



# Leverage Does Not Equal Risk

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Investors have traditionally associated the amount of leverage in a portfolio with the level of risk; the higher the leverage, the riskier the portfolio should be. Although this view might be accurate for traditional notionally allocated portfolios, it does not always hold true; leverage can also be used to improve diversification and risk-adjusted returns, while minimising the concentration in the portfolio. In this article, we look at two examples of a significant sell-off in risk assets and increase in market volatility: Covid-19 and the Global Financial Crisis from 2008. We illustrate how exposure and risk levels can be adapted to market conditions to help avoid excessive risk taking.

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# 1. Introduction: Portfolio Leverage, a Red Flag?

There are two distinct ways investors can use leverage in their portfolio: at the portfolio level and at the asset class level.

Excessive portfolio leverage was undoubtedly one of the root causes for the Global Financial Crisis ('GFC') in 2008 and typically raises red flags when used in a portfolio. But leverage is among the oldest and most established economic concepts. If investors are holding what they perceive as the most attractive trade-off between risk and return (for example a 30/70 split between equity and bonds), yet they desire to increase their returns, they are faced with two choices. Option one would be to increase their allocation to risky assets, equities in our example, and tilt the portfolio towards a 60/40 allocation, effectively 90/10 in terms of risk<sup>1</sup> (Figure 1). Option two would be to leverage their existing allocation, maintaining their risk-return profile. Modern portfolio theory would suggest the leverage route, as it will ensure that the ideal portfolio allocation is intact. However, some investors – limited by their ability to create leverage in their portfolios – have traditionally chosen to increase their equity allocation, thus establishing the 60/40 as the industry standard moderate portfolio allocation.

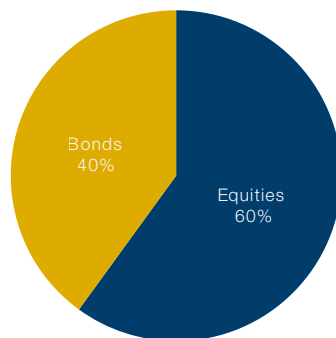
Our view is that the first choice, using moderate leverage to maintain the ideal portfolio allocation while trying to achieve the return goals, should be the preferred option.



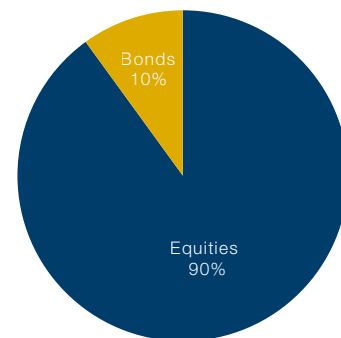
Portfolio leverage can help achieve return goals, while avoiding portfolio concentration.”

Figure 1. A 60/40 Notional Portfolio is, in Reality, 90/10 in Terms of Risk

60/40 portfolio notional exposure



60/40 portfolio risk exposure



Source: Man Group. Illustrative example. For information only. A 60/40 composite index made of 60% MSCI World Net Total Return index and 40% Barclays Capital Global Aggregate bond index (hedged to USD).



Asset class leverage can help improve diversification and risk-adjusted returns...”

## 1.1. But What About Asset Class Leverage to Improve Diversification?

Leverage can also be used to balance risks and diversify, not just amplify portfolio returns. Whether investors measure risk by the standard deviation of returns, expected tail loss or some other metric, the asset allocation should aim to balance risks and not notional exposures. As we have highlighted, a 60/40 notional portfolio sounds fairly well-balanced between equities and bonds, but because equities are much riskier, the risk allocation is significantly biased towards equities.

To improve the portfolio, we believe investors should first make assumptions on the riskiness of each of the asset classes and then make use of moderate leverage to increase the exposure of low-risk assets, in this case bonds. This should result in an improved and more balanced risk allocation compared with a traditional 60/40 portfolio.

This usage of portfolio and asset class leverage is, in our view, justified by the diversification benefit it is able to preserve, and hence the higher risk-adjusted returns it could achieve over a portfolio with more concentrated risks.

## 2. Risk Parity and Leverage

A risk parity strategy makes use of both types of leverage: portfolio and asset class leverage. It puts equal risk in each asset class traded, meaning that in notional terms, bonds, for example, are levered relative to equities, and this improves diversification.

All else equal, improving diversification reduces overall portfolio volatility. In order to preserve a desired level of volatility, risk-parity strategies need to use portfolio leverage to 'volatility scale'. This involves increasing exposure when market volatility is low, and reduce the exposure in heightened volatility environments, aiming to achieve a constant level of risk as market conditions evolve.

Aiming for a constant level of volatility in the portfolio is a technique called **volatility targeting**. It helps reduce extreme risk across asset classes in the portfolio and potentially improve risk-adjusted returns.<sup>2</sup>



...but leverage without dynamic risk management and efficient execution, could result in large losses.”

## 3. When Risk Parity Breaks Down

One could have stopped at the assumption that in an equal risk portfolio, the asset class diversification will help mitigate drawdowns in the portfolio.

But potential issues arise at times when this diversification breaks down, for example when bonds sell off, triggering a sell-off in other asset classes. When this happens, the left tail of this levered portfolio could result in losses as bad as or worse than that of a 60/40 portfolio. This is where the requirement for dynamic risk management and efficient execution comes to the fore.

## 4. Diversified Allocations and Dynamic Risk Management

The key purpose here is to show that higher leverage does not necessarily translate into higher risk. The remainder of this article will therefore attempt to highlight how the use of dynamic risk management, coupled with efficient execution, can help mitigate the concern that risk parity strategies are vulnerable to large losses if diversification breaks down.

### 4.1. Dynamic Risk Models

Dynamic risk models can be used to measure and detect warning signals that can trigger exposure reduction. These include:

- **Momentum overlay:** exposure is reduced in assets with moderate or strong down trends;
- **Volatility overlay:** exposure is reduced at the asset-class and portfolio levels in response to rapidly rising volatility;
- **Correlation overlay:** exposure is reduced across the portfolio when there is a short-term pick-up in the risk of a bond sell-off spreading to other asset classes.

### 4.2. Execution

Execution is often neglected, yet it plays an important role. What use are the most accurate signals if they cannot be efficiently executed? A focus on execution naturally dictates which instruments a strategy should use to construct a portfolio. In our view, the instruments best-suited to applying dynamic risk models are predominantly futures contracts. These are generally highly liquid securities, but if overlays activate, they can significantly reduce risk over a short period of time. The resulting strategy can therefore remain cost effective if execution costs are kept low.

Dynamic risk management naturally requires more trading than the average portfolio. This requires an execution infrastructure that can reduce explicit cost (commissions, settlement costs, custodian costs, etc) and to minimise implicit costs (bid/offer spread, timing, market impact, etc). To this end, investors looking to implement such a strategy require a sophisticated execution platform that is up to the task of efficiently executing

2. The Impact of Volatility Targeting. May 2018 Man AHL. [man.com/maninstitute/the-impact-of-volatility-targeting](http://man.com/maninstitute/the-impact-of-volatility-targeting).

highly dynamic risk overlays. To build and maintain such a platform is a significant undertaking, requiring a great deal of investment, experience and quantitative talent to achieve results.

In summary, dynamic risk management – facilitated by an efficient execution platform – permits the use of leverage to improve risk-adjusted returns, helping a strategy perform in the good times and reduce drawdowns in periods of market stress.

## 5. Case Studies: Covid-19 and the GFC

In this section, we highlight two examples of a significant sell-off in risk assets: Covid-19 and the GFC of 2008. During both, the volatility of risk assets rose significantly, providing a useful illustration of how exposure and risk levels can practically be adapted to market conditions, and how such a strategy can help avoid excessive risk taking.

### 5.1. Covid-19 Sell-Off

One cannot say that the Covid-19 crisis hit global markets ‘out of the blue’. During late December 2019, the infection had already started to spread out of control in China and southeast Asia. Yet global markets discounted its impact and global equity and bond markets continued to rally. It was only in late February that markets woke up to the pandemic. A theoretical volatility-targeting strategy’s response in terms of asset class exposure is highlighted in Figure 2a.

During January and most of February 2020, while markets were calm, the strategy required a gross exposure of 350% in order to achieve its risk-balanced profile and volatility target of 10%. In this benign period, the strategy was fully invested and had almost double the volatility of a 60/40 portfolio (Figure 2b) allowing it to better participate in the market rally and outperform 60/40 in January and early February (Figure 2c).

By the end of February, when the pandemic started infecting global markets, the dynamic risk overlays quickly reacted; volatility first, then momentum, and finally the correlation overlay. This reduced exposure from around 350% to around 30% (Figure 2a). In volatility terms, however, the volatility of a 60/40 portfolio increased significantly from 5% to 30% (Figure 2b). This is because exposures in a 60/40 portfolio are static and portfolio risk therefore reflects higher volatility in markets. The continued falls in risk assets meant that the strategy’s outperformance was clearly visible in March 2020, although a rebound in April led to underperformance (Figure 2c).

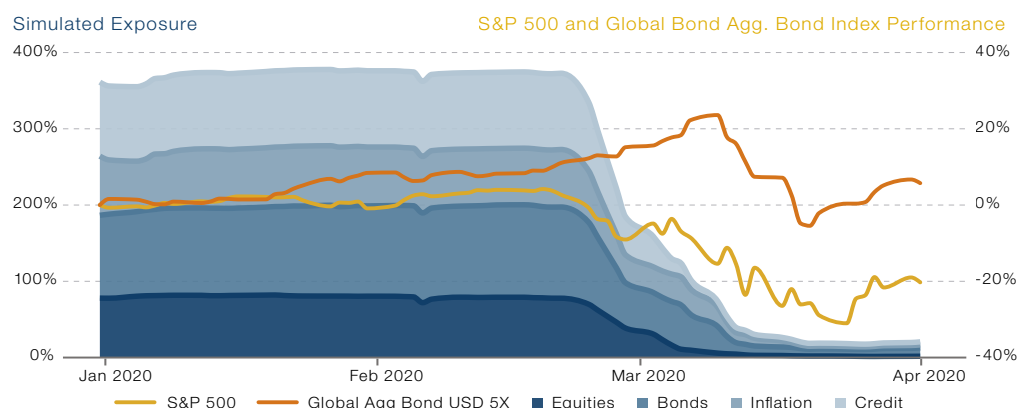
In summary, although the volatility-targeting strategy entered the Covid-19 market event fully levered at 3.5x, it outperformed an un-levered 60/40 portfolio. This was achieved through the two facets we introduced previously:

1. Diversification and a balanced risk-based allocation which mitigated the initial equity losses to mid-February;
2. Risk management overlays, which cut risk substantially on rising market volatility.

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The volatility-targeting strategy entered the Covid-19 market event, fully levered yet outperformed an un-levered 60/40 portfolio.”

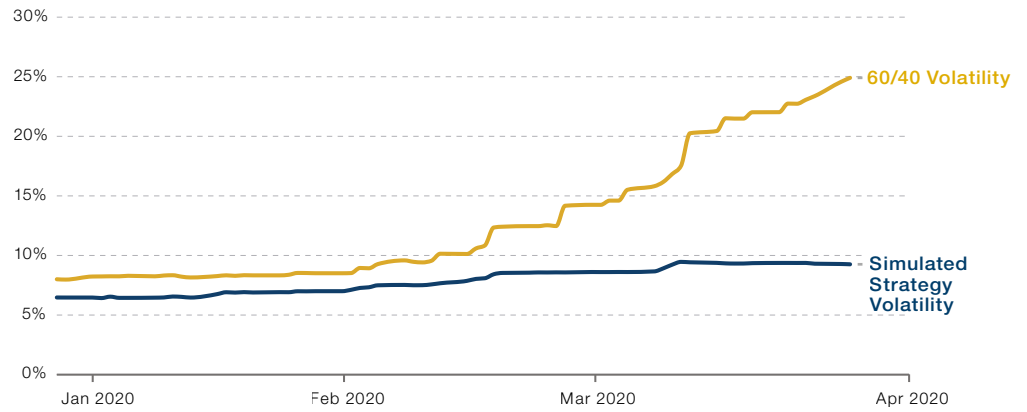
Figure 2. Covid-19 Case Study

#### a) Simulated Exposure During Q1 2020

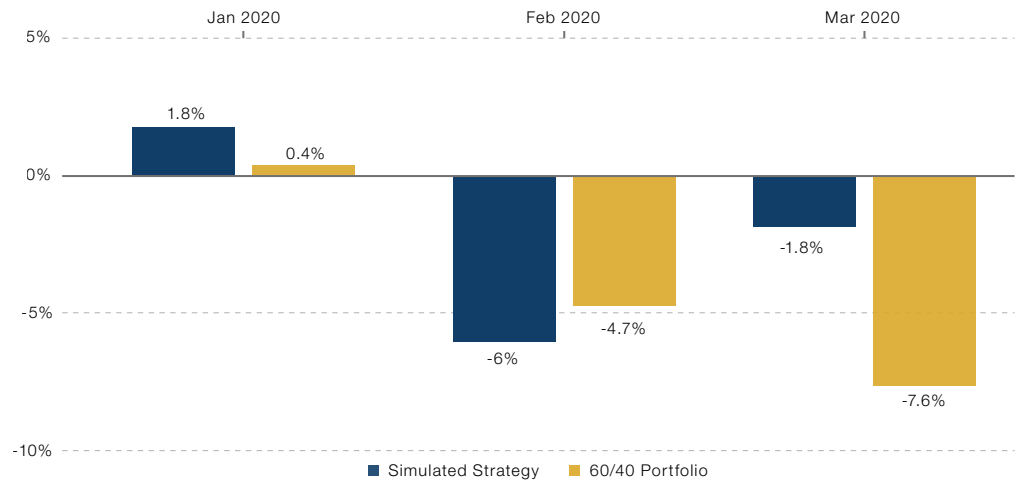


## b) Volatility of a 60/40 Portfolio Versus the Simulated Strategy

3m rolling standard deviation



## c) Simulated Performance Versus 60/40



### Simulated past performance is not indicative of future results.

Source: Man Group, Bloomberg. An example fee load of 0.95% management fee has been applied. A 60/40 composite index is made of 60% MSCI World Net Total Return index and 40% Barclays Capital Global Aggregate bond index (hedged to USD).

## 5.2. The 2008 GFC

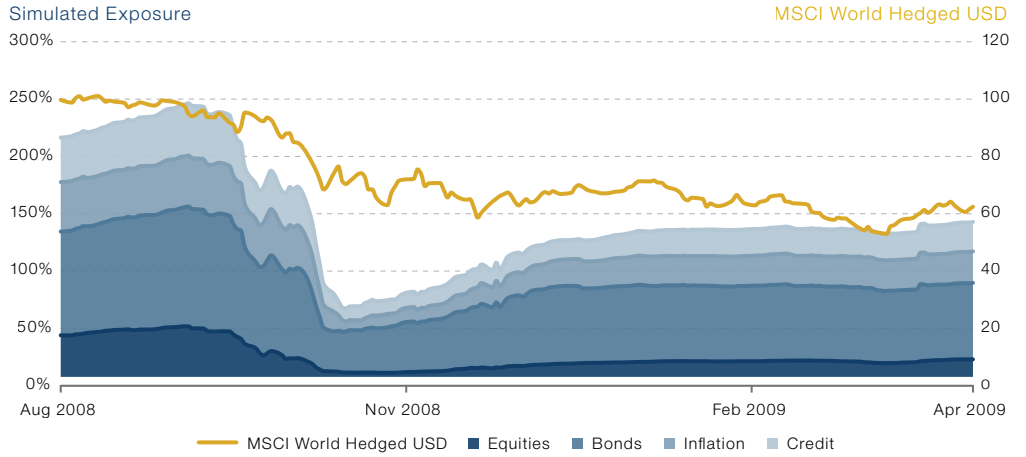
In the eyes of many commentators, the Covid-19 crisis had its closest parallel during the GFC in 2008.

The theoretical volatility-targeting strategy entered the period around 2.5x geared (Figure 3a), but cut exposure quickly to around 0.5. Hence the strategy did not see the same pickup in risk as a static 60/40 portfolio (Figure 3b), and it outperformed as markets continued to fall (Figure 3c).

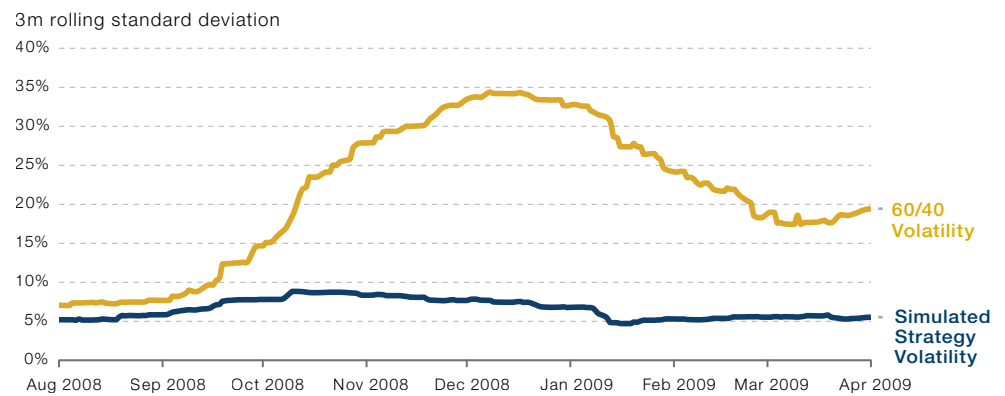
We see in this example, however, how the strategy re-gearred as markets stabilised towards the end of 2008 and into 2009. Total exposure does not reach levels seen before the crisis because volatility remained high, as can be seen in the case of a static 60/40 portfolio in Figure 3b.

Figure 3. GFC Case Study

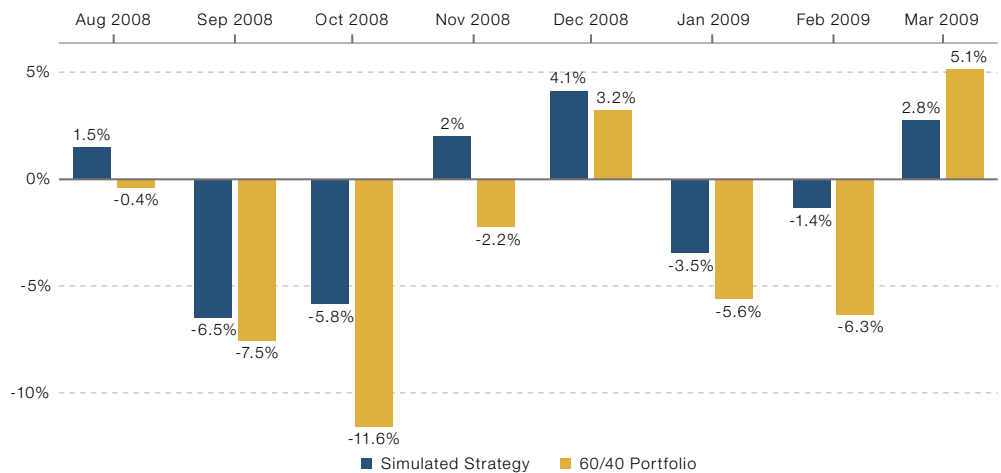
a) Simulated Exposure During and After the Lehman Bankruptcy



b) Volatility of a 60/40 Portfolio Versus Simulated Strategy



c) Simulated Performance Versus 60/40



Simulated past performance is not indicative of future results.

Source: Man Group. A 60/40 composite index is made of 60% MSCI World Net Total Return index and 40% Barclays Capital Global Aggregate bond index (hedged to USD).



Leverage is not always a great indicator of portfolio risk, especially in the presence of diversification and active risk management.”

Conclusion

We have illustrated that, for two of the largest market events in recent memory, the leverage of a volatility-targeting strategy before a crisis does not translate into significant risk or losses during the crisis itself. In contrast, a traditional 60/40 portfolio with less leverage at the outset of each crisis ended up being more risky during the crises and suffered larger losses.

We believe this demonstrates that leverage is not always a good indicator of portfolio risk, especially in the presence of diversification and active risk management.

## Author

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