



De-Risking Portfolios with Low Volatility Equities

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Diversification may be one of the most misunderstood concepts in finance. Perceived to be the only free lunch in investing, it is too often seen simply as a matter of combining different asset classes.

Renowned economist Harry Markowitz was the first to articulate the theory of portfolio diversification in 1952 in his seminal work *Portfolio Selection*¹, where he noted that assets with correlations of less than one can be assembled into a portfolio that is less risky than the sum of its parts. Markowitz's insight has become common knowledge in the investment community. Yet many fail to appreciate that a simplistic approach to portfolio diversification doesn't always lead to lower volatility – and can even leave investors exposed to downside risk when they most need protection.

When it comes to reducing equity risk on a standalone basis, as well as total portfolio risk in a balanced portfolio, low volatility equities can play a strategic role. Investing in low volatility stocks – i.e., non-cyclical companies with stable earnings whose prices aren't volatile – can be an effective way for risk-averse investors to de-risk their portfolios while maintaining equity exposure, even in the presence of other correlated, low-risk assets. By substituting low volatility equities for capitalization-weighted equities (i.e., broad-based stock indices weighted by market capitalization), in whole or in part, investors can potentially achieve comparable returns over a full investment cycle with a significant reduction in total portfolio risk. This phenomenon tends to be persistent across market, volatility and correlation regimes.

¹Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77.



When Diversification Fails

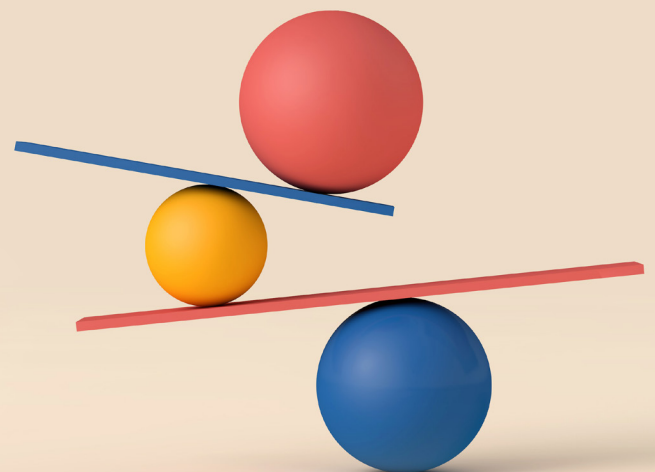
It's easy to conflate diversification with risk reduction. If two assets do not move up or down in perfect synchrony, they should be less risky in combination than either is individually. This is the basic tenet of portfolio diversification. But its premise – non-correlation between two assets – can break down in periods of market stress. As the saying goes, in a crisis, all correlations go to one.

This is precisely what happened in 2022. The 60/40 portfolio² – long the staple model of portfolio diversification – recorded its worst year since the 2008 Great Financial Crisis, as bonds and equities both fell amid soaring inflation, rising interest rates and slowing economic growth. The fundamental premise of the 60/40 portfolio is the persistent negative correlation between bonds and equities: when equities go up, bonds go down, and vice versa. But when that relationship breaks down, as it did in 2022, so do the purported benefits of diversification.

The 2022 experience reminds us that while diversifying across asset classes is necessary to reduce risk, it may not always be sufficient. In addition, investors who ignore intra-asset class risk may sacrifice downside protection when the next crisis comes knocking.

²The 60/40 portfolio is characterized by a 60% allocation to stocks and a 40% allocation to bonds. It is designed to balance the growth potential of stocks over the long run with the defensive properties of bonds.

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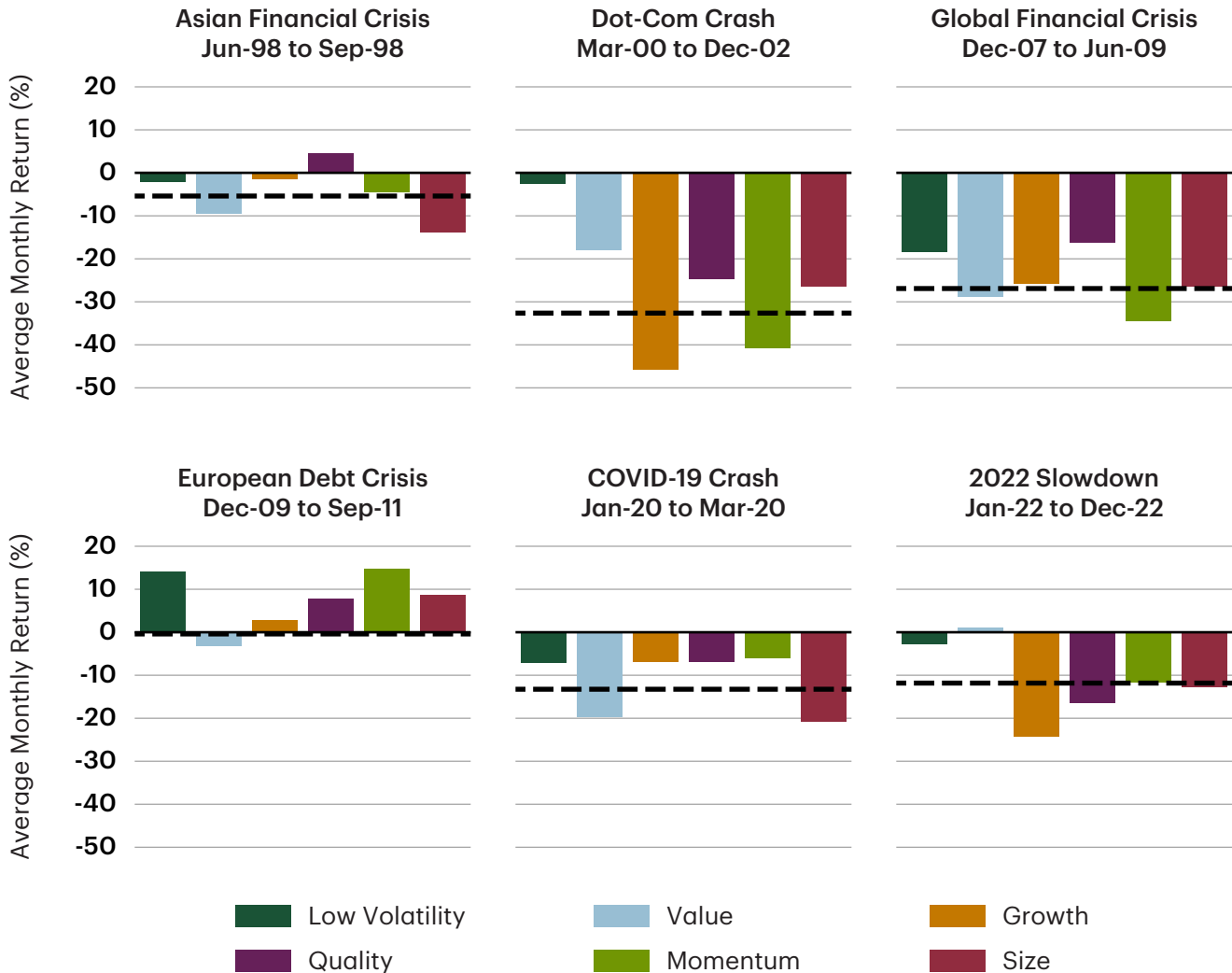


Weathering Equity Crashes

As a standalone strategy, low volatility equities have proved remarkably resilient, consistently lowering risk and downside participation across a variety of market regimes. **Figure 1** shows the performance of some of the most popular investment styles during the six worst crises of the past 25 years. In each case,

the low volatility style provided downside protection, dependably outperforming nearly every other equity style – often by a wide margin. Low volatility was also the only style to outperform the market (shown as a dashed line) in all six crises.

Figure 1: Style Performance During Crises



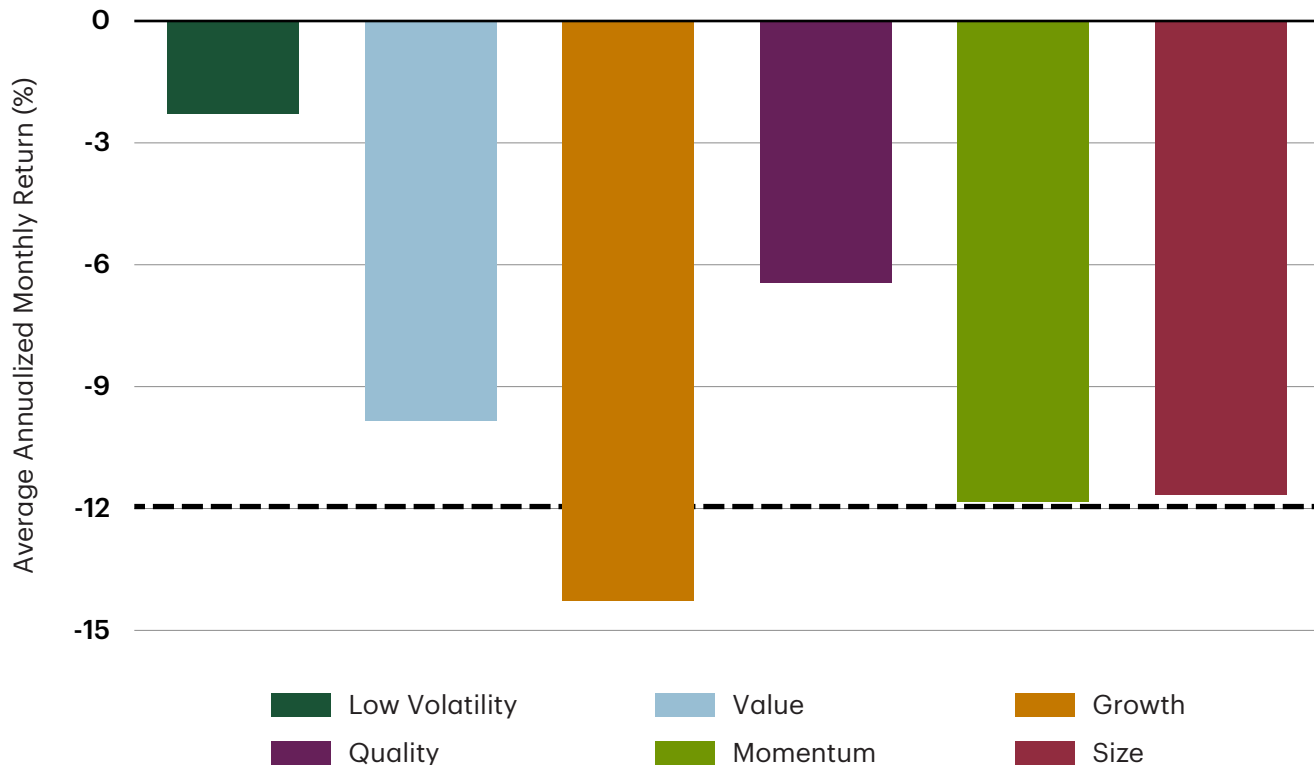
Note: The global low volatility, value, growth, quality, momentum, and size factors are represented by the MSCI World Minimum Volatility Index, the MSCI World Value Index, the MSCI World Growth Index, the MSCI World Quality Index, the MSCI World Momentum Index and the MSCI World SMID Cap Index, respectively. The dashed lines correspond to the performance of the MSCI World Index.

Source: MSCI, TD Asset Management Inc. As of May 31, 2023.

While low volatility was not the top performer in every crisis, it ranked among the best. But hindsight about which style performed best in each period is only useful if investors could predict accurately which type of crisis will occur next. Absent such foresight, risk-averse investors should consider focusing on achieving the best expected outcome if any one of these crises were to occur randomly. This can be

done by comparing the average performance of each equity style across all six episodes. That analysis is presented in **Figure 2**, and it shows that low volatility outperformed every other style, on average, by a large margin. As a result, diversifying into other equity styles would only have lowered an investor’s expected performance in down markets.

Figure 2: Average Performance Across Crises



Note: Average annualized monthly return refers to the average annualized return over the 94 months spanning the six crises described in **Figure 1**.
 Source: MSCI, TD Asset Management Inc. As of May 31, 2023.

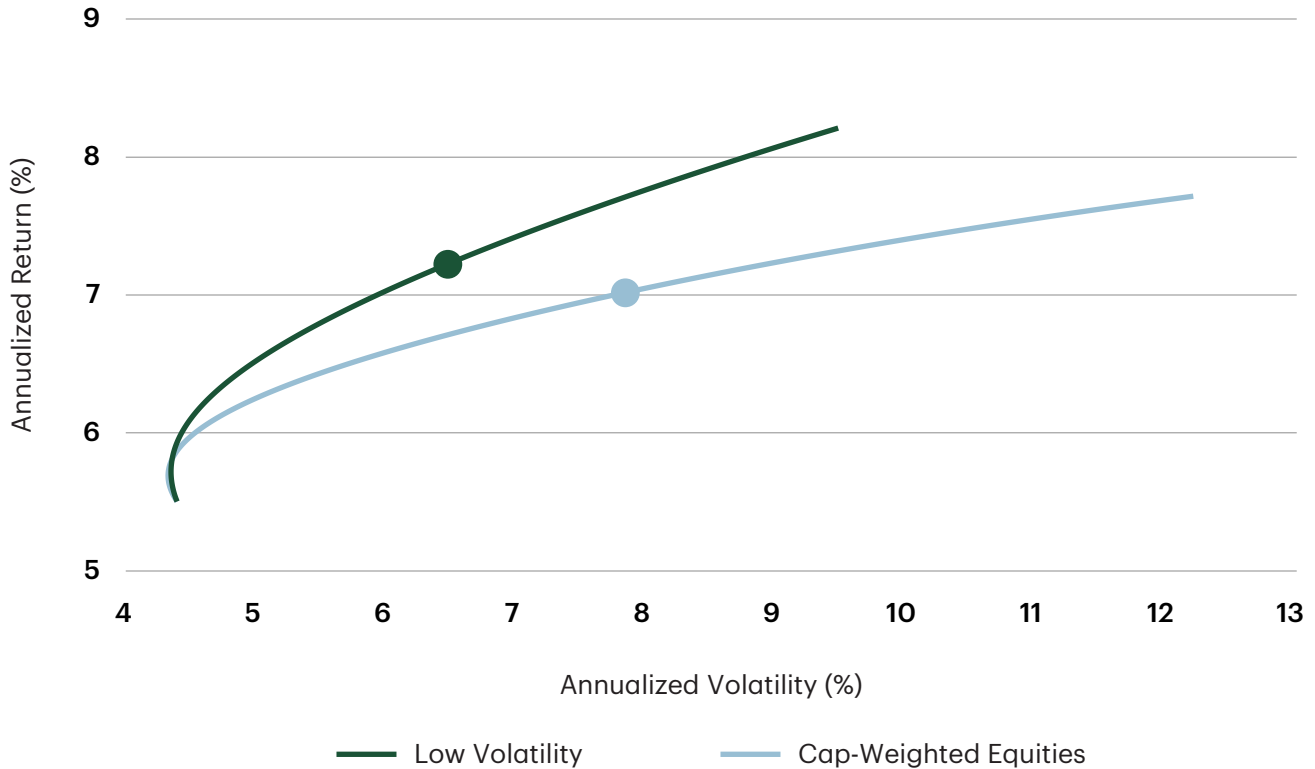
Growth

Managing Portfolio Risk

The discussion above demonstrates that low volatility equities outperformed other equity styles during the worst crises of the last quarter century. Now we'll examine their risk-reducing properties in the context of the classic balanced portfolio over roughly the same period.

Let's begin with a portfolio 100% allocated to bonds and progressively add traditional capitalization-weighted equities. As the share of equities increases, so does the volatility – and expected return – of the balanced portfolio. We then perform the same exercise, using low volatility equities in place of capitalization-weighted equities. The results are plotted in **Figure 3**.

Figure 3: Risk-Return Trade-Off



Note: Cap-weighted and low volatility equities are represented by the MSCI World Index and the MSCI World Minimum Volatility Index, respectively. The markers on each curve correspond to a 60/40 equity-bond allocation. Bonds are represented by the FTSE Canada Universe Bond Index. We assume monthly rebalancing and no transaction costs.

Source: FTSE, MSCI, TD Asset Management Inc. Data from July 29, 1994 to May 31, 2023.

Figure 3 shows that replacing capitalization-weighted equities with low volatility equities in a simple bond-equity framework has historically led to lower risk and higher risk-adjusted returns at nearly every asset mix level. This risk reduction is realized despite the marginally higher correlation between bonds

and low volatility stocks, as compared with that between bonds and capitalization-weighted equities (approximately 0.34 for low volatility equities versus 0.22 for capitalization-weighted equities over the full historical sample).

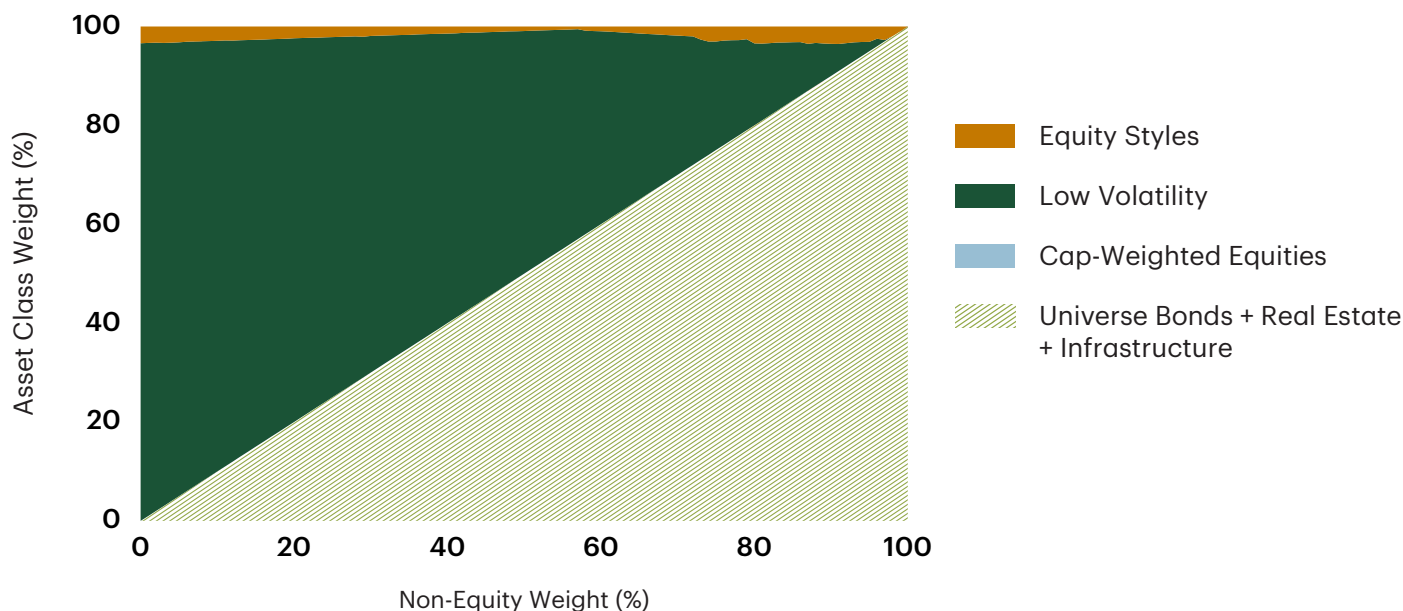
Some observers have suggested that low volatility stocks' higher correlation to bonds means investors may forgo some of the diversification benefits offered by cap-weighted equities in a traditional bond-equity portfolio. However, over the last 28 years, this has only held true for portfolios with bond allocations of roughly 90% or more. For all other portfolios, investors would have earned better risk-adjusted returns by holding low volatility equities. This is because the lower absolute volatility of these stocks relative to their cap-weighted peers more than offsets their slightly higher correlation to bonds.

We find the same results when we extend the analysis to incorporate additional equity styles and alternative assets. To illustrate this, we start with a fixed allocation to each non-equity asset class³, then solve for the equity weight that minimizes the ex-ante volatility of the overall portfolio.

For every portfolio with a bond/alternative allocation of **90% or less, low volatility equities provide by far the largest reduction in total portfolio risk.**

The results are presented in **Figure 4**. For low levels of fixed income and alternative assets, the equity portion of the minimum variance portfolio is composed almost exclusively of low volatility equities. As we increase the allocation to bonds and alternatives, the minimum variance portfolio requires the addition of more equity styles (chiefly small-cap stocks). But here, too, for every portfolio with a bond/alternative allocation of 90% or less, low volatility equities provide by far the largest reduction in total portfolio risk.

Figure 4: Minimum Variance Portfolio



Note: Bonds, cap-weighted equities and low volatility equities are represented by the FTSE Canada Universe Bond Index, the MSCI World Index and the MSCI World Minimum Volatility Index, respectively. For infrastructure, we use the Dow Jones Brookfield Global Infrastructure Index from 2003 to 2023. Prior to 2003, we use the average of the Dow Jones Global Telecommunications Index and Dow Jones Global Utilities Index. For real estate, we use a simple average of the FTSE NAREIT All REITs Index (i.e., a proxy for listed real estate) and the NCREIF Property Index (i.e., a proxy for unlisted real estate). Equity styles include the value, growth, quality, momentum and size factors, and they are represented by the MSCI World Value Index, the MSCI World Growth Index, the MSCI World Quality Index, the MSCI World Momentum Index and the MSCI World SMID Cap Index, respectively.

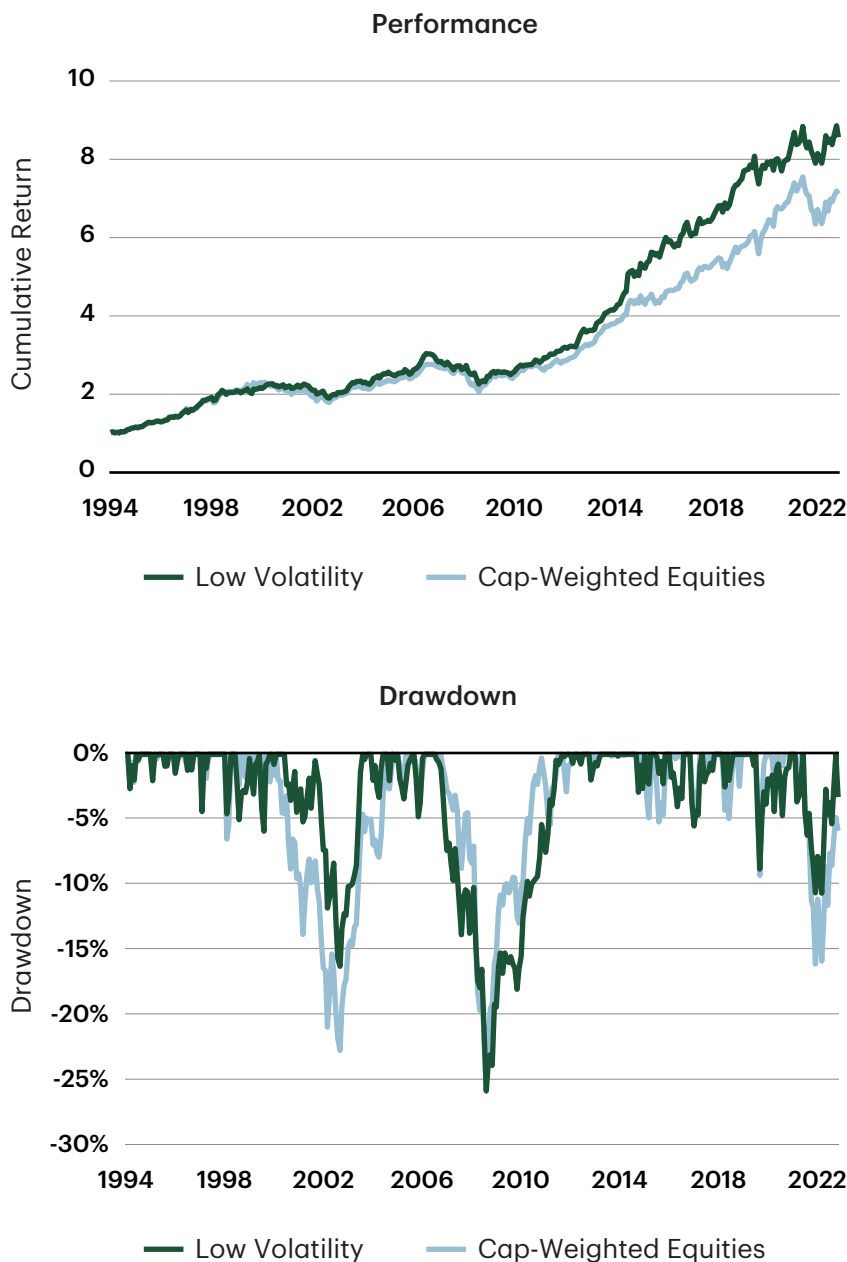
Source: Bloomberg Finance L.P., FTSE, MSCI, TD Asset Management Inc. Data from July 29, 1994 to May 31, 2023.

³For this exercise, we've chosen a mix of 70% bonds, 15% real estate and 15% infrastructure. The results also hold for other mixes of bonds, real estate and infrastructure.

Making Room for Risk

Another way of thinking about the risk-reducing property of low volatility equities is to see that they free up room in investors' risk budget, allowing them to hold more equities or other return-seeking assets. **Figure 5** shows this with two classic 60/40 portfolios, one using capitalization-weighted equities and the other low volatility equities. The lower absolute risk of low volatility equities means that the portfolio can increase its equity weight by nearly 19% relative to its cap-weighted counterpart (i.e., 79% compared to 60%) while targeting the same level of ex-post volatility. The higher equity allocation improves the expected return of the portfolio without incurring a commensurate increase in volatility or downside risk.

Figure 5: Two Portfolios with Equal Risk



Note: The cap-weighted bond-equity portfolio is a 60/40 portfolio comprised of capitalization-weighted equities and bonds. The low volatility portfolio is a bond-equity portfolio comprised of low volatility equities and bonds. The low volatility portfolio is constructed to have the same ex-post volatility as the cap-weighted 60/40 portfolio. Capitalization-weighted and low volatility equities are represented by the MSCI World Index and the MSCI World Minimum Volatility Index, respectively. Bonds are represented by the FTSE Canada Universe Bond Index. We assume monthly rebalancing and no transaction costs.



Source: FTSE, MSCI, TD Asset Management Inc. Data from July 29, 1994 to May 31, 2023.

Conclusion

Low volatility strategies have the potential to help risk-averse investors weather market turmoil and reduce risk at the total asset mix level, even when combined with other defensive assets such as bonds and alternatives. Compared to other risk-reducing options, low volatility equities offer many of the same benefits as capitalization-weighted equities (i.e., comparable returns over a full investment cycle,

low cost, ease of implementation and liquidity) but with lower risk and less downside participation. Moreover, by using low volatility stocks to free up space in their equity risk budget, investors can allocate more of their risk budget to other potentially more aggressive return-seeking assets in order to help increase their expected return. ■

Strategy



Volatility



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