



Milliman Managed Risk Parity Strategy

Building a reliable portfolio that seeks to survive an unpredictable story line



As of June 29, 2019

THE MILLIMAN MANAGED RISK PARITY STRATEGY (MMRP)

MMRP Seeks to provide stable growth by maintaining diversified asset class exposure with tactical allocations. The strategy differentiates itself from traditional asset allocation approaches through the combination of *systematic tactical allocation* and *volatility management* overlay.

Traditional approaches to asset allocation often assign fixed target weights to specific asset classes. In many cases, these target weights are static and are only rebalanced periodically on a predetermined schedule. Such an approach implicitly acknowledges the benefits of a diversified portfolio, but is limited in its rigid implementation.

A DYNAMIC APPROACH

Similar to the traditional approach, the design of MMRP also implicitly recognizes that the goal of asset allocation is to diversify a portfolio's sources of risk and return in an effort to enhance risk-adjusted returns. While the traditional approach, however, is content to remain rigid in its allocations, MMRP incorporates two distinguishing dynamic features:

- 1. Risk Parity:** Rather than using a traditional approach to asset allocation, where fixed asset weights determine portfolio risk, MMRP uses a risk parity approach, where individual asset risk and correlation determine portfolio weights.
- 2. Volatility Management:** A shortfall of the more rigid traditional approach to asset allocation is an inability to protect against volatile

Traditional Asset Allocation:



MMRP Allocation:



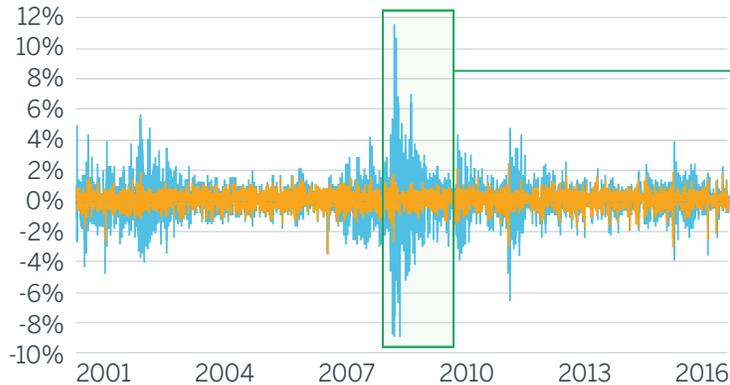
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declining markets. In such circumstances, asset correlations tend to increase and generate less diversification benefit than they do during more normal market conditions. With a volatility management overlay, when volatility rises, the strategy deallocates out of equities and into cash. This is designed to stabilize risk and reduce portfolio drawdowns, as shown in the charts below.

MMRP IN VOLATILE MARKETS

The following pages provide an overview of the first two years of MMRP's history, focusing specifically on how it responded during the two significant market downturns and the benefit it generated through its tactical allocations.

Daily Equity Returns with Volatility Management



● Equity with Vol Mgmt ● Equity ● Equity Allocation with Vol Mgmt

Cumulative Performance & Allocation with Volatility Management



Equity is measured by the S&P 500. Equity with vol management is measured by the S&P 500 Daily Risk Control 10% Index. Equity Allocation with Volatility Management is from S&P Dow Jones Indices.

The results shown are historical, for informational purposes only, not reflective of any investment, and do not guarantee future results. Any reference to a market index is included for illustrative purposes only, as it is not possible to directly invest in an index. Indices are unmanaged, hypothetical vehicles that serve as market indicators and do not account for the deduction of management fees or transaction costs generally associated with investable products, which otherwise have the effect of reducing the results of an actual investment portfolio.

FEBRUARY 2018 CORRECTION

In 2017, the S&P 500 generated its highest Sharpe ratio in more than 20 years, and that momentum carried over into 2018. After closing at an all-time high on Friday, January 26, 2018, having climbed 7.6% month-to-date, the rally was abruptly interrupted.

Over the course of the next four trading days, the S&P 500 fell 1.7% as both realized and implied volatility edged gradually higher. On the morning of Friday, February 2, it began to fall more precipitously. This coincided with the release of some surprising economic data; specifically, larger-than-expected growth in payrolls and average hourly earnings triggered fears that the Fed would begin to tighten policy at a faster rate than previously expected. As it turned out, the Fed increased rates four times in 2018, one more than the three hikes the market was anticipating in early 2018.

Over the course of that tumultuous stretch, **MMRP Growth** saw three reallocations, the dates of which are indicated by the orange dots in the chart on the following page.

Notably the first rebalance was done on January 31, after volatility had edged higher, but before the first major sell-off on February 2. The strategy moved out of global equities and REITs, and into bonds and gold. As equity and REIT volatility increased, their weights reduced accordingly. The volatilities of bonds and gold also increased, but not as high as that of equities and REITs. On February 5th, the strategy deallocated again along the same lines due to the continued market volatility. By mid-February, the S&P 500 had recovered some of its

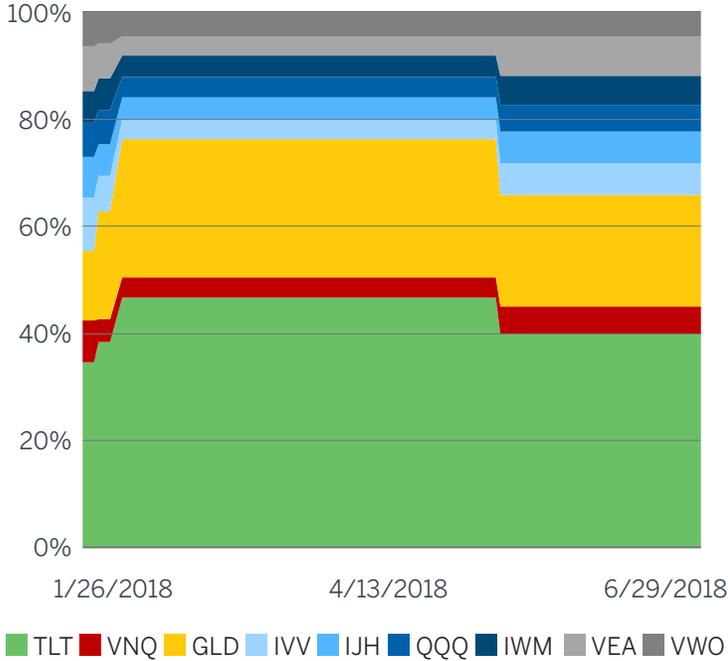
losses but volatility and risk were still elevated in Milliman FRM's models. Another sharp decline followed in end of March and into April. As Q2 wore on, equity market volatility abated. On May 10, the strategy reduced its allocation to Treasuries and gold, and reallocated to equities, leaving it in a better position to benefit from the strong equity returns in Q3.

Compared to the S&P 500, the strategy's asset allocation helped it generate a higher return over the period, with less volatility and smaller drawdown.

1/26/2018 – 6/29/2018	MMRP Growth	S&P 500
Return	-2.9%	-3.9%
Volatility	6.9%	17.4%
Drawdown	-5.7%	-10.1%

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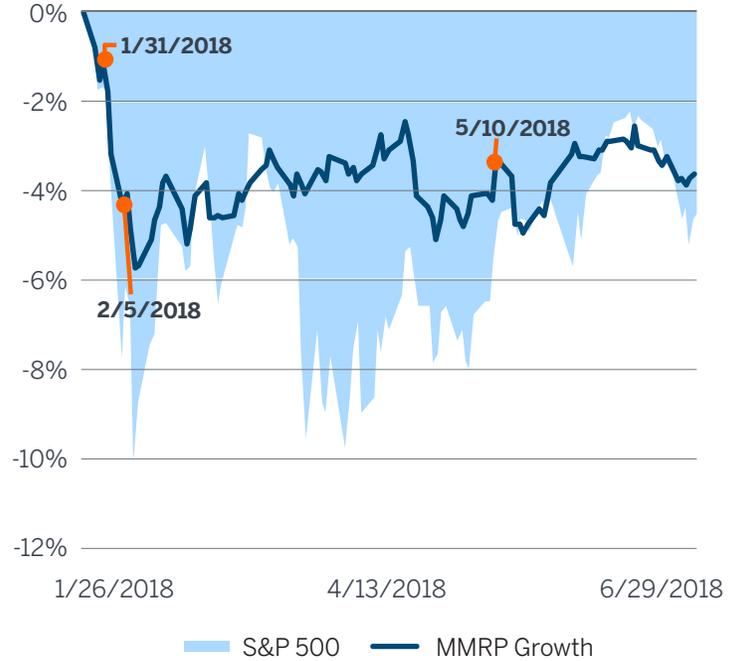
MMRP Growth Target ETF Weights



See back page for ETF list

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Cumulative Returns



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DOVISH FED PIVOT: Q4 2018

The S&P 500 touched 2018 highs on September 20, climbing 9.6% YTD. From that peak, the index embarked on its deepest calendar-year drawdown since 2009. By market close on Christmas Eve, it had fallen 19.8% from its high.

While concerns over a trade deal with China weighed on markets, the bigger driver of the downturn was the Fed. Three-quarters of the decline occurred in December, a month in which the Fed made its ninth hike in three years and continued to communicate a hawkish stance, casting shadow of uncertainty on the prospects for economic growth.

MMRP Growth made trades in October and November amidst heightened equity market volatility. On October 9th, as stocks grew more volatile and long-term rates began to rise, the strategy traded reducing exposure to equities and long-term Treasuries, while increasing exposure to gold.

By late November, long-term rates stabilized and began to revert lower. On November 28, the strategy further reduced allocations to equities and gold, while increasing exposure to REITs. This stabilized the portfolio for December as markets plunged dramatically.

Early in 2019 the Fed reversed course, announcing a much more dovish policy stance. As stocks began to rally in the new year, MMRP Growth made two trades. In mid-January, it reduced

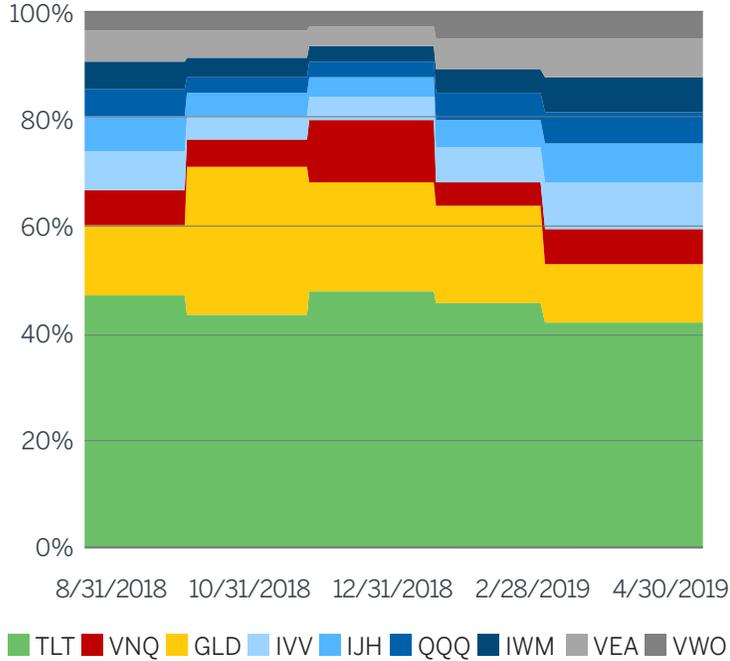
exposure to bonds, gold and REITs, and increased exposure to equities. As Q1 wore on, volatility continued to decline. On March 1, the strategy traded again, further reducing exposure to bonds and gold, and adding to global equity exposure.

Over this highly volatile period, by virtue of its tactical allocation, MMRP Growth outperformed the S&P 500 by 70 basis points, while experiencing about one-third of the S&P 500's volatility and drawdown.

8/31/2018 – 4/30/2019	MMRP Growth	S&P 500 TR
Return	3.5%	2.8%
Volatility	5.8%	17.3%
Drawdown	-5.9%	-19.4%

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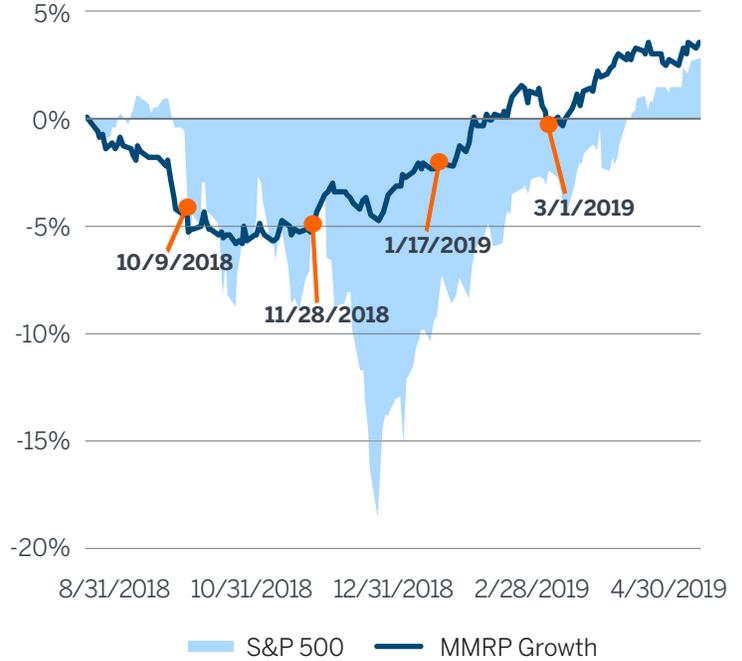
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TLT: iShares 20+ Year Treasury	VNQ: Vanguard REIT	GLD: SPDR Gold Shares	IVV: iShares Core S&P 500	IJH: iShares Core S&P Midcap
QQQ: PowerShares QQQ	IWM: iShares Russell 2000	VEA: Vanguard FTSE Dev'd	VWO: Vanguard FTSE EM	

Performance results are gross of advisory fees.

The S&P 500 Index is comprised of the 500 largest U.S. publicly traded companies.

The S&P 500 Daily Risk Control 10% Index seeks to limit the volatility of the S&P 500 to a target level of 10% by allocating to a cash component.

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