Global Institutional Consulting

Bank of America Merrill Lynch

GWIM Chief Investment Office

Redefining Indexing Using Smart Beta Strategies

SEPTEMBER 2017

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Over the past several years, a number of new strategies and solutions have been launched in the investment marketplace. Among the more interesting sets of strategies are those defined as "Smart Beta." The term broadly describes strategies that seek to provide differentiated returns from a market capitalization-weighted index based on rules, algorithms or some other structured approach. In this whitepaper, we examine the Smart Beta growth trends and define ways in which clients can consider when and how Smart Beta strategies can be used in their portfolios.

Defining Smart Beta

Smart Beta encompasses a broad range of strategies that seek the return and risk characteristics available through exposure to a variety of factors or styles by taking systematic deviations from market capitalization-based asset weights. Examples include equally weighted and fundamentally weighted strategies, among others.

The Institutional Resource Allocation Framework

Asset Category	Protective	Market	Strategic
Need addressed	To provide cash flows, as much and when needed, for an institution to function effectively in the near term.	Invest to maintain spending needs over the longer term.	Potential for significant growth in assets and impact, relative to its peer group.
Risk type	Operational risk that could jeopardize an institution's basic operations	Market risk that comes from investment exposure to financial markets (the widely known dimension of risk)	Strategic risk that assets earmarked for future organizational growth fall short of their desired growth target
Examples	• Cash (emergency fund) • Certificates of Deposit (CD) • T-bills/notes	• Equities: Broadly diversified size/style/sector exposure • Fixed income: Credit quality and duration diversification • Cash (reserved for opportunistic investing) • Diversified Alternative Investments	• Concentrated stocks and bonds • Patents • Certain private equity funds • Ownership stakes in companies • Direct real estate
Risk-return characteristic	Often lower risk, but low return	Risk and return in line with market performance	High risk, but with the potential for above-market returns
Benchmark	***Inflation:*** Protective assets are expected to help reduce downside risk and provide potential safety.	***Risk-Adjusted Market Return:*** All traditional portfolio performance measures are applicable for market assets.	***Absolute Return or Mission-Related:*** Strategic assets are intended to significantly outperform the market if and when they succeed, or to serve the organization's strategic goals and advance its mission.

Please see important disclosure information on the last page.

Smart Beta is becoming increasingly popular among investors, especially through Exchange-Traded Products (ETP) such as Exchange-Traded Funds (ETF). According to Morningstar, as of June 30, 2017:

1. There were 1,320 Smart Beta ETPs, with total assets under management (AUM) of $707 billion, globally. While multifactor offerings have been growing rapidly and reached 349 ETPs with $57 billion in total AUM, dividend-based ETPs are still the most popular as a category.
2. 650 (49%) of those ETPs, with a corresponding AUM of $622 billion (88% of the global total) and $70 billion in trailing 12-month inflows, were U.S.-domiciled.
3. Smart Beta accounted for 21% of all U.S. ETP assets.

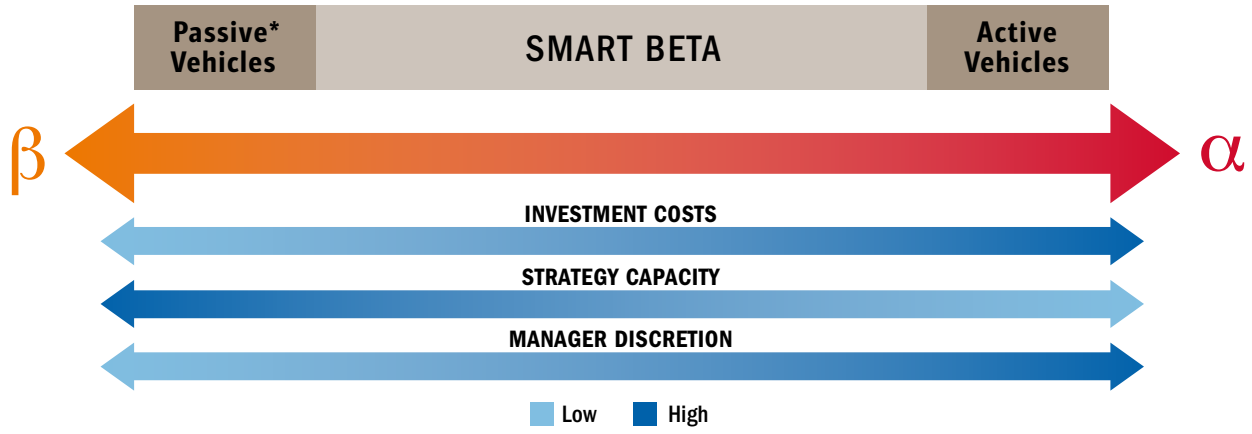
A survey published in January 2015 by Market Strategies International found that 64% of institutional decision makers expected to increase their use of Smart Beta ETPs within 12 months[1]. Smart Beta strategies may also be implemented in some quantitatively managed Mutual Funds, Hedge Funds, and other vehicles.

"Smart Beta" is a new name that seeks to group a variety of mostly existing investment approaches under a common umbrella and to enhance the image of the most arcane and esoteric approaches by rebranding them in simpler terms. Morningstar calls "Smart Beta" "an unfortunate name, one that has positive connotations that may not always be warranted," and prefers the more neutral "Strategic Beta."[2] In this context, "beta" denotes a portfolio's direct exposure to one or more specific risk factors or strategies, and not the portfolio's sensitivity to broad market movements, as typically understood. "Active-," "Alternative-," "Enhanced-," "Rules-Based-," "Scientific-," "Structural-," "Systematic-," "Quantitative Beta," or "Quantitative [Investment] Management"[3] might also be terms that can be used.

Smart Beta occupies the space between traditional passive and active investing[4] by taking systematic rules-based tilts from market capitalization-weighted indices with a focus on simplicity, transparency, large capacity, liquidity, diversification, and a low-cost implementation[5] (see Exhibit 1).

In the last few decades[6], the results of several studies have challenged the orthodoxy upon which market capitalization-weighted investing is based: that the entire market is the only risk factor that systematically rewards exposure to it[7], according to the Capital Asset Pricing Model (CAPM). In addition to the market, other **common risk factors**—i.e., common sources of risk across the investable universe of equities—and investment styles[8] were shown to be potential sources of abnormal (excess)

Exhibit 1: Characteristics of Passive*, Smart Beta and Active Strategies



Source: BlackRock (Kahn and Lemmon 2014).
* Market capitalization-weighted.

[1] Market Strategies International [50]
[2] Morningstar Manager Research (Choy, J. *et al.* [20]).
[3] See Asness and Liew [9].
[4] See Arnott and Kose [4], and GSAM Perspectives [30].
[5] See Asness [8].
[6] For a concise summary and timeline of developments in the field, see Kumar *et al.* [46], [47].
[7] See Sharpe [54]—in articles written and/or published around the same time, J. Treynor, J. Lintner, and J. Mossin proposed similar models. The model is often attributed to all four of them.
[8] See papers by Ross [53] and Sharpe [55], [56], [57].

equity returns[9], including value/growth, size, momentum, low volatility, quality (profitability), and liquidity[10]. Furthermore, dividends, sales, earnings and other fundamental metrics were proposed as potentially superior index weights compared to market capitalization[11]. Fundamentally weighted equity indices have been constructed by the Financial Times Stock Exchange and Research Affiliates (RAFI), MSCI, Russell, S&P Dow Jones, WisdomTree and other providers. ETPs based on such index weighting schemes have been offered for several years now[12]. Table 1 summarizes how these common risk factors and fundamentally weighted schemes work[13]. Tax-efficient investing systematically practiced through gain deferral, holding-period management, loss harvesting, tax-lot identification, and the avoidance of wash sales[14], which is commonly referred to as "tax alpha," can also be thought of as belonging to the suite of Smart Beta strategies.

Factor-based asset allocation has started to be practiced more broadly by managers and accepted by investors[15], along with the understanding that many more than the traditional common risk factors can explain returns[16] and embed risk premia that can be harvested without taking unrewarded risks[17]. Over the years, researchers "discovered" hundreds of factors by analyzing historical data sets. Many were proven statistically significant "by chance," with no forward-looking statistical or economic significance, and/or were not easily investable and at a reasonable cost. For styles or factors to be selected as benchmarks in investment portfolios, Sharpe[18] contended that

Table 1: Smart Beta Index Weighting Schemes

Common Risk Factors	Implementation
Market	Gain market capitalization-weighted exposure to the entire market
Value	Overweight low Price-to-Earnings (P/E), and underweight high P/E stocks; alternatively, use a different value metric, e.g., Price-to-Book Value, Price-to-Cash Flow, etc.
Growth	Overweight stocks with high Earnings-per-Share (EPS) growth and underweight those with low EPS growth; growth stocks often are momentum stocks too
Size	Overweight smaller, and underweight larger capitalization stocks; one way to achieve this is to equally weight stocks in a portfolio
Momentum	Overweight stocks that have outperformed, and underweight those that have underperformed their peers or their reference index
Low volatility	Overweight less volatile stocks, and underweight more volatile ones
Profitability/Quality	Overweight stocks of more, and underweight those of less profitable companies
Liquidity	Overweight less liquid stocks, and underweight more liquid ones
Fundamentally weighted portfolio construction	
Create portfolios in which stocks are represented proportionately by their dividends, revenues, earnings, expected returns, shareholder yield/buybacks, or other fundamental metrics, instead of market capitalization	

Source: GWIM CIO.

[9] Papers by Banz [12], Basu [13], Fama and French [23], [24], [25], and Lakonishok *et al.* [48] describe these factors.

[10] Readings for each factor: momentum: Jegadeesh and Titman [41], [42], Carhart [16]; low volatility: Black and Scholes [14], Clarke *et al.* [21], Baker *et al.* [11]; profitability/quality: Sloan [60], Novy-Marx [51]; liquidity: Amihud and Mendelsohn [2], Ibbotson *et al.* [36], Subrahmanyam [61]. Fama and French [26] provide a good overview.

[11] The 2005 study by Arnott *et al.* [5] provides evidence of superior performance of passive indexing based on fundamental metrics compared to market capitalization.

[12] See, for example, WisdomTree [64] and Siracusano [59].

[13] The Morningstar report (Choy, J. *et al*. [20]) provides a comprehensive taxonomy of product offerings in the space.

[14] See, for example, Bouchey et al. [15]. According to a study by GSAM, tax-efficient investing could add 1% annually to the value of portfolios over long horizons (GSAM [31]).

[15] See, for example, Asl and Etula [7], and Idzorek and Kowara [37].

[16] Jacobs and Levy [39], [40]. Carhart et al. [17] propose nine so-called "exotic beta" factors, which deliver positive expected returns with little or no correlation to global equity markets.

[17] See Amenc et al. [1], Goltz et al. [28].

[18] See Sharpe [57]. Harvey et al. [32] proposed more stringent tests to eliminate the element of chance. Using these stricter criteria, Green et al. [29] found 24 strongly significant factors from among 100 tested. And Hsu [34] expresses skepticism over the value of most academically discovered factors in managing portfolios.

they must be "identifiable before the fact," "low-cost," "not easily beaten" and "a viable alternative."

The quest for Smart Beta has expanded beyond Equities to Fixed Income and other asset classes, such as Foreign Exchange, and Volatility[19]. For Fixed Income, Smart Beta strategies seek to harvest premia on several risk factors, or circumvent limiting conventions used in the construction of established indices. Examples include smoothing of rigid maturity or rating thresholds or using fundamental instead of market-valuation weights[20].

Finally, there are multi-asset class Smart Beta strategies that attempt to harvest risk premia on factors underlying many asset classes. Such factors include macroeconomic, inflation, interest rate, geopolitical, credit, and liquidity risk, among others.

Whatever the strategy they may be considering, investors should keep in mind that economic and market conditions drive investment performance. Strategies—whether factor- or style-based—that do well in one environment may perform weakly in another. For example, strategies based on the size factor—i.e., overweighting small capitalization stocks relative to large capitalization stocks—have tended to outperform when interest rates have been falling. On the other hand, growth stocks have underperformed value stocks during periods of robust earnings growth. Poor timing of an initial investment in certain factors could lead to prolonged periods of underperformance.

In addition, investors should be aware of the fact that the relatively short history of most Smart Beta offerings does not facilitate definitive performance comparisons among them.

Smart Beta Implementation

Smart Beta strategies are typically implemented through ETPs, but also in some quantitatively managed Mutual Funds[21] and Hedge Funds, among others. The main implementation differences from fully active and fully passive strategies are costs, manager discretion, transparency and capacity.

Table 2 compares Smart Beta to traditional passive (market capitalization-weighted) and active strategies across several operational dimensions. Passive market cap-weighted index funds trade very little, mainly as a response to flows, and to mirror their underlying index upon rebalancing. Manager discretion is minimal, and transparency is high, since to know their holdings one only needs to know the index constituents. As a result, index funds have almost unlimited capacity, and only minimal management fees can be justified. Active funds have higher turnover and incur high trading costs, their managers have high discretion in strategy implementation, their transparency must be kept low in order to build positions with minimal price impact, and their capacity is constrained as a result. Active managers charge higher fees for their skill and extra effort, and for the promise of superior returns. Yet, many active managers' portfolios differ little from their reference index, limiting their potential for superior performance and charging fees in excess of those involved in passive strategies[22]. Smart Beta requires more trading compared to market cap-weighted strategies, since they rebalance along more factors, but their turnover remains considerably below that of active funds, and manager discretion almost as low as that of market cap-weighted strategies, as their trading remains rules-based.

Table 2: Comparison of Operational Characteristics of Passive*, Smart Beta and Active Strategies

Investment Vehicle	Management Fees	Trading Costs	Manager Discretion	Transparency	Strategy Capacity
Passive*	Lower	Lower	None	Higher	Higher
Smart Beta	Moderate	Moderate/Lower	Lower	Moderate	Moderate
Active	Higher	Higher	Higher	Lower	Lower

Sources: GWIM CIO; ICI Factbook 2014; BlackRock (Kahn and Lemmon 2014).
* Market capitalization-weighted.

[19] See, for example, Asness et al. [10], Kahn and Lemmon [43], Hsu [33], and Tucker and Woida [63].

[20] Arnott et al. [6] show that non-market valuation-weighted bond indices outperform; see also Shepherd [58].

[21] Dimensional Fund Advisors, for example, offers funds that take exposures on factors such as size or value.

[22] The degree of difference of a portfolio's holdings from its reference index is called "active share." Managing low-active share portfolios, yet collecting high-active management fee rates, is a practice referred to as "closet indexing." Some academic research correlates stronger relative performance to higher active share (e.g., Cremers and Petajisto [22], Petajisto [52]). Hsu [35] has highlighted Smart Beta strategies' promise of delivering value to investors through the same or better expected returns than closet indexers, at much lower fees.

If they track an established index, transparency is similar to market cap-weighted funds; if not, it requires a little more effort to construct when the rules are known. As a result, capacity and management fees are higher than those of market cap-weighted funds but lower than those of active funds[23]. However, capacity depends on the liquidity in the markets that each Smart Beta strategy focuses on.

Smart Beta helps refine our thinking on investment return

Smart Beta causes us to rethink the breakdown of investment return into relevant sources in order to more closely align portfolios to client goals. In the traditional CAPM-based framework, investment return is broken down into two parts based on market factors:

4. **Market Beta (β)**, earned through capitalization-weighted exposure to the entire market
5. **Alpha (α)**, earned through active management, in excess of market beta

Research has shown that active managers may outperform their benchmarks, not in the truly active sense, but through static exposure to common risk factors[24]. Alpha, in the traditional sense, can then be broken down as follows:

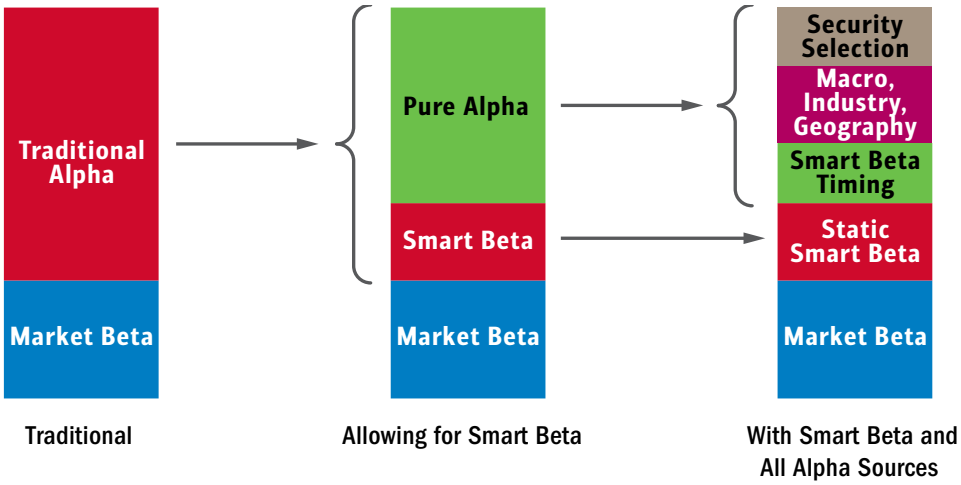
1. **Smart Beta**, earned through static exposure to common risk factors
2. **Pure Alpha (α)**, earned through truly active management, adjusted for exposure to common risk factors (see Exhibit 2)

While Smart Beta can be implemented in a cost-effective, systematic, rules-based, almost passive manner, pure alpha throughout an investment time horizon consists of all the value-adding components of active management[25]:

1. **Security Selection**, in a bottom-up approach where specific security idiosyncratic risk is the only source of return expected to be earned, after exposure to common risk factors (Smart Beta) has been adjusted away
2. **Macro, Industry and Geography**, again, adjusted for exposure to common factors
3. **Smart Beta Timing,** only if the manager attempts to time exposure to Smart Beta factors

It is important to distinguish between static Smart Beta and Smart Beta timing and classify the latter as active management. The Smart Beta timing component exists only if the active manager uses discretion to vary exposures to common risk factors hoping to capture any perceived excess return[26]. If exposure to common risk factors remains static, the Smart Beta timing component of pure alpha is zero. The above breakdown of investment return by source can be seen in Exhibit 2.

Exhibit 2: Breakdown of Investment Return by Source*



Sources: GWIM CIO; BlackRock (Kahn and Lemmon 2014); Goldman Sachs Asset Management (GSAM Perspectives 2014).
* Proportions of returns by source for illustrative purposes only.

[23] The relatively low cost is used as an argument by critics of Smart Beta, who contend that "... if beta were smart, asset managers would find a way to charge higher fees for it." (Anson [3]).

[24] See Carhart [16].

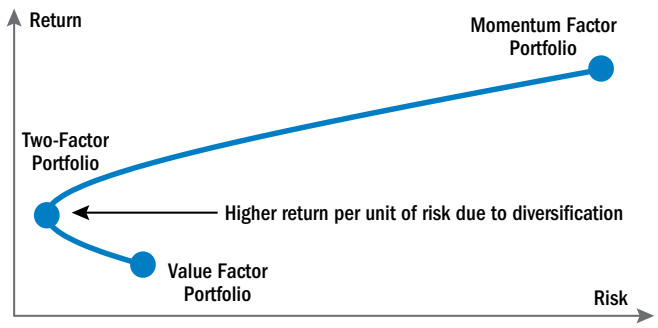
[25] See Kahn and Lemmon [44], [45].

[26] For example, different factors may work in a bull or bear market, a more or less volatile one, a steepening or flattening yield curve environment, and other contrasting economic or market regimes. Taking tilts on factor exposures to harvest time-varying risk premia or exploit any potential asset mispricing is part of Global Tactical Asset Allocation (GTAA) or Dynamic Asset Allocation (DAA) strategies (see Suri *et al.* [62]).

In addition to potentially improving investment performance, a portfolio's risk-reward profile may also benefit from two sources of diversification:

1. Returns to common factors have shown low to negative correlations to one another, although historical correlations may not hold moving forward. The portfolio's risk-adjusted performance metrics, such as Sharpe or Information Ratio, could therefore improve through exposure to common risk factors. A good example is combining value and momentum factor exposures[27] and therefore improving a portfolio's expected return per unit of risk, as illustrated in Exhibit 3.
2. Returns to the pure alpha components, i.e., bottom-up security selection, macro, industry, geography, and Smart Beta timing, are uncorrelated to static Smart Beta returns, since they exclude the effect of exposure to common factors. This represents an additional diversifying benefit to the portfolio.

Exhibit 3: Efficient Frontier*



Source: GWIM CIO.
* For illustrative purposes only.

Smart Beta can meet the needs of different investors

Investor goals

All investors have goals that they expect their invested assets to help meet. We must therefore examine how Smart Beta can improve portfolio allocations in the context of the Institutional Resource Allocation Framework (IRAF)[28]. Smart Beta aims neither to eliminate risks from a portfolio, nor to make idiosyncratic bets, but rather to systematically improve the portfolio's risk-reward profile with regard to market or factor exposure over that of capitalization-based passive allocations.

That said, at a high level, we see Smart Beta strategies as most appropriately placed in the IRAF's market portfolio, rather than in the protective or strategic portfolios. To that end, single- and multi-factor strategies, together with any passive and active allocations, ought to provide as close to total market exposure across asset classes as possible.

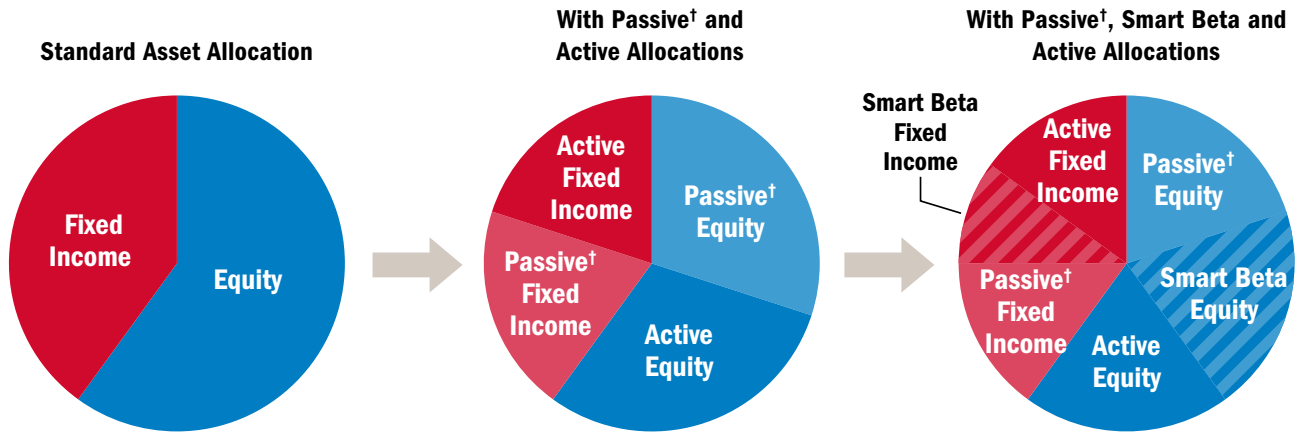
A simple example can illustrate how asset allocation can be rethought in the presence of Smart Beta strategies. Let us start with a straightforward illustrative allocation of 60% Equities / 40% Fixed Income in the market (policy) portfolio, as shown in the left hand pie chart of Exhibit 4. Traditionally, this allocation can be implemented by taking positions in passive (market cap-weighted) vehicles to gain exposure to market beta, as well as active managers in an attempt to capture alpha; see the middle pie chart in Exhibit 4. If the investor believes that risk premia beyond market beta can be harvested through exposure to common risk factors or non-market cap weights, additional slices can be allocated to Smart Beta strategies. As the right hand side of Exhibit 4 shows, a slice can be carved out from each passive allocation in order to refine the investor's expression of views with regard to common factors and non-market cap weights. A slice taken from each active allocation can provide cost-efficient exposure to the common risk factors managers derive part of their returns from[29] and invest the rest with carefully selected truly active managers[30].

Investor size and type

With the introduction of Smart Beta ETPs, even the smallest individual investors with daily liquidity needs can express investment views that include exposure to common factors in one or multiple asset classes. Investors with larger portfolios seeking to implement specific sets of views in a tax-optimal manner may consider custom Smart Beta implementations. Also available to (Ultra) High Net Worth individuals and institutions with longer time horizons and limited liquidity needs are Quantitative Hedge Funds; such vehicles are suitable for entities with special tax status, offer the benefit of scale up to any strategy capacity limits, and allow unconstrained long or short exposure to common risk factors.

[27] See First Trust [27].
[28] See Page 1. Also, the WAF is discussed in great detail in Chhabra [18] for individual investors and [19] for institutional investors.
[29] See Carhart [16].
[30] See Cremers and Petajisto [22], Petajisto [52].

Exhibit 4: Evolution of Asset Allocation to include Smart Beta Strategies*



Source: GWIM CIO.
* For illustrative purposes only. † Market capitalization-weighted.

Investor philosophies and preferences

Portfolio implementations must address investors' goals and be aligned with their philosophies and preferences:

1. Investors who believe in the efficiency of some or all markets may invest in market capitalization-weighted vehicles. This group, however, includes some who may seek to modestly enhance passive risk-adjusted returns by taking certain tracking error-controlled tilts consistent with their risk tolerance.
2. Those who believe that certain inefficiencies exist in market capitalization weights must have a clear understanding of these inefficiencies, as well as the appropriate alternative weighting scheme that can eliminate them from their portfolios; for example, by introducing an equal-weighted size tilt.
3. Investors with a philosophical preference for certain factors or styles over others may adjust their exposures accordingly. As an example, some investors may favor the momentum factor; others may prefer value, low volatility, or quality. These preferences will ultimately drive the portfolio strategy mix, even though the benefits of a systematic multi-factor allocation approach should be highlighted[31].
4. Those who reject market efficiency and have confidence in their ability to select active managers with superior skill may consider active management. However, as part of their due diligence, those investors should determine how much of the candidate active managers' performance can be attributed to common factor exposure, because Smart Beta strategies can offer inexpensive, more transparent and less capacity-constrained exposures to such factors compared to active management.

Issues to consider

Investors must take some issues into consideration before committing capital to Smart Beta strategies:

1. The economic and market environment drives investment performance. Strategies—whether factor- or style-based—that do well under one set of economic and market conditions may perform weakly in another. For example, strategies based on the size factor—i.e., overweighting small capitalization stocks relative to large capitalization stocks—have tended to outperform when interest rates have been on the decline. On the other hand, growth stocks have underperformed value stocks when earnings growth has been robust. Poor timing of an initial investment in certain factors could lead to prolonged periods of underperformance.
2. Smart Beta strategies could have higher risk and lower diversification than passive portfolios and still not consistently outperform[32]. Investment time horizons can significantly impact performance; while certain risk factors may perform well over a full market cycle, they could severely underperform and expose portfolios to higher tail risk during shorter intervals, especially periods of market stress, when

[31] Goltz et al. [28] make a compelling case.
[32] See Malkiel [49].

cross-asset and cross-factor return correlations become elevated.

3. Portfolios that seek exposure to common factors typically have higher than passive turnover and may be more costly to implement as a result.
4. The higher risk-adjusted returns historically attributed to common risk factors, especially in academic studies, may not be available in the future, due to changes in the market, increasing levels of invested assets, and other reasons. Furthermore, the relatively short history of most Smart Beta offerings does not facilitate definitive performance comparisons among strategies.

Conclusions

The increasing availability of Smart Beta products is equipping investors with additional tools that fill the gap between traditional passive and active choices. The better risk-adjusted returns than market cap-weighted investing promised over reasonably long time horizons raise the probability of meeting investors' goals, such as retirement, education and bequest. Furthermore, the educational literature offered by providers of Smart Beta products, and academic research on Smart Beta strategies, can help investors refine their understanding of risk factor contribution to investment returns. This improved understanding enables them to better express their investment preferences and target them according to their philosophy and risk tolerance in order to build portfolios that can meet their goals with a high degree of confidence.

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