Investing at Full Tilt

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Introducing a method for capturing both value and size premiums in the global market through the Morningstar® Factor Tilt Index family.

Background
One of the most influential theories of capital markets to come out of academic finance is the Capital Asset Pricing Model, or 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 Economics 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, that over the long run, the only factor that should predict the relative performance of different assets 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 relatively 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.

From Anomalies to Indexes
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.

In the U.S., Morningstar popularized the concept among retail investors in 1992 with its nine-square Morningstar Style Box™, 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 time periods, market capitalization and valuation ratios explain the differences in returns between stocks. Furthermore they found that after controlling for the size and value effects, beta has no explanatory power.
**Going Global**
Evidence of value and size premiums is not limited to U.S. markets. For example, Sinquefield (1996) concludes “recent research for the U.S. market shows that two risk factors, value and size, explain differences in expected returns across equity performance. Preliminary evidence suggests that the same factors also work in foreign markets.” For a more recent example, see Fama and French 2011.

**Explaining the Anomalies**
While there is generally agreement that the size and value effects exist, or at least have existed historically, there is much disagreement on (1) the causes of these effects and (2) 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 continually and instantaneously process all relevant publicly available information about the values of the companies so that at each and every instant, the price of every stock reflects all relevant publicly available information about the values of the companies that they represent. 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. 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 undiversifiable 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 that are available to investors who are willing to take the additional risks. They further postulate that the size and value effects either are or are proxies for such risk premiums.

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 actually 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, and found that the size premium went away. However, later research by Grobowski and King (1996) overturned his findings. As I discuss below, 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).

**Ways to Tilt**
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 and the large providers also do so for markets outside of the U.S.

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 funds 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 story 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. Their claim was 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, 2007a, 2007b) and one of us (Kaplan 2008) were quick to explain the simple reason that fundamental worked empirically: fundamental weighting is a method for tilting a portfolio toward 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.” (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, the size and value premiums are well established phenomena that patient investors can take advantage of with portfolios that are tilted toward value-oriented, smaller-cap stocks. Below we describe our 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

At Morningstar, when creating the Market Factor Tilt Indexes, 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. For the U.S., 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 (see Kaplan Phillips, and Pascavis 2009) and had been developing a similar set of indexes for Europe (see Kaplan 2010). By market-cap weighting the stocks within each of the nine style indexes, we should have lower 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 while holding every stock in the broad market index, the Market Factor Tilt Indexes offer alternative exposures to the broad U.S. and global stock markets by tilting the portfolio to capture 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.

There are three Morningstar Factor Tilt Indexes:
1. Morningstar® U.S. Market Factor Tilt IndexSM
2. Morningstar® Developed Markets ex-US Factor Tilt IndexSM
3. Morningstar® Emerging Markets Factor Tilt IndexSM

These indexes are constructed as follows:

Step 1: Divide the parent index into market-cap based sub-indexes.

For parent indexes for the three tilt indexes are the Morningstar US Market Index, the Morningstar Developed Markets ex-US Index, and the Morningstar Emerging Markets Index, respectively. We divide each of these indexes into market-cap based sub-indexes as follows:

► 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.
► The Micro-Cap Index represents the bottom 3% of the investable universe.

Step 2: 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 3: Apply Factor Tilt.**

This step varies by market:

**US Market**

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 create 25 portfolios by using values of 0.1, 0.2, 0.3, 0.4, and 0.5 for each of two parameters. We then use the U.S. market three-factor FF model to guide us toward one of these 25 candidate portfolios to use. (See Fama and French 1993, 1995, 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.) The target factor loadings are 0.16 for size and 0.14 for value respectively. We find that the portfolio with the closest match is 0.4 for size and 0.1 for value.

**Developed Markets ex-US**

For developed markets ex-U.S., we construct 25 tilt portfolios from the Developed Market ex-U.S. style indexes that we construct in Step 2 in a way that is analogous to the U.S. market candidate portfolios. These are the candidates for the Developed Market ex-U.S. Tilt Index. To select among the candidates, we use the Fama and French (2011) three global factors (“market”, “size”, “value”) that are analogous to their U.S. counterparts. Since these factors include the U.S., rather than evaluate the candidates on a stand-alone basis, we pair each one with the US tilt index constructed above to form 25 50/50 portfolios. The target factor loadings are 0.14 for size and 0.16 for value respectively. We find that the portfolio with the closest match is 0.2 for size and 0.1 for value.

**Emerging Markets**

As with the developed markets indexes, we construct 25 candidate portfolios from the Emerging Markets style indexes that we construct in Step 2 and evaluate them using the global three-factor FF model. In this case, each of the 25 portfolios used in the evaluation consists of 50% of the US tilt index, 37.5% in the Developed Markets ex-U.S. tilt index, and 12.5% in the Emerging Markets candidate. The target factor loadings are 0.14 for size and 0.16 for value respectively. We find that the portfolio with the closest match is 0.2 for size and 0.1 for value.

For each of the three indexes, at each reconstitution the Morningstar Index Committee will review the long-term sensitivities of the candidate portfolios to value and size factors, using at least in part the appropriate FF model to ensure the tilt factors continue to be appropriate.

**Conclusion**

There is an extensive body of research showing that over many decades biasing a diversified portfolio of U.S. stocks towards small-cap and value stocks has yielded better performance than the market-cap weighted market portfolio. There is also research that shows that the same is true in other markets as well. Morningstar has constructed three Factor Tilt Indexes that tilt the broad market portfolios of the U.S. the developed markets outside the U.S., and emerging markets respectively. By creating Factor Tilt Indexes, Morningstar has provided a simple way for investors who would like to tilt their portfolios towards small-cap and value stocks.
References

- Asness, Clifford. 2007b. “Non-Cap Weighted Indexes.” Presentation to the Institute for Quantitative Research in Finance (Q-Group), Sea Island, GA (March 27).

Important Disclosures:
An investment in FlexShares is subject to numerous risks, including possible loss of principal. Fund returns may not match the return of the respective indexes. The Funds are subject to the following principal risks: asset class; credit (or default) risk; concentration; currency; debt extension; derivatives; emerging markets; financial sector; foreign securities; interest rate/maturity risk; issuer; leveraging; liquidity; management; market; market trading; mortgage-related and other asset-backed risks; municipal market volatility; new fund; non-diversification; prepayment; and U.S. Government Securities risk. A full description of risks is in the prospectus.

Before investing, carefully consider the FlexShares investment objectives, risks, charges and expenses. This and other information is in the prospectus, a copy of which may be obtained by visiting www.flexshares.com. Read the prospectus carefully before you invest.

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