

The anatomy of smart beta

Smart beta indexes have become increasingly popular in recent years, with nearly three-quarters of global institutional investors and asset owners now either using or evaluating smart beta index based strategies for their portfolios.¹

Smart beta is a generic term for indexes constructed using a variety of approaches other than the standard method of weighting index constituents by their market capitalization. These indexes capture a variety of exposures to academically recognized drivers of risk or reward, helping users gain more control as they fine-tune their portfolios toward achieving specific investment objectives. In this FTSE Russell *Insights* we examine the origins of smart beta, consider the variety of indexes on offer and their uses, and look into the future of this type of index.

¹ [FTSE Russell Smart Beta Survey](#), 2016.

Key findings from the FTSE Russell 2016 Smart Beta Survey

The survey covered 250 asset owners from North America (49%), Europe (33%) and Asia Pacific and elsewhere (18%), with total assets under management of over US\$2 trillion. Its key findings were:

- **72%** of asset owners are now using or evaluating smart beta, up from **44%** a year earlier
- **Return enhancement, risk reduction and increased diversification** remain the primary objectives for those implementing smart beta allocations
- **Cost savings** were cited by more than a third of the largest asset owners as a reason for evaluating smart beta
- Asset owners increasingly view smart beta as part of their **active equity allocation**
- **Low volatility, value, multi factor and fundamental** indexes are the most commonly used smart beta strategies

Where did smart beta come from and what is it?

CAPM, beta and alpha

To understand smart beta and its origins, we must start with the term “beta.”

A financial theory called the Capital Asset Pricing Model (CAPM) that was introduced in the 1950s and 1960s had a profound influence on investing and security pricing.²

The CAPM model quantifies the risk of a security or portfolio of securities and converts that risk into expected return measures. This measure of risk is defined as beta, and according to CAPM, the riskier the asset, the higher the expected return premium. In up markets, high beta stocks will therefore tend to outperform the broader market.

CAPM and the efficient markets hypothesis (EMH), which is another theory from the 1960s, have played a major role together in the rise of index-based (often called passive) investing. And the type of index most commonly used by tracker portfolios was capitalization-weighted (also called market-weighted): individual stocks were weighted in the index by their overall market value. Popular indexes like the FTSE 100, FTSE All-World or the Russell 1000[®] and Russell 2000[®] are all built this way.

Another Greek letter—alpha—also entered the investment lexicon around this time. Many investors decided to split their portfolios into a passive, index-tracking part and an actively managed part. The passive part—tracking the beta of a particular market or market segment—benefited from the low fees charged by index-tracking managers. The bulk of the investor’s fee budget could then be devoted to seeking the extra returns promised by active managers.

The return on the actively managed portfolio was measured against the returns of a capitalization-weighted index. Any residual (excess) return, called alpha, could then be attributed to the manager’s skill. Successful active managers can produce alpha through a variety of methods, including fundamental stock analysis, top-down macroeconomic analysis and strategic asset allocation, or market timing.

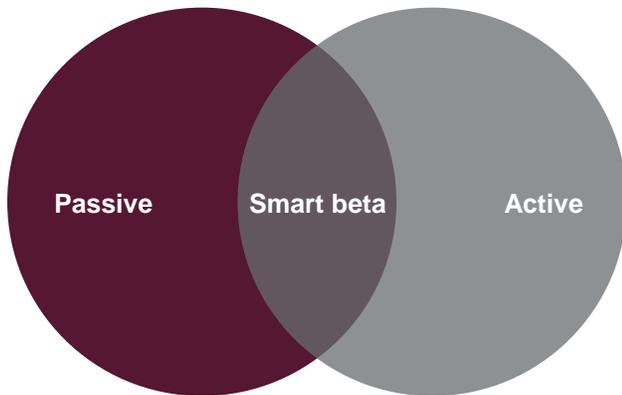
Elusive alpha and rising interest in smart beta

Practical experience has shown that alpha has proved hard to generate consistently over time. As a result, market participants' doubts about the feasibility of consistently achieving alpha by conventional methods have helped drive interest in smart beta. An increasing number of market participants believe that there are alternative ways of constructing the passive part of the portfolio than by following capitalization weights.

FTSE Russell’s research has shown that return enhancement, risk reduction and increased diversification are the primary objectives for those considering smart beta allocations. But for the largest of asset owners, we’ve seen a notable increase in cost savings as an objective. Since implementing a smart beta strategy is generally more expensive than a traditional passive strategy and less expensive than a traditional active strategy, one interpretation of this result is that allocation to smart beta can more efficiently utilize the asset owners’ fee budget, replacing a more expensive active strategy with a lower-cost smart beta allocation. In this way, smart beta can become a complement to active investing.

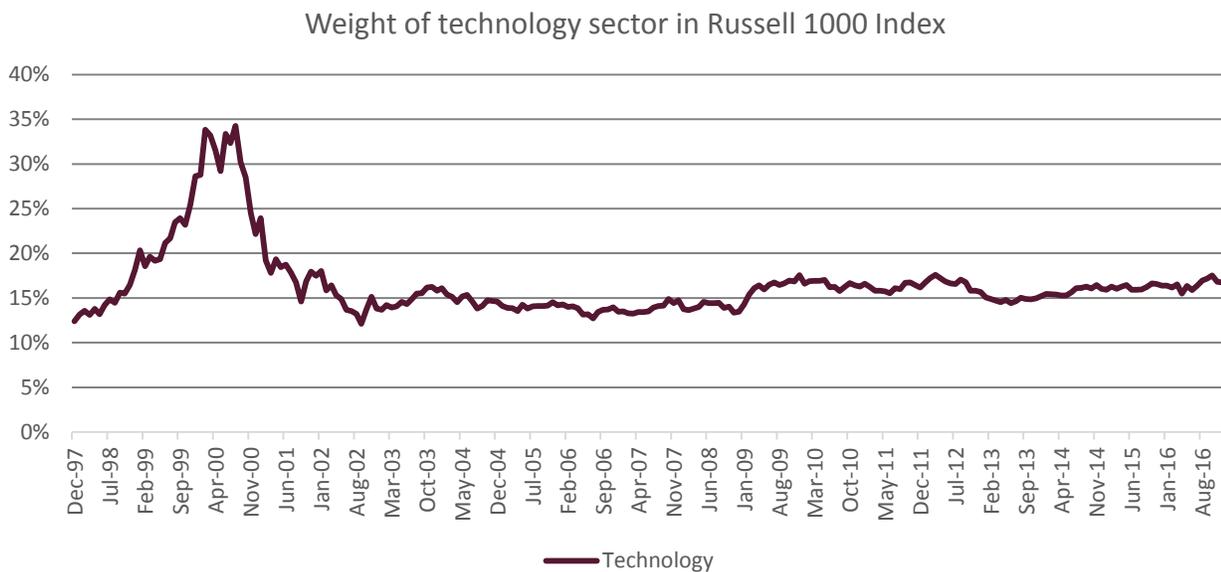
² “Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk”, William F. Sharpe, Journal of Finance, Vol. 19, No. 3 (Sept. 1964).

Figure 1. Smart beta at the intersection of passive and active



Although capitalization-weighted indexes have long been used as benchmarks for performance measurement and as the basis for index-tracking investment products, they can be prone to periods of high concentration in individual sectors or stocks, reflecting short-term market trends. For example, the capitalization-weighted Russell 1000® Index became heavily overweight in technology stocks during the internet bubble of 1999/2000.

Figure 2. Rise in technology stock weightings during internet bubble



Source: FTSE Russell, data from *December 31, 1997 to January 31, 2017*. Past performance is no guarantee of future results. Please see the disclaimer for important legal disclosures.

To avoid an index having stock or sector concentration, smart beta indexes often apply their methodology with the specific objective of modifying index risk levels or maintaining high levels of diversification within the index.

While smart beta indexes produce different outcomes in terms of index performance, a well-designed smart beta index should retain the key characteristics of a traditional index: in other words, it should follow transparent, published rules, be managed by an independent index provider with clear governance procedures, offer access to a broad range of markets and asset classes and take into account requirements for capacity and scalability for users running portfolios based on the index.

What types of smart beta are there?

Categorizing smart beta

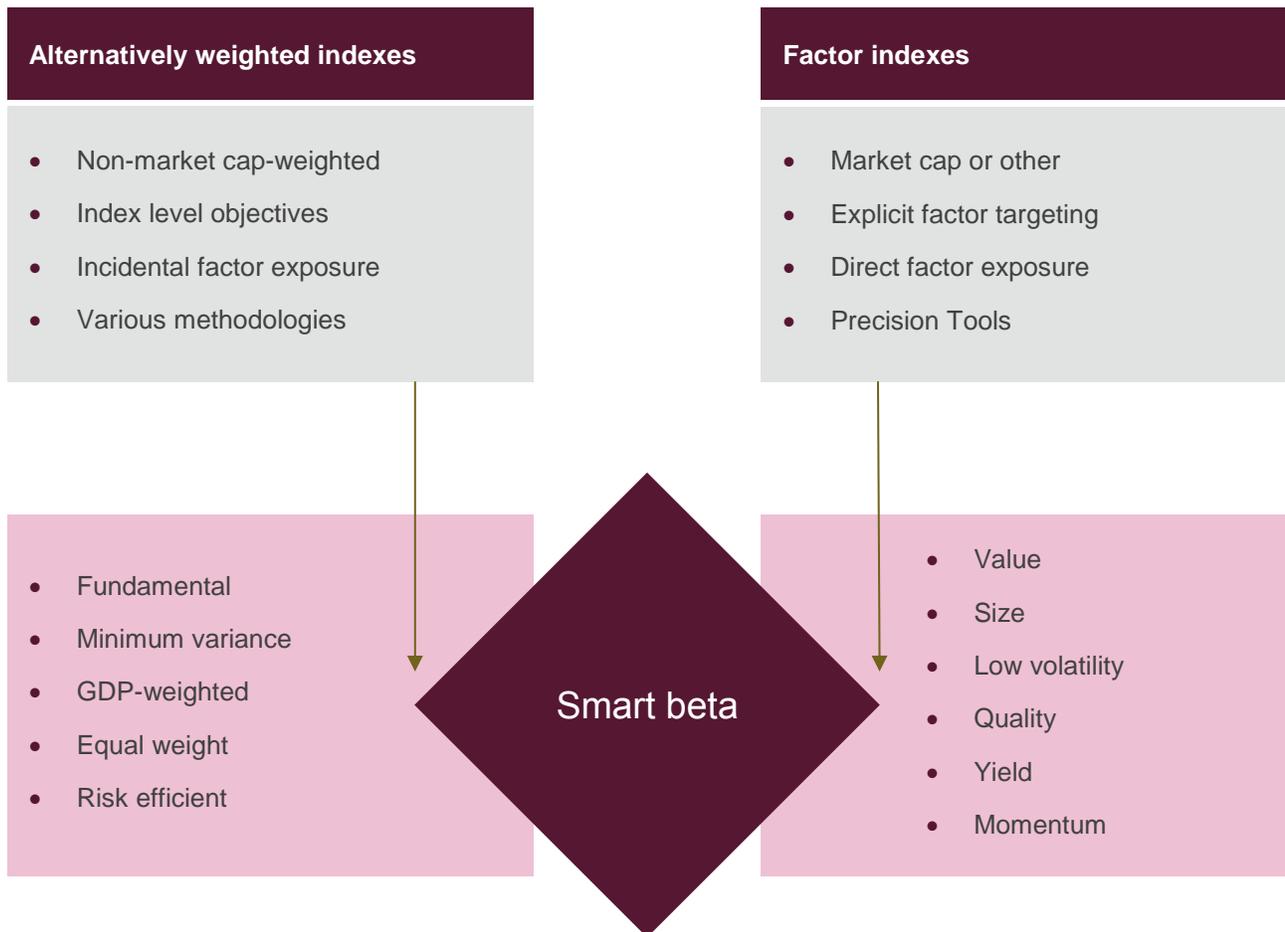
Smart beta is a term that covers a wide range of non-market weighted indexes in the equity markets and, increasingly, in other asset classes. In general terms, smart beta indexes depart from the standard methodology of weighting constituents by their market capitalization in order to reflect a variety of different objectives.

Smart beta is therefore a very broad concept and some classification of approaches is helpful.

FTSE Russell defines smart beta as encompassing two types of indexes:

- **Alternatively weighted indexes** — typically designed to address perceived concentration risks in capitalization-weighted indexes or reduce volatility within the index;
- **Factor indexes** — designed to replicate factor risk premia in a transparent, rules-based and investable format.

Figure 3. Types of smart beta



This distinction between alternatively weighted and factor indexes helps categorize smart beta in a way that reflects common practices and objectives in using these tools.

Who uses risk-based indexes?

Index users wishing to reduce concentration in capitalization-weighted indexes may wish to approach this objective in different ways.

They may target reductions in constituent concentration, risk concentration, index-level volatility, or a combination of these features. Risk-based smart beta index approaches helping to achieve these outcomes include minimum variance, equal weighting, GDP weighting or risk-efficient indexes.³

Many market participants have decided to use smart beta as a tool to help manage their portfolios' risk levels. In FTSE Russell's 2016 Smart Beta Survey, 46% of respondents said that they had initiated their evaluation of smart beta because they wished to reduce the volatility of their equity exposure.

Factor indexes

To understand factors, let's remember the CAPM model of the 1950s/1960s. CAPM is a single factor model, which assumes that a single factor (equity market risk) is the primary driver of stocks' returns.

Equities therefore offer investors a long-term return premium for holding risky claims on companies' assets and their future earnings. And a single beta coefficient is the way we assess individual companies' relative risk under CAPM.

But since CAPM was first introduced, many observers have pointed out that other factors or characteristics, in addition to market risk, can help to explain equities' performance. There are many documented factors, but those with the most academic and empirical support include value, size, low volatility, quality, yield, and momentum. Factor indexes embed these factors in a transparent, replicable and consistent way.⁴ In a world of factors, we end up with multiple betas instead of a single beta.

Is there an overlap between risk-based and factor indexes?

All indexes, including risk-based indexes, have exposures to factors. As a result, there is an overlap between the two categories of smart beta.

Equal-weighted indexes, for example, allocate larger weightings to small-capitalization stocks than a capitalization-weighted index based on the same starting set of equities (and, correspondingly, equal-weighted indexes give relatively smaller weightings to large-cap stocks). In aggregate, this gives the equal-weighted index a positive exposure to the size factor (since the size factor is a characteristic representing smaller companies).

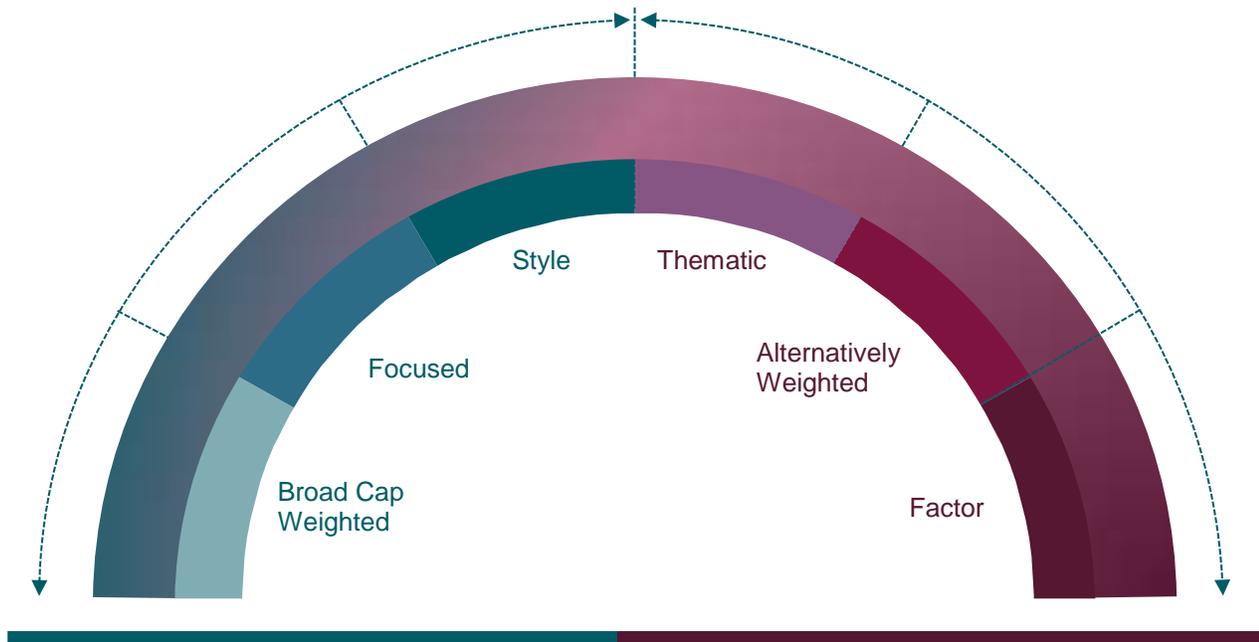
But there is a distinction between the two categories of smart beta in terms of index objectives. While factor exposures can be useful for describing a risk-based index, they are not the explicit focus of the index construction. The factor exposures of risk-based indexes can also change over time, while factor indexes aim to achieve consistent exposure to the targeted factor (or factors).

It's helpful to view alternatively weighted and factor indexes as part of a continuum. Capitalization-weighted, traditional indexes are at one end of the scale and smart beta indexes are at the other, with variants in between.

³ See the FTSE Russell Insights "Understanding Risk-Based Index Construction" for further information.

⁴ See the FTSE Russell Insights "The Objectives of Factor Indexes" for further information.

Figure 4. The continuum of equity indexing



Putting factors together

Over 20% of asset owners who have adopted smart beta are now using five or more smart beta strategies. And around half the respondents to the survey said they are now evaluating multi-factor strategies. There are different ways of combining factors. The simplest approach is to average stock weights across a number of single factor indexes.

A variant of this approach is to use a composite of the target factors to create a new factor index that integrates all the individual factors.

A third alternative to achieve exposure to multiple factors within an index is an integrated approach, which aims to simultaneously target factors in one index, rather than allocating across multiple, single factor indexes. While the first approach could be viewed as a “top down” way of allocating across factors, the integrated factor index approach works from the “bottom up.” In FTSE Russell’s tilt-tilt approach, the starting index is tilted repeatedly, each time towards one of the desired factors. In other words, index weights are first tilted towards the first factor of interest, then towards a second factor of interest, and so on. The multiple tilt procedure allows the index to retain exposure to all the desired factors.

The future of smart beta

With the rise of smart beta indexes, asset managers and their advisors are taking advantage of the growing range of related investment products. They are using them to build much more sophisticated portfolios than was possible even a few years ago.

This is particularly true of factor and multi-factor smart beta indexes, in which there is a great deal of interest. Plenty of debate surrounds factors both in the academic literature and the financial press.

The questions typically discussed are whether it’s possible to time factor allocations, to what extent individual factors may become over- or under-valued (and how to measure this), and the best ways of combining factors. As an index provider, FTSE Russell takes an agnostic view on valuations, but we have taken a view on how best to combine factors within our index products (via the tilt mechanism described above). As factor-based allocation approaches become more widely used, they are likely to move from a typical asset owner’s satellite allocation to a core part of long-term portfolios. Judging by the

recent acceleration of inflows into smart beta ETFs, retail participation in the market is also likely to increase in coming years.

Technological advances may also have a significant impact on the growth of smart beta. The increasing availability of data and developments in data science mean that smart beta indexes are likely to reflect a growing range of different approaches, across asset classes.

Fixed income smart beta, in particular, is an area of interest for many market participants, since a standard approach of constructing indexes by the market value of the debt in issue may not reflect the user's risk preferences.

Smart beta and smart sustainability

One rapidly growing area of interest for many investors is sustainable investing, where FTSE Russell has done pioneering work on combining traditional equity market factors with models for sustainable investment.

In a recent research project undertaken for a large UK pension scheme and designed to serve as the basis for a new fund, FTSE Russell combined smart beta with smart sustainability to produce a new equity index, using four steps.

The approach taken by FTSE Russell in the index design highlights the power of the tilting methodology outlined above. In particular, the methodology proves as adept at capturing sustainability preferences as it is as embedding factor signals, as long as those sustainability preferences are quantifiable.

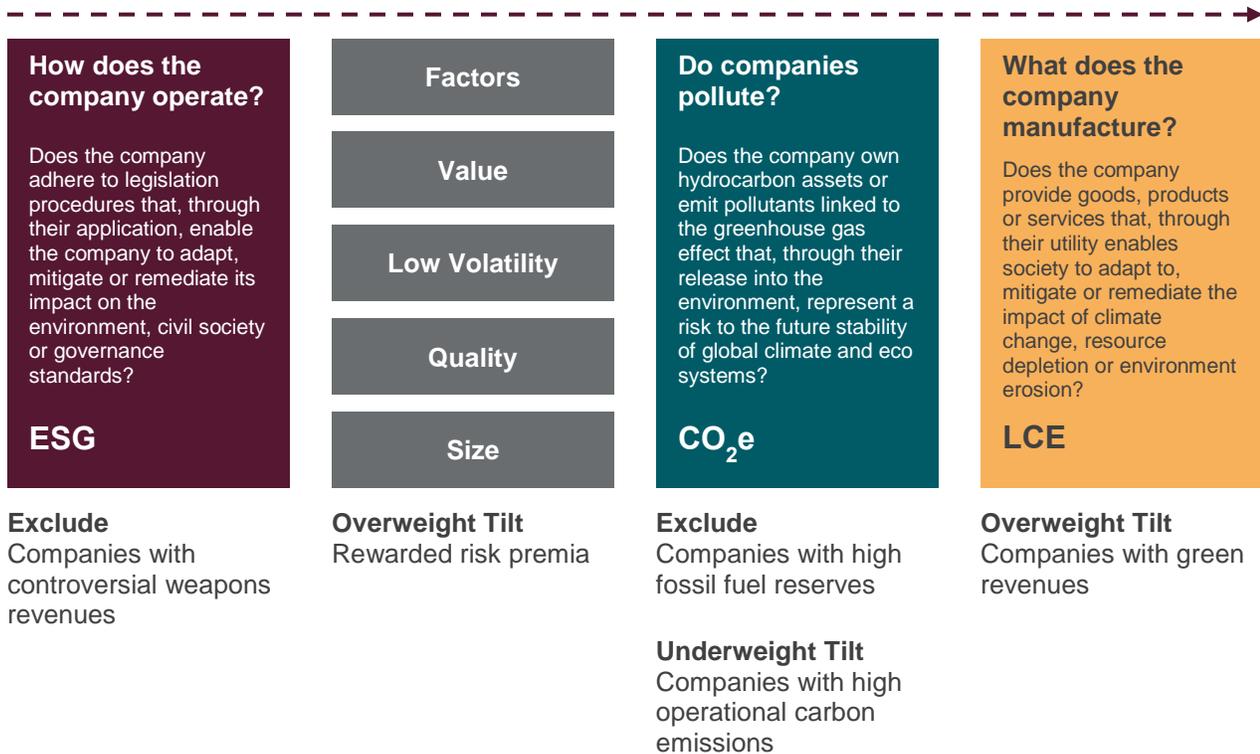
In this particular case, the following design steps were used.

1. FTSE Russell's Environmental, Social and Governance (ESG) data model was used to exclude companies with a perceived negative impact on civil society and governance standards, in this case "controversial weapons" manufacturers.⁵
2. The index was tilted towards four smart beta factors: value, low volatility, quality and size.
3. FTSE Russell's greenhouse gas model (C02e) was used to exclude companies with high fossil fuel reserves and add a sustainability tilt to the index, index away from companies with high operational emissions of carbon dioxide and equivalent gases.
4. FTSE Russell's green revenues (Low Carbon Economy or LCE) model was used to implement another sustainability tilt, this time towards constituents providing goods, products or services that help mitigate or remediate the impact of climate change, resource depletion or environmental erosion.

These four modelling steps resulted in the launch of a new FTSE All-World ex CW Climate Balanced Factor Index in November 2016.

⁵ "Controversial Weapons" are anti-personnel, biological and chemical weapons.

Figure 5. Combining smart beta with smart sustainability



A continuing evolution

As we have seen when charting the evolution of financial theory and investment management since the 1960s, smart beta indexes have become popular because they have met specific needs of their users.

While traditional, capitalization-weighted indexes play a vital role in the measurement of market movements and continue to form the basis of many index-replicating financial products, smart beta has helped market participants access a much broader range of tools to help implement their investment strategies using a transparent, replicable, index-based format. This trend appears likely to continue and even accelerate in the years ahead.

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

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