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A Mature-Cycle Playbook

Market volatility may be on the horizon. Here are three liquid and cost-conscious ideas that can help get your portfolio ready.

If your fund is like many multiemployer and public funds, your assets are likely in a diversified portfolio of equities and bonds, with a sleeve of alternative assets.

For some time now, concern has been building about equity market valuations. Earnings remain strong, but as this exceptionally long business cycle matures, the tension is palpable between these positive fundamentals and the potentially disruptive forces of trade conflict, geopolitics, the return of inflation and the withdrawal of ultra-loose monetary policy.

Many investors were jolted out of their complacency earlier this year when the S&P 500 Index rapidly shed 10% on fears that the Federal Reserve would respond to signs of a pickup in inflation with more aggressive rate hikes; as a result, they are now looking for ways to reduce risk. This is particularly true of multiemployer pension plans. Plans in general have come a long way from pre-crisis levels; average funded status was hovering around 50% in 2008 and 75% as recently as 2015.¹ According to Segal Consulting's 2017 Survey of Multiemployer Plans, average funded status today is on stronger footing with about two-thirds of plans maintaining "green zone" status of over 80% funded and less than a quarter in the "red zone."²

In the past, if you thought the business cycle was mature and equities looked expensive relative to the yields you could get from bonds, you could adjust your portfolio allocations from stocks to fixed income. After a post-crisis decade of below-trend growth and quantitative easing, however, bond yields today remain historically low and have not been falling but rising.

In short, neither of the two major asset classes seem to offer particularly attractive value, and both look prone to increased volatility. How can investors prepare for these conditions?

We highlight three potential liquid and cost-conscious ideas for consideration:

1. Collateralized equity index put writing as a way to maintain equity exposure at lower volatility without adding significant interest rate risk
2. Long-short risk premia investing for its low correlation with equities and bonds
3. A risk-parity approach to investing to promote genuine diversification among traditional asset classes

1. Index Put Writing: Lower-Volatility Equity without Adding Significant Interest Rate Risk

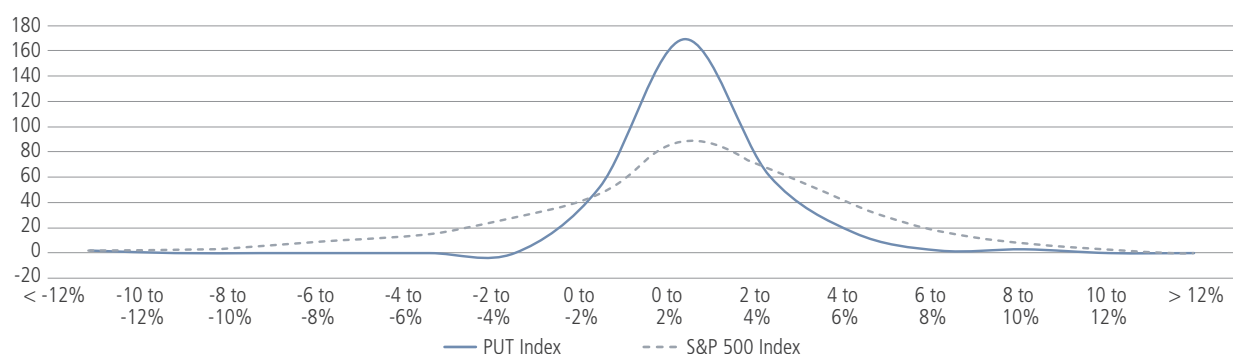
Selling (or "writing") equity index put options, backed by collateral held in high-quality short-term fixed income, is a way to maintain equity exposure that has historically exhibited lower volatility than the underlying equity index itself.

An index put option is a financial contract. It enables the buyer to sell an equity index at a certain price at any point until the contract's expiration. As such, it is like an insurance contract, bought by investors to protect (aka hedge) their portfolios from steep equity market drawdowns. Like all insurance, it commands a premium, which generates an excess return for the writers of the put options.

The size of option premiums—and therefore the performance of the put writing strategy—is related to the volatility of the underlying index; historically, the performance of the CBOE S&P 500 PutWrite Index (PUT), which replicates a systematic collateralized put writing strategy, has benefited, relative to the underlying S&P 500 Index itself, from higher market volatility. At the same time, however, its performance has been less volatile than that of the S&P 500; since 1990 its annualized return has been almost exactly the same, at 10%, but it has achieved that with just over two-thirds of the annualized volatility (see Figure 1).

FIGURE 1. AN EQUITY-INDEX PUT WRITING STRATEGY CAN "CUT THE TAILS" OFF OF THE UNDERLYING INDEX AND LOWER VOLATILITY

Number of months exhibiting a given range of return
December 1990 to July 2018



Source: Bloomberg. The CBOE S&P 500 PutWrite Index was introduced in 2007 by the Chicago Board Options Exchange, and tracks a hypothetical portfolio that every month sells one-month "at the money" put options on the S&P 500 Index, fully backed by short-term U.S. Treasuries as collateral; the index sells another put when the prior put expires; the initial investment amount and all net premiums are invested in short-term U.S. Treasuries. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principle. **Past performance is no guarantee of future results.**

¹ Milliman Multiemployer Pension Funding Study, Spring 2018.

² Segal Consulting data, 2017 Survey of Plans' Zone Status.

RETURN & RISK STATISTICS

December 1990–July 2018

	CBOE S&P 500 PutWrite (PUT)	S&P 500 Index (SPX)
Annual Return (%)	9.85	10.42
Volatility (%)	9.52	13.97
Risk-Adj. Ret.	1.04	0.75
Beta (S&P 500)	0.56	1.00
Max DrawDown (%)	-32.7	-50.9
Up-Mkt. Cap. (%)	63	100
Down-Mkt. Cap. (%)	41	100

Source: Bloomberg. The CBOE S&P 500 PutWrite Index was introduced in 2007 by the Chicago Board Options Exchange, and tracks a hypothetical portfolio that every month sells one-month “at the money” put options on the S&P 500 Index, fully backed by short-term U.S. Treasuries as collateral; the index sells another put when the prior put expires; the initial investment amount and all net premiums are invested in short-term U.S. Treasuries. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principle. **Past performance is no guarantee of future results.**

Why not simply invest in “low-vol” defensive equities or one of the many low-volatility equity products on the market? Why not, indeed? In fact, we would suggest that a collateralized put writing strategy can be employed not as a replacement for but as a complement to traditional low-vol equity strategies.

In seeking to deliver lower monthly return volatilities and drawdowns than their parent index, low-vol stock portfolios typically tend to be biased toward larger index constituents in sectors that tend to have steadier earnings streams and pay higher dividends. For example, they are usually substantially overweight utilities and consumer staples. Historically, such approaches—as represented by the S&P 500 Low Volatility Index and MSCI USA Minimum Volatility Index, for example—have been very sensitive to changes in interest rates, outperforming their parent index when interest rates are falling and lagging when rates are on the rise.

The PUT Index, in contrast, has demonstrated the ability to outperform in both rising- and falling-rate scenarios. Periods of adjustment in the interest-rate regime are often associated with a less directional but higher-volatility equity market, resulting in higher option premiums for put sellers whether rates rise or fall. The PUT Index’s collateral portfolio of cash and short-term U.S. Treasuries, meanwhile, can get a boost from rising rates.

In our experience, achieving attractive long-term investment results typically hinges on maintaining a perspective balanced between historical relationships and present context. As such, we believe many investors would be well served by employing a diversified approach to low-volatility equity investing, the historical benefits of which are evident in Figure 2. Given the recent performance of the S&P 500 and the limited upside participation of put writing strategies, these benefits can persist regardless of future underlying market dynamics. And importantly, the risk-efficiency potential of option strategies can require smaller allocations away from low-cost passive exposures.

FIGURE 2. A DIVERSIFIED APPROACH TO LOW-VOL INVESTING

Return & Risk Statistics

December 1990–July 2018

	CBOE S&P 500 PutWrite (PUT)	S&P 500 Index (SPX)	S&P 500 Low Volatility Index (SPLV)	50/50 Portfolio (PUT & SPLV)
Annual Return (%)	9.85	10.42	11.11	10.97
Volatility (%)	9.52	13.97	10.76	10.21
Risk-Adj. Ret.	1.04	0.75	1.03	1.07
Beta (S&P 500)	0.56	1.00	0.58	0.58
Max DrawDown (%)	-32.7	-50.9	-35.4	-34.5
Up-Mkt. Cap. (%)	63	100	72	71
Down-Mkt. Cap. (%)	41	100	48	48

Source: Bloomberg. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principle. **Past performance is no guarantee of future results.**

2. Alternative Risk Premia: A Source of Uncorrelated Returns

If you consider the return from a U.S. Treasury to be “risk free,” the extra return you can get from equities is the “equity risk premium,” while the extra return you can get from corporate bonds is the “credit risk premium.” These are traditional market risk premia.

Volatility—which as we mentioned is one of the sources of return to an index put writing strategy—is typically known as an “alternative” risk premium. There are many others, and they are extracted using long-short investment strategies. Some come from “factors” such as value (securities with lower valuations tend to deliver higher long-term returns than those with higher valuations) and momentum (securities whose price has gone up recently tend to continue going up, and vice versa). Others are harvested using systematic investment strategies such as put writing (for the volatility risk premium) or selling an acquiring company while holding the target in an acquisition (for the merger risk premium).

Many alternative risk premia have been proposed, but we think investors can get most of the benefit from just a handful when thoughtfully assembled in holistic, multi-factor portfolios diversified across equities, volatility, commodities, currencies and rates. An equity momentum strategy, for example, may seek to capitalize on the tendency for winners to continue to outperform losers in the stock markets by taking long positions in outperforming stocks and shorting the laggards. Meanwhile, a volatility strategy may take advantage of turbulent markets by selling expensive implied volatility through options while recreating cheap realized volatility through futures.

Because strategies designed to access alternative risk premia tend to take a long-short approach, they have typically exhibited market-neutral returns. Moreover, different alternative risk premia have exhibited low or negative correlation with one another—even those extracted from the same asset class—amplifying the potential diversification benefits that can be generated by a thoughtfully constructed portfolio of alternative risk premia exposures. While many alternative long-short strategies command high fees and have lock-ups, alternative risk premia approaches can be accessed in a lower-cost, more liquid structure.

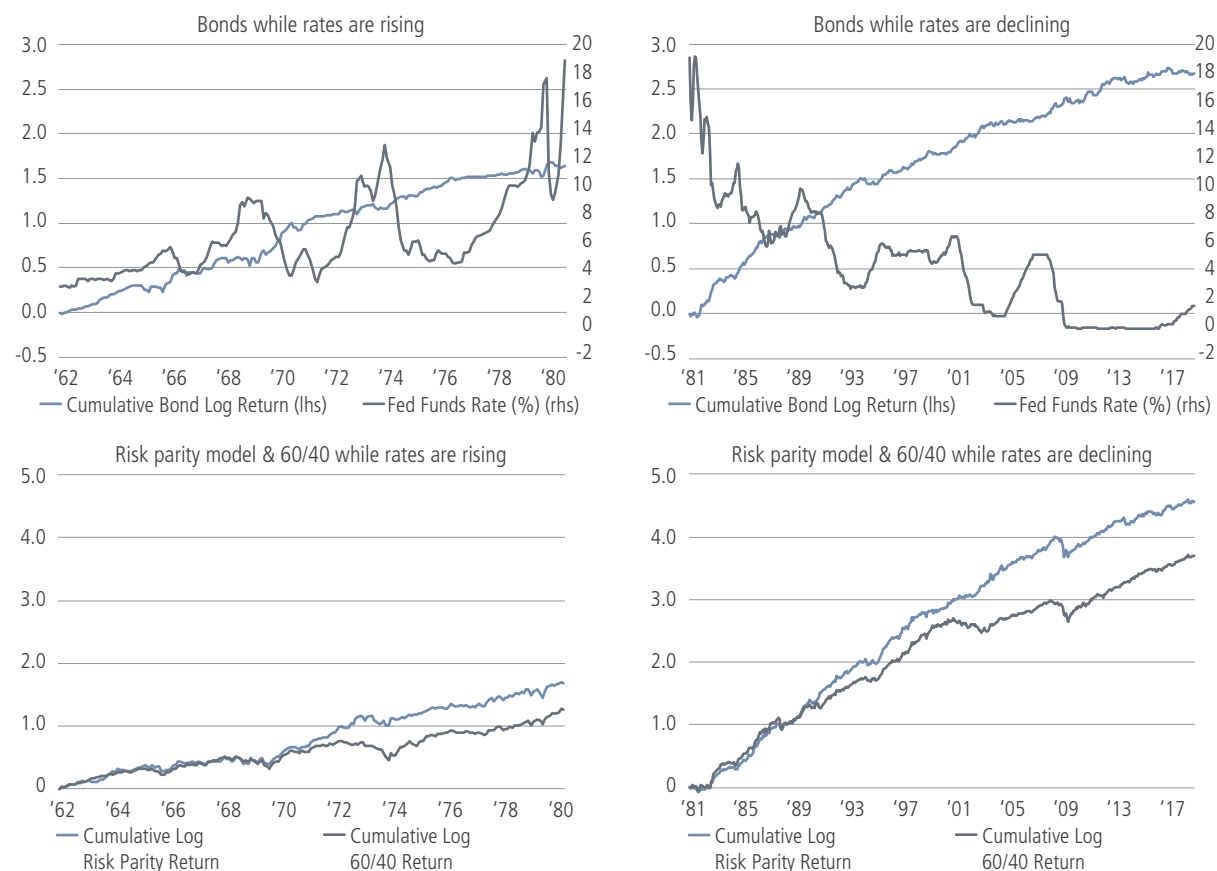
3. Risk Parity: Genuine Diversification of Traditional Market Risks

Having diversified using alternative risk premia, we can still improve diversification between the traditional market risk premia, using the risk parity approach.

Because equities tend to be riskier than bonds, in a capital allocation split equally between equities and bonds, the bond characteristics will be largely drowned out by the equity risk. To get the most efficient benefit from bonds, an investor could weight bonds until their risk contribution is equal to that of the equities. To do that without compromising the return profile, you would need to leverage the resulting portfolio and target typical pension portfolio risk levels. That is risk parity in a nutshell.

Many will have heard risk parity characterized as “leveraged bonds”—which causes concern in an environment where yields are rising. However, in analyzing a hypothetical backtest of a simple model risk parity portfolio of equities, bonds and commodities, we see that the backtested model generated positive returns, and outperformed a 60/40 portfolio (60% S&P 500 and 40% Ibbotson U.S. Intermediate-Term Government Bond Index; assumes monthly rebalancing), not only after 1980 with declining rates, but also with rising rates during the 1960s and '70s—despite higher interest rate exposure and less equity exposure (Figure 3).

FIGURE 3. BONDS—AND RISK PARITY—CAN THRIVE WHEN RATES ARE RISING OR FALLING



January 1963–December 1980	Model Risk Parity	60/40 Portfolio	Stock	Bond	Commodities
Annual Return (%)	9.80	7.28	8.40	4.96	16.77
Volatility (%)	10.80	9.32	14.45	5.43	20.94
Max DrawDown (%)	-14.0	-26.4	-42.6	-8.9	-37.5
Sharpe Ratio	0.39	0.19	0.24	-0.13	0.57
Annual Return / Max DrawDown	0.70	0.28	0.20	0.56	0.45

January 1981–July 2018	Model Risk Parity	60/40 Portfolio	Stock	Bond	Commodities
Annual Return (%)	12.85	10.30	11.25	8.05	7.22
Volatility (%)	9.80	9.29	14.71	6.56	13.99
Max DrawDown (%)	-27.4	-29.6	-50.9	-8.6	-59.9
Sharpe Ratio	0.87	0.67	0.53	0.60	0.28
Annual Return / Max DrawDown	0.47	0.35	0.22	0.93	0.12

Source: Ibbotson Associates, Federal Reserve Bank of St. Louis (FRED database), Neuberger Berman. The model risk parity portfolio includes bonds, equities and commodities, with volatility contributions equally weighted based on two-year trailing realized volatility, and a target portfolio volatility of 10% annualized; bonds are represented by the Ibbotson U.S. Intermediate-Term Government Bond Index, equities by the S&P 500 Index and commodities by the GSCI Commodity Index after 1970, and commodity futures data from Bloomberg pre-1970. 60/40 portfolio consists of 60% S&P 500 Index and 40% Ibbotson U.S. Intermediate-Term Government Bond Index, rebalanced monthly. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principle. **Please see "Hypothetical Backtested Performance Disclosures" at the end of this material. Past performance is no guarantee of future results.**

One reason for this is that bonds have been surprisingly resilient even when rates are rising. It is intuitive that the price of a bond should decline as interest rates go up. But because a bond generates income, it is still possible for it to deliver a positive total return. In June 2018, for example, market pricing indicated that the 10-year U.S. Treasury yield would need to rise by more than 40–50 basis points before it delivered a negative total return. The question for bond investors is not “Are yields rising?”, but rather “Will yields rise faster than the market is currently pricing?”

The other, more powerful, reason is the genuine diversification within a risk parity portfolio. When we look at the worst calendar years for stocks, bonds and commodities since 1960, we find that when equities experienced their worst losses (2008, 1974, 2002), bonds posted good positive returns—and sometimes commodities helped, too. When commodities performed most poorly (2008, 2015, 1981), bonds were positive—and sometimes equities helped, too. When bonds struggled the most (2009, 2013, 1994), equities were positive. When equities and bonds both lost money due to a surge in inflation, in 1969, commodities performed extremely strongly. By balancing the risk contributions of all three asset classes, we can get the full benefit of these natural hedges.

To sum up, risk parity can be a way to achieve genuine diversification between traditional market risks when none of them present clear value—and it may perform much better than expected in a rising-yield environment.

A Powerful Threefold Response to a Challenging Environment

Investors—especially multiemployer pension plans and well-funded health and welfare plans—face a dilemma. The business cycle appears to be maturing, equity markets are becoming more fully valued and market volatility is increasing, but bond yields are rising after a decade of quantitative easing.

The threefold approach of put option writing, alternative risk premia and risk parity can help address this challenge by implementing low-volatility, low interest rate risk equity exposure, uncorrelated alternative risks and genuine diversification between traditional market risks.

We believe these solutions are useful in themselves. In combination, we think they can be very powerful at any time—but particularly in the current conditions.

Hypothetical Backtested Performance Disclosures

The hypothetical performance results included in this material are for a backtested model portfolio and are shown for illustrative purposes only. Neuberger Berman calculated the hypothetical results by running a model portfolio on a backtested basis using the methodology described herein. The results do not represent the performance of any Neuberger Berman managed account or product and do not reflect the fees and expenses associated with managing a portfolio.

The model risk parity portfolio includes bonds, equities and commodities, with volatility contributions equally weighted based on two-year trailing realized volatility, and a target portfolio volatility of 10% annualized; bonds are represented by the Ibbotson U.S. Intermediate-Term Government Bond Index, equities by the S&P 500 Index and commodities by the GSCI Commodity Index after 1970, and commodity futures data from Bloomberg pre-1970. The results assume a minimum investment of \$10 million, monthly rebalancing, no cash allocation, no withdrawals and reinvestment of any dividends and distribution. Model performance figures referenced are shown gross of fees, which do not reflect the deduction of investment advisory fees and other expenses. If such fees and expenses were reflected, returns referenced would be lower.

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Past performance is no guarantee of future results.

Options involve investment strategies and risks different from those associated with ordinary portfolio securities transactions. By writing put options, an investor assumes the risk of declines in the value of the underlying instrument and the risk that it must purchase the underlying instrument at an exercise price that may be higher than the market price of the instrument, including the possibility of a loss up to the entire strike price of each option it sells but without the corresponding opportunity to benefit from potential increases in the value of the underlying instrument. The investor will receive a premium from writing options, but the premium received may not be sufficient to offset any losses sustained from exercised put options.

The S&P 500 consists of 500 stocks chosen for market size, liquidity and industry group representation. It is a market value weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value. The "500" is one of the most widely used benchmarks of U.S. equity performance. As of September 16, 2005, S&P switched to a float-adjusted format, which weights only those shares that are available to investors, not all of a company's outstanding shares. The value of the index now reflects the value available in the public markets.

The CBOE S&P 500 PutWrite Index (PUT) is designed to track the performance of an index option put writing strategy that sells a sequence of one-month, at-the-money, S&P 500 Index puts and invest cash at one- and three-month Treasury Bill rates. The number of puts sold varies from month to month, but is limited so that the amount held in Treasury Bills can finance the maximum possible loss from final settlement of the SPX puts, i.e., put options are fully collateralized.

The S&P 500® Low Volatility Index measures performance of the 100 least volatile stocks in the S&P 500. The index benchmarks low volatility or low variance strategies for the U.S. stock market. Constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights.

The GSCI Commodity Index, published by Standard & Poor's, is a world production-weighted index of the most liquid futures contracts in 24 commodity sectors.

Ibbotson U.S. Intermediate-Term Government Bond Index is a one-bond index that tracks the total return of the shortest non-callable bond with a maturity of not less than five years for one calendar year, before choosing a new bond on the same criteria.

The MSCI USA Minimum Volatility (USD) Index aims to reflect the performance characteristics of a minimum variance strategy applied to the large and mid cap USA equity universe. The index is calculated by optimizing the MSCI USA Index, its parent index, in USD for the lowest absolute risk (within a given set of constraints). Historically, the index has shown lower beta and volatility characteristics relative to the MSCI USA Index.

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