to time factors, but the average investor likely is better off investing in multiple factors in a single product as a low-cost way to capture factor returns and to achieve the traditional benefits of diversification.

Much of the recent discussion around combining factors centers on the way in which factors are combined. There are generally two distinct methods for creating an index designed to provide exposure to multiple factors, top-down and bottom-up.

The top-down method of combining factors simply allocates among a series of individual factor indexes such as size, value, momentum, etc. So if an investor wants to create a multi-factor index that has equal exposure to size, value, and momentum, the investor simply allocates one-third of assets to each of the single-factor indexes. This method has

the benefit of being reasonably easy to construct and explain, but it can be shown that the individual factor exposures are lower than a bottom-up method, because there is a dilutive effect to the top-down method.

The bottom-up method of creating a multi-factor composite requires a bit more work but has advantages over a top-down method. In a bottom-up design, the investor first decides the starting index (Russell 3000, FTSE All-World, etc.), then that index is tilted toward the stocks that exhibit the strongest scores for the desired factors. To construct a multi-factor composite with factor exposures similar to the top-down method described above, the bottom-up method places a higher weight on companies that exhibit stronger factor characteristics across all of the desired factors. As a result, it can be shown that the factor exposure of a bottom-up method is higher than a top-down method.

those factors. In contrast, the top-down method selects the stocks with the highest scores in each of the factor indexes, but in many cases these are not the same companies. As a result, the stocks with the highest value scores may have low size score, and vice versa. In the top-down example, diversification among factors actually works against you because it dilutes the factor exposures in the combination.

The availability of a variety of single-factor indexes across the global equity asset class provides a substantial number of multi-factor indexes that can meet a variety of investor needs. For example, an investor who wants exposure to low-volatility stocks but is worried about valuations can create a combination of low volatility and value that includes only the cheaper low-volatility stocks. Or, if an investor wants to invest in value stocks but is concerned about introducing junk into the

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The mathematics underlying the differences between the two methods can be complex, but an explanation of why the bottom-up method works better can be illustrated using the analogy of a triathlon, which requires athletes to excel in three areas, not just one. We don’t necessarily expect a winning triathlete to be the fastest in any one event; instead, we expect the winning triathlete to exhibit the greatest combined strength across the three activities. The same is true for our factor example. In the bottom-up method the stocks with the highest scores across all the desired factors are overweighted, which produces a result combination with high scores to

portfolio, the investor can avoid junk by tilting toward value and higher-quality stocks. Individual factor exposure strength can be increased or decreased in a multi-factor combination, the value exposure can be double the size exposure, etc.

### THE NEXT INNOVATION

Smart beta has spawned an entirely new segment within the investment management industry, fostered by advances in computing power, market events, and new investment vehicles. As technology and markets continue to evolve, there are a number of areas where we may see new product innovation.

## SYSTEMATIC STOCK-PICKING

As more smart beta strategies come to market, it's becoming harder to tell whether a particular investment strategy is smart beta or just a variation on traditional active management. The definition of smart beta has never been universally agreed upon. To the extent that any smart beta strategy is based on a transparent methodology (i.e., not on unique information), its superior performance must result from taking on additional risk or exploiting behavioral anomalies. If a transparent, rules-based strategy were outperforming because of unique information in an efficient market, arbitrageurs eventually would take advantage of that information and any performance advantage would disappear.

Given that the industry is widely employing the most common risk factors (size, value, quality, momentum, volatility), it is unlikely that a completely new set of risk factors will be identified in the equity space any time soon. As innovation continues, a new group of systematic stock picking strategies is emerging that leverages rules-based models to identify mis-priced stocks—but the information driving the rules is kept proprietary to avoid potential arbitrage. Because these strategies no longer would be transparent, they would be more akin to traditional active fundamental strategies rather than smart beta.

## MULTI-ASSET

To this point, much of the passive industry has been focused on developing strategies within individual asset classes, such as U.S. equity, global equity, fixed income, etc. Ultimately, most investors diversify their portfolios across asset classes, generating an opportunity for product providers to create index-based products that expand beyond a single asset class and combine asset classes in a single strategy. In their simplest form these strategies could represent some sort of balanced strategy such as a 60/40 equity/fixed-income blend, or even target-date or target-risk

strategies that follow a rules-based glide path and use passive components for each asset class. More-sophisticated multi-asset strategies may seek to balance risk across asset classes or even rotate among asset classes using some sort of timing signal. Adding the asset class dimension extends the range of investment outcomes that can be produced, which ultimately provides more choice for investors.

## BIG DATA, ARTIFICIAL INTELLIGENCE

Just as advances in computer technology spawned the index industry in the past century, access to big data and artificial intelligence (AI) will provide new insights that will lead to lower-cost investment opportunities in the future. Already, investment providers are mining vast amounts of data from social media and other content venues to spot actionable information about specific companies or gauge market sentiment. Sophisticated text-processing algorithms are being used to interpret public filings and corporate statements to detect unique information that can be used to identify investment opportunities. Obviously, the new companies themselves create new investment opportunities for investors.

The success of traditional active management has been based on possessing unique information and applying judgment to investment decisions. Whether or not it will continue to provide superior investment outcomes at a reasonable cost in the face of increasing technological advances remains to be seen.

## MASS CUSTOMIZATION

Increased investor demand for investment outcomes that reflect their unique circumstances will spur providers to develop mass customization capabilities that can leverage economies of scale for a particular investment proposition but then tailor that outcome for specific clients. Growing interest in environmental, social, and governance (ESG) considerations have added another

dimension to investment outcomes. Although many institutions are constrained by their fiduciary duties regarding ESG, individual investors and nonfiduciary entities increasingly are demanding that ESG considerations be included as part of their investment processes. ESG considerations generally are an overlay to any existing investment strategy. Some investors, however, may feel that ESG-oriented companies provide a superior risk-return outcome as a group, and products that specifically target these companies already are available from a number of providers.

## CONCLUSION

The availability of cap-weighted, alternatively weighted, and factor index products provides a vast range of tools that investors can use to achieve investment goals. Investors who want to achieve the market return at low cost can invest in cap-weighted index funds. Those who want an outcome that is different than the market return can use alternatively weighted, single-factor, or multi-factor index products. It is always difficult to predict exactly which types of products will come to market and which of those will be successful with consumers. Regardless of the investment outcome desired, index-based investment products provide objective and transparent results, in many cases at lower cost than traditional active strategies. It is safe to say that products that embody these characteristics will have a high probability of being successful in the future. ●

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