

Is Smart Beta Really Smart?

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There is a popular new investment strategy in portfolio management called smart beta. With a catchy title and a promise of improved portfolio performance, the strategy has already attracted hundreds of billions of dollars and is growing by leaps and bounds. Unfortunately, smart beta portfolios do not consistently outperform and when they do produce appealing results, they flunk the risk test.¹

WHAT IS SMART BETA?

There is no universally accepted definition of smart beta strategies. What most people who use the term have in mind is that it may be possible to achieve greater-than-market returns using a variety of relatively passive investment strategies that involve no more risk than would be assumed by investing in a low-cost total stock market index fund, which, by definition, has a beta of one. They claim that one doesn't have to be a stock picker, as most active managers are, to be able to beat the market. Rather, you can manage a relatively passive (low turnover) portfolio to accomplish good results more dependably without assuming any extra risk. And you can do so at a fee well below that charged by active managers.

The trick is to tilt (or flavor) the portfolio in some direction such as value versus growth, smaller versus larger companies, relatively strong stocks versus weak, and low-volatility stocks versus high volatility ones.

Other tilts or flavors that have been suggested include *quality* (encompassing attributes such as stable sales and earnings growth and low leverage), profitability, high dividends, and liquidity. Just-as-good cooking blends a number of food flavors, some smart beta portfolios mix two or more flavors together. There are portfolios that blend value and small size as well as those that mix several of the flavors mentioned above. Moreover, all this can be accomplished without increasing the expected volatility (beta level) of the smart beta portfolio.

Smart beta strategies are related to multifactor models of asset pricing. If one assumes that the beta of the capital asset pricing model (CAPM) is an incomplete measure of risk, the tilts or flavors listed above can be considered as additional risk factors. By tilting the portfolio toward smaller companies, for example, the investor is making a bet that the risk premium that is available from smaller companies can enhance returns. Here, of course, the interpretation of smart beta is that it is a technique to enhance returns by assuming additional risk.

THE INTELLECTUAL CASE FOR FACTOR TILTING

Value Stocks Are to be Favored Over Growth Stocks

In 1934, David L. Dodd and Benjamin Graham published a manifesto for investors that has attracted strong adherents, including the legendary Warren Buffett. They argued that value wins over time. To find value, investors should look for stocks with low price-earnings ratios and low prices relative to book value. Value is based on current realities rather than on projections of future growth. The resulting theory is consistent with the views of behaviorists that investors tend to be overconfident in the ability to project high earnings growth and thus overpay for growth stocks (see Kahneman and Riepe [1998]).

There is some evidence that a portfolio of stocks with relatively low earnings multiples (as well as low multiples of book value, cash flow, and/or sales) produces above-average rates of return even after adjustment for risk, as measured by the capital asset pricing model. For example, when ten equal-sized groups of stocks, ranked by their P/E ratios, are formed, returns tend to be larger for the lowest P/E groups.

Another predictable pattern of return is the relationship between the ratio of a stock's price to its book value (the value of the company's assets as recorded on its books) and its later return. Stocks that sell at low ratios of price-to-book value tend to produce higher future returns. This pattern appears to hold for both U.S. and many foreign stock markets, as has been shown by Fama and French [1992, 1997].

Of course, stocks with low P/E multiples and low price-to-book value (P/BV) ratios can reflect risk factors that are priced into the market. Companies in some degree of financial distress are likely to sell at low prices relative to earnings and book values. For example, the big money center banks such as Citigroup and Bank of America sold at prices well below their reported book values during 2009, when it appeared that these institutions could quite possibly be taken over by the government and the stockholders' equity wiped out.

The Small-Firm Effect

Another pattern that academic investigators have found in stock returns is the tendency over long periods of time for small company stocks to generate larger returns than those of large company stocks (see Keim [1983]). Since 1926, according to Ibbotson Associates, small-company stocks in the United States have produced rates of return about two percentage points higher than the returns from large-company stocks. Fama and French [1992] provided cross-sectional support for the hypothesis. They divided stocks into deciles according to their size. They found that decile 1, the 10% of stocks with the smallest total capitalization, produced the highest rate of return, whereas decile 10, the largest-capitalization stocks, produced the lowest rate of return. Moreover, small firms tended to outperform larger firms with the same beta levels.

Again, we need to remember that small firms may be riskier than larger firms and deserve to give investors a higher rate of return. Thus, even if the small-firm effect were to persist in the future, such a finding would not violate market efficiency. A finding that small-company stocks outperform the stocks of larger companies on a risk-adjusted basis depends on how one measures risk. Beta, the risk measure typically used in the studies that have found excess returns from small firms, may be an incomplete measure of risk. We cannot distinguish whether the abnormal returns are truly the result of inefficiencies or whether they result from inadequacies in our measure of risk. The higher return for smaller companies may simply be the requisite reward owed to investors for assuming greater risk.

Momentum and Mean Reversion

The earliest empirical work on the behavior of stock prices, going back to the early 1900s, found that a sequence of random numbers had the same appearance as a time series of stock prices (see Bachelier [1900] and Cootner [1964]). But although the earliest studies support a general finding of randomness, more recent work indicated that the random walk model does not strictly hold (see Lo and MacKinlay [1999]). Some patterns appear to exist in the development of stock prices. Over short holding periods, there is some evidence of momentum

in the stock market. Increases in stock prices are slightly more likely to be followed by further increases than by price declines. For longer holding periods, mean reversion appears to be present. When large price increases have been experienced over a period of months or years, such increases are often followed by sharp reversals (See Jegadeesh and Titman [1993, 2001]).

Two possible explanations for the existence of momentum have been offered: the first is based on behavioral considerations, the second on sluggish responses to new information. Shiller [2000] emphasized a psychological feedback mechanism imparting a degree of momentum into stock prices, especially during periods of extreme enthusiasm. Individuals see stock prices rising and are drawn into the market in a kind of bandwagon effect. The second explanation is based on the argument that investors do not adjust their expectations immediately when news arises—especially news of company earnings that exceeded (or fell short of) anticipation. Some investigators have found that abnormally high returns follow positive earnings surprises as market prices appear to respond to earnings information only gradually (see Rendleman et al. [1982]).

Other studies have documented negative serial correlation—that is, return reversals—over longer holding periods. A considerable amount of the variation in long holding period returns can be predicted in terms of a negative correlation with past returns. Some studies have attributed this forecastability to the tendency of stock market prices to overreact. They argue that investors are subject to waves of optimism and pessimism that cause prices to deviate systematically from their fundamental values and later to exhibit mean reversion. They suggest that such overreaction to past events is consistent with behavioral factors, where investors are systematically overconfident of their ability to forecast either future stock prices or future corporate earnings (see Hong and Stein [1999] and Kahneman and Riepe [1998]).

Low-Volatility Can Produce High Returns

According to the capital asset pricing model, risk and return are related to beta, a measure of the relative volatility (or nondiversifiable risk) of any stock or portfolio. The higher the beta (risk) of any stock or portfolio, the higher should be the return. However, the empirical support for the theory is weak. High-beta portfolios do

not produce higher returns than low-beta ones. The relationship between beta and return is relatively flat both in the United States and internationally.

Investors can use this fact to fashion a variety of “betting against beta” portfolio strategies (see Asness et al. [2012] and Frazzini and Pederson [2011]). For example, suppose very low beta portfolios have a beta of $\frac{1}{2}$ (they are half as volatile as the broad market portfolio) but produce the same return as the market, which by definition has a beta of one. Suppose the market return was 10%. By buying a low-beta portfolio on margin (putting up 50 cents for each dollar of market value) an investor could double the beta and double the return of the low-beta portfolio. Alternatively, an investor might buy (go long) the 10% of the stocks with the lowest volatility and sell short the 10% of the stocks with the highest volatility.

Blended Flavors and Strategies

Dimensional fund advisors funds. Dimensional Fund Advisors (DFA) offers mutual funds sold through investment advisors. The funds are formed by selecting stocks quantitatively, based on the Fama-French criteria of value and size. For example, the DFA small-cap value fund (DFSVMX) is a value-tilted portfolio of small-cap stocks designed to capture both the size and value effects. The Fama-French work suggests that the effects exist not only in the United States but internationally as well. Thus, DFA offers international funds as well as domestic ones. DFA also states that it may also blend other flavors into its portfolios, such as quality, when conditions warrant.

RAFI fundamental indexes™. The firm Research Affiliates has designed both domestic and international portfolios based on trademarked indexes they believe are vastly superior to standard indexes, which are capitalization-weighted. The RAFI ETF PRF weights stocks in the Russell 1000 Index not by total capitalization but by their “economic footprint.” The RAFI Fundamental Index™ weights each stock by fundamental measures of worth such as sales, earnings, book values, and so on, rather than by capitalization.

In fact, the RAFI procedures tilt the portfolio toward the same value and size factors that are present in other smart beta. Consider two companies with equal earnings, but company A sells at 25 times earnings whereas company B sells at $12\frac{1}{2}$ times earn-

ings. With capitalization-weighting, company A gets twice the weight of company B. Under fundamental indexing, they both get the same weight. Thus, value stocks (with low P/Es) and small-capitalization stocks are overweighted relative to their weights in standard cap-weighted indexes.

Equal-weighted indexes. As the name implies, these portfolios give equal weight to all the stocks contained in the index. As with the RAFI portfolio, this procedure introduces both a size and a value tilt to the ETF.

Investable portfolios are available that reflect the different tilts listed above. There are value and growth as well as small-cap and large-cap funds and ETFs. There are portfolios designed to capture momentum and low-volatility effects. There are also portfolios that employ multiple tilts such as equally weighted portfolios and those offered by Research Affiliates (RAFI) and Dimensional Fund Advisors (DFA). There are even portfolios designed simultaneously to capture all of the tilts that have been suggested to improve portfolio performance. Some smart beta funds have produced above-market returns over their history. But even these portfolios may not be smart investments.

APPRAISAL OF SMART BETA

All smart beta strategies represent active management rather than indexing. Capitalization-weighted portfolios are the market. If you believe a subset of securities will give you superior returns, you are counting on some “dumb” investors to hold portfolios producing inferior returns. Some smart beta advocates have been quite explicit in suggesting who these dumb investors might be. They claim that the investors in traditional capitalization index funds are the dumb beta investors since by holding the broad index they will be holding a number of overvalued growth stocks. But that argument must be false. The holder of a broad-based index fund will by definition achieve the average return for the market. If smart beta funds generate above-average returns, it can't be at the expense of traditional index fund investors—it must be at the expense of all active managers who do not hold the market portfolio.

- To the extent that smart beta funds do generate excess returns, it is most likely because they are assuming greater risks. By tilting in one direction

or another, small size for example, investors, will be less diversified and exposed to greater risk than those associated with the broad market portfolio. Managers such as DFA readily admit that whatever higher returns such funds may generate are simply compensation for the extra risks assumed. Over its history, all of the above-market returns for the RAFI Fundamental Index™ portfolio were achieved during 2009, when bank stocks were overweighted and almost 15% of the portfolio was invested in two stocks, Citigroup and Bank of America. The bet worked but was certainly risky, because it was unclear whether banks would avoid nationalization and a “zeroing out” of the banks’ shareholders. Smart beta portfolios may not have high betas, but they do carry considerable risk.

- When smart beta portfolios are assessed with multifactor risk models (such as the Fama-French three-factor model or extensions of it), the typical finding is that no excess risk-adjusted performance is demonstrated. Smart beta portfolios do not produce alphas.
- Smart beta funds require periodic rebalancing. For example, for an equally weighted fund to maintain its equal weighting, stocks that have gone up more than average must be pared back. In a rising market, the trading involves transactions costs and short-term capital gains taxes. Smart beta funds and ETFs also carry considerably higher management expenses than traditional capitalization-weighted index funds.
- All smart beta portfolios have undergone long periods of underperformance. There is considerable evidence of reversion to the mean, and periods of excess performance are often followed by periods of disappointing results.
- Mutual funds (and exchange traded funds (ETFs)) designed to capture momentum and low-beta effects have not demonstrated superior performance over their short history. Often real money results differ from those simulated returns demonstrated in academic studies.
- Whether smart beta strategies will perform well in the future depends crucially on the market valuations existing at the time the strategy is implemented. Value strategies performed extraordinarily well coming out of the Internet bubble, when high-tech growth stocks were priced extremely richly

relative to value stocks. Similarly, small-company stocks did particularly well when they were inexpensively priced relative to large-cap stocks. Particularly as these strategies become increasingly popular, the stocks favored by those techniques will become more richly priced, and results could prove disappointing. No strategy will be effective irrespective of valuation relationships.

- Finally, many of the smart beta ETFs are more costly to buy and sell than their traditional cap-weighted brethren. Plain vanilla index funds, such as S&P 500 funds, trade at prices essentially the same as their net asset values because any differences tend to be quickly arbitrated away. Many smart beta ETFs follow nonstandard indexes that are far more difficult to hedge against. Hence, their prices are more likely to deviate from fair value and often trade at significant premiums or discounts from the value of their underlying holdings. Moreover, the successful smart beta funds offered by DFA can be purchased only from investment advisors, adding an additional layer of fees.

THE RECORDS OF SMART BETA FUNDS AND ETFs

The actual records of smart beta portfolios run with real money do not in general replicate the results suggested by academic studies. For example, an examination of mutual funds' returns of funds with value and growth mandates starting in the mid-1930s shows that both types of funds had similar 70-year average annual returns. Growth funds outperformed until the mid-1960s whereas value funds produced higher returns through 2005. The 1992–2013 results with ETFs show a similar pattern. The returns from the value ETF, ticker VVIAX, and the growth ETF, ticker VIGAX, were roughly similar, with alternating periods of outperformance.

A somewhat similar story can be told about the small-cap effect. There has been substantial volatility in the relative returns of small-cap and large-cap portfolios. For example, the 30-year returns are almost identical for the Russell 1000 and 2000 indexes and there is no evidence of consistent outperformance of either index. Data over the ten-year period from 2004–2013, when investable exchange traded funds were available for the Russell 1000 (ticker IWB) and 2000 (ticker IMB) indexes, also show considerable reversion to the mean although

smaller companies have produced average annual returns almost one percentage point greater than the returns for larger companies during this period.

Low-beta and momentum ETFs have not demonstrated superior performance over the brief periods during which they have been in existence. The SPDR Russell 1000 Low Volatility ETF (ticker LGLV) has been available only since early 2013. The Power Shares S&P 500 Low Volatility ETF (ticker SPLV) and the iShares MSCI USA Minimum Volatility ETF (ticker USMV) have been available since 2011. None of the three ETFs have produced returns that have exceeded their capitalization-weighted benchmarks through the first quarter of 2014.

The AQR Momentum Fund Class L ETF (ticker symbol AMOMX) has a longer history, having been available since 2009. Over its life through the first half of 2014 the ETF has failed to produce excess returns over either the Russell 1000 capitalization-weighted ETF or the Russell 1000 Growth ETF. Although the time period for the low-beta and momentum ETFs is too short to draw definitive conclusions, it is fair to say that thus far neither strategy has demonstrated superiority when the portfolios have been run with real money. Real money portfolios do not in general demonstrate the kind of effectiveness shown in academic simulations.

Blended strategies have produced somewhat better results than many other smart beta offerings available to investors. Over the past decade many of the DFA blended funds have produced returns that have exceeded their benchmarks. However, we need to emphasize that DFA is quite explicit that these extra returns represent an appropriate compensation for the added risk of the portfolios. Note also that the DFA funds, as do all the smart beta funds, experience periods of underperformance. Furthermore, DFA funds are only available through investment advisors, and therefore the extra returns that have been available from many DFA funds need to be reduced by the fees charged by these advisors.

By the criterion of commercial success, the Research Affiliates Fundamental IndexTM (RAFI) smart beta funds are among the most impressive of all the new fund offerings. Research Affiliates argues that cap-weighted portfolios will always be holding too big a share of overpriced growth stocks. This problem is avoided by adjusting the weight of each stock to its eco-

conomic footprint such as earnings, assets, and so on. Of course, this weighting gives the RAFI portfolios a tilt toward value and small size.

The RAFI ETF (ticker PRF) has indeed outperformed its benchmark, the Russell 1000 Index, by about one percentage point over its seven-year history to early 2014. Research Affiliates claims the excess return results from its avoidance of overpriced stocks. An analysis of the RAFI results suggests, however, that the excess performance results from the assumption of higher risk.

Exhibit 1 shows the quarterly excess return of the RAFI portfolio (PRF) over its benchmark portfolio, the Russell 1000 Index (ETF IWB). The chart indicates that there are usually small quarterly differences over time that are more likely to represent underperformance by RAFI rather than excess performance. There is, however, one notable exception during 2009, when PRF delivered extraordinary excess returns that were entirely responsible for the seven-year RAFI excess return.

The RAFI portfolio substantially overweighted large bank stocks in 2009 coming out of the financial

crisis since these stocks sold at unusually large discounts from their book (asset) values. The RAFI Fundamental Index™ portfolio had about 15% of its portfolio in two stocks (Citigroup and Bank of America) at that time. It turned out that such an overweighting helped to produce excellent returns. But it was far from clear at the time that the troubled banks would avoid nationalization. In any event, the strategy involved considerable risk. It is hard to avoid the conclusion that whatever success RAFI has had in generating excess returns resulted from the assumption of greater risk rather than the mispricing of growth stocks.

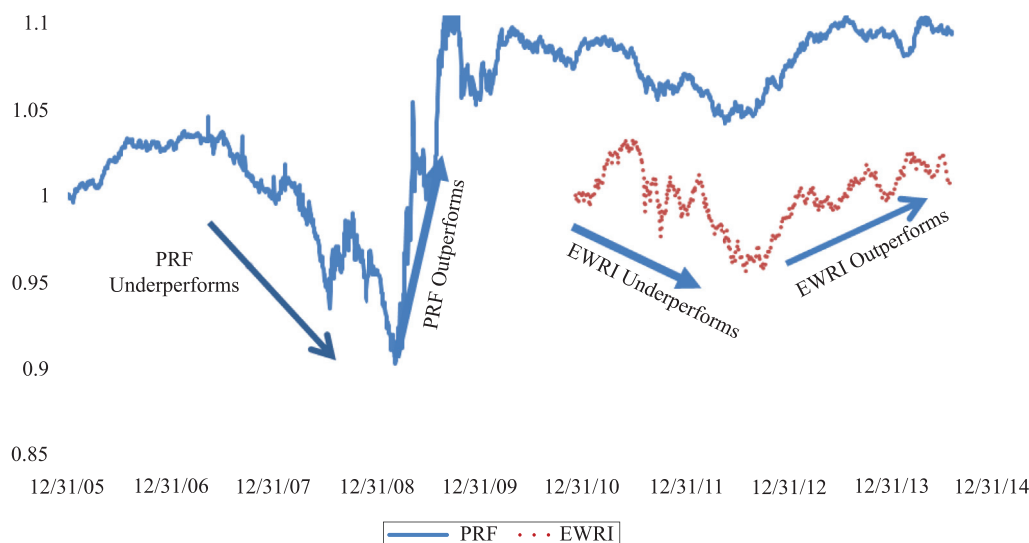
A statistical analysis of the RAFI results also supports the risk explanation. If one performs a statistical analysis of the PRF's returns explaining them via the Fama-French three-factor risk model (where value and size are considered risk factors), the RAFI excess performance (its alpha) is estimated to be zero. The performance chart also indicates long periods of underperformance during the history of the ETF.

Equally weighted portfolios have delivered somewhat similar returns. There are alternating periods of

EXHIBIT 1

Fundamental Index (PRF) and Equal Weight (EWRI) vs. Russell 1000 (IWB) (through 7/31/14)

The chart shows the return of the smart beta strategy divided by the return of the benchmark index. A number above (below) 1 indicates the smart beta fund outperforming (underperforming) the benchmark index.



Fundamental Index Average Annual Return (since 12/19/2005): 8.60%, Equal Weight Average Annual Return (since 12/03/2010): 16.09%, Russell 1000 Average Annual Return (since 12/19/2005): 7.47%, Russell 1000 Average Annual Return (since 12/03/2010): 15.92%.

Source: Morningstar.

over and underperformance, with equal weighting producing a slightly larger average annual return. Of course, two types of portfolios do not always have the same characteristics. Equally weighted portfolios give far greater weight to the smallest companies and hence have quite different diversification and risk characteristics than capitalization-weighted portfolios. They are also tax inefficient for taxable investors.

CONCLUDING COMMENTS

Smart beta strategies rely on a type of active management. They do not try to select individual stocks but rather tilt the portfolio toward various characteristics that have historically appeared to generate larger than market returns. In their favor these smart beta portfolios provide these factor tilts at expense ratios that are lower than those charged by traditional active managers.

In general, the records of smart beta funds and ETFs have been spotty. Many smart beta ETFs have failed to produce reliable excess returns, although a few have *beaten the market* over the lifetime of the funds. To the extent that some smart beta strategies have generated greater than market returns, those excess returns should be interpreted as a reward for assuming extra risk. In departing from the market portfolio investors are taking on a different set of risks. Smart beta portfolios do not represent a sophisticated better mousetrap for investors. Investors should be wary of getting caught in the riskier mousetrap themselves. Smart beta fails the safety test.

Smart beta portfolios have been the object of considerable marketing hype. They are more a testament to smart marketing rather than smart investing. Whether smart beta strategies will perform well in the future depends crucially on the market valuations existing at the time the strategy is implemented. Value strategies performed extraordinarily well coming out of the Internet bubble, when technology growth stocks were priced richly relative to most value stocks. Similarly, small stocks did particularly well when they were inexpensively priced relative to large caps. Investors should be aware that if value and small size becomes richly priced, as smart beta funds become increasingly popular, the results are likely to be disappointing. The success of any strategy is highly dependent on valuation relationships existing when the strategy is undertaken.

I find no reason to change the advice I have offered investors for the whole period of time that *The Journal of Portfolio Management* has been published. The core of every portfolio should consist of broad-based, low-cost, capitalization-weighted index funds. They continue to outperform the vast majority of actively managed and smart beta portfolios and are generally very tax efficient. Although predictable patterns in stock returns do appear over time and even persist for periods, the records of professional managers do not suggest that they imply exploitable opportunities to produce alphas. Our stock markets can make mistakes—often egregious ones—but they remain extremely hard to beat.

ENDNOTE

¹My views on smart beta are developed more fully in the forthcoming 11th edition of *A Random Walk Down Wall Street*, WW Norton.

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