



UNDERSTANDING RISK PARITY

The Clifton Group
A Division of Parametric
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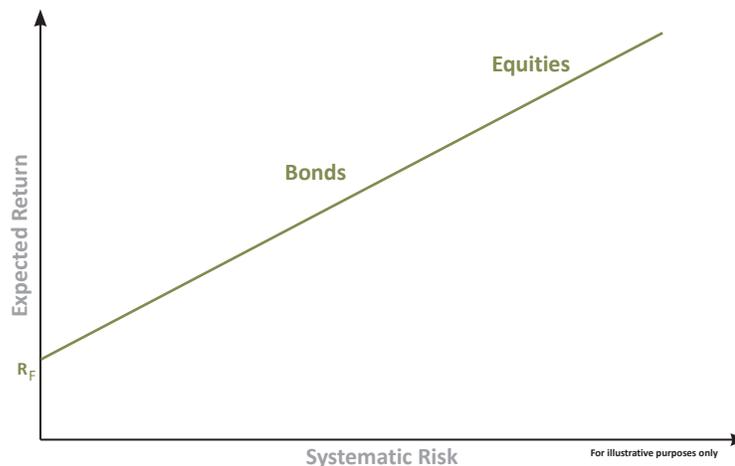
The most important decision any investor makes, ahead of manager or security selection, is a portfolio’s asset allocation. A decade of challenging markets, particularly for equities, has led to growing investor interest around risk parity. This article seeks to explain what risk parity is and how it offers investors the potential to achieve superior risk adjusted returns relative to a portfolio with a traditional asset allocation. This article also identifies the key differentiators among the various risk parity strategies, and addresses some common investor concerns about the strategy.

WHAT IS RISK PARITY?

“The social object of skilled investment should be to defeat the dark forces of time and ignorance which envelope our future.”
John Maynard Keynes

In its simplest form, risk parity seeks to balance the contribution to total portfolio risk from each asset class that composes a diversified portfolio. A traditional 60% equity / 40% fixed income portfolio, which is the base of many investors’ portfolios, is not diversified. Approximately 90% of the risk in this traditional portfolio is concentrated in equities, due to the fact that historically equities have been three times more volatile than fixed income securities. Risk parity seeks to avoid this concentration of risk through the construction of a more diverse, risk balanced portfolio.

Figure 1: Securities Market Line

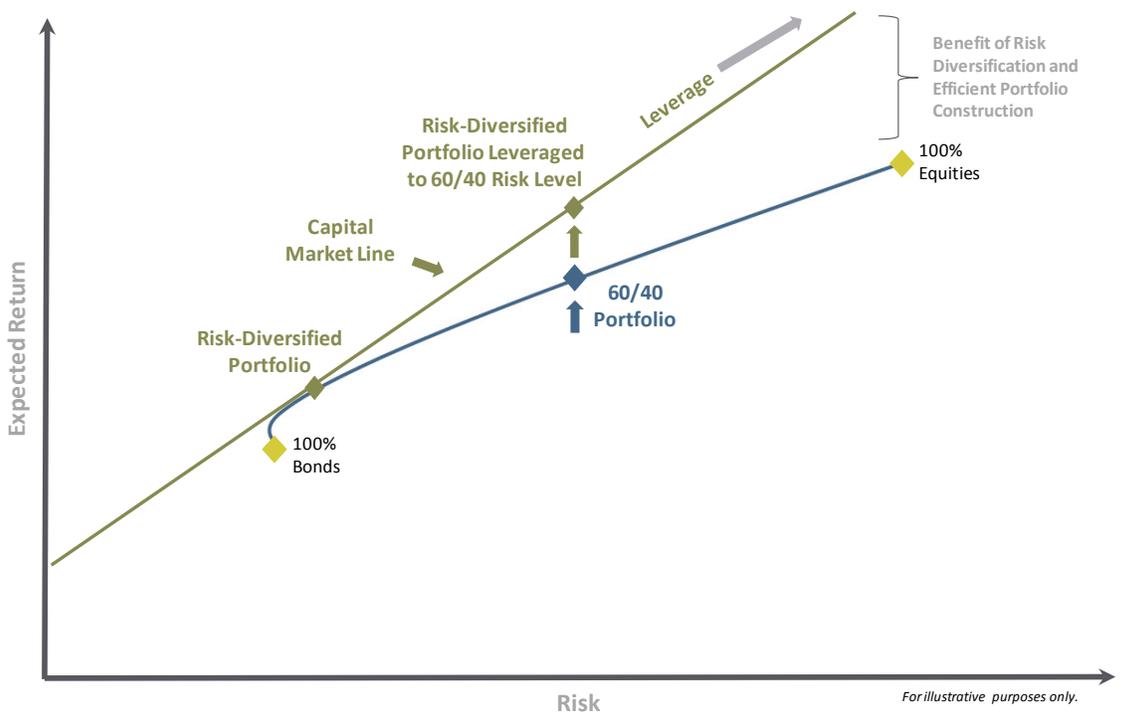


Risk parity’s theoretical underpinnings come from the same Modern Portfolio Theory (MPT) that underlies traditional portfolio asset allocation. If one believes that there is a consistent long-term relationship between risk and return, as represented in **Figure 1**, then the asset classes that fall along the securities market line (SML) are assumed to all have similar risk adjusted returns over time.

In other words, if the expected returns for equities and fixed income securities were adjusted according to their respective levels of risk, then the excess return¹ expected from equities would equal the excess return expected from bonds. This theory holds true when the slope of the SML is constant. Economic theory supports this outcome to the extent that the SML represents the capital structure of a dynamic economy. According to the theory, if any component of the capital structure were to become significantly more efficient at delivering returns than another, free market forces would respond and remove the advantage.

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Figure 2: Why Risk Parity?



If one accepts the premise that the risk adjusted returns of all asset classes are equivalent, then a portfolio holding diversified asset classes that each contribute equally to risk should produce superior risk adjusted returns relative to a traditional 60/40 portfolio. This point is defined in **Figure 2** above as the Risk-Diversified portfolio. This portfolio depicts the maximum diversification benefit from holding the various diversified asset class exposures. However, it includes significant allocations to lower risk, lower expected return assets, like bonds. Consequently, this portfolio would not meet the return expectations of most long-term investors. These investors compensate for the expected return shortfall by gravitating up the efficient frontier towards portfolios that are comprised of higher allocations to riskier assets (e.g. 60/40 portfolio). This move is executed with the expectation of achieving higher returns, however, the outcome is the surrender of diversification benefits.

¹ Excess return is defined as the expected return above a cash return.

Risk parity is designed to help investors maintain a portfolio with significant risk diversification benefits while still meeting their return expectations. This result is achieved through the prudent use of leverage. Specifically, leverage is employed within the Risk-Diversified portfolio to move it further up the capital market line to the point where it becomes risk equivalent to the 60/40 portfolio. The resulting levered Risk-Diversified portfolio has a higher expected return than the 60/40 portfolio with an equivalent amount of risk. Some have argued that if all asset classes can be adjusted to contribute the same total level of risk and therefore similar expected returns, then choosing between asset classes is no longer important. This is not the case. If all asset classes had the same expected risk, then the selection of which asset classes to include in the portfolio should be driven solely by the asset class's diversification benefit. Put another way, if the question of expected return is removed from the portfolio construction process, then the focus is shifted to managing risk through portfolio diversification.

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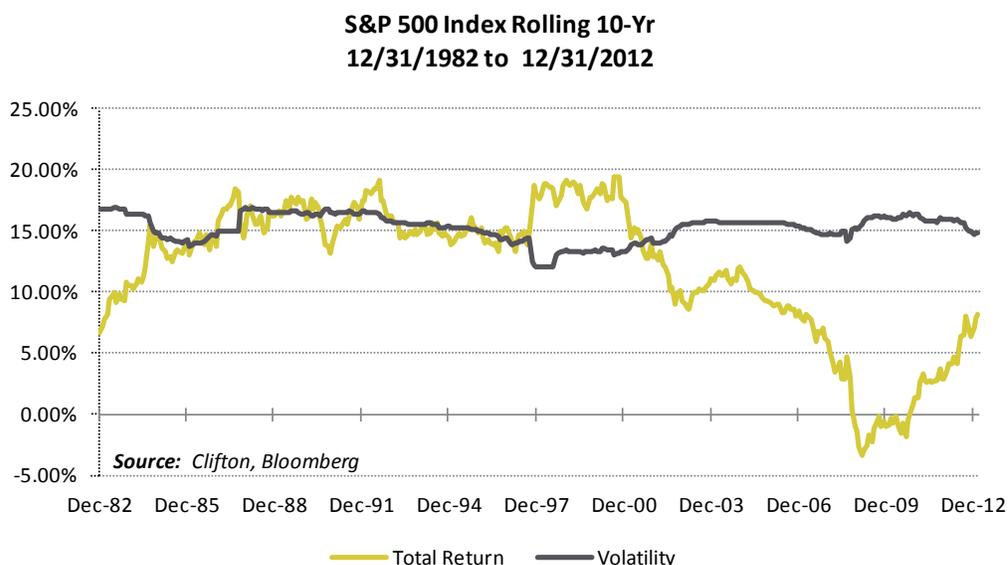
A less discussed, yet important, advantage of a risk parity approach is its potential to realize significant incremental returns through rebalancing. The amount of excess return generated through rebalancing is a function of asset class volatility and diversification. All else equal, the more volatile and diversified the assets within a portfolio, the more value that can be created through rebalancing. In the risk parity portfolio, assets are selected based on their diversification benefits and levered up or down to achieve target volatility. This construction process creates an ideal environment for systematically harvesting gains in the portfolio through rebalancing.

It is worth noting that a risk parity strategy can target any level of portfolio risk and thus excess return. Theoretically, an investor with a relatively long time horizon would prefer to target a higher level of risk, while an investor with a shorter time horizon would be inclined to seek a lower level of risk. Both investors would hold the same asset classes and thus own similarly diverse portfolios. The only difference between the portfolios would be notional exposure required to achieve the investor's target risk level.

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Most risk parity strategies target a 10% level of realized risk. This is the level of risk historically exhibited by the traditional 60/40 portfolio. At this risk level, a risk parity manager generally expects to generate 6% of annual excess return. Over the last 25 years, a traditional 60/40 portfolio has generated approximately 4% of annual excess return.

Figure 3: S&P 500 Index Rolling – 10 years



HOW ARE RISK PARITY STRATEGIES DIFFERENTIATED?

Constructing a portfolio based on risk and diversification benefits requires measuring an asset class's risk and its correlation to other asset classes. The normal measure of risk for an asset class is its annualized standard deviation of returns over some defined period. There is a decision to be made, however, with respect to the appropriate time period over which to measure the standard deviation. A short-term measure of risk may capture changes in risk regimes, but is dependent on the manager selecting the correct time frame. As **Figure 3** illustrates, a long-term measurement of risk will miss these short-term changes in risk regimes, but should lead to a more accurate measure over time, as volatility is mean reverting. Choosing an appropriate time period for measurement depends on how the investor thinks of the portfolio. An investor looking for a tactical strategy with a component of active risk will be more open to an approach that measures risk over shorter time horizons. Conversely, an investor seeking a strategic investment approach with minimum active risk will gravitate towards strategies that measure risk over longer periods.

Correlations provide another point of differentiation between risk parity strategies. **Figure 4** shows the rolling correlation between the S&P 500 and US Treasuries. As this chart illustrates, correlations are not stationary. In fact, asset class correlations change dramatically through time. A risk parity manager must carefully consider correlations between various asset classes in constructing a diversified portfolio. As **Figure 4** demonstrates, static estimates of correlations are problematic. Forecasting future correlations is a complex exercise that is fraught with challenges.

Figure 4: Correlation between S&P 500 and Treasuries



A risk parity investor should understand how its manager addresses correlations in the portfolio construction process, as this decision has the potential to introduce a significant amount of active risk into the strategy.

An alternative to explicitly calculating historical asset class correlations is to take fundamental economic drivers into account. Factors such as growth and inflation or, more specifically, how those economic variables perform relative to expectations, are primary drivers of asset class returns. A manager could therefore construct a portfolio with asset classes that react differently to changes in these economic variables and achieve a high degree of diversification. This construction process does not require an explicit estimation of asset class correlations. A risk parity investor should understand how its manager addresses correlations in the portfolio construction process, as this decision has the potential to introduce a significant amount of active risk into the strategy.

COMMON CRITICISMS OF RISK PARITY

Like all investment strategies, risk parity has its detractors. One common criticism is that this strategy requires leveraging low-risk assets, primarily bonds. Risk parity allocations create an overweight to bonds in order to equalize the contribution to risk from all asset classes. Levered bond strategies performed well over the last several years as interest rates declined sharply since the onset of the financial crises in 2007. Risk parity critics note that given today's interest rate environment, investors should have tempered expectations for the performance of their bond holdings in the future.

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These critics may miss the objective of a risk parity approach, which is to have equal contributions to risk from all asset classes in the portfolio. The purpose of seeking equal contributions to risk from varied asset classes is to limit the potential economic impact to any one asset class in the portfolio. By equally weighting risk across a broad array of other asset classes such as equity, real estate, credit spreads, commodities, and inflation bonds, risk parity is not dependent solely on bonds as the source of diversification or return. It is important to note that a rise in interest rates would impact a risk parity strategy in different ways, depending on why interest rates were rising.

A gradual rise in interest rates as a result of a period of economic stability and prosperity would be positive for a risk parity approach. Although bonds may underperform in this environment, growth assets such as equities, real estate, and credit spreads would likely exhibit above average performance. If interest rates rise in response to increases in inflation expectations, a risk parity approach should benefit from exposure to inflation sensitive asset classes such as commodities and inflation linked bonds. In summary, because diversification is central to a risk parity strategy, there will likely always be some asset classes in the portfolio performing below expectations. However, at the same time other asset classes may well be performing above average. **The goal of the strategy is to allow the investor to collect the average risk premium across all asset classes over time in the most efficient manner possible and thus realize a superior risk adjusted return.**

Another criticism leveled at risk parity is that it often employs leverage. Risk parity strategies target a total level of portfolio volatility commensurate with an investor's risk and return objective. To achieve this objective, a risk parity strategy may employ economic leverage in the form of futures contracts and financial leverage in the form of repurchase agreements and over-the-counter swaps. At a 10% risk target, it is not uncommon for a risk parity manager to have 200% cumulative exposure. This amount of leverage is required to equalize the risk contribution from low-risk assets like nominal and inflation linked bonds.

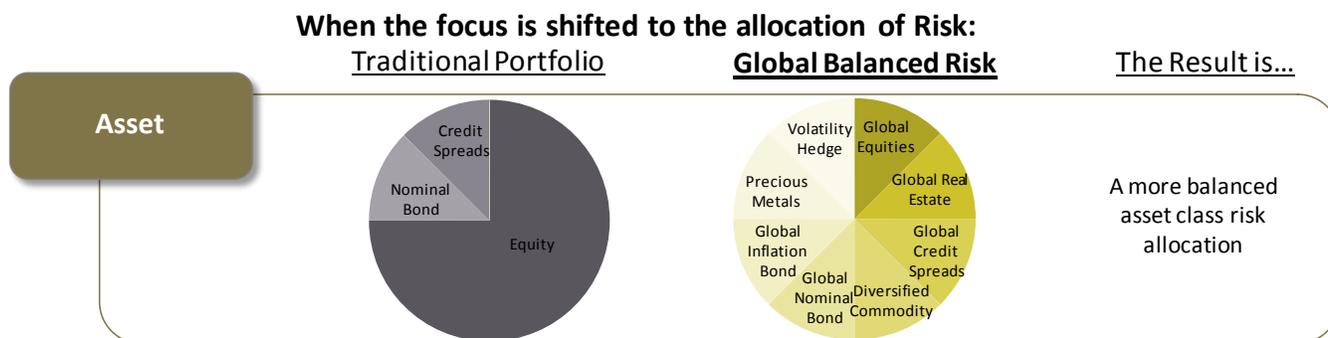
Leverage by itself is not a problem. Anyone who has used a mortgage to finance the purchase of a home has been exposed to leverage. What is critical is how that leverage is managed. It is here that the diversification prevalent within the portfolio and the operational and implementation experience of the manager are important. Diversification must be considered not only at the total portfolio level, but also among the various asset classes that are levered within the portfolio and therefore may require daily liquidity. Proven operational experience in managing leverage is key to risk parity managers. This experience should include having systems in place to monitor leverage levels on a real-time basis and developed plans for managing the strategy through challenging market environments. Assuming the diversification and experience criteria are met, the amount of leverage employed in a risk parity strategy should not create excessive risk to the investor.

RISK PARITY IN PRACTICE

The Clifton Group’s Global Balanced Risk (GBR) strategy is a risk parity approach designed around 8 fundamental exposures. Like several other risk parity strategies, GBR targets a 10% volatility with the expectation of realizing a 6% excess return. Figure 5 provides a summary of the risk exposures included in the GBR strategy.

GBR targets a 10% volatility with the expectation of realizing a 6% excess return.

Figure 5: Risk Parity Process



Source: The Clifton Group, For illustrative purposes only.

For the most part, the asset classes included in the GBR strategy such as equities, government bonds, corporate bonds, and commodities are fairly common to most risk parity strategies. However, the GBR strategy also includes an allocation to volatility. On a standalone basis, being long volatility has an expected cost. Within the context of a broadly diversified portfolio, however, volatility aids in reducing risk by providing downside protection in extreme environments. The inclusion of volatility also allows the strategy to be less dependent on nominal rates as the sole offset to growth assets like equity and credit spreads. On a net basis, an allocation to volatility is expected to improve the risk-adjusted performance of the portfolio.

The GBR strategy is actively constructed but implemented in a disciplined, rules-based manner. In this regard, GBR would qualify as a passive approach, as it is exposed to a minimum amount of active risk. As previously noted, most risk parity strategies require leverage, and GBR is no exception. Futures are the primary instrument used to gain leverage in the strategy. Exchange traded futures offer the benefit of liquidity, transparency, and minimal counterparty risk.

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All of these characteristics are important, as liquidity and rebalancing is a key component of the strategy. Rebalancing adds value through a mean reversion process that controls risk exposures of the various asset classes within narrow bands. Most often, this process requires the manager to sell assets that have performed relatively well and symmetrically purchase assets that have performed relatively poorly. Importantly, rebalancing also provides a risk control by forcing the portfolio to reduce exposures in a negative environment as the manager controls risk relative to the capital base. This type of trend following rebalancing forces the manager to decrease exposures in extended negative environments. Bilateral swaps may not be as liquid and flexible as an instrument to manage this rebalancing process, but futures make this approach possible.

CONCLUSION

This article presents arguments that support a risk parity approach to investing. The history of asset management is all about evolution. After the great depression, equities were considered speculative and prudent investors held portfolios heavily weighted towards fixed income. In the early 1960's investors began to gravitate back towards equities with a balanced framework that ultimately moved them to what has become known as the traditional 60/40 allocation which is at the core of many investor's portfolios. This traditional benchmark allocation has been the mainstay for many investors until the recent financial crises. The crises helped investors to understand that the 60/40 portfolio was not "balanced". Risk parity represents a new incarnation in the investment allocation process. Although the concepts related to equalization of risk and diversification are not new, all of the benefits of a portfolio with these characteristics have not been broadly understood. At the highest level, risk parity attempts to deliver superior risk adjusted returns through the construction of a risk-balanced portfolio. If done correctly, theory supports that the risk-balanced or risk parity portfolio can achieve this desired objective.

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