Weathering the Risk Parity Storm: An Alternative Approach to Reduce Duration and Correlation Risk

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Risk parity strategies have historically performed well, but recent struggles, characterized by irregular asset correlations, caused many to question the theoretical underpinnings of the strategy. In this paper we explain how the intelligent application of risk parity's principles has the potential to help institutional asset owners reduce interest rate risk without jeopardizing their return goals. By targeting a lower volatility and reconsidering risk parity's ingredients, investors can potentially create a balanced portfolio that has bond-like returns with lower interest rate risk.

The financial crisis of 2008-2009 laid bare the pitfalls of conventional approaches to asset allocation and portfolio construction. The standard 60/40 portfolio came under increased scrutiny as investors found that equities contributed up to 90% of their risk and the 40% asset-weighted bond position failed to insulate them from significant losses.[1] In response, institutional asset owners shifted their attention towards alternative methods of asset allocation and portfolio construction that had fared relatively well during the financial crisis.

One strategy to garner increased attention is risk parity. Predicated on the belief that *ex-ante* assumptions regarding market outcomes require a significant amount of skill, risk parity states that in the absence of such skill, investors should balance risk in order to achieve stable returns across all market environments. How market environments are defined is a source of considerable debate, and is a topic onto itself. While there may be some disagreement about the schema used to construct a risk parity portfolio, the conventional approach achieves balance by allocating more notional exposure to lower volatility assets such as bonds. The resulting portfolio is then levered to target equity-like volatility, with the intended beneficial side-effect of lower correlations to the equity market.

While some risk parity providers tout it as a new paradigm in portfolio construction theory, in practice few investors have adopted this framework wholeheartedly. Instead, they have used risk parity as a means to reduce pro-cyclical risks in their portfolios. In many cases, investors have used risk parity

[1] "Investing at the Zero Bound: A Role for Alpha in a Balanced Risk Portfolio" January 2015 (Weiss internal educational and research paper)

as an equity substitute due to its unique risk/return profile. In fact, a 2014 survey by Chief Investment Officer Magazine indicated that 59.2% of respondents who have allocated or plan to allocate to risk parity will fund the allocation from their equity bucket.[2] This enabled asset owners to diversify their equity risk while still targeting the same level of returns needed to meet obligations. In effect, risk parity afforded asset owners an opportunity to make their equity portfolio more efficient. Diversifying equity risk was a necessary step for many institutional asset owners, and many asset owners are less exposed to pro-cyclical risks than they had been previously. Still, they face other risks that have not been adequately addressed by a traditional risk parity portfolio.

Bonds in a Low-Rate Environment

Perhaps the most pressing of these risks is the interest rate exposure that many asset owners now carry. With interest rates languishing near historic lows, many asset owners are considering a reduction in their portfolios' duration out of fear that the secular bull market in bonds may be coming to an end.[3] These concerns may indeed be warranted, but bonds remain risky even if rates fail to make a sustained move upward. When interest rates reach the zero bound (and stay there for nearly seven years), bonds can suddenly become more volatile as incremental changes by policy makers can have a profound impact on markets.

The "Taper Tantrum" of 2013 was an example of how small changes by policy makers can wreak havoc on markets. On May 22, 2013, then Federal Reserve Chairman Ben Bernanke hinted that the Federal Reserve may taper its bond and mortgage-backed security purchasing program later that year. His comments were enough to send bond yields soaring as yields on the 10 year US Treasury bond rose over 125 basis points between May and August.[4] **Exhibit 1** illustrates how the rise in interest rates affected short, intermediate and long duration bonds.[5] The short and intermediate duration bonds are levered to mimic the interest rate sensitivity of longer duration bonds, which is typical of many risk parity funds.[6]

All three ETFs posted significant negative returns in both May and June 2013, and the duration adjusted IEF suffered losses in excess of 6% in both months. To make matters worse, asset correlations broke down during the taper tantrum and neither commodities nor equities provided sufficient protection to offset the spike in interest rates.

The Effects on Institutional Portfolios

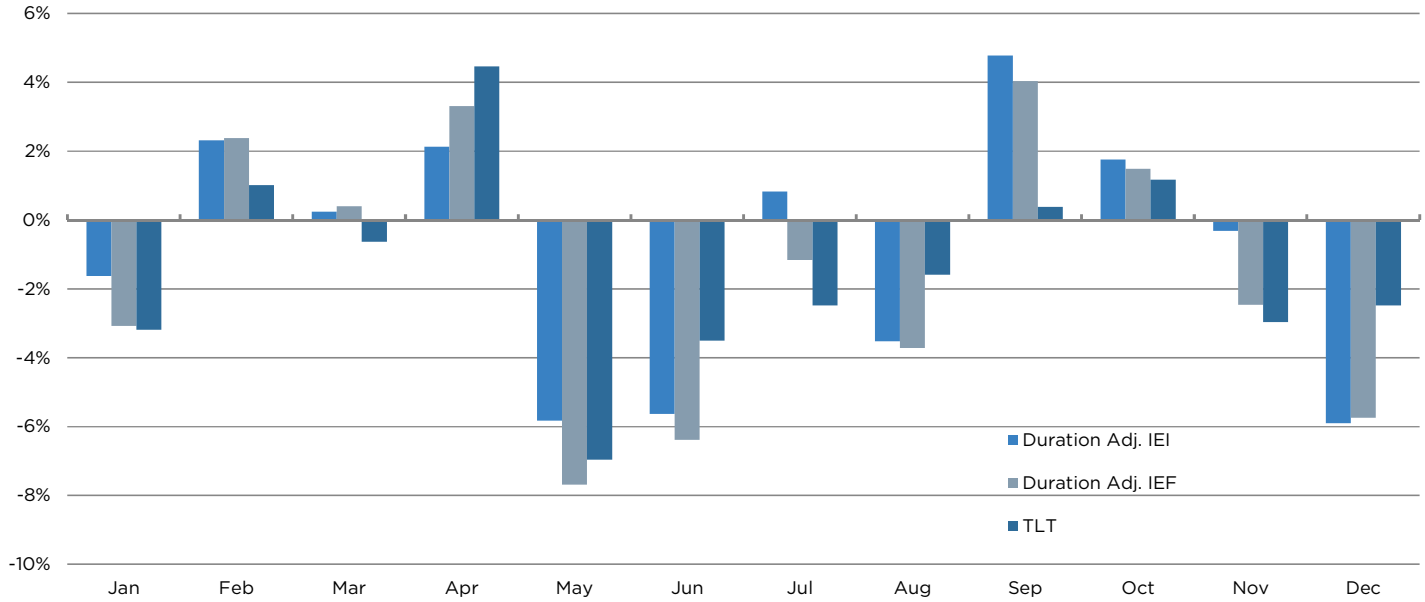
Events such as these are historically rare, but given that rates have been at the zero bound – influencing investors' behavior across asset classes and geographical divides for nearly seven years now – we anticipate more bond market tantrums in the years to come.[7] In fact, a similar episode occurred in August 2015 when equities sold off and bonds failed to offset the losses. As a result, many traditional risk parity funds failed to deliver on their promise of stable returns, regardless of the economic weather. Generally these tantrums are short-lived, but

[2] http://www.ai-cio.com/2014_Risk_Parity_Survey.aspx?page=5
[3] http://www.wsj.com/articles/bond-investors-trade-one-risk-for-another-1437647938

[4] Source: Bloomberg
[5] Proxied by the following three ETFs respectively: iShares 3-7 Year Treasury Bond ETF (IEI), iShares 7-10 Year Treasury Bond ETF (IEF), and iShares 20+ Year Treasury Bond ETF (TLT)
[6] Leverage calculations were based on durations reported on May 1, 2013
[7] Over the last 30 years, the S&P 500 Index and Barclays Aggregate Bond Index have both posted negative monthly total returns 13% of the time. (Source: Bloomberg)

Exhibit 1: Fixed Income Markets Throwing a Tantrum

Monthly Total Returns in 2013



Source: Bloomberg

as we will see, they can have a significant impact on the risk-adjusted performance of institutional portfolios.

On the surface, bond market crises appear to be fairly innocuous, but they can have a pernicious effect on asset owners who must continue to fund liabilities. To understand how even a short-term spike in interest rates can impair institutional portfolios, consider an investor that has 25% allocated to the duration adjusted IEF and a 5% spending rate. **Exhibit 2** suggests that a 100 basis point rise in interest rates would cause a 12.5% loss in the bond portfolio and a 3% loss on the total portfolio, assuming all other assets remain flat. While this loss may not seem significant, the 5% spending rate erodes the principal, making it even more difficult to recoup its high water mark. In this scenario, the portfolio would have to return nearly 9% just to get back above water in dollar terms. These losses may be further exacerbated if equities and commodities fail to provide portfolio protection, as was the case during the "Taper Tantrum". In fact, some question whether commodities will continue to afford any risk premium as we transition to the Information Age.

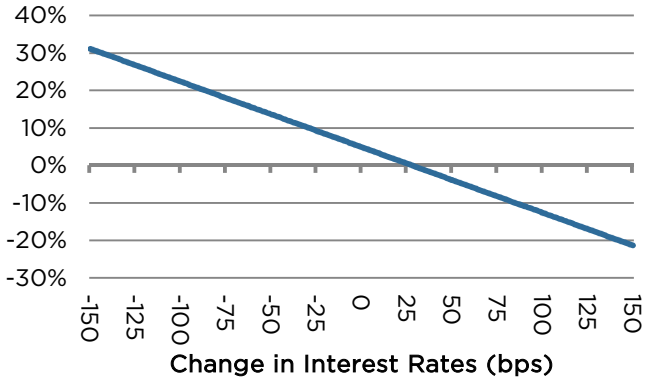
Achieving such high returns in a low interest rate environment is a daunting task, and speaks to the importance of limiting losses in these challenging times. Investors have several options to consider when limiting interest rate risk. One option is reducing duration and moving their bond portfolio to cash and near-cash instruments. This will no doubt limit duration risk, but it comes at the cost of achieving target returns. With the Federal Funds rate between 0.0% and 0.25%, investors cannot afford to make a significant allocation to cash because it will severely impair their ability to meet their return objectives.

A second option is reducing duration and replacing it with credit risk. This is a path that some asset owners have pursued, but it is at their own peril. By incurring additional credit risk, investors are exposing themselves to more pro-cyclical risks – the very exposure many sought to diversify when reducing equity in favor of risk parity. This is

unpalatable since excessive pro-cyclical risk leaves investors vulnerable to a downturn in markets. In effect, investors eschew their risk tolerances and focus on achieving target returns. In order to strike the proper balance between return objectives and risk tolerances, investors must consider unconventional approaches to limiting duration risk. Somewhat counterintuitively, the principles of risk parity may provide a roadmap to achieve this balance.

Exhibit 2: Duration Adjusted IEF Returns[8]

Estimated 1 Year Total Returns



Source: Bloomberg

A More Balanced Risk Parity

When most investors think of risk parity, a balanced portfolio of equities, commodities, nominal and inflation-linked bonds comes to mind, but we believe this is a narrow definition. Instead, investors should view risk parity as a tool that can be applied in various ways to help achieve risk and return objectives. As we have already seen, traditional risk parity has been an effective tool for limiting equity risk while still maintaining return targets. Recall that risk parity achieves its unique risk/return profile by selecting the correct asset classes, risk balancing them, and targeting the desired level of volatility. The resulting portfolio has the potential for equity-like volatility without equity-like correlations. These same lessons can be applied to achieve bond-like volatility without bond-like correlations.

By adjusting the ingredients of a risk parity portfolio and calibrating the volatility, investors can create a return stream that has the potential to increase the chances of meeting risk and return objectives. To create a fixed income substitute, risk parity managers must target a volatility that matches a typical bond portfolio. The long-term annualized volatility of the Barclays Aggregate Bond Index is roughly 4%.[9] In order for a risk parity product to be an adequate bond substitute, it should also have a volatility of approximately 4%. That way, it may provide some portfolio stability when other, more volatile assets behave erratically. This is a necessary condition for creating a bond substitute, but it is not sufficient. Risk parity managers must also reconsider the portfolio's ingredients.

As noted previously, a conventional risk parity portfolio balances risk across equity, commodities, and fixed income instruments. Given that bonds have considerably lower volatility over the long-term, they tend to be assigned a greater notional value. In an interest rate crisis however, volatility on bonds tends to spike and risk parity investors may find that their portfolios are not, in fact, balanced properly. In these scenarios, equities and commodities may struggle to provide the necessary returns to offset losses in the bond portfolio. While some argue that these scenarios are short-lived and therefore not worth addressing, we have already seen how even a short-term crisis can have a deleterious effect on beneficial portfolios. Traditional risk parity portfolios may have a place in asset owners'

[8] Total return estimates are calculated using the yield to maturity and effective duration as of September 1, 2015. IEF has been levered 2.4x to mimic longer duration bonds

[9] Source: Bloomberg

portfolios, but they may not offer sufficient protection from bond market volatility.

A Forward-Looking Approach: Low Volatility Alpha

To help protect against rising interest rates, risk parity managers could introduce a new asset class to their portfolios: moderate volatility alpha. By adding a new, moderate volatility ingredient, less notional exposure is given to bonds and as a result, the effects of a bond market dislocation can be dampened. To be clear, bonds are not eliminated; they still have positive expected returns and correlation benefits, and should therefore be included to create a more efficient portfolio. This is analogous to traditional risk parity being used to de-risk institutional equity portfolios.

While a conventional risk parity portfolio has an equity component, it is balanced with other assets so the effects of a bear market can be lessened. In effect, traditional risk parity seeks to provide equity-like returns without equity-like correlations, meaning it may perform relatively well during an equity market selloff. Similarly, a modified risk parity portfolio that includes moderate volatility alpha and no top-down leverage can have the potential for bond-like returns without bond-like correlations and can therefore be an effective tool to reduce interest rate exposure. Such a portfolio could hold promise for institutional investors looking to limit duration risk in their fixed income portfolios.

To illustrate this point, consider two simple proxy portfolios: one with an alpha allocation and one without. The **traditional risk parity proxy** is composed of 60% iShares 7-10 year Treasury Bond ETF (IEF), 20% S&P 500, and 10% Barclays Commodity Index. It should be noted that the IEF has been levered 2.4x in order to mimic the risks of a longer duration bond. The **alpha risk parity proxy** is composed of 40% unlevered IEF, 30% HFRI blend[10] (the alpha allocation), 20% S&P 500, and 10% Barclays Commodities. The IEF need not be levered in the second proxy portfolio because the alpha component helps investors achieve fixed income-like returns without incurring excessive duration risk.

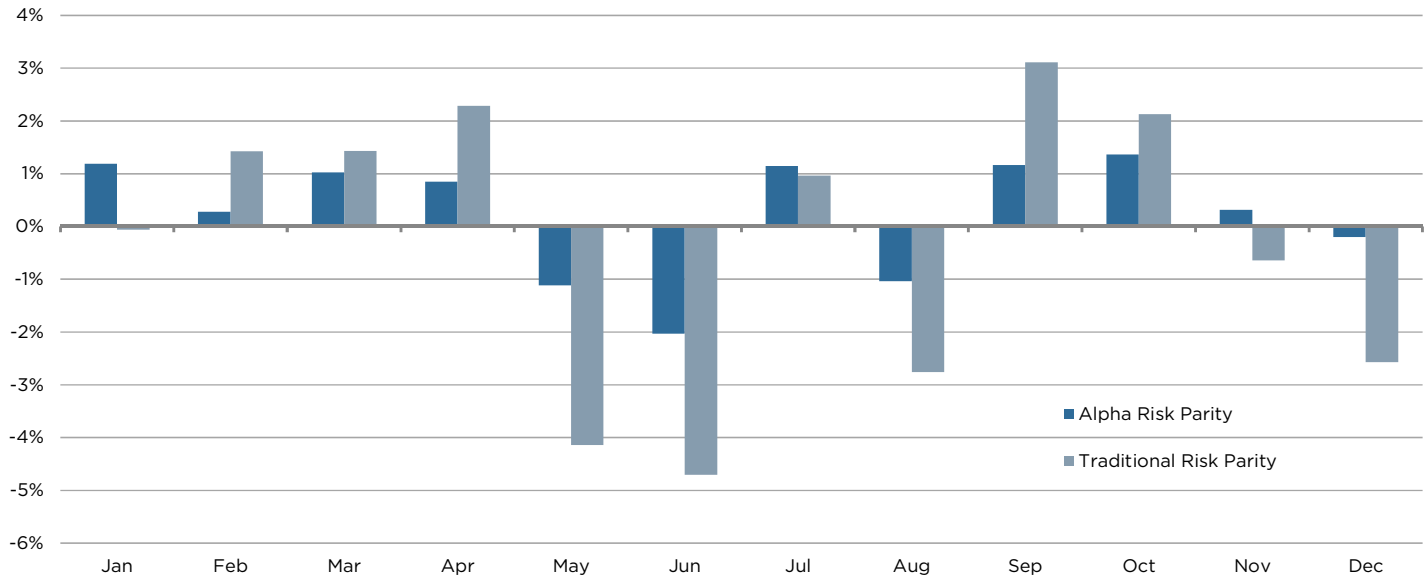
Exhibit 3 shows the performance of both proxies in 2013. The alpha risk parity proxy outperformed the traditional risk parity proxy by 6.78% for the calendar year, and the bulk of this outperformance occurred when the traditional risk parity proxy fell 8.65% during the May - June "Taper-Tantrum" while the alpha risk parity proxy fell 3.13%. Even after accounting for differences in volatility, the alpha proxy outperformed by over 200 basis points during the May-June tantrum.[11] The alpha risk parity proxy may, therefore, afford investors more attractive performance in the event of a bond market dislocation. It also has the potential ancillary benefit of decreased sensitivity to fluctuations in the correlations between bonds and equities. More importantly, it has the potential to help investors avoid steep drawdowns that are exacerbated by the need to fund liabilities, or make spending rate distributions.

Not only did the alpha risk parity proxy outperform during past bond market dislocations, it may also deliver attractive risk adjusted returns once interest rates reach the zero bound. Since the equity market lows in March 2009, the alpha risk parity proxy outperformed the traditional risk parity proxy by nearly 340 basis points annually after adjusting for differences in volatility.[12]

[10] HFR Blend is composed of 70% HFRI Equity Market Neutral, 15% HFRI Macro, and 15% HFRI Relative Value Arb
[11] The alpha proxy was levered 2x to match the 9% annualized volatility of the traditional risk parity proxy
[12] Source: Bloomberg

Exhibit 3: 2013 Taper Tantrum Revisited

Monthly Total Returns of Alpha Risk Parity vs. Traditional Risk Parity



Source: Bloomberg

This point is further illustrated by examining the summary statistics for each proxy over the same period. For example, the volatility adjusted alpha risk parity proxy has less negative skew (-0.15 vs -0.24) and lower excess kurtosis (-0.07 vs. 0.27). This suggests that once interest rates reached the zero bound, the alpha risk parity proxy has not felt left tail events as acutely as traditional risk parity proxy.

And although the traditional risk parity proxy is likely to outperform when declining bond yields are a tailwind, there is evidence to suggest the alpha proxy may produce stronger results when rates are near the zero bound. As a result, the alpha risk parity option may afford investors a more efficient way to achieve target returns in a zero-bound interest rate environment.

Key Insights

While risk parity has historically delivered strong risk-adjusted returns, it is not a panacea. Using traditional risk parity products to reduce interest rate risk is a dangerous application of risk parity's principles, but these same principles can be applied to create a more efficient fixed income substitute. By targeting a fixed income-like volatility and incorporating moderate volatility alpha, risk parity managers can engineer a return stream that may help asset owners achieve their risk and return goals.

This modified risk parity portfolio is designed to have the volatility of a bond with disparate correlations to traditional asset classes, and may therefore be an effective way to reduce duration risk in fixed income portfolios. In addition it has the potential to be an effective means to avoid drawdowns during a bond market dislocation, thereby improving asset owners' ability to meet liabilities. Alternatively, it may offer investors more attractive risk adjusted returns in a zero bound interest rate environment. For asset owners with excessive fixed income risk, this

non-traditional version of risk parity may be a solution.

While this article is for educational and research purposes only, Weiss Multi-Strategy Advisers LLC offers non-traditional risk parity solutions. Please feel free to reach out for additional information.

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