

# Smart Volatility Management in a Risk On/Risk Off World



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Stock-market volatility can rapidly destroy wealth. Many investors learned this harsh lesson first-hand as a consequence of the 2008 global financial crisis. That experience has led to an increased awareness of the importance of risk management while sparking a widespread interest in low-volatility equity strategies. Ideally, investors would be able to switch between a conventional core equity strategy during normal market conditions and a more defensive portfolio during a crisis. Conventional wisdom suggests, however, that solutions that require market timing are fraught with peril—it cannot be reliably done. There is a different solution: By constructing a portfolio based on the level of market volatility instead of return forecasts, a managed volatility strategy is able to more readily adapt to changing market conditions.

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## Take Your Pick

To illustrate these ideas, consider the following three idealized (and hypothetical) portfolios:

- Portfolio A implements a relative-risk strategy and every year achieves an excess return of 3% above the MSCI World Index (zero tracking error);
- Portfolio B implements a low-volatility strategy and achieves an annual return equal to one-half of that of the MSCI World Index every year (high tracking error);
- Portfolio C responds dynamically to changing market environments, behaving more like Portfolio A during stable market environments and more like Portfolio B during highly volatile market environments.

As Table 1 shows, despite the spectacular skill of achieving outperformance with zero tracking error, Portfolio A still experiences a significant drawdown in absolute terms over the 2008-2009 period. Portfolio B would weather this period much better, but still experience a high tracking error that may be tolerable — indeed, desirable — during the crisis, but may equally pose significant challenges in normal market environments.

**Table 1: MSCI World Index and three hypothetical portfolios**

	2008	2009	2010	2008-2009	2008-2010
<b>MSCI World Index</b>	-40.3%	30.8%	12.4%	-22.0%	-12.3%
<b>Portfolio A</b>	-37.3%	33.8%	15.4%	-16.1%	-3.3%
<b>Portfolio B</b>	-20.2%	15.4%	6.2%	-7.9%	-2.2%
<b>Portfolio C</b>	-18.7%	9.2%	17.5%	-11.2%	4.3%

The results achieved by Portfolio C are both more realistic and more effective than either of the other portfolios. The portfolio's beta depends on the market volatility. It is comparable to that of Portfolio B in the midst of the crisis, but it quickly jumps up higher when it is safer to do so, resulting in a more robust recovery after a few years. Because of this dynamic risk reduction, the strategy is arguably superior at truly managing portfolio volatility over time than either of the other two

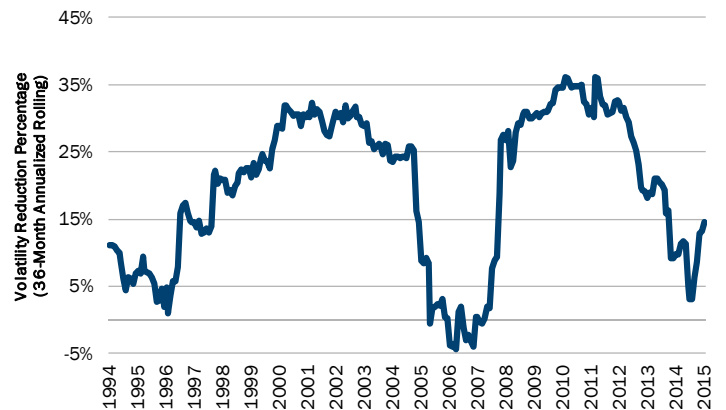
strategies. For this reason, we propose that the term 'managed volatility' should not be synonymous with 'low volatility,' and should in fact be reserved for strategies, such as Portfolio C, which can adjust their volatility to accommodate different market environments.

## Volatility is Volatile

To design a managed-volatility strategy, such as Portfolio C, one must answer the following question: Is it possible to reduce relative risk without trying to time the market? The answer is "Yes." Portfolio optimization designed to minimize portfolio volatility, while targeting above-market return over the long term, is a key to reducing risk.

Market volatility has such a wide range, however, that it may make sense to attempt to distinguish between two distinct market regimes. We denote these regimes as the low- and high-risk regimes for simplicity; however, both the typical market return and volatility are quite different (and anti-correlated) in each regime.

**Figure 1: Volatility reduction for a hypothetical managed volatility strategy compared to the MSCI World Index**



It makes sense to attempt to construct a managed-volatility strategy by setting up the optimization as follows: minimize the portfolio volatility subject to the constraint of outperforming the market portfolio by a given target over the long term. Optimizing this way, the managed-volatility portfolio experiences only a moderate increase in risk, more closely resembling a low-volatility portfolio and results in a far more focused reduction in volatility. This approach results in a far more focused reduction in volatility as shown in Figure 1. Even though the maximum

volatility reduction is only moderately diminished during periods of heightened market volatility (e.g., about 32% in 2002, compared to about 38% for the low volatility strategy), the risk reduction drops to much lower levels during normal market conditions (e.g., no reduction in the mid 2000's compared to about 16% for the low volatility strategy).

### Protection When You Need it Most

The dynamic volatility reduction achieved by this approach to optimization relies exclusively on volatility estimates – which tend to be more reliable – and not on market timing. If market volatility spikes upward, the portfolio volatility will already typically be lower than that of the market, because the portfolio is more diversified than the market. The increased efficiency resulting from the optimization generally raises the Sharpe ratio sufficiently such that, even after allowing for the increased absolute return, the volatility is materially decreased.

Furthermore, if the increase in volatility persists, the volatility estimates will typically reflect the change fairly promptly, resulting in a more defensive optimization solution, and

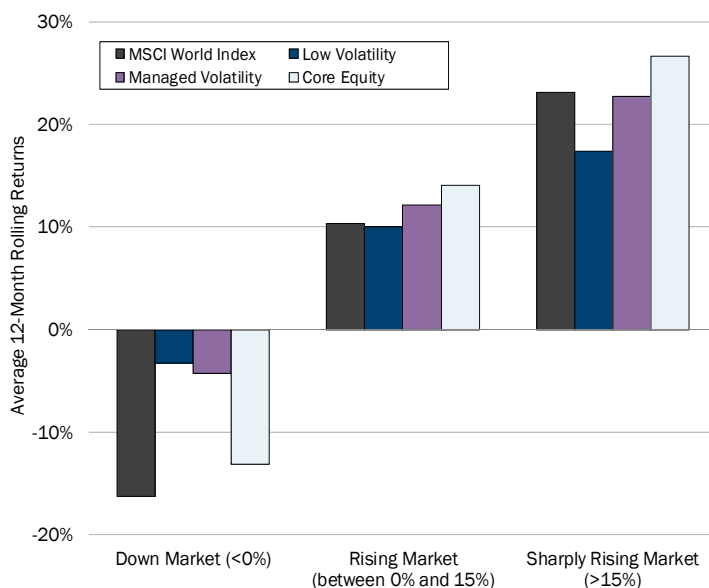
realignment trades, as the strategy assumes the optimal posture for the new market regime. These two mechanisms allow the managed-volatility strategies to both weather sharp volatility spikes and avoid whipsawing.

The increased focus of the risk reduction, when it is especially needed, has two major benefits:

- Firstly, it helps the portfolio to outperform the market over the long term.
- Secondly, it increases the likelihood of greater consistency of outperformance.

This is demonstrated in Figure 2 for hypothetical low- and managed-volatility strategies, respectively (a hypothetical core equity strategy and the benchmark are also included). In both absolute-volatility strategies, the volatility reduction proves its value by preserving the capital in periods where the market exhibits large drawdowns. Moreover, both strategies handily keep up with the market when it is up only moderately (up to 15% over the preceding 12 months). However, only the managed-volatility strategy can adjust swiftly enough to the core-like configuration to keep up with the market, even when the market rises strongly (greater than 15% over the preceding 12 months).

**Figure 2: Average performance of hypothetical strategies in different market environments (based on the MSCI World Index, 1992-2013)**



Is it really possible to estimate the volatility structure of the market accurately enough to achieve this outcome? The answer to this question is a clear “Yes!” The market generally transitions slowly between regimes, and risk metrics measured by competent statistical methodologies can identify those shifts in a timely fashion, especially if updated regularly.

### Conclusion

The value of employing a dynamic risk-reduction approach in equity management, especially given the wide variety of market environments, is best understood in terms of two distinct volatility regimes. A reliable implementation of the managed-volatility framework can be achieved through a simple recasting of the portfolio optimization objective. Given the wide range of market volatility experienced during different market conditions, a dynamic approach to volatility reduction could be vital to properly balance capital preservation with capital appreciation within an overall portfolio.

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