# Low Volatility

From December 9th's WSJ:

## THE REASONS LOW-VOLATILITY STOCKS HAVE FALLEN OUT OF FAVOR

**BY MARK HULBERT**

After a couple months of poor performance, low-volatility stocks have fallen out of favor.

But you shouldn't give up on them. The recent downturn is just a blip in a long history of delivering strong performance with less risk.

Consider the S& P 500 Low Volatility Index, which comprises the 100 stocks from the S& P 500 that have experienced the least volatility over the trailing year. From February 1972, which is how far back data extend, through November, this index has a 12.4% annualized return, according to S& P Dow Jones Indices, versus 10.5% for the S& P 500 itself. (Both returns reflect the reinvestment of dividends.) Better yet, the Low Volatility Index was 18% less volatile, or risky, than the S& P 500 itself.

This result stands much of investment theory on its head, since a riskier strategy is supposed to produce greater returns to entice investors to incur that higher risk. In the case of low-volatility stocks, however, investors in effect are being paid, in the former of higher returns, to incur less risk. One theory is that investors are drawn to more-volatile stocks because they are "exciting"—thereby bidding their prices to too high a level relative to those of more "boring" low-volatility stocks.

This impressive record is widely known, however. So why has the strategy so suddenly fallen out of favor with investors?

Before the beginning of November, for example, the low-volatility stock ETF with the most assets— **iShares Edge MSCI US Minimum Volatility** ETF (USMV)—had 16 straight months of net inflows, averaging over $1 billion a month, according to Ned Davis Research. Through October, in fact, the USMV was the second-most popular of *any* ETF for year-to-date inflows. In November, in contrast, the ETF had outflows of $527 million.

Holly Framsted, head of U.S. iShares Factor ETFs, says it is important to put recent "small outflows" in the context of the "record $18 billion that USMV had brought in through October."

The reasons for why low-volatility strategies have fallen out of favor fall into three categories:

• **Recent disappointing performance.** In September and October, low-volatility strategies lagged far behind the broad market—after having outperformed it for several years. In contrast to the S& P 500's total return of 5.9% over those two months, USMV gained 1.2%.

Remember, however, that no strategy—no matter how good its long-term record—beats the market in each and every short-term period along the way. Since 1972, the S& P 500 Low Volatility Index has trailed the S& P 500 in nearly half of all two-month periods, according to data from S& P Dow Jones Indices. Performance over periods as short as two months is little more than statistical noise—and sheds no light on the strategy's future potential.

• **Low-volatility stocks have become overvalued.** Another criticism of low-volatility stocks is that they have become overvalued: USMV's price-earnings ratio, when calculated using trailing 12-month earnings, is 17%

higher than the S& P 500's, according to iShares. This is indeed unusual, since more often than not, low-volatility stock portfolios have had lower P/E ratios than that of the overall market.

This shift doesn't mean that previous years' low-volatility stocks have become more richly valued, however, according to Nardin Baker, chief strategist at South Street Investment Advisors in Needham, Mass., which offers low-volatility portfolios. It instead reflects the shifting composition of the low-volatility portfolio away from value toward growth stocks— which have always sported above-average P/Es.

Why would the usually more-volatile growth stocks become less so? Mr. Baker says the likely cause is the Fed's easy-money policies, which make growth stocks artificially more attractive. In normal times, growth stocks are particularly volatile because of the outsize losses they would incur if the economy were to enter into a recession. The Fed's policies help to immunize growth-stock investors from that downside risk by lessening the risk of a recession, resulting in growth stocks with value-stock-like volatility. This doesn't mean you should avoid low-volatility stocks in the future, Mr. Baker adds, unless you think easy-money policies will end soon.

•**Low-volatility strategies are nothing more than a proxy for other strategies.** Those lodging this objection don't deny that low-volume strategies have beaten the market with below-market volatility. They point instead to various studies that have found that you could have done just as well by constructing a portfolio with just the right combinations of other market styles, or factors. The implication is that there is nothing magical about low-volatility strategies in and of themselves.

Kent Daniel, a finance professor at Columbia University and a former co-chief investment officer at Goldman Sachs, disagrees. He argues that those prior studies failed to fully correct for other characteristics of the low-and high-volatility portfolios that affected their returns. He says that he and three colleagues have found that, upon controlling for those characteristics, the low-volatility strategy isn't reducible to other styles.

Prof. Daniel adds that, while there is never a guarantee that a strategy will continue working, he is unaware of any evidence that the low-volatility strategy has stopped working. (Prof. Daniel is on an academic advisory council to Martingale Asset Management, which offers low-volatility strategies.) ...

*Mr. Hulbert is a columnist whose Hulbert Ratings tracks investment newsletters ....*

# Low-Vol Strategies Are Not the Same as Value, Profitability

**Daniel Sotiroff**   21 Nov 2018

One critique of defensive-equity (low-volatility) strategies is that they're repackaged versions of two known investment styles: value and profitability. That statement implies that defensive strategies are nothing new, and investors should forgo them in favor of others that explicitly target the value and profitability factors.

There is some truth to this statement, but context matters. Low-volatility strategies have had significant but inconsistent exposure to both value and profitability. Therefore, investors who want exposure to these factors are better off with a strategy that explicitly targets those types of stocks. Those who want to reduce risk should stick with defensive strategies but should not assume they're directly exposed to value, profitability, or both.

**Repackaged Factors?**
Robert Novy-Marx, a professor at the University of Rochester and a consultant for Dimensional Fund Advisors,

conducted a thorough analysis of defensive stocks in his paper "Understanding Defensive Equity." [1] He argued that low-risk stocks (those with lower volatility and less exposure to market risk) also tended to trade at lower valuations and be more profitable than the broader market. Hence, their value and profitability characteristics drove their performance, and their low-risk nature didn't present a new phenomenon.

I tested the factor overlap that Novy-Marx addressed in his paper using data from the Ken French Data Library. I included five known drivers of return in the analysis: the market, size (small caps), value, profitability, and momentum. Most low-volatility indexes have a limited history, so I used the low-variance (low 20) portfolio that is also available from French's site. Monthly returns for this portfolio date back to July 1963--a much longer record than was available for any strategic-beta low-volatility fund or index.

Exhibit 1 shows the results from the regression. The market coefficient, a measure of the portfolio's exposure to market risk, was less than 1--indicating that the portfolio was less risky than the broader U.S. stock market. The portfolio also had statistically significant exposure to value (the high minus low, or HML, coefficient) and profitability (the robust minus weak, or RMW, coefficient). Simply put, these results support Novy-Marx's observation that defensive stocks have historically overlapped with the value and profitability factors.

**Exhibit 1: Regression of Fama-French Low-Variance Portfolio (July 1963–September 2018)**

| Alpha | MKT | SMB | HML | RMW | MOM |
|-------|------|-------|------|------|------|
| 0.00 | 0.79 | -0.15 | 0.24 | 0.24 | 0.03 |

Sources: Ken French Data Library and author's calculations.
Coefficients in bold are statistically significant with a t-stat greater than 2.0.

But there's more to this story that can't be captured in a single regression. To complement the above analysis, I ran a 36-month rolling regression from July 1963 through September 2018 to see how the low-variance portfolio's factor exposure changed over time. The results for the value and profitability coefficients of the low-variance portfolio are shown in Exhibits 2 and 3 (*Sources: Ken French Data Library and author's calculations.*) alongside those for individual value and profitability portfolios.

Exhibit 2: Rolling Profitability Coefficient From a 5-Factor Regression of the Fama-French Portfolios (June 1966–September 2018)
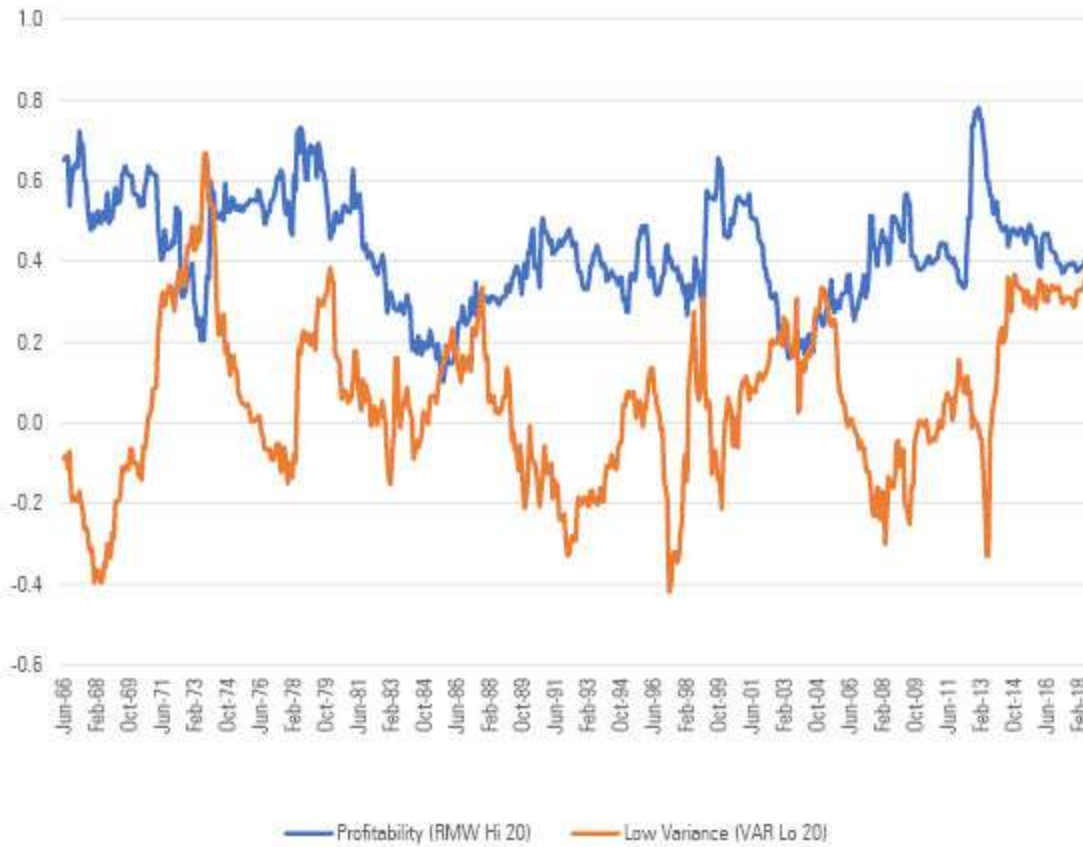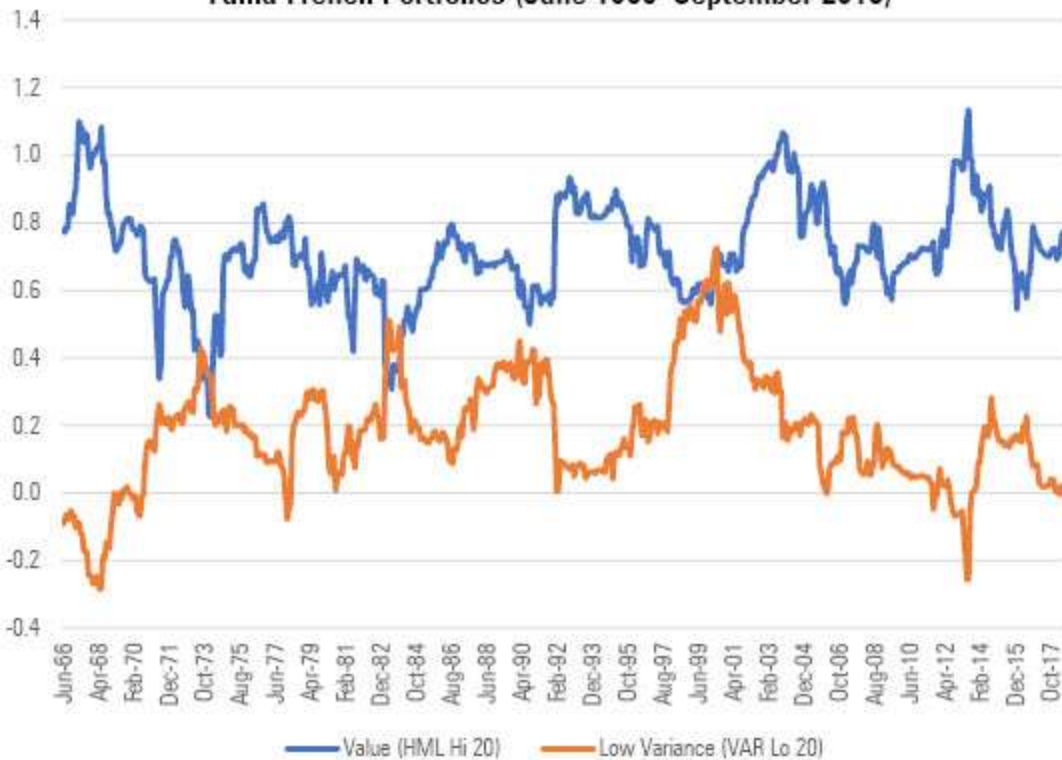


Exhibit 3: Rolling Value Coefficient From a 5-Factor Regression of the Fama-French Portfolios (June 1966–September 2018)

This more detailed analysis shows that the low-variance portfolio's exposure to value and profitability was less consistent over time than portfolios that focused on the individual value and profitability factors. The takeaway is that investors shouldn't look at defensive stocks as a way to get clean exposure to the value or profitability factors. Defensive strategies don't explicitly target stocks trading at lower valuations or those that are more profitable relative to the broader market. Their exposure to both will ebb and flow over time as those factors become more or less risky.

**The Goal Is Risk Reduction**

Defensive strategies shouldn't be written off. Low-volatility strategies, as their name implies, attempt to build portfolios that are less risky than the market. To that end, they have been effective. Exhibit 4 compares the live track record of the suite of iShares Edge Minimum Volatility ETFs to their respective parent indexes. All three funds had lower standard deviations than their respective parent benchmark. Less risk (a lower standard deviation) also means these funds had higher risk-adjusted returns, as measured by their Sharpe ratios.

**Exhibit 4: iShares Minimum Volatility Fund Performance (January 2012–September 2018)**

| | Market Beta | Standard Deviation | Return | Sharpe Ratio |
|---|---|---|---|---|
| iShares Edge MSCI Min Vol USA USMV | 0.69 | 8.0 | 14.25 | 1.66 |
| MSCI USA GR Index | 1.00 | 9.7 | 15.61 | 1.51 |
| iShares Edge MSCI Min Vol EAFE EFAV | 0.69 | 9.5 | 8.93 | 0.90 |
| MSCI EAFE NR Index | 1.00 | 12.3 | 8.10 | 0.66 |
| iShares Edge MSCI Min Vol Emerging Markets EEMV | 0.75 | 11.7 | 4.99 | 0.44 |
| MSCI Emerging Markets NR Index | 1.00 | 15.2 | 4.55 | 0.34 |

Source: Morningstar Direct.

The live track record of these three funds speaks to the advantages and disadvantages of defensive strategies. From a total-return perspective, iShares Edge MSCI Min Vol USA ETF (USMV) underperformed the MSCI USA Index. Taking on less risk in a strong bull market was the main reason it lagged the cap-weighted benchmark. On the other hand, iShares Edge MSCI Min Vol EAFE ETF (EFAV) and iShares Edge MSCI Min Vol Emerging Markets ETF (EEMV) had total returns that beat their respective parent benchmarks. Both developed- and emerging-markets indexes struggled (by historic standards) over this period. So, taking less risk than the market resulted in mildly better total returns.

To summarize, low-volatility strategies should lag a cap-weighted index during bull markets but hold up better during downturns. They're more appropriately viewed as strategies that are less risky than the broader market. As such, their market coefficient, or market beta, should be lower than 1. Exhibit 5 shows that the market beta of the low-variance portfolio consistently ran below 1 between July 1963 and September 2018.

**Exhibit 5: Rolling 36-Month Market Coeffecient for the Low-Variance Portfolio**
**(June 1966–September 2018)**
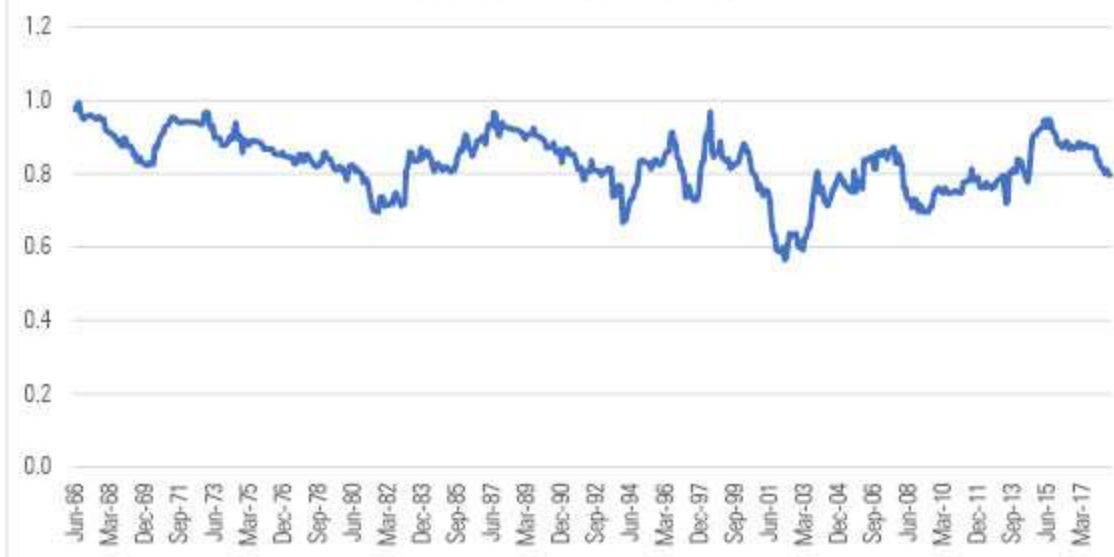


What's clear is that low-volatility strategies are an effective means to cut back on risk, but they won't always perform as well as a cap-weighted index. Thus, investors should view them as a risk-reducing strategy, not one that is expected to deliver market-beating total returns. They're a great alternative for investors who want exposure to stocks but with less risk than a cap-weighted index, and they shouldn't be used as a substitute for dedicated value and profitability strategies.

Exhibit 6 summarizes the more popular low-volatility funds that investors can access today, along with their expense ratios and Morningstar Analyst Ratings (where applicable). The suite of funds offered by iShares uses a different portfolio construction process than the Invesco suite. Those interested in evaluating the trade-offs of their processes should check out "A Framework for Evaluating Low-Volatility Funds" authored by my colleague Alex Bryan. The framework he presents explains the thought process we use to evaluate low-volatility strategies when assigning Analyst Ratings.

**Exhibit 6: Low-Volatility ETFs**

| | Ticker | Morningstar Analyst Rating | Net Expense Ratio (%) |
|---|---|---|---|
| iShares Edge MSCI Min Vol USA | USMV | Silver | 0.15 |
| iShares Edge MSCI Min Vol EAFE | EFAV | Silver | 0.20 |
| iShares Edge MSCI Min Vol Emerging Markets | EEMV | Silver | 0.25 |
| Invesco S&P 500 Low Volatility | SPLV | Bronze | 0.25 |
| Invesco S&P International Developed Low Volatility | IDLV | — | 0.25 |
| Invesco S&P Emerging Markets Low Volatility | EELV | — | 0.29 |

Source: Morningstar Direct.

**Reference**
1) Novy-Marx, R. 2016. "Understanding Defensive Equity." NBER, Working Paper 20591 (March): //rnm.simon.rochester.edu/research/UDE.pdf.

# Investor Attention and the Low Volatility Anomaly

By Larry Swedroe | May 24th, 2018

One of the big problems for the first formal asset pricing model developed by financial economists, the Capital Asset Pricing Model (CAPM), was that it predicts a positive relationship between risk and return. However, the historical evidence demonstrates that while the slope of the security market line is generally positive (higher-beta stocks provide higher returns than low-beta stocks), it is flatter than the CAPM suggests.

Importantly, the quintile of stocks with the highest beta meaningfully underperforms the stocks in the lowest-beta quintile in both U.S. and international markets — the highest-beta stocks provide the lowest returns while experiencing much higher volatility (explored in this simulation study). Over the last 50 years, defensive stocks have delivered higher returns than the most aggressive stocks, and defensive strategies, at least those based on volatility, have delivered significant Fama-French three-factor alphas. This runs counter to economic theory, which predicts that higher expected risk is compensated with higher expected return.

The superior performance of stocks with low idiosyncratic volatility was documented in the literature in the 1970s — by Fischer Black (in 1972) among others — even before the size and value premiums were "discovered." The low-volatility anomaly has been demonstrated to exist in equity markets around the globe. What's interesting is that this finding is true not only for stocks, but for bonds as well.[1][2]

Over the past few years, we have had a series of academic papers published that have demonstrated that the returns to low-volatility strategies are well explained by the Fama-French five-factor asset pricing model (which includes the newer factors of profitability and investment, as well as market beta, size and value) and the term factor. The research has also provided us with three main explanations for the low-volatility anomaly:

1. Many investors are either constrained by the use of leverage or have an aversion to its use. Such investors who seek higher returns do so by investing in high-beta (or high-volatility) stocks — despite the fact that the evidence shows they have delivered poor risk-adjusted returns. Limits to arbitrage, including aversion to shorting and the high cost of shorting such stocks, prevent arbitrageurs from correcting the pricing mistakes.
2. There are individual investors who have a "taste," or preference for, lottery-like investments. This leads them to "irrationally" (from an economic perspective) invest in high volatility stocks (which have lottery-like distributions) despite their poor returns — they pay a premium to gamble. In other words, a preference for lotteries may generate a demand for high-volatility stocks that is not warranted by the stocks' fundamentals.
3. Mutual fund managers who are judged against benchmarks have an incentive to own higher-beta stocks. In addition, managers' bonuses are options on the performance of invested stocks, and thus more valuable for high-volatility stocks.

## How is Investor Attention Related to the Low-Volatility Anomaly?

Ching-Chi Hsu and Miao-Ling Chen contribute to the literature on the low-volatility anomaly with their study, "The Timing of Low-volatility Strategy," which appears in the November 2017 issue of Finance Research Letters. Their study explores the role of investor attention and its impact on a low-volatility strategy. To capture data on investors with a preference for lottery-type stocks, they used daily stock returns to calculate the average of the five highest daily returns for each firm in each month as a proxy for investor attention. Stocks with the highest average of the five daily highest daily returns are classified as the high-investor-attention decile and the stocks with the lowest average of the five daily highest daily returns are classified as low-investor-attention decile.

Hsu and Chen state:

*Intuitively, when highly positive returns observed in the past are more frequent, and investors with a preference for lotteries might believe that extreme return is more likely to be realized again. Accordingly, this calculation may capture the propensity for investors to speculate.*

They used three stock characteristics to identify stocks that might be perceived as lotteries: (1) idiosyncratic volatility, (2) idiosyncratic skewness, and (3) stock price (investors with a preference for skewness prefer "cheap bets" and thus prefer low-priced stocks). Their data set covered all stocks trading on the NYSE, AMEX and NASDAQ from July 1965 to October 2015. Returns were adjusted for exposure to the four Carhart factors (market beta, size, value and momentum).

The following is a summary of their findings:

- Investors with a preference for lotteries tend to seek high-investor-attention stocks for speculation, causing them to overvalue high-volatility stocks.
- The high-attention stocks tend to have high market betas, low prices, high idiosyncratic volatility, greater skewness and are less liquid. This preference can be reinforced by increasing optimism about the future payoffs of higher-idiosyncratic-volatility stocks. Thus, there is greater demand for high-idiosyncratic-volatility stocks with high investor attention, and the low-volatility strategy is more profitable.
- Idiosyncratic volatility increases monotonically from low-investor-attention to more speculative high-investor-attention stocks, and the data has high statistical significance. In addition, stock prices monotonically decrease moving from low to high investor attention deciles — influenced by the lottery characteristics, investors are likely to find low-priced stocks attractive because they perceive them to be a "cheap bet."
- A low-volatility strategy for high-investor-attention stocks (HAX) is more profitable than low-investor-attention stocks (LAX).
- Conditioned on high investor attention, the profitability of a low-volatility strategy significantly increases due to lower returns on higher-idiosyncratic-volatility stocks.
- Investors' propensity for gambling-type strategies (a preference for lottery-like distributions) leads to negative returns with high-idiosyncratic-volatility stocks.

As you can see in the following table, which is from the study, the difference in alphas between high-investor-attention and low-investor-attention portfolios (DIFF) monotonically decrease in months succeeding portfolio formation from a highly significant -1.919 (t-statistic of −8.111) to an insignificant -0.373 (t-statistic of -1.580) for equal-weighting.

Returns for portfolio of stocks sorted by investor attention.

| | HAX | LAX | DIFF | HAX | LAX | DIFF |
|---|---|---|---|---|---|---|
| | Equal-weighted returns | | | Value-weighted returns | | |
| **Panel A. Abnormal returns** | | | | | | |
| Month t + 1 | −1.671*** | 0.249** | −1.919*** | 0.904** | 0.274* | 0.630** |
| | (−7.935) | (2.001) | (−8.111) | (3.142) | (1.950) | (2.020) |
| Month t + 2 | −1.163*** | 0.393** | −1.556*** | 0.258 | 0.406** | −0.148 |
| | (−5.494) | (3.121) | (−6.673) | (0.858) | (2.520) | (−0.432) |
| Month t + 3 | −0.841*** | 0.395** | −1.236*** | 0.585* | 0.466** | 0.119 |
| | (−3.637) | (2.640) | (−4.925) | (1.996) | (2.556) | (0.358) |
| Month t + 6 | −0.296 | 0.115 | −0.411* | 1.281*** | 0.312* | 0.969** |
| | (−1.344) | (0.871) | (−1.661) | (3.876) | (1.952) | (2.607) |
| Month t + 12 | 0.156 | 0.218 | −0.373 | 1.139*** | 0.274 | 0.865** |
| | (−0.737) | (1.605) | (−1.580) | (3.656) | (1.496) | (2.400) |
| **Panel B. Net returns** | | | | | | |
| Month t + 1 | −2.065*** | −0.635*** | −1.430*** | −1.858*** | 0.137* | −1.996*** |
| | (−9.858) | (−5.156) | (−5.831) | (−8.047) | (1.884) | (−6.251) |
| Month t + 2 | −1.542*** | −0.367** | −1.175*** | −1.327*** | 0.252* | −1.579*** |
| | (−7.218) | (−2.796) | (−6.444) | (−4.873) | (1.681) | (−5.327) |
| Month t + 3 | −1.251*** | −0.327** | −0.924*** | −0.964*** | 0.276* | −1.240*** |
| | (−6.387) | (−2.805) | (−6.191) | (−3.487) | (1.656) | (−4.453) |
| Month t + 6 | −0.732*** | −0.325*** | −0.407*** | −0.266 | 0.287* | −0.553** |
| | (−4.826) | (−3.878) | (−4.060) | (−1.117) | (1.941) | (−3.007) |
| Month t + 12 | −0.283** | −0.340*** | −0.580*** | 0.132 | 0.154* | −0.022** |
| | (−2.758) | (−5.544) | (−4.503) | (0.723) | (1.754) | (−2.494) |

*Notes:* Decile portfolios are formed every month from July 1965 to October 2015 by sorting stocks based on the average highest daily return (HAX) over the past one month. LAX (HAX) attention is the portfolio of stocks with the lowest (highest) average of 5 highest daily returns over the past one month. This table reports the Fama-French–Carhart four-factor alphas on the value-weighted and equal weighted portfolios respectively. DIFF presents the differences in alphas with respect to the Fama- French–Carhart four-factor model between high investor attention and low investor attention. Four- factor alphas are given in percentage terms. Net returns for each stock are computed at each point in time by taking the trading cost estimates associated with the stock's volume rank using the schemes based on the transaction cost provided by Nomura Securities listed in De Groot et al. (2012) Table

Hsu and Chen concluded:

*In sum, our results provide a behavioral foundation for behavioral biases where individual investors have a preference for lotteries. Such investors are seeking high investor attention stocks to purchase in preference to high volatility stocks, and these erroneous beliefs cause high volatility stocks to be overpriced, thereby leading a low-volatility strategy to be more profitable.*

## Conclusions Regarding the Low-Volatility Anomaly

Hsu and Chen's results provide a behavioral explanation for the low-volatility anomaly based on investors' propensity to gamble. Remember, despite the publication of the findings, limits to arbitrage can prevent sophisticated investors from correcting the mispricing. This is especially true because the most overpriced stocks tend to be low-priced, less liquid and costlier to short (they have higher securities lending fees). With that said, investors should be aware that the publication of academic findings, along with the bear market of 2008, led many investors to seek out ways to reduce the risk of equities. This led to a large increase in the flow of funds into low-volatility strategies. For example, as of October 2017, the three largest low-volatility strategy funds, the iShares Edge MSCI Minimum Volatility USA ETF (USMV), iShares Edge MSCI Minimum Volatility EAFE ETF (EFAV) and PowerShares S&P 500 Low Volatility ETF (SPLV), have almost $30 billion in total assets under management. The increased cash flows have impacted valuations. The result is that while, historically, low-volatility strategies have loaded on the value factor, they now are in a growth regime. When low-volatility stocks have value exposure, on average they outperformed the market by 2.0 percent; when low-volatility stocks have growth exposure, they have underperformed by 1.4 percent on average.

The bottom line is that investors do not need to invest in low-volatility stocks (which are now much more highly priced) to exploit the low-volatility anomaly. The reason is that it's mostly about the very poor performance of high-volatility stocks. And the poor performance of high-volatility stocks can be avoided simply by screening out stocks with the negative characteristics of high idiosyncratic volatility, high skewness and low prices. Mutual funds, such as those run by Dimensional Fund Advisors, have been using such screens for decades.

**Our thoughts**

Low volatility is the first Factor I cover in my Advanced Topics in Investments class, and was the first Factor (excluding Market Beta) that academics discovered. The standard CAPM theory in finance states that the more risk/volatility one adds to a portfolio, the higher the expected returns. However, the low volatility factor empirically demonstrates that this theoretical relationship is mostly false, as the following sophisticated chart from Alpha Architects shows:
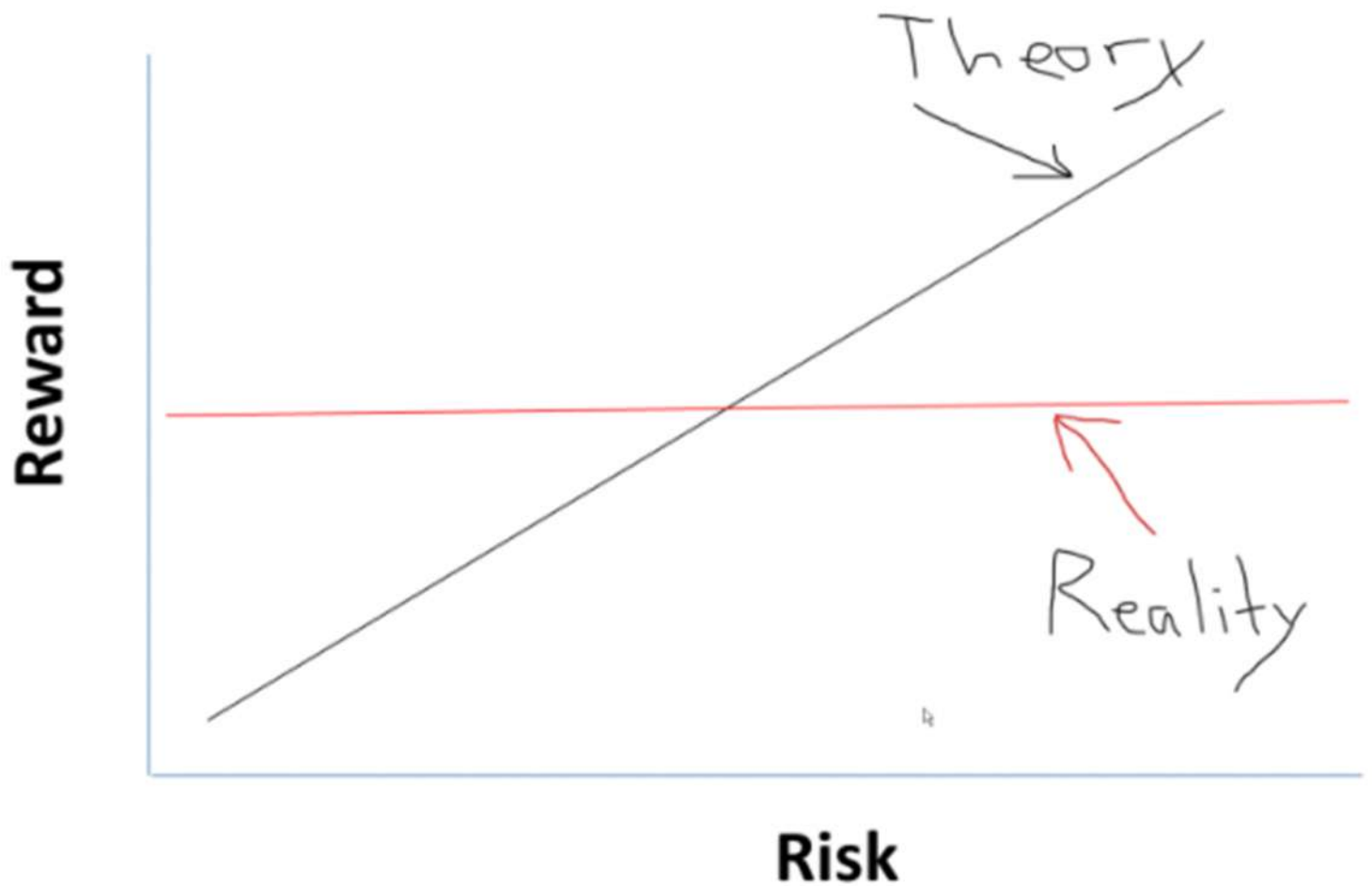
Like most Factors, Low Volatility works best in Small Caps. We use iShares Edge MSCI Min Vol USA Sm-Cp ETF (SMMV) for clients. This 5 star ETF, Morningstar's highest rating for past performance, is shown below since inception. We have added iShares Russell 2000 ETF (orange line), at $47.6 billion the largest ETF tracking the Russell 2000, for comparison: