WHITE PAPER
June 2012
For professional investors

ROBECO
The Investment Engineers

Enhancing a low-volatility strategy is particularly helpful when generic low-volatility is expensive

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Frequently the question comes up if low-volatility is ‘expensive’, measured by multiples such as P/E and P/B ratios. The investors asking this are sometimes worried about the expected performance of low-volatility in such an environment. In this note, we address this question using an extended 82-year sample period for the US stock market. We find that a generic lowvolatility strategy sometimes exhibits value (1990s) and sometimes growth (1930s) characteristics. An enhanced low-volatility strategy, which includes valuation and sentiment factors, yields a much better return/risk ratio than a generic low-volatility strategy and is necessary to achieve superior long-term returns.
Recently, the P/B ratio of a generic low-volatility strategy has become relatively high again. Historically, generic low-volatility underperforms the market in such an environment, but proves effective to lower the risk. An enhanced low-volatility strategy is particularly helpful when generic low-volatility is expensive and improves the return of a generic low-volatility strategy by up to 6% per year.

Long-term perspective

In order to answer the question if low-volatility is expensive, a long-term perspective is required. For this purpose, we use US stock market data going back to the 1920s. To ensure high liquidity, we only include stocks above the NYSE median market capitalization and sort stocks into five quintile portfolios, based on historical three-year stock market volatility.[1] This systematic approach to low-volatility investing could be classified as generic or passive. Our sample ranges from January 1929 through December 2010. The table below shows the average risk and return over this extended 82-year sample period for (1) the capitalization-weighted stock market index and (2) a generic equal-weighted low-volatility quintile portfolio.

1929-2010	Market index	Low-vol generic
Return	9.1%	10.1%
Standard deviation	18.3%	14.2%
Return / Standard deviation	0.50	0.71
CAPM alpha	-	3.7%
Price-to-book ratio	1.66	1.61
Dividend yield	3.9%	4.9%

Source: Robeco Quantitative Research

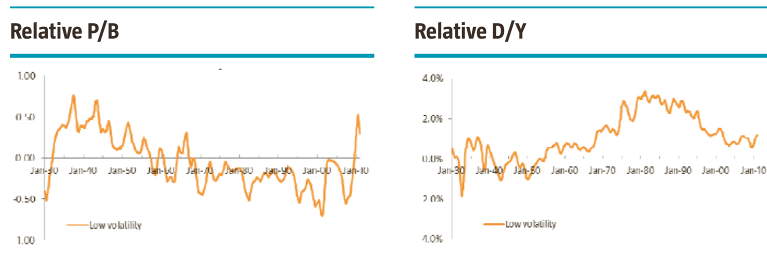
In the long-run, low-volatility has slightly higher compounded returns compared to the market-capitalization-weighted index (10.1% versus 9.1%). The risk of a low-volatility portfolio is much lower (14.2% versus 18.3%), which translates into a better return/risk ratio (0.71 versus 0.50). The risk-adjusted outperformance (CAPM alpha) is 3.7% per year. This is in line with previous studies of the low-volatility anomaly.[2] In addition, the table shows two valuation metrics which are available for this extended sample period: price-to-book (P/B) ratio and dividend yield (DY). We find that a low-volatility portfolio has a slightly lower price-to-book ratio and about 1% additional dividend yield compared to the market-capitalization-weighted index. Thus, on average, low-volatility could be characterized as value, especially when considering dividend yield.

[1] Portfolios are monthly rebalanced similar to many academic studies, such as Blitz and van Vliet (2007). We report compounded returns and show the median P/B and dividend yields of the market index and low-volatility quintile portfolio.

[2] For an overview of the low-volatility anomaly see: http://en.wikipedia.org/wiki/Low_volatility_anomaly

Sometimes value, sometimes growth

On average, low-volatility stocks tend to have somewhat more value characteristics measured by market-to-book and dividend yield. However, this can change significantly over time, varying from value to growth and back. It could also be argued that value stocks have time-varying risk and time-varying beta. It is a matter of perspective. The figure below shows the relative P/B ratio of low-volatility stocks over time compared to the market. On average low-volatility has a P/B which is 0.05 lower than the market, but this varies from 0.7 in the 1940s (growth) up to -0.6 in the early 2000s (value).



Source: Robeco Quantitative Research

For the most recent years, we observe that the P/B ratio has gone up again relative to the market-capitalization-weighted index, going back to levels comparable to post-depression levels. However, based on dividend yield, low-volatility can still be characterized as 'value'. The current DY difference is about +1% in line with the long-term average. Thus, low-volatility is sometimes value and sometimes growth, but this also depends on which measure is used. Nowadays it is a mixed picture: low-volatility is growth, based on P/B and is value, based on DY.

Some academic studies employ a multi-factor model to correct for systematic style exposures. However, these factor models assume a constant and static style factor exposure, while we have seen that this is certainly not true for low-volatility stocks. The style exposure is dynamic and wandering through time from value to growth. Therefore we would like to warn against the use of such multi-factor models to explain the alpha of low-volatility investing, since the underlying assumption (static loading) does not hold.

Low-volatility enhanced

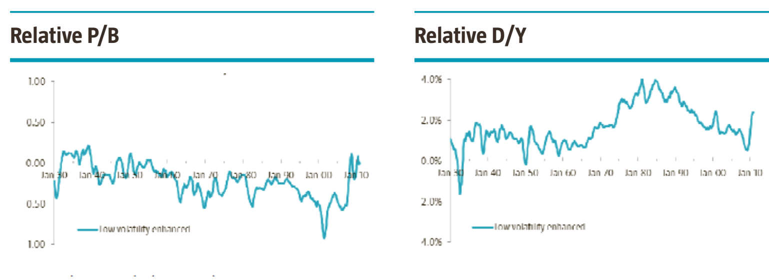
Not only in time, but also in the cross-section, large style differences could exist between lowvolatility stocks. Not all low-volatility stocks are equal and a wide dispersion exists based on different valuation multiples. Therefore we believe a generic low-volatility strategy should be enhanced by including valuation and sentiment factors. The enhanced strategy aims for an 80/20 tracking error contribution for low-volatility and value/sentiment factors.[3] The table below shows the long-term statistics and characteristics of this enhanced low-volatility strategy:

1929-2010	Market index	Low vol generic	Low vol enhanced
Return	9.1%	10.1%	13.7%
Standard deviation	18.3%	14.2%	15.5%
Return/Standard deviation	0.50	0.71	0.88
CAPM alpha	-	3.7%	6.6%
Price-to-book ratio	1.66	1.61	1.44
Dividend yield	3.9%	4.9%	5.5%

Source: Robeco Quantitative Research

We find that the average return could be enhanced by 3.6% to 13.7%, at the cost of somewhat more risk. As a result, the return/risk ratio further improves from 0.71 to 0.88. The alpha goes up sharply from 3.7% to 6.6%. The enhanced volatility strategy has more favorable multiples. The average P/B is 0.17 lower and the dividend is 0.6% higher. The figure below shows the rolling multiples through time. The additional factors are helpful. At this moment the P/B ratio is about par with the market, while the dividend yield is more than 2% higher than the market.

Relative P/B **Relative D/Y**



Source: Robeco Quantitative Research.

[3] The inclusion of valuation/sentiment factors is in the same spirit as the Robeco Conservative Equity strategies. However, differences remain. For example, Robeco Conservative Equities includes distress factors which lead to a larger reduction in downside risk.

Is value a predictive signal?

Yes, value is a predictive signal. In the previous section we have seen that the P/B of low-volatility is time-varying. Based on this multiple, the generic low-volatility strategy is 38% of the time 'growth' and 62% of the time 'value'. An interesting question would be to test what the risk, return and alpha of low-volatility would have been in growth and value scenarios over time, measured by P/B. We therefore split the historical sample into two sub-samples based on the relative P/B of the generic low-volatility strategy. We use the P/B value at time t=0 and then consider the returns at t+1, to make the valuation signals predictive. The table below shows the statistics based on a relative P/B split.

1929-2010	**Low P/B value (62%)**			**High P/B growth (38%)**		
	Market index	**Low vol generic**	**Low vol enhanced**	**Market index**	**Low vol generic**	**Low vol enhanced**
Return	7.5%	9.7%	12.3%	12.2%	10.8% 1	6.7%
Standard deviation	16.5%	13.5%	13.9%	20.3%	15.3%	17.2%
Return / Standard deviation	0.45	0.72	0.88	0.60	0.70	0.97
CAPM Alpha	-	4.5%	6.7%	-	2.0%	6.9%

Source: Robeco Quantitative Research.

- When generic low-volatility has a relatively low P/B (value): low-volatility outperforms the market, also on a risk-adjusted basis. The return is 2.2% higher for generic low-volatility and the alpha is 4.5%. An enhanced low-volatility strategy is even more effective and provides 4.8% more return and the alpha is 6.7%.
- When generic low-volatility has a relatively high P/B (growth): low-volatility does not outperform the market on a total return basis, but it does outperform on a risk-adjusted basis. Generic low volatility has 2.0% positive alpha, but the market index has 1.4% more return. The low-volatility enhancement pays off significantly in this environment. The return and alpha increase by up to 6% compared to a generic low-volatility strategy.

Interestingly, equity markets become more volatile when generic low-volatility has a relatively high P/B. This has been the case historically, but we have also experienced it more recently (2008-2012). When markets are volatile, low-volatility investing proves effective to decrease risk. However, in order to achieve a superior long-term return, valuation/sentiment factors are needed to enhance a generic low-volatility strategy.

Conclusion

A generic low-volatility strategy sometimes exhibits value (1990s) and sometimes growth (1930s) characteristics. An enhanced low-volatility strategy, which includes valuation and sentiment factors, yields a much better return/risk ratio than a generic low-volatility strategy.
Recently, the P/B ratio of a generic low-volatility strategy has become relatively high again. Historically, during such growth periods equity markets are more volatile and a low-volatility strategy proves effective to lower the risk. However, a generic low-volatility tends to underperform the market in this scenario. An enhanced low-volatility strategy is particularly helpful when generic low-volatility is expensive. The addition of valuation and sentiment factors improves the average return of a generic low-volatility strategy by up to 6% per year.

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