

# Investing at Full Tilt

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Introducing a new method for capturing both the value and size premiums in the Morningstar® US Market Factor Tilt Index.<sup>SM</sup>

One of the most influential theories of capital markets to come out of academic theory is the Capital Asset Pricing Model (CAPM). Developed in the 1960s, the CAPM is the intellectual origin of the practice of using indexes for measuring systematic risk (“beta”), for separating manager skill from exposure to the market (“alpha”), and for forming the basis for passive investment products. While the construction of broad market indexes predates the development of the CAPM, it is the CAPM that made indexes such an important investment tool. So it is little wonder that one of the CAPM’s originators, William F. Sharpe, was awarded the Nobel Prize in Economic Studies in 1990 for his pioneering work.

However, academic research done in the late 1970s and early 1980s showed that one of the main predications of the CAPM fails empirically—namely, the predication that over the long run, the only factor that should predict the relative performance of stocks is beta. Research on the U.S. equity market showed that over long periods of time, portfolios of the stocks of small companies, as measured by market capitalization, tend to outperform portfolios of the stocks of large companies within the same equity markets, even after controlling for beta. (See Banz 1981.)

Similarly, research on the U.S. market concluded that in addition to a small-cap effect, there is also a value effect. In other words, over long periods of time, portfolios of stocks with rela-

tively favorable valuation ratios (low price/book, low price/earnings, high dividend yields, etc.) tend to outperform portfolios of stocks with relatively unfavorable valuation ratios, even after controlling for beta. (See Basu 1977.) Stocks with favorable ratios became known as “value” stocks, and those with unfavorable ratios became known as “growth” stocks.

These “CAPM anomalies” led to the practice of dividing the U.S. stock market into groups of stocks on the basis of market capitalization and valuation ratios, especially among investment consultants, advisors, and institutional investors.

Morningstar popularized the concept among retail investors in 1992 with its nine-square Morningstar Style Box,<sup>TM</sup> which classifies equity mutual funds on the basis of market capitalization (large, mid, small) and value/growth orientation (value, blend, growth). Also in 1992, two prominent academics, Eugene Fama and Kenneth French, published a highly influential paper that showed that over long periods, market capitalization and valuation ratios explain the differences in returns between stocks. Furthermore, they showed that after controlling for the size and value effects, beta has no explanatory power.

While there is generally agreement that the size and value effects exist, or at least have existed historically, there is much disagreement on the causes of these effects and the best way to take advantage of them in practice.

Most explanations for the size and value effects fall into one of two camps: the efficient markets camp and the inefficient markets camp. Not surprisingly, since he is one of the founders and greatest proponents of the theory of efficient markets, Fama is a leader of the efficient markets camp.

According to the efficient markets camp, equity markets are fully efficient in that they continually and instantaneously process all relevant publicly available information about the values of companies so that at each and every instant, the price of every stock reflects all relevant publicly available information about the value of the company it represents. Hence, there is no point in actively managing a portfolio.

In an efficient market, there is one way to outperform the market: take systematic exposure to undiversifiable risk. The theory is that while the market will not reward you for acting on publicly available information (since that has already been incorporated into market prices), it will reward you for taking additional risk, so long as that risk cannot be eliminated through diversification. This reward is called a risk premium.

In the CAPM, the market portfolio itself embodies all nondiversifiable risk. Fama and French postulate that the CAPM is an oversimplification in that there are a number of risk factors that have associated risk premiums. They further postulate that different exposures to size and value factors is the only other way to achieve greater expected return than the market.

A problem with the risk premium theory of the size and value effects is that no one has ever been able to identify what actual risks they might represent. Jonathan Berk (1995) came up with a more straightforward explanation: if the CAPM systematically underestimates the diversifiable risk of stocks but the market does not, stocks with smaller capitalizations and price ratios will generate returns greater than the CAPM predicts. To test his hypothesis, Berk sorted stocks into size groups using various non-market measures of size such as revenue, earnings, and book value, rather than market capitalization. He found that the size premium went away. However, later research by Grabowski and King (1996) overturned his findings. This line of research was important, as it anticipated fundamental weighting as a method of value tilting a portfolio.

According to the inefficient markets camp (which could have been called the “noisy market” camp had that term not been appropriated by Jeremy Siegel [1996] to promote fundamental weighting), if market prices differ from fair values but the differences tend toward zero over time, value and size premiums will occur without any connection to risk factors. This theory was informally proposed by Lakonishok, Shleifer, and Vishny (1994), and formally demonstrated by Arnott, Hsu, Liu, and Markowitz (2007).

As to taking advantage of the size and value effects in practice, there are also two main camps: the market-cap weighting camp and the fundamental weighting camp.

The popularity of style classification naturally led to the demand for indexes to represent the various investment styles. Today, nearly all stock index providers decompose their U.S. broad market indexes into style groups based on market capitalization and value/growth orientation.

The standard practice of market-cap weighting the constituents of broad market indexes was quite naturally carried over into the style-based indexes. With the wide availability of these indexes as investment products (mutual and exchange-traded funds), investing in these products became the most convenient way to make size and value bets. However, with the challenge of fundamental weighting as an alternative approach to taking these bets, in some quarters the myth was started that this was not only the most convenient way to place these bets, but also the theoretically most sound and empirically best performing approach.

The fundamental weighting camp originally did not start as a challenge to cap-weighted small-cap and value indexes, but rather as a challenge to cap-weighted broad market indexes. They did this by spreading their own myth that weighting the constituents of a market index by fundamental measures of size (as had been suggested by Berk [1995]) rather than by market cap would unambiguously produce superior long-term results.

Fortunately, several researchers, including Clifford Asness (2006, 2007, 2007) and myself (Kaplan 2008) were quick to expose the myth for what it was and explain the real reason that fundamental weighting worked empirically: it's simply a method for tilting a portfolio towards value.

Even Rob Arnott has confessed that fundamental weighting is a value strategy. He went so far as to say “Fundamental index portfolios have a value tilt, and that’s going to help you when value wins and hurt you when it loses. Has it lived up to people’s expectations? No. A lot of folks heard what they wanted to hear—long-term value added—and assumed that meant all of the time. That’s just not realistic.” (*The Wall Street Journal*, April 6, 2009.)

Therefore, fundamental weighting is now at least somewhat recognized as a form of value tilting.

The bottom line is that whether markets are efficient or not, the size and value premiums are well established phenomena that patient investors can take advantage of with portfolios that are tilted towards value-oriented smaller-cap stocks. Below we describe the Morningstar approach to creating an index that when replicated by a fund, provides a simple way for investors to take advantages of these premiums.

**Morningstar’s Approach**

When creating the Morningstar® US Market Factor Tilt Index,<sup>SM</sup> we recognized the advantages and disadvantages of both the market-cap approach and fundamental approach to tilting a market portfolio toward smaller and more value-oriented stocks. We had already developed a family of style indexes that divides the U.S. equity market portfolio into nine sub-portfolios on the basis of market capitalization and value/growth orientation. By market-cap weighting the stocks within each of the nine style indexes, we should have less turnover than produced by fundamental weighting. However, by shifting the weights among

the nine style indexes away from pure market weights and toward the small-cap and value-oriented stocks the US Market Factor Tilt Index offers an alternative exposure. The resulting portfolio captures the size and value premium in the equity market that should have less turnover than a pure fundamental approach. Furthermore, it is easy to replicate and thus can be made available to investors at a lower cost than similar existing products.

The index construction follows a four-step process:

**Step 1: Define the Morningstar Investable Universe**

To qualify for inclusion in the investable universe, the investment must be classified as a U.S. security, trade on one of the three major U.S. exchanges (the NYSE, Nasdaq, or NYSE Amex) and must have sufficient liquidity.

**Step 2: Define the Morningstar Total U.S. Market Portfolio**

The largest 99.5% of liquid securities by market capitalization qualify for inclusion in the total U.S. market portfolio. The portfolio is then broken down into four cap indexes using the following guidelines:

- ▶ The Large Cap Index is constructed by selecting the largest stocks that comprise 70% of market capitalization of the investable universe.
- ▶ The Mid Cap Index represents the next largest stocks that comprise 20% of market capitalization of the investable universe.
- ▶ The Small Cap Index represents the next largest stocks that comprise 7% of the market capitalization of the investable universe.

Figure 1. Morningstar® US Market Factor Tilt Index<sup>SM</sup> Construction Process

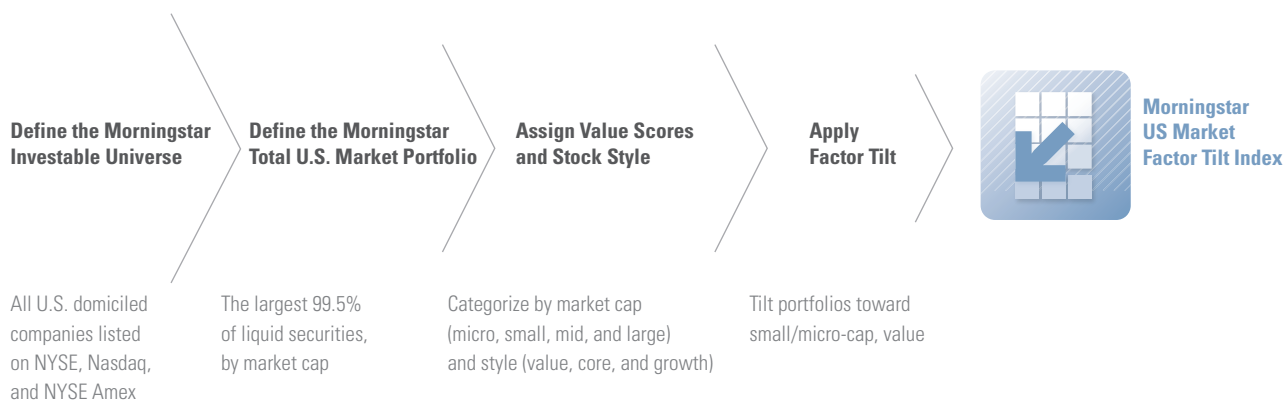
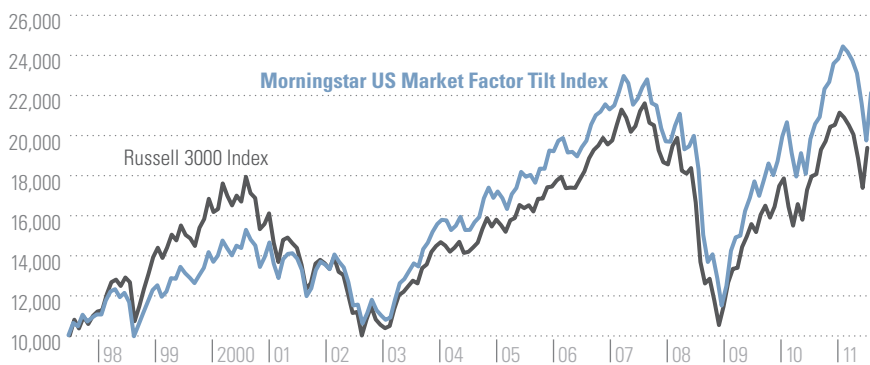


Figure 2. **Growth of a \$10,000 Investment** July 01, 1997–October 31, 2011**Index Comparisons**

	Annualized Return %	Standard Deviation %	Sharpe Ratio	Max Drawdown %
<b>Morningstar US Market Factor Tilt Index</b>	<b>6.17</b>	<b>18.10</b>	<b>0.27</b>	<b>-52.46</b>
Russell 3000 Index	3.94	16.87	0.14	-51.20

- ▶ The Micro Cap Index represents the next largest stocks that comprise 2.5% of the market capitalization of the investable universe.

**Step 3: Assign Value Scores and Stock Style**

A stock's value orientation reflects the price investors are willing to pay for a share of some combination of the stock's prospective earnings, dividends, sales, cash flow, and book value. Value orientation is determined using the following steps:

- ▶ Calculate five prospective yields (earnings, dividend, cash flow, revenue, and book value) for each stock within each of the cap indexes.

- ▶ Compute an aggregate value score for each security by averaging the scores of the five prospective yields. These average scores are then used to assign the stocks within each size band to the size band's value, core, and growth indexes.
- ▶ Index constituents are assigned so that within each of the large-cap, mid-cap, small-cap and micro-cap size bands, the three indexes that reflect each of the three levels of value orientation account for roughly a third of the total float-adjusted market capitalization of the size band.

**Step 4: Apply Factor Tilt**

We developed a model that allows us to set separate degrees of value tilting and size tilting, each on a scale from 0 (no tilt) to 1 (full tilt). To select which combination of settings to use for the tilting parameters, we first created 25 portfolios by using values of 0.1, 0.2, 0.3, 0.4, and 0.5 for each of two parameters. We then used the Fama-French three factor (FF) model to guide us toward one of these 25 portfolios to use. (See Fama and French 1993, 1995, and 1996.) (The three factors of the FF model are the excess return on the market portfolio; SMB, which is the difference between the returns of a small-cap and a large-cap portfolio; and HML, which is the difference in returns between a high book/market and low book/market portfolio.) Setting the size tilt factor to 0.4 and value tilt factor to 0.1 results in FF regression coefficients over the 14+ year history of SMB and HML of 0.18 and 0.23, respectively. Since these coefficients are close to our target sensitivities to the FF factors, we selected this portfolio. At each reconstitution, the Morningstar Index Committee reviews the long-term sensitivities of the candidate portfolios to value and size factors, using at least in part the FF model to ensure the tilt factors continue to be appropriate. ■■■

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