Reduce risk in portfolios without hampering returns – introducing ‘Efficient Core’

Published October 12, 2023

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Asset allocation is ultimately about balancing returns with risks. While it is relatively easy to reduce risk in a portfolio, it is harder to do so without diminishing its return potential. Diversification, that is, adding uncorrelated assets to the portfolio, is one of the main tools available to investors to lower such risk, but it often comes at the cost of returns. The 60/40 portfolio, a mix between 60% equities and 40% fixed income, is the bedrock of asset allocation for many investors.

Adding fixed income to equities does lower volatility and improve the Sharpe ratio, in line with Markowitz’s findings in this Nobel Prize-winning work and due to the historically negative correlation between equities and investment-grade fixed income. However, it is also true that a 60/40 portfolio has tended to deliver lower returns than a 100% equity portfolio.

Does it mean that investors have to choose between higher returns with increased volatility or lower returns with decreased volatility?

Cliff Asness’ thought experiment: the levered 60/40

As with any problem, the solutions usually require out-of-the-box thinking. In our case, it requires to start thinking about leverage. Cliff Asness, co-founder of AQR Capital, provided such a solution in December 1996 when serving as Goldman Sachs Asset Management’s director of quantitative research with his paper ‘Why Not 100% Equities: A Diversified Portfolio Provides More Expected Return per Unit of Risk’.

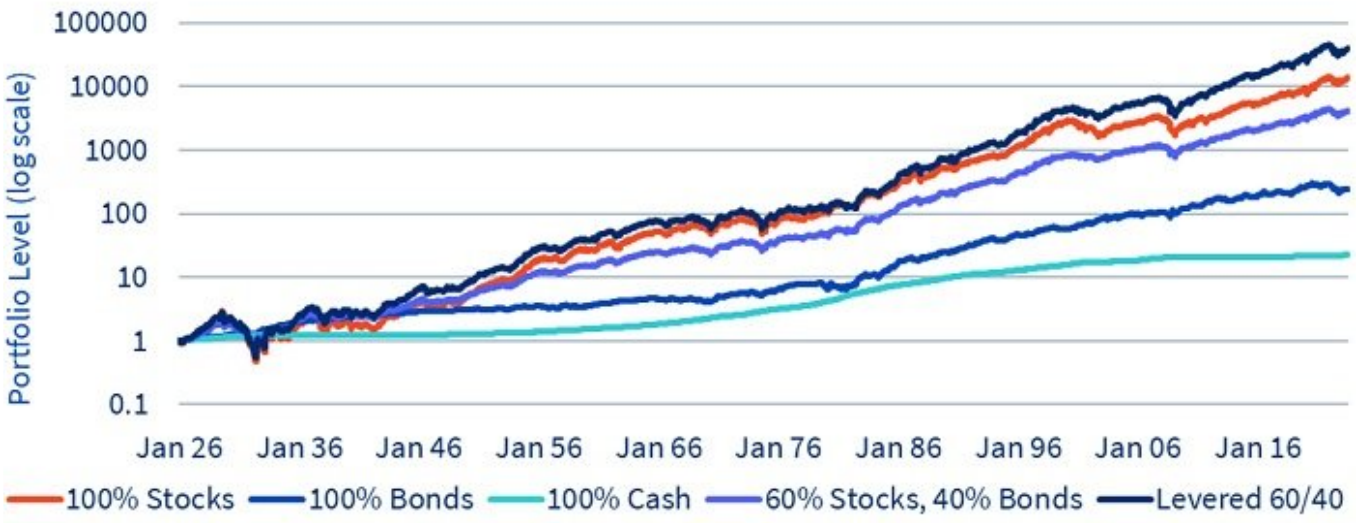
In his paper, Asness argues that investors can achieve competitive returns while managing risk more effectively by diversifying their portfolios with a combination of equities and bonds and using leverage. Asness designs the ‘Levered 60/40’ portfolio which leverages a 60/40 portfolio so that the volatility of the leveraged portfolio is equal to those of equities. The applied leverage is, therefore 155%. The borrowing rate used for leveraging his 60/40 portfolio is proxied by the one-month t-bill rate.

In his original paper, Asness finds that, over the period 1926 to 1993, the Levered 60/40 portfolio returns 11.1% on average per year with 20% volatility. Equities, in contrast, return only 10.3% with the same volatility.

For reference, the 60/40 portfolio (unleveraged) returns 8.9% with 12.9% volatility.

In Figure 1, we extended the Asness analysis to the most recent period. We observe that over this longer period, the results still hold true. The Levered 60/40 delivers higher returns than equities with similar volatility. The Sharpe ratio of the Levered 60/40 benefits from the diversification and is improved, compared to equities, with no cost to returns themselves.

Figure 1: Extension of the results from Cliff Asness' paper– 1926-2023



	100% Stocks	100% Bonds	100% Cash	60% Stocks, 40% Bonds	Levered 60/40
Annualised Returns	10.3%	5.8%	3.2%	8.9%	11.5%
Annualised Volatility	18.6%	7.8%	0.9%	12.2%	18.9%
Sharpe Ratio	0.38	0.32		0.46	0.43

Source: WisdomTree. December 1925 to July 2023. Monthly data in USD are used. US equities are proxied by the data series Ibbotson SBBI US Large Stock TR USD. US High Investment Grade bonds are proxied by the series Ibbotson SBBI US LT Corp TR USD until February 2022. After that, the Bloomberg U.S. Long Credit Aa Total Return Index is used. Cash is proxied by Ibbotson SBBI US 30-Day TBill TR USD. The levered 60/40 portfolio invests 155% each month in the 60/40 portfolio and -55% each month in the Cash portfolio. Historical performance is not an indication of future performance and any investments may go down in value.

Leveraging the 60/40 around the world, a successful extension

In Figure 2, we extend the analyses to other regions to test the robustness of such results. While the history is not as deep, Figure 2 shows similar results. Across all the tested regions, the returns and Sharpe ratio of the Levered 60/40 portfolio exceeds those of the equities alone. At the same time, the volatility is identical, and the max drawdown is reduced.

Note that we do not use a 155% leverage in all those analyses; we use the relevant leverage to match the volatility of the equities in the region. Having said that, the leverage remains very similar across regions as it oscillates between 160% for global equities and 170% for Japanese equities.

In Figure 2: Leverage 60/40 in other geographies

European Equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	6.6%	4.3%	6.2%	7.6%
Volatility	18.2%	4.1%	10.9%	18.2%
Sharpe Ratio	0.20	0.31	0.29	0.25
Max Drawdown	-60.5%	-21.5%	-36.0%	-57.6%

German Equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	6.8%	4.3%	6.4%	7.8%
Volatility	20.7%	4.1%	12.4%	20.7%
Sharpe Ratio	0.18	0.31	0.27	0.23
Max Drawdown	-68.3%	-21.5%	-43.0%	-66.0%

Japanese Equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	4.9%	1.3%	3.9%	5.9%
Volatility	18.6%	2.1%	11.0%	18.6%
Sharpe Ratio	0.26	0.60	0.35	0.31
Max Drawdown	-57.2%	-8.8%	-37.2%	-26.4%

Asia Pacific ex Japan Equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	7.5%	5.0%	7.1%	9.1%
Volatility	20.3%	4.6%	12.2%	20.3%
Sharpe Ratio	0.16	0.14	0.22	0.23
Max Drawdown	-61.4%	-17.8%	-39.1%	-58.3%

Global Developed Equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	7.8%	6.3%	7.5%	9.0%
Volatility	15.0%	5.2%	9.4%	15.0%
Sharpe Ratio	0.23	0.38	0.33	0.31
Max Drawdown	-53.6%	-17.8%	-32.7%	-48.6%

Emerging markets equities

	Equities	Bonds	60/40 Portfolio	Levered 60/40 P
Annualised Returns	8.8%	5.0%	8.0%	10.4%
Volatility	22.1%	4.6%	13.2%	22.1%
Sharpe Ratio	0.20	0.14	0.27	0.27
Max Drawdown	-61.4%	-17.8%	-38.9%	-58.7%

The theory behind the Levered 60/40

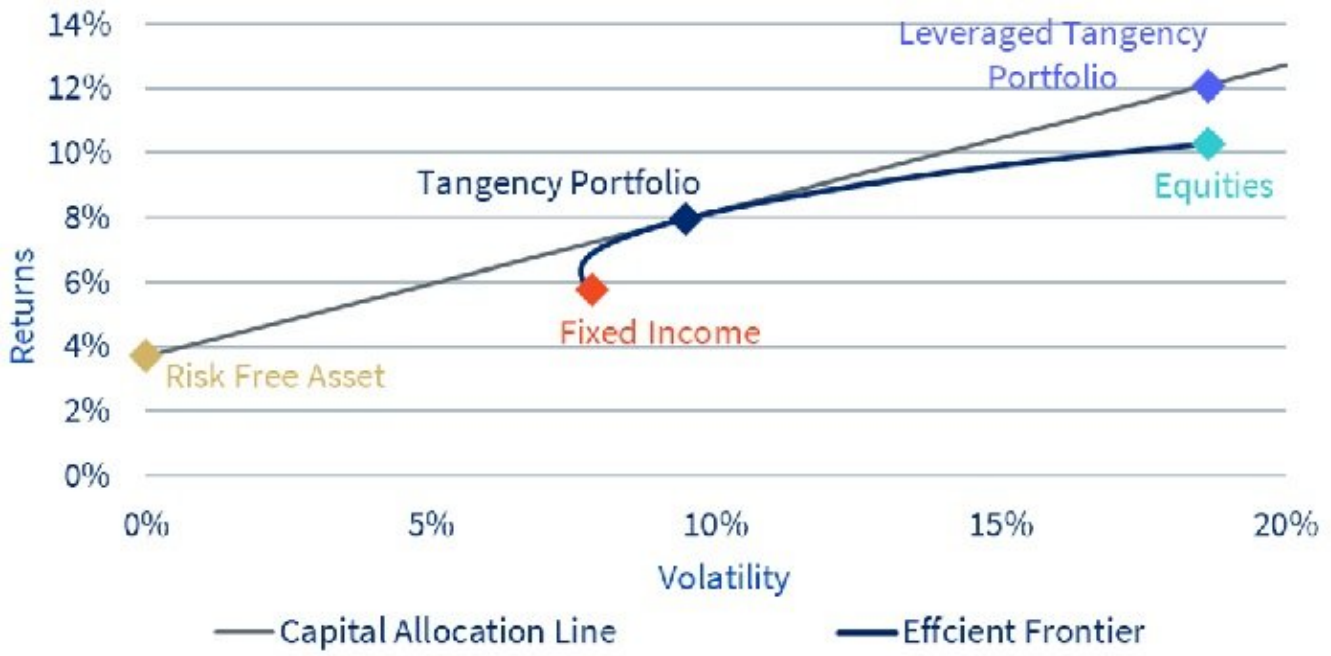
From a theoretical point of view, the idea of focusing on the most efficient portfolio possible and leveraging it to create the most suited investment for a given investor is well anchored in financial theory. When he introduced the Modern Portfolio Theory (MPT) in 1952, Harry Markowitz had already outlined the concept through the Capital Allocation Line (Markowitz, March 1952).

Figure 3 shows the efficient frontier for a mix of 2 assets: US equities and US high investment-grade bonds. Note that each portfolio on the efficient frontier is the most efficient for a given level of volatility, assuming no leverage. All portfolios on the efficient frontier are not equal and have, in fact, different Sharpe ratios. Along this efficient frontier, there is a portfolio with the highest Sharpe ratio of all, called the 'Tangential Portfolio'. This most efficient of all the efficient portfolios happens to be found where the Capital Allocation Line touches the efficient frontier. The Capital Allocation Line is the line that is tangential to the efficient frontier and crosses the Y axis (the 0% volatility axis) at a return level equal to the risk-free rate.

When it comes to building the most efficient portfolio for a given level of volatility, investors have two choices. Without leverage, they can pick the portfolio with the highest return for that volatility level on the efficient frontier. If investors look for strategies with a volatility level equal to equities, equities are the most efficient portfolio. Considering potential leverage, the answer is quite different. With leverage, an investor can pick the portfolio with the relevant volatility level (in this case, the equity volatility) on the Capital Allocation Line. Portfolios on this line happen to have a Sharpe ratio equal to the Sharpe ratio of the Tangential portfolio (that is, the best Sharpe ratio of all the portfolio combinations without leverage) but with any level of volatility that may be required. We called the Leveraged Tangency Portfolio the portfolio on the Capital Allocation

Line with the same volatility as the equity portfolio. This portfolio is a 'more efficient portfolio'. The return is improved by almost 2% for the same volatility, leading the Sharpe ratio to jump from 0.27 to 0.45.

Figure 3: Modern Portfolio Theory: The Efficient Frontier and the Capital Allocation Line



	Annualised Returns	Volatility	Sharpe Ratio
Equities	10.3%	18.6%	0.27
Fixed Income	5.8%	7.8%	0.35
Tangency Portfolio	8.0%	9.5%	0.45
Risk-Free Asset	3.7%	0.0%	0.00
Leveraged Tangency Portfolio	12.1%	18.6%	0.45

Source: WisdomTree. December 1925 to July 2023. Monthly data in USD are used. US equities are proxied by the data series Ibbotson SBBI US Large Stock TR USD. US High Investment Grade bonds are proxied by the series Ibbotson SBBI US LT Corp TR USD until February 2022. After that, the Bloomberg U.S. Long Credit Aa Total Return Index is used. Cash is proxied by Ibbotson SBBI US 30-Day T-bill TR USD. Historical performance is not an indication of future performance and any investments may go down in value.

Key Takeaways

“Diversification is the only free lunch in Finance”, whether a real or fake H. Markowitz’s quote, epitomises the philosophy that underpins the 60/40 portfolio. It is also one of the main lessons from Markowitz's Nobel prize-winning work. Having said that, the second lesson has not been heeded as well: leveraging a good portfolio can make an even better portfolio. Overall, by leveraging a traditional 60/40 portfolio, an idea that, at WisdomTree, we call ‘Efficient Core’, investors could potentially receive a similar level of volatility present in a portfolio 100% allocated to equities but with the better Sharpe ratio of a 60/40 portfolio.

Possible examples of where such Efficient Core portfolios may be used widely in multi-asset portfolios include:

1. **An equity replacement**
   A core equity solution designed to replace existing core equity exposures. By offering return enhancement, improved risk management and diversification potential compared to a 100% equity portfolio, Efficient Core can also be used to complement existing equity exposures.
2. **A capital efficiency tool**
   By delivering equity and bond exposure in a capital-efficient manner, Efficient Core can help free up space in the portfolio for alternatives and diversifiers. In line with the illustrations above, allocating 10% of a portfolio to this idea, investors would aim to get 9% exposure to US equities and 6% exposure to US Treasuries. This could allow investors to divest 6% from existing fixed income exposures and consider alternative assets (such as broad commodities, gold, carbon or other assets). In this scenario it could potentially be achieved without losing the diversifying benefits of their fixed income exposure.

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