

Tail wind for tail-risk hedge funds

Introduction

Tail-risk hedging strategies were once again on investors' mouths, following the March 2020 drawdowns. April 2020 headlines were dominated by tail-risk hedge funds' performance numbers and tenfold returns were not uncommon. By mainly incorporating complex option-based and CDS strategies, the funds look to minimize portfolio drawdowns in most volatile market scenarios and provide protection against "fat tails". Its proponents claim it's a necessity, while the other group treats it as an unnecessary cost when holding a well-diversified portfolio. For two famous in the world of finance individuals, it turned out to be a point of a heated public debate. In this article we will try to contrast these two approaches and look at the empirical results of both strategies, as well as obstacles which both of them might be facing in the current market conditions.

3600% return for Universa

One hedge fund particularly gained publicity – Universa, founded by Mark Spitznagel and "Black Swan" author and former options trader Nassim Nicholas Taleb. The fund famously returned 3600% in March and led to a large scale debate on implications of tail risk hedging for long-term performance. Taleb, its current adviser, is especially known for his criticism of modern portfolio theory and the assumption of normally distributed returns, claiming that tail risk events, or "Black Swans", are more common than people think, a phenomenon perhaps best described in "The (Mis)behaviour of Markets" by a famous mathematician Benoit Mandelbrot.

Such singular returns certainly draw attention, but for the investors in the fund, a total portfolio effect should be considered. As stated in a "Those Astronomical Returns Aren't What They Seem" Bloomberg article "Suppose you pay \$100 per month for homeowner's insurance on a house valued at \$250,000. One day the house burns down and you collect \$250,000. Would you call that a 249,900% return on the \$100 monthly premium? No, you'd say you recouped 100% of the \$250,000 pre-fire value of the house."

Thus, Universa suggests to allocate 3.33% to its tail-fund and 96.67% to S&P 500 Index fund. This amount has to be rebalanced, perhaps annually, due to the nature of the strategy, which loses most of the time. Thus, effectively, investors end up paying the "insurance premium" most of the years and hope to mitigate the risk of fat-tails. Its CIO, Mark Spitznagel argues that this is the long-term wealth maximizing solution and presents a table comparing different approaches.

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The Risk Mitigation Scorecard

Strategy	March 2020	CAGR			
		Since 2019	Since 2015	LTD (Since Mar 2008)	2008 (Mar-Dec)
Universa Tail Hedge (3.33%) + SPX (96.67%)	0.4%	16.2%	8.3%	11.5%	9.9%
CBOE Eurekahedge Tail Risk (3.33%) + SPX (96.67%)	-11.4%	5.2%	6.3%	7.7%	-29.4%
iShares 20Y+ Treasury (25%) + SPX (75%)	-6.8%	12.2%	7.3%	8.9%	-15.1%
iShares 3-7Y Treasury (25%) + SPX (75%)	-8.3%	6.9%	6.1%	7.2%	-21.1%
CBOE Eurekahedge Long Volatility (25%) + SPX (75%)	-2.3%	10.7%	6.1%	8.2%	-13.8%
Gold (25%) + SPX (75%)	-9.1%	8.4%	6.5%	7.4%	-25.4%
Hedge Fund Index (25%) + SPX (75%)	-10.3%	4.4%	5.6%	6.7%	-27.5%
CTA Index (25%) + SPX (75%)	-8.7%	5.6%	5.3%	6.6%	-21.5%
SPX (100%)	-12.4%	4.5%	6.6%	7.9%	-30.7%

Depending on the relative size of the market drawdown, the fund earns a high multiple of the premium. Although the data is not publicly available, the Bloomberg article estimates that in 2008 the fund returned 20 years-worth of premia and March 2020 returns were equal to cost of 5 years of rebalancing. Interestingly, CalPERS, California Public Employees' Retirement System, has ended its tail-risk hedging program with Universa in October 2019, 6 months before the crash, as it was considered "too costly". It is estimated that their position with Universa would yield around \$1bn in Q1 2020.

Both Spitznagel and Taleb have put up comments against traditional diversified portfolios, claiming that risk-parity strategies have been only smoothening the results, rather than providing added benefits. In one of his tweets, Taleb went after two research papers by a \$140 bn AUM hedge fund AQR, which triggered a response from Clifford Asness, one of its cofounders. This has led to a heated debate with a stream of invective from the two.

AQR's response

The AQR white papers advocated that risk-parity outperforms tail-risk hedged portfolios in the long term, suggesting that CalPERS and other investors who fled such funds, were in fact right. As we can read in the AQR paper: "Investors have a natural urge to protect their portfolios from sudden crashes like the one we've seen recently. We argue that they should instead focus on bad outcomes that unfold over longer periods, as those tend to be more detrimental to the long-term goal of wealth accumulation."

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Exhibit 8: A Periodic Table of Portfolio Protection
 Outperformance Over Various Horizons, Sorted by Hit Rate
 January 5, 1996 – March 31, 2020*

1 Week	1 Month	1 Quarter	1 Year	3 Years	5 Years	10 Years
10% OTM Puts 100%	10% OTM Puts 100%	10% OTM Puts 100%	Trend 100%	Styles 100%	Styles 100%	Styles 100%
20% OTM Puts 100%	20% OTM Puts 100%	20% OTM Puts 100%	10% OTM Puts 100%	Combined 100%	Trend 100%	Risk Parity 100%
Combined 95%	Combined 98%	Combined 100%	20% OTM Puts 100%	Trend 100%	Combined 100%	Combined 100%
Styles 95%	Trend 96%	Trend 98%	Combined 100%	Risk Parity 100%	Risk Parity 100%	Trend 100%
Defensive 60/40 92%	Styles 93%	Defensive 60/40 97%	Defensive 60/40 100%	10% OTM Puts 100%	Defensive 60/40 100%	Defensive 60/40 100%
Trend 91%	Defensive 60/40 93%	Risk Parity 90%	Risk Parity 100%	Defensive 60/40 100%	10% OTM Puts 48%	10% OTM Puts 20%
Risk Parity 82%	Risk Parity 87%	Styles 88%	Styles 92%	20% OTM Puts 100%	20% OTM Puts 44%	20% OTM Puts 7%

*Using each series' full history does not alter the conclusions of this chart.

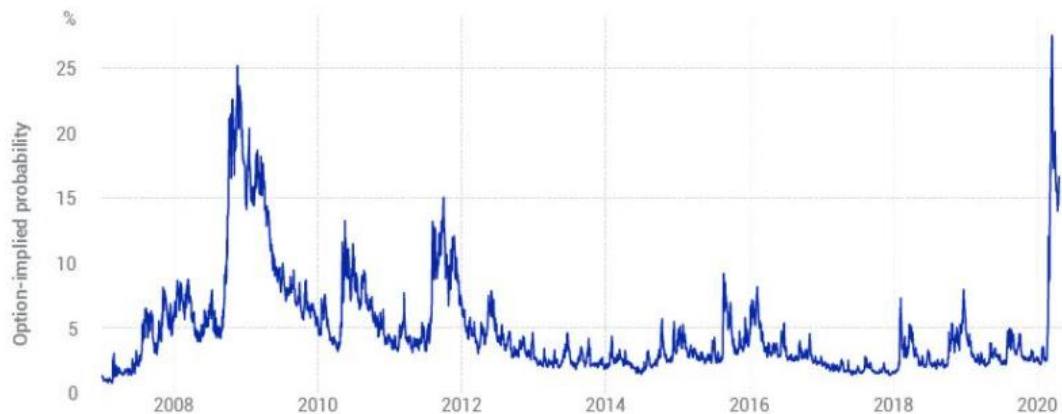
Sources: AQR, Federal Reserve, OptionMetrics, Bloomberg. All series are described in previous exhibits. This chart ranks each of the Hypothetical portfolios based on their hit rate versus 60/40 over the various horizons. If two portfolios have the same hit rate, we give priority to the portfolio with the larger magnitude of outperformance over that period. This data is described in greater detail in the Appendix. Each series is compared to 60/40 over the common overlapping period from 1/5/1996 to 3/31/2020. Time period is based on availability of data. All returns are excess of cash and gross of fees. All underlying calculations use arithmetic returns. For illustrative purposes only. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix.

However, it seems that for its calculations, AQR only included 20% OTM strategies, which would not have produced such returns as Universa’s in March 2020. Taleb stated that the strategies proposed are not comparable and that “It is a waste of time comparing boxed wine and a French Bourdeaux”. The specific details of Universa’s methodology and strategy remain unknown to the public.

Looking ahead

Since it’s not very plausible that investors can time the market, the empirical returns differ with time periods chosen and different strategies. It’s clear however, that as investors become more worried about sharp declines, the cost of such protection grows and it was no different in April 2020. As volatility has spiked, the relative attractiveness of tail risk hedge funds and CDS based strategies decreased.

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Option-implied risk-neutral probability of a 20% or greater drawdown over the subsequent three months for the U.S. equity market. Source: OptionMetrics, MSCI

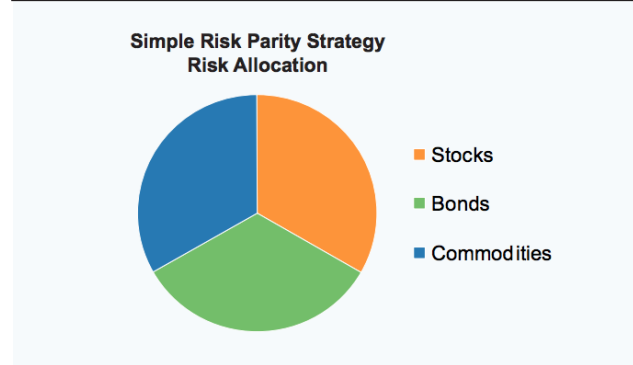
As with all successful strategies over time, once more investors start incorporating such strategies, its edge may deteriorate and different strategies would need to be employed. A FactorResearch article showed that in the period of 2007-2020, a portfolio of short-term US Treasury Bonds offered a similar return with a comparable maximum drawdown to a 90% Equity + 10% Tail Risk Hedge Funds portfolio, using TAIL ETF as a proxy. Once again, due to lack of clarification of exact tail risk mitigating strategies used by e.g. Universa, it's very difficult to give a clear verdict on whether tail risk hedging offered better results in general. However, looking specifically at Spitznagel and Taleb's fund we may say that it employs strategies that perform better on average than 20% OTM Put proxies employed by AQR's research. Now, to analyze the other side of the debate, we will explore how risk-parity funds performed and what is its future outlook for investors.

Risk Parity

The risk parity strategy was founded by Bridgewater Associates and the fund that run this strategy within the firm is named All Weather. The fund was originally thought for Ray Dalio's trust assets. A risk parity strategy tries to deliver acceptable outcomes in any market environment, whether it is currency devaluation, stock market declines or any other event that changes the conditions that are currently priced in the market.

Risk parity is an approach to investment management which focuses on allocation of risk, usually defined as volatility, rather than allocation of capital. Most of the times, the strategy entails a balanced holding of a mix of asset classes (equity, government bonds, inflation-linked bonds, commodities) where risk weightings are equal for each asset class. Therefore, capital weightings will be higher for lower risk assets such as nominal and inflation-linked bonds. A risk parity portfolio can achieve a higher Sharpe Ratio since the returns of lower risk assets (government and inflation-linked bonds) are usually enhanced through the use of leverage or financial derivatives such as futures and swaps contracts.

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Exhibit 3: The “Simple Risk Parity Strategy” Offers a Balanced Allocation Across Asset Classes.

Source: AQR. For illustrative purposes only.

As an example, if you invest \$10 in the S&P 500 and \$10 in US bonds, the portfolio risk is dominated by the S&P because it is much riskier than the bonds. If instead you invest \$5 in the S&P and \$15 in 10 year bonds the portfolio is much more balanced, though with a lower return. Invest \$5 and \$15 in the manner described and add a bit of leverage and the portfolio has the same return as the stocks but less risk.

Risk parity is mostly a passive strategy. It may involve future rebalancing depending on the market environment or moderate tactical shifts performed by portfolio managers but it does not entail trading actively.

Which asset class play a key role in a risk parity fund?

A risk parity portfolio consists of hedging equity exposure with long term duration bonds and to levered them so that they are adjusted to stock-like risk. In this manner, price gains coming from bonds appreciation rise in a similar magnitude to the decline in the stocks when there are periods of market turmoil. Having long duration government bonds has proved to be an effective hedge to stock market risk and a stabilizing force on annual returns for two reason. If yields fall equally at both ends of the curve, the long end will provide better price performance. Moreover, during the last two Euro crisis (2011 and 2013), yields on the long end have fallen more than yields at the front end as the curve was already very steep with short term rates nearing zero and thus being little scope for 2-year appreciation.

The All Weather portfolio and other risk parity funds also uses inflation-linked bonds and commodities in order to hedge against inflation. Indeed, during periods of great inflation both equities and nominal government bonds decline. The role of inflation-linked bonds and commodities brings structural correlation benefits and improve diversification.

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How does a risk parity portfolio compare to the traditional 60/40?

Since the traditional portfolio has 60% of its holdings in stocks and since stocks are more volatile than bonds, over time the performance and risk of the portfolio can be mostly explained looking at the equity component. This does not seem to be a very well diversified portfolio.

On the other side, a risk parity portfolio has the majority of its capital weightings in government bonds and inflation-linked bonds and the rest in stocks. Therefore, we can easily understand that with this setup the risk weightings are equal across the asset classes but the overall return of the portfolio will be lower over time. To overcome this, leverage is used to enhance the returns. Risk parity is considered to be a better diversified strategy.

Why does the future of risk parity funds look a bit scary?

Falling interest rates in the last decades have obviously benefited the bond component of this strategy but if they are going to rise in the future you are going to have poor performances on the asset side and rising cost on the liability side (rising cost of leverage).

There are some critics saying that the growing influence of risk parity funds exacerbates the markets in periods of downturn. Indeed, when correlation turns positive between stocks and bonds during a downturn and they decline at the same time, the risk contribution of each rises and portfolio managers have to sell in order to reduce overall risk and in order to meet margin calls on the leveraged bet they made on bonds. Selling begets selling.

How did risk parity funds perform during the pandemic?

Around March 23rd, when S&P500 reached its intrayear low, the All Weather fund and AQR Risk Parity funds slid roughly 12 per cent from the beginning of the year. This was mostly due to a combined selloff in both equities and long duration bonds.

The YTD performance is -2.18% for AQR Risk Parity High Volatility Fund, -0.64% for AQR Risk Parity Moderate Volatility Fund and All Weather is near 0%.

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How does risk parity differ from a tail risk hedging strategy?

Risk parity focuses on volatility and allocates asset classes based on equal weightings of risk. Its goal is to perform fairly well in all different kinds of economic environments and to have a better risk/reward profile than the traditional 60/40 portfolio.

Tail risk hedging strategy puts the focus on expected tail loss and ought to outperform only in periods of severe crash.

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Tail-risk, option-based strategies, risk mitigation, portfolio allocation, risk-parity, pandemic, CDS, equities, fixed income

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