Avoiding Pricey Low Volatility Investing by Feifei Li, Ph.D., FRM

Low volatility investing reduces a portfolio's exposure to the market factor in favor of other historically reliable sources of equity risk premium. But the alluring risk-adjusted performance characteristics of low volatility strategies have lately attracted serious investors, and many managers have developed products to meet the growing demand. Is it possible to preserve the benefits of low volatility investing when prices rise? Feifei Li, Head of Research, suggests implementation refinements that might make a difference.

Strong interest in low volatility equity investing has triggered in-depth discussions about how the strategy works and what investors should watch out for when entering the space. Empirical evidence demonstrates that low volatility strategies offer higher-than-market returns and considerably lower risks, producing highly attractive Sharpe ratios that are 50% to 100% greater than that of the market index. Not surprisingly, these desirable performance characteristics have attracted many players to the market. In this issue, we will focus on one of the biggest challenges in harvesting the seemingly low hanging fruit: its popularity.

Fast Flows Into the Low Volatility Arena

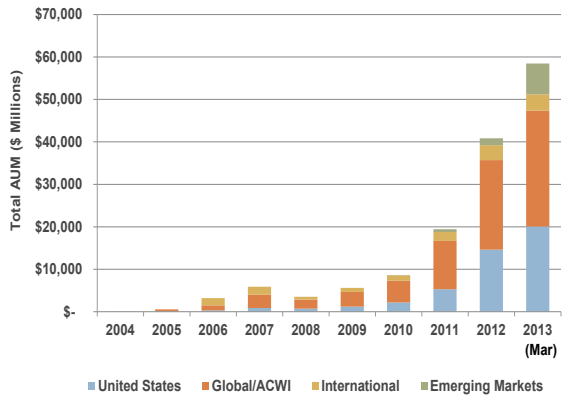
Low volatility strategies dramatically increased in popularity after the Global Financial Crisis. As **Figure 1** and **Figure 2** show, the total assets managed in accordance with low volatility strategies, and the number of U.S. managers specializing in low volatility investing, both more than doubled in 2011. According to eVestment Alliance, USD8.65 billion was managed by 27 managers at the end of 2010. One year later close to USD20 billion was managed by 54 managers. As of March 31, 2013, the assets under management were USD58.47 billion, and the total number of managers was 72.

Value and Low Volatility

The fast pace of growth raises the question: Does the rapid flow into this space erode the strategy's effectiveness in delivering attractive risk-adjusted returns? This is a legitimate concern. After all, naïve low volatility portfolios are designed to reduce market risk but lack an investment thesis on returns. If cash equivalents were an option, they would dominate the low volatility portfolio and produce very uninteresting returns. Investors, we believe, are interested in more than merely minimizing the volatility of their equity portfolio; they are also interested in earning an "appropriate" return. The investment decision makes sense only in the context of trade-offs between return and risk.

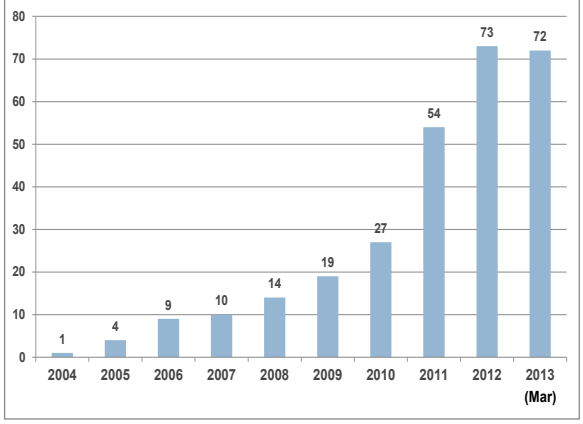
Empirical research shows that low volatility strategies reallocate risk from the market factor to other reliable

Figure 1: Total AUM in Low Volatility Strategies by Strategy Type



Source: Research Affiliates, LLC, based on data from eVestment Alliance and Bloomberg.

Figure 2: Total Number of Managers Engaged in Low Volatility Investing



Source: Research Affiliates, LLC, based on data from eVestment Alliance and Bloomberg.

sources of equity returns, forming a more risk-balanced portfolio. Lower volatility is the natural consequence of this risk diversification (Chow, Hsu, Kuo, and Li, 2013). It is fortuitous that, in developed markets, low volatility stocks earn an anomalous premium due to investors' "leverage aversion" (Black, 1972; Frazzini and Pedersen, 2011) or "speculative demand for gambling" (Baker, Bradley, and Wurgler, 2011), and that they also benefit from a value premium. These anomalous premiums, historically, have more than offset the loss in return associated with the reduction in portfolio risk. However, as Chow *et al.* (2013) discovered, in emerging markets, low volatility stocks have not historically been the "cheap" stocks and can indeed be the high price-to-book stocks (see also Oey, 2013). It is possible that, if low volatility stocks were to become more expensive in the developed world (exhibiting growth-like P/B ratios), then the premium they earn might no longer suffice to offset the loss of return due to reduced market exposure.

Is that the case now? Let's take a look at the valuation ratios of three naively constructed low volatility strategies: Minimum Variance, Inverse Beta, and Inverse Volatility.[1] Market capitalization-weighted portfolios will serve as benchmarks (**Table 1**). In developed markets, the low volatility group has historically tended to have higher earnings yields and lower book-to-price ratios than the market cap-weighted portfolio. However, over the past 10 years, the cheapness or "valueness" of developed market low volatility stocks seems to have diminished. As of May 1, 2013, the earnings yield and B/P ratio data indicate that low volatility strategies have become more expensive than the market cap-weighted core indices. In emerging markets, the valuation level for low volatility strategies has never been lower, relative to the core equity index—but emerging market low volatility portfolios are growing less attractive, especially considering that the benchmark index has fallen quite a bit this year.

It certainly does not make sense to invest in overpriced stocks just for the sake of reducing portfolio risk. It is equally senseless to sacrifice the benefit of earning a premium by diversifying risk exposures. Is it possible to add back the 'valueness' and maintain the strategy's attractiveness? We think so.

Solving the Problem

As shown in the previous sections, naïve low volatility portfolios, such as Minimum Variance, Inverse Volatility, and Inverse Beta, can be too blunt as instruments to achieve the benefit of more efficient risk budgeting through broad allocation across risk factors. These approaches are analogous to equal weighting securities to capture the value premium; the approach works, but it also creates too much turnover and reduces investment capacity too significantly.

Rather than using blunt instruments, we can apply simple portfolio techniques to change the portfolio characteristics and risk factor loadings so that the future return prospect

Table 1: Low Volatility Portfolios' Characteristics

	EARNINGS YIELD			BOOK-TO-PRICE		
	Baseline Low-Vol Strategies			Baseline Low-Vol Strategies		
	Full Sample	Last 10 Yr	May 2013	Full Sample	Last 10 Yr	May 2013
United States (1967-2012)						
Cap-Weighted Benchmark	6.3%	4.3%	5.8%	0.49	0.39	0.40
Minimum Variance	7.1%	4.9%	4.1%	0.59	0.34	0.31
Low Volatility (1/Vol)	8.0%	6.0%	5.1%	0.65	0.44	0.37
Low Beta (1/β)	7.6%	5.4%	4.6%	0.63	0.43	0.34
Global (1987-2012)						
Cap-Weighted Benchmark	4.6%	4.7%	5.6%	0.40	0.46	0.51
Minimum Variance	4.9%	4.8%	4.8%	0.45	0.41	0.45
Low Volatility (1/Vol)	6.2%	5.8%	4.6%	0.49	0.43	0.36
Low Beta (1/β)	5.2%	5.0%	5.4%	0.48	0.50	0.64
Emerging Markets (2002-2012)						
Cap-Weighted Benchmark	7.6%	7.7%	9.0%	0.54	0.53	0.65
Minimum Variance	5.5%	5.4%	3.6%	0.46	0.43	0.37
Low Volatility (1/Vol)	6.5%	6.4%	5.3%	0.52	0.49	0.40
Low Beta (1/β)	6.5%	6.2%	4.8%	0.44	0.40	0.33

Source: Research Affiliates based on data from CRSP, Compustat, Datastream, Worldscope.

is more favorable without raising realized volatility significantly. For instance, modifying naïve low-volatility strategies by scaling portfolio weights using book value of equity (i.e., stocks with larger book value will receive a bigger allocation) increases the investment capacity of the strategy, reduces trading costs, and shifts the portfolio toward more value-oriented firms. More directly, omitting stocks with low book-to-market value ratios (the top half of the selection universe) increases allocation to value (HML), yielding higher return without sacrificing the Sharpe ratio.[2]

As **Table 2** demonstrates, all the modified strategies seem to be more value-oriented than the original naïve versions. In the Appendix, we show that those changes in the portfolios do not negatively impact their ability to deliver superior Sharpe ratios over cap-weighted benchmarks.

Conclusion

Low volatility equity investing has attracted serious interest from the investment community recently. Its popularity has led consultants and institutional investors to express doubts regarding the valuation level for low volatility stocks after seeing rapid flows into this arena. Clearly, it does not make sense to invest in low volatility strategies that are poised to experience low returns because the low volatility stocks are trading at high valuation multiples. We believe thoughtful portfolio engineering and careful design can lead to a more sensible low volatility portfolio solution for investors by diversifying equity risk premium sources *explicitly* rather than fortuitously.

Table 2. Modified Low Volatility Portfolios' Characteristics[3]

	EARNINGS YIELD						BOOK-TO-PRICE					
	Weights Scaled by Book Value			Dropping Those w/Low Book-to-Market			Weights Scaled by Book Value			Dropping Those w/Low Book-to-Market		
	Full Sample	Last 10 Yr	May 2013	Full Sample	Last 10 Yr	May 2013	Full Sample	Last 10 Yr	May 2013	Full Sample	Last 10 Yr	May 2013
United States (1967-2012)												
Minimum Variance	7.0%	5.2%	4.1%	8.1%	5.7%	4.5%	0.61	0.39	0.38	0.79	0.62	0.57
Low Volatility (1/Vol)	8.2%	6.6%	5.8%	8.6%	6.4%	5.4%	0.67	0.49	0.44	0.76	0.59	0.55
Low Beta (1/β)	8.3%	6.2%	5.2%	8.3%	5.7%	5.4%	0.75	0.50	0.44	0.76	0.60	0.52
Global (1987-2012)												
Minimum Variance	5.2%	4.6%	7.0%	5.6%	5.1%	7.7%	0.57	0.55	0.64	0.66	0.71	0.81
Low Volatility (1/Vol)	6.8%	6.6%	5.1%	6.7%	6.5%	5.1%	0.56	0.51	0.50	0.63	0.63	0.61
Low Beta (1/β)	5.9%	5.7%	6.4%	6.1%	5.6%	6.5%	0.61	0.61	0.81	0.64	0.68	0.85
Emerging Markets (2002-2012)												
Minimum Variance	6.8%	6.6%	4.6%	7.4%	7.3%	7.3%	0.64	0.60	0.47	0.84	0.78	0.75
Low Volatility (1/Vol)	9.0%	9.0%	7.2%	7.3%	7.2%	7.0%	0.73	0.70	0.63	0.69	0.65	0.67
Low Beta (1/β)	7.3%	6.8%	5.4%	7.8%	7.3%	6.2%	0.60	0.55	0.48	0.66	0.61	0.60

Source: Research Affiliates based on data from CRSP, Compustat, Datastream, Worldscope.

Endnotes

1. For the Minimum Variance strategy, the covariance matrix is estimated on the basis of a PCA factor model. For the Inverse Beta and Inverse Volatility strategies, we select the 200 lowest beta (volatility) stocks from the 1,000 largest companies and weight them in the portfolio by their inverse beta (volatility). Intuitively, the resulting portfolio will contain the 200 lowest beta (volatility) stocks, with higher weights allocated to the lower beta (volatility) stocks.
2. Here we are proposing some simple ways to change the valueness of the portfolio without considering other potential impacts. For a more thoughtful approach to tackle the problem, please contact the author.
3. The valuation ratios for the cap-weighted benchmark remain the same.

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Appendix: Low Volatility Portfolios' and Modified Portfolios' Performance									
	Baseline Low-Vol Strategies			Weights Scaled by Book Value			Dropping Those w/ Low Book-to-Market Ratio		
	Return	Volatility	Sharpe Ratio	Return	Volatility	Sharpe Ratio	Return	Volatility	Sharpe Ratio
United States (1967-2012)									
Cap-Weighted Benchmark	9.81%	15.43%	0.29	—	—	—	—	—	—
Minimum Variance	11.63%	11.57%	0.55	11.12%	12.03%	0.48	11.89%	12.38%	0.53
Low Volatility (1/Vol)	11.65%	12.55%	0.51	11.24%	12.80%	0.46	11.72%	12.82%	0.50
Low Beta (1/β)	11.83%	12.84%	0.51	11.26%	12.56%	0.47	12.23%	12.82%	0.54
Global (1987-2012)									
Cap-Weighted Benchmark	7.58%	15.77%	0.24	—	—	—	—	—	—
Minimum Variance	7.50%	10.50%	0.36	8.70%	11.18%	0.44	10.06%	11.58%	0.55
Low Volatility (1/Vol)	10.58%	11.56%	0.59	10.08%	12.11%	0.52	10.41%	11.82%	0.57
Low Beta (1/β)	10.40%	12.44%	0.54	10.90%	11.23%	0.64	10.71%	11.52%	0.61
Emerging Markets (2002-2012)									
Cap-Weighted Benchmark	14.59%	23.83%	0.54	—	—	—	—	—	—
Minimum Variance	15.56%	11.61%	1.20	17.03%	12.08%	1.27	20.67%	14.03%	1.36
Low Volatility (1/Vol)	21.14%	16.21%	1.20	19.67%	17.04%	1.06	22.59%	16.79%	1.25
Low Beta (1/β)	23.46%	16.20%	1.35	24.67%	16.00%	1.44	28.59%	16.74%	1.61

Source: Research Affiliates based on data from CRSP, Compustat, Datastream, Worldscope.

ABOUT THE AUTHOR

Dr. Feifei Li is responsible for quantitative research on equity products and strategies, including the RAFI Fundamental Index strategies and RAFI Low Volatility Equity strategies. She also conducts research on the optimal asset allocation decision over the business cycle for the global tactical asset allocation products. In addition, she oversees strategies development and publications for the research group.

Feifei has taught undergraduate and MBA finance classes at the California Institute of Technology and University of California, Irvine. She has contributed a number of investment-related articles for both academic and practitioner journals, as well as books.

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