GREENLINE PARTNERS

Margin of Safety in Asset Allocation: Unlevered Risk Parity

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Executive Summary

Experienced investors understand that managing risk is the most important driver of long-term success. Yet traditional asset allocation models are blind to this fact, as they rely on a single asset class, namely equities, for their success. While a decade of flat returns for equities (including two 50+% loss periods in our new century) has reminded investors of the benefits of diversification, change in behavior is only just beginning.

Risk parity, as a technique for asset allocation, has emerged as the most fundamentally sound solution for improving diversification by allocating adequate risk (not capital) to more diversifying asset classes such as Treasury bonds, inflation-linked bonds, commodities and corporate credit. Risk parity promises, and has largely delivered, consistent returns through greater diversification. But in order to achieve this diversification, all risk parity solutions that we have seen rely on the use of leverage, primarily through the derivative markets. History has shown that this leverage can be difficult to manage and maintain through volatile market environments, some of which are the same environments in which risk parity is expected to perform.

However, risk parity and leverage *do not* have to be synonymous, even at the return targets required by long-term investors such as family offices, pensions and endowments. Unlevered implementations can offer potentially higher returns, with lower risk and far greater tax efficiency (if relevant) than both traditional asset allocations and conventional levered risk parity approaches. ***Instead of being forced to sell and de-lever after a drawdown, an unlevered portfolio can take advantage of lower asset prices by systematically rebalancing into the most depressed assets therefore being more likely to benefit from a recovery in markets*** when it occurs. Furthermore, because it is not limited to the exposures offered in the derivative markets, an unlevered risk parity portfolio can utilize a broader range of securities to be even more diversified. Other benefits from removing leverage include no borrowing costs, lower transaction costs, greater tax efficiency and fewer operational risks.

This paper introduces the application of a risk parity framework to managing portfolios without leverage, and the resulting benefits from this approach.

Original Risk Parity Framework

Risk parity has its roots in the efficient frontier and mean-variance optimization models first conceived in the 1950's. Today, there is over $1 trillion of assets invested in strategies labeled as Risk Parity[1]. These strategies vary in style from passive asset allocation to active trading to fund of hedge funds. The only commonality we have observed is that they all size positions based on some measure of risk (instead of

[1] http://www.ai-cio.com/datasurvey.aspx?id=3198&page=1

capital). Below is a brief review of the risk parity framework and its application to long-term strategic asset allocation.

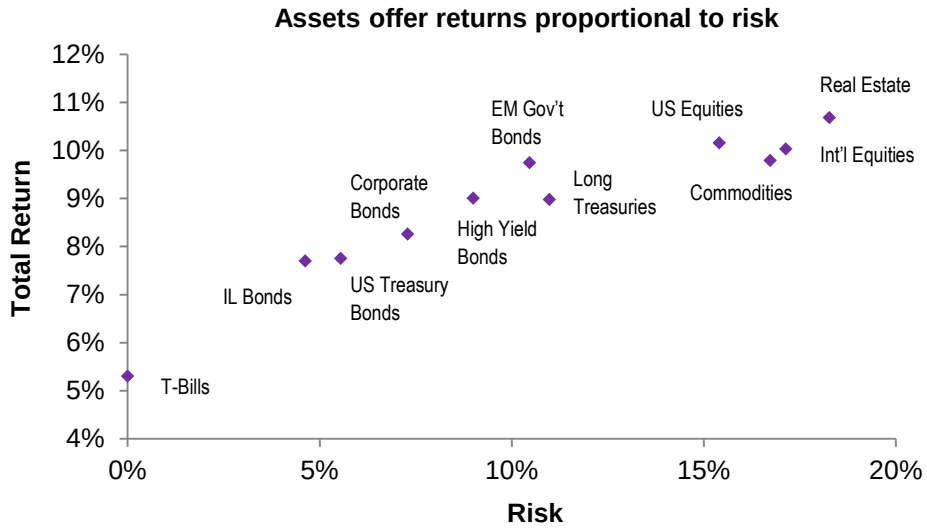
There are only two primary assumptions underlying the most robust risk parity frameworks:

1) Risky assets offer a return above cash over time, roughly proportional to their riskiness
2) Fundamental economic factors, such as growth and inflation, drive the relationship between asset classes

While some claim that there are many risk factors and assumptions behind risk parity constructions, our research and experience show that the most time-tested and dependable approaches are built on fewer assumptions and rely on only a few primary risk factors.

<u>All Assets Produce a Return Above Cash</u>

Risk assets such as stocks and bonds promise returns in exchange for taking risk. This is both logical and supported by long data histories across time and place. The chart below shows the historical returns of major asset classes. Returns have been proportional to risk, as we would expect. For example, ***riskier bonds such as EM Bonds and long maturity Treasury bonds have produced returns comparable to equities.***



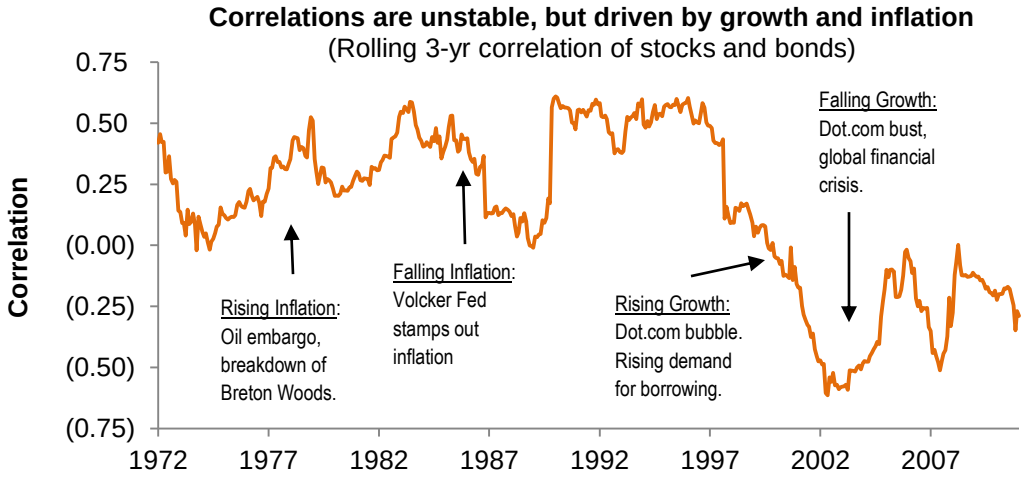
Past performance is not a guarantee of future results. Source: MSCI, Barclays, Wilshire, Federal Reserve. Data from Jan 1970 to Jun 2014. Where asset class data begins later, data has been backfilled using comparable asset class data.

Applying the first assumption in the risk parity framework, we see that there is no need to concentrate exposure in a single asset class since all assets should produce returns approximately proportional to their risk. Since all assets are good, if we take into account the riskiness of each asset to size its impact, we can begin to engineer portfolios that should earn returns far more consistently than concentrated portfolios.

Once we accept the fact that risky assets should earn a return above cash, then the next question is "How do we combine these assets into an optimal portfolio?" Most investors start with statistical correlation, even though we all know that correlations are unstable and unreliable.

Risk Factors Drive Correlation and Inform Asset Allocation Model

In 2008, in the midst of the financial crisis, virtually all asset prices were falling. Diversification as defined by statistical measures such as correlation had failed. This period of time opened the eyes of many and proved that statistical measures are not reliable and therefore not useful in portfolio construction. The chart below illustrates this concept with the rolling correlation of stocks to bonds since 1970. No one number in this wide range from almost -1.0 to +1.0 would be useful for portfolio construction. What is more useful is an understanding of how fundamental drivers, growth, inflation and risk premiums, drove this correlation.

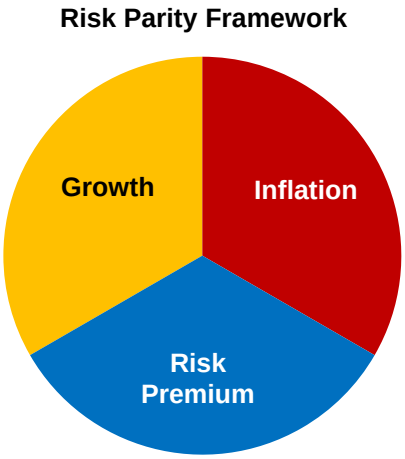


Past performance is not a guarantee of future results. Stocks are represented by the MSCI USA Equity Index and bonds by the Barclays US Treasury Bond Index. Source: MSCI, Barclays. Data from Jan 1970 to Jun 2014.

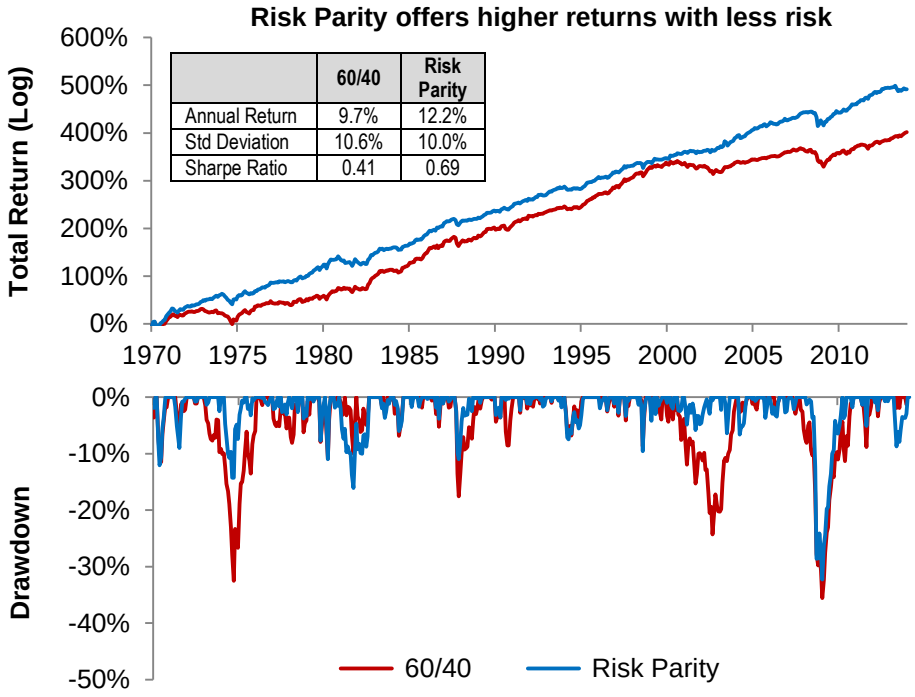
All assets are simply a series of expected future cash flows. And the value of these cash flows is determined by three factors: 1) ***growth expectations*** for these cash flows, 2) ***inflation expectations*** that discount them to a present value and 3) a ***risk premium*** which is compensation for taking risk, or technically speaking part of the discount rate for all assets. All of these factors are part of the basic present value formula as shown below.

$$Present\ Value = \sum \frac{Cash\ Flow\ (1 + Growth)}{(1 + Inflation + Risk\ Premium)^n}$$

These primary drivers of asset prices, growth, inflation and risk premiums explain the changes in correlations as shown above. Understanding that these three factors are the primary drivers of assets prices, leads logically to an asset allocation framework which allocates *risk* across these factors as shown below. While all assets are influenced by all three risk factors, the objective is to allocate assets based on which environment they should perform best in. For example, stocks outperform when growth expectations are rising (e.g. late 90's dot.com era) and Treasury bonds outperform other assets during a flight to quality when risk premiums are widening (e.g. 2008 global financial crisis). These are just a two examples of assets that can be included in this framework.



These are dependable relationships to expect from assets over time and the results of allocating risk across the three primary environments speak for themselves both over their long-term back tests (below) and actual performance histories from the previous two decades[2]. The chart below shows results for a risk parity portfolio engineered to target 10% annual volatility (a risk level similar to a 60/40 traditional allocation). This portfolio achieved higher returns and with less risk, as illustrated by depth and length of drawdowns, than a traditional equity heavy portfolio.



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There are a growing number of risk parity managers that use investment frameworks that all differ on the margin. We have studied the performance differences between the major players and have found their

[2] The first risk parity strategies were created in the 1990's, http://en.wikipedia.org/wiki/Risk_parity

return characteristics are actually all very similar and their risk allocations are roughly consistent with the above allocation. Most of the difference between them will therefore come down to thoughtful implementation.

Most of the risk parity strategies we have studied appear to deliver consistent results over long periods in simulations. However, current implementations rely on the use of leverage, which comes with risks that call into question the validity of the historical simulations. For example, if instead of riding the snapback in markets during 2009, a risk parity manager had been forced out of their leveraged positions in 2008, these simulated results would overstate their actual return advantage over a traditional portfolio.

Risks with Leveraged Risk Parity

> "A long, long time ago a friend said to me about leverage, 'If you're smart you don't need it, and if you're dumb, you got no business using it.'"
>
> - ***Warren Buffett on financial leverage***

The higher returns promised by conventional risk parity approaches require the use of leverage. It is common for these risk parity strategies to use the futures markets for equities, global interest rates, and commodities to construct portfolios, typically using 2-4x leverage with some even using significantly more (as has been observed over time, irresponsible managers often figure out ways to imprudently use more leverage until this behavior leads to the next crisis).

There are a few benefits to using financial leverage but more often many more problems that eventually dominate end results[3]. The most important of which is that ***leverage always works against you.*** This is due to the fact that leverage acts as a drag on returns both on the way up and more importantly on the way down. The example below illustrates the math of using financial leverage for a portfolio that starts with 2x leverage (conservative compared to many risk parity strategies). As a result of how leverage magnifies market movements, ***the portfolio manager is always lagging the market***. In the first column, after a gain, to maintain leverage, the portfolio manager is forced to buy more assets at higher prices. And in the second column, after losses, to reduce leverage back to target, the portfolio manager is forced to sell at lower prices. Furthermore, this example does not even take into account the costs of using leverage, which we address further below.

Leverage Always Works Against You

	25% Gain	**25% Loss**
Starting Capital	$100	$100
Required Notional Exposure (2x)	$200	$200
+ Return	+$50	-$50
= Ending Capital	$150	$50
Ending Leverage	1.6x	3x
Action Required to Maintain Leverage	Buy assets at higher prices	Sell assets at lower prices

While the drag on return during a rising market can be meaningful, forced selling into a rapidly declining market can also lead to complete ruin. When forced selling driven by losses on leveraged assets (whether housing or stocks) becomes a broad market phenomenon, it leads to the disastrous domino effect that was experienced in 2008 which forced risk parity managers to cut positions at the worst

[3] The main benefits we know of are the ability to increase returns, primarily for non-taxable investors, and the additional liquidity that derivative markets add to large investors and active traders.

possible time. And if near blow up was not enough, this delevering caused them to miss much of the run up in markets in 2009.

The table below compares an unleveraged portfolio to a leveraged one in a volatile market environment. While ***the moderately levered portfolio was promising twice the gains of the unlevered portfolio, it actually lost 4 times as much!***

Levered Portfolio Does Not Recover From Loss

	2x Levered Portfolio			Unlevered Portfolio	
	Period 1: 25% Loss	**Period 2: 25% Gain**		**Period 1: 25% Loss**	**Period 2: 25% Gain**
Starting Capital	$100	$50		$100	$75
Leverage Factor	2.0x	2.0x		1.0x	1.0x
Notional Exposure	$200	$100		$100	$75
+ Return	-$50	$25		-$25	$18.8
= Ending Capital	$50	$75		$75	$93.3
Ending Notional	$150	$125		$75	$93.3
Ending Leverage	3.0x	1.67x		1.0x	1.0x
Net Profit		**-25%**			**-6%**

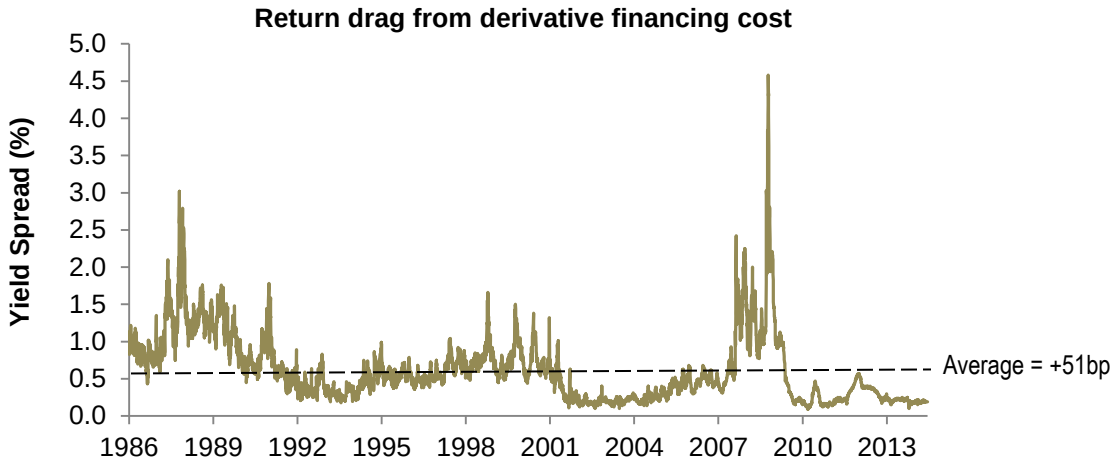
It is easy to see how the 25% loss on the levered portfolio is a permanent loss that will be difficult to recover from in order to catch the unlevered portfolio[4].

Some portfolio managers attempt to pre-empt such large drawdowns by predicting market volatilities in an effort to reduce portfolio leverage *before* losses occur. But of course this in complete conflict with the premise of risk parity and strategic asset allocation, which is that no one can reliably predict the future. Predicting volatility is just market timing and just as likely to fail. Even the best market timers are right only 60% of the time. This means 40% of the time they are wrong. ***With a levered strategy, it only takes being wrong once to destroy your long term results.***

Costs of Leverage

Maintaining financial leverage through the inevitable ups and downs of markets is something we expect few to successfully manage through. And even for those who are adept or fortunate enough, there are other costs to maintaining leverage that slowly chip away at returns and eventually compound into a meaningful drag on performance. One such cost is the financing cost built into most derivative contracts. Most futures and forward markets are priced relative to the LIBOR rate, which is thought of as a benchmark risk-free rate[5]. But LIBOR has an embedded credit spread which can be seen by comparing it to the yield on a similar maturity Treasury bill. Collateral held against derivatives is typically held in the most liquid T-Bills or cash earning little to no return, leading to a cost and therefore a drag on returns. ***This financing cost historically would have resulted in a 0.51% drag on returns compared to buying and holding a comparable security.*** The chart below additionally shows how this credit spread fluctuates over time and spikes during times of market distress indicating a large drag on returns.

[4] In our 3Q 2014 client letter, titled "Not All Losses Are The Same" we wrote about the difference between permanent and temporary losses
[5] LIBOR is the London Interbank Offer Rate. Since it is the rate at which banks lend to each other it is not truly risk-free like lending to the US Government. Hence a comparable maturity US Treasury Bill should always have a lower yield than LIBOR.



Source: Federal Reserve

In addition to this financing cost, there are additional transaction costs to holding derivatives, which are not present for physical securities. While the traditional risk parity strategies designed to be strategic asset allocation portfolios tend to make only modest rebalancing adjustments to their asset exposures, they primarily use derivative markets to achieve the required leverage. Derivatives such as futures contracts need to be traded every few months as contracts mature, resulting in transaction costs. We estimate that these costs per futures contract can range from 5-80 BP per year depending on the market. An investor buying the same exposures in physical securities that could be held for many years would all but eliminate this drag on returns. ***When one adds the additional financing and transaction costs of a levered strategy, its return advantages over even a traditional asset allocation begin to diminish.***

Counterparty Risk and Risk of Ruin

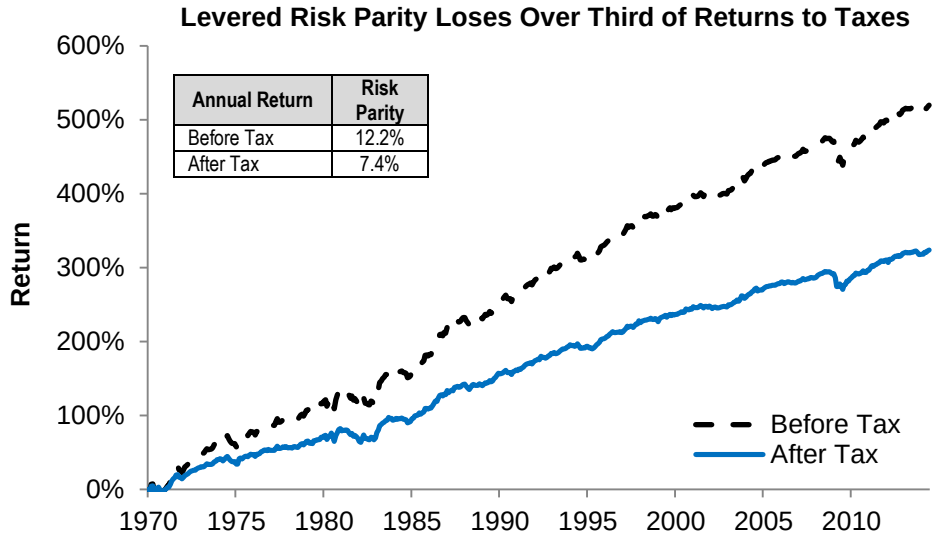
The spikes in borrowing costs in the chart above are driven by periods of market volatility and financial crisis, introducing another form of risk of ruin. Borrowing money via the derivatives market (explicitly or implicitly) introduces counterparty risk. This is the risk that one side fails to pay the other. Either the lender fails to deliver funds (or calls them back early) or the borrower fails to repay. Both of these events are most likely to happen during a financial crisis, when defaults rise, lenders stop lending, and cash is king. In these environments, many are forced out of their levered positions and the survivors are those who own their assets free and clear. The direct owner needs only for their security to perform, the levered owner's performance relies on both the underlying investment and the counterparty.

Tax Inefficient

For taxable investors there is the additional cost of taxation. We have written extensively about the challenges for taxable investors to achieving real after-tax returns from most portfolios[6]. Traditional risk parity portfolios holding derivatives are highly tax inefficient and therefore not suitable for taxable investors. Taxes act like very high performance fees on a portfolio, the more you can lower this fee and the longer you can defer it, the better. Derivatives offer neither of these benefits. They are taxed at rates higher than long-term capital gains rates and since gains are realized as frequently as daily (on futures) there is no ability to defer taxes. ***High and frequent taxation destroys the ability to compound returns.***

[6] See white paper titled "Hurdle Rate for Active Management", August 2014

The chart below shows our long-term simulation of a traditional levered risk parity portfolio, holding primarily derivatives, both before and after tax, for an investor subject to the current highest Federal income tax rate (an investor subject to State income taxes would see even further erosion of results). As a reference point, the average yield on a risk-free T-Bill over this time period was 5.4%. Taxable investors would have fared only slight better than cash in the bank, before fees, and therefore been far better off holding only tax-free municipal bonds.



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Applies current Federal top bracket income tax rates and long-term capital gains rates and assumes 10% annual turnover. Data from Jan 1970-Jun 2014.

While the large risks with traditional risk parity implementations are evident, they can be overcome. The risk parity framework as it was originally conceived provides a robust analytical approach for asset allocation which did not exist prior. The benefit of applying this framework is the potential to earn returns more consistently and through more widely varying environments than traditional asset allocations. The remainder of this paper introduces techniques to engineer unlevered risk parity portfolios that can produce more dependable results with less risk (both before and after taxes) than a levered approach.

Unlevered Risk Parity

The power of the risk parity framework is not only its real world effectiveness but also the flexibility with which it can be applied. It is this flexibility that allows one to engineer portfolios that are equally well diversified at varying levels of target risk. Below we discuss techniques for how to remove leverage as part of engineering portfolios that target even high risk and return levels.

Leverage comes in two forms, financial and economic leverage. Financial leverage is the kind used by most risk parity strategies wherein they borrow short term (implicitly through derivatives or explicitly through margin and repurchase agreements) to achieve greater market exposures and therefore returns. We have discussed only some of the shortcomings of financial leverage and the events of 2008 were a reminder to many of its additional dangers. Economic leverage on the other hand is more powerful as it comes with many of the benefits of financial leverage (greater return potential) but without the high costs and potentially catastrophic results. The table below summarizes some of the differences.

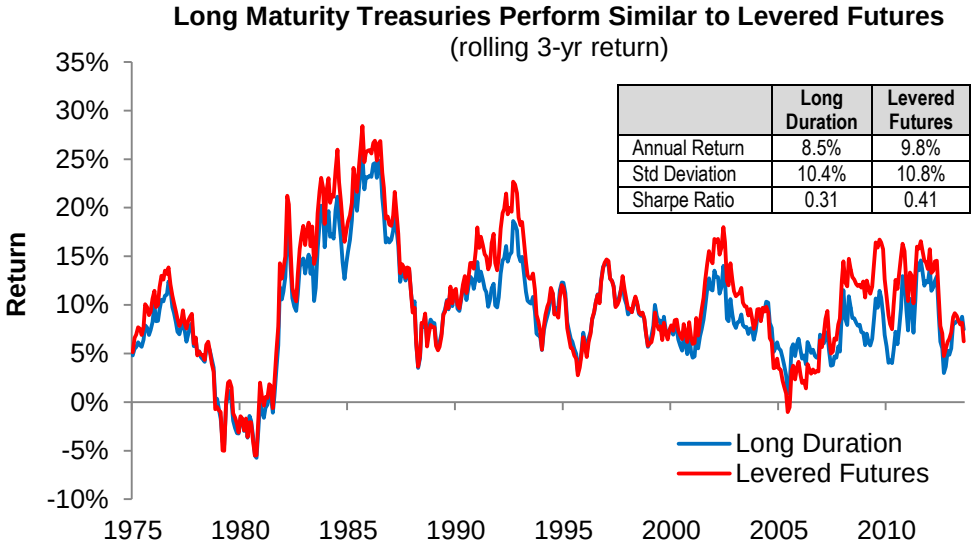
Advantages of Economic Leverage Compared to Financial Leverage

	Financial Leverage	Economic Leverage
Term	Short term	Unlimited
Cost	Low to High	Zero
Availability	High	Low to Medium
Counterparty Risk	Yes	No

Below are two examples of the economic leverage embedded in securities. These are just some examples of how the financial leverage in risk parity portfolios can be replaced with more dependable and lower cost sources of the same exposure.

Economic Leverage: Long Duration Bonds

The basis of the risk parity framework is that return is proportional to risk. In the fixed income world, this is the same as saying that return is proportional to duration. Bonds of longer maturity and duration should offer higher returns than shorter maturity, lower duration bonds. Similarly, higher duration exposures achieved through leverage (e.g. Treasury futures) should offer similar returns to long maturity bonds with comparable duration. This makes logical sense and has been true historically. The chart below compares the returns of 20+ yr maturity US Treasury bonds to duration-matched US 10-yr Treasury futures (2-3x leveraged). As we can we see, their returns are largely the same and are all but perfectly correlated.



Source: Barclays Long US Treasury Bond Index and Barclays US Treasury Bond Index duration-matched. Data from Jan 1973-Jun 2014.

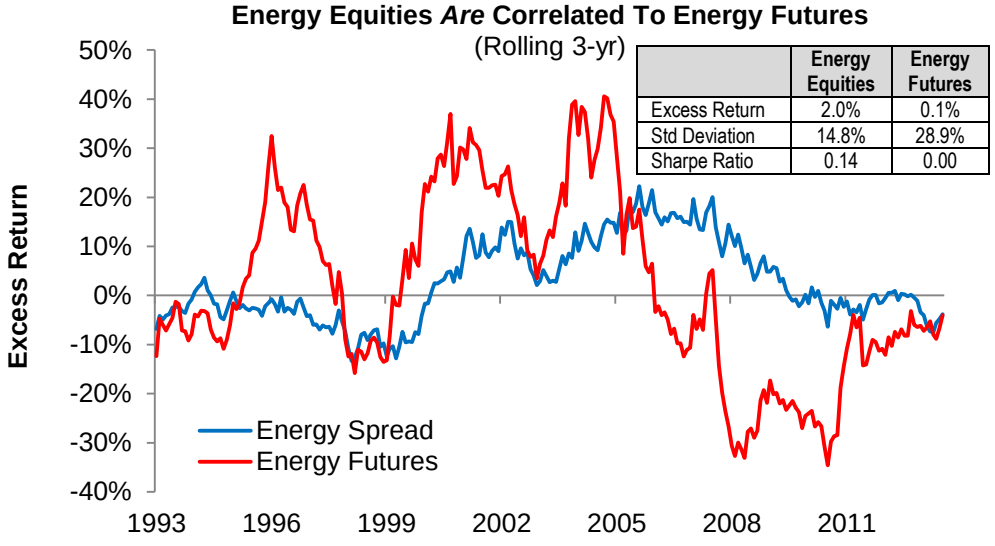
The returns on the levered Treasury portfolio were slightly higher than long bonds in the simulation. But note how the slight difference in returns comes as bond prices rise, or as *interest rates fall*. ***Given the current level of interest rates, we do not think it is logical to expect the same benefit to levered bonds going forward.*** Additionally, this simulation does not count the real world trading costs to maintain the leverage, rolling futures contracts and the drag on returns of leverage always working against the investor.

Economic Leverage: Commodity Producer Equities

A second example of utilizing economic leverage is commodity producer equities. For example, energy companies come embedded with two exposures, 1) equities (they are exposed to the same factors that impact most businesses) and 2) energy prices as they own energy in the ground and their profits are tied to fluctuations in energy prices. As a result, every dollar invested in an energy company gives you exposure similar to buying an equity index overlaid with energy futures (i.e. economic leverage). Risk parity strategies generally hold both equity and commodity exposures via the futures markets (i.e. financial leverage). One can combine these equity and commodity exposures into a single holding in commodity producer equities to generate similar results.

Many studies point to the fact that commodity companies are only moderately correlated to commodity futures markets, but commodity futures are uncorrelated to equities. These studies are often used to suggest that commodity futures are more diversifying to equities and offer better protection against rising inflation than commodity companies. But this is measuring the wrong correlation. To appropriately compare commodity companies to commodities, one needs to strip away the embedded equity exposure. Only then can we assess whether we get the desired inflation protection from commodity equities. We have done these studies going back to the 1920's (let us know if you would like to see the results) and ***commodity companies, across all sectors of commodities, do outperform other equity sectors during periods of rising inflation and therefore provide the desired inflation protection.***

Specifically comparing energy equities and energy futures, the chart below illustrates the exposure one gets to energy through equities compared to that obtained through futures. The energy equity spread is obtained by measuring the excess return of energy sector equities above that of a broad equity index. And similarly for commodity futures, we are isolating their excess return above cash. As we can see, both energy equity spreads and energy futures generally rise and fall at the same time, during periods of rising and falling inflation respectively. The exposure through equities though delivers this exposure with less volatility and higher return. Again this does not take into account the extra costs of trading and maintaining energy futures exposure which would have further reduced their returns.

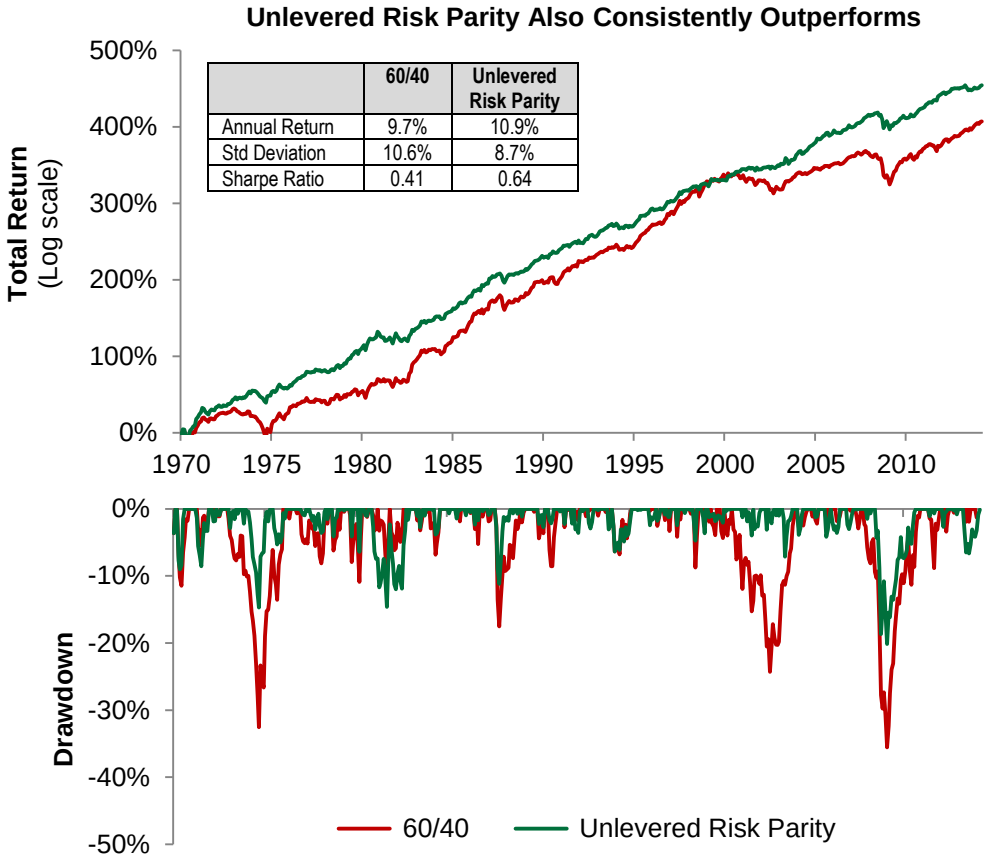


Source: Energy futures is DJ-UBS Energy Sub-Index Excess Returns. Energy Spread is S&P Energy Index minus MSCI USA Equity Index. Data from Jan 1991-Jun 2014.

The economic leverage in long maturity Treasury bonds and commodity producer equities are only two examples of how to replace unreliable and costly financial leverage in risk parity portfolios. One only needs to get creative to find innumerable ways to improve diversification through introducing economic leverage in portfolios.

Higher Returns, With Less Risk and No Leverage

We have already shown how a levered risk parity portfolio can produce consistent and higher returns than a traditional portfolio concentrated in equities. The natural question is then can a similarly designed unlevered portfolio also provide the same benefits? The chart below shows that an unlevered risk parity portfolio also delivers more consistent and higher returns with significantly less risk than a traditional 60/40 portfolio. Instead of relying on derivative markets and borrowing like the levered risk parity portfolio above, the portfolio below is engineered using physical equities and global long duration nominal and inflation-linked fixed income.



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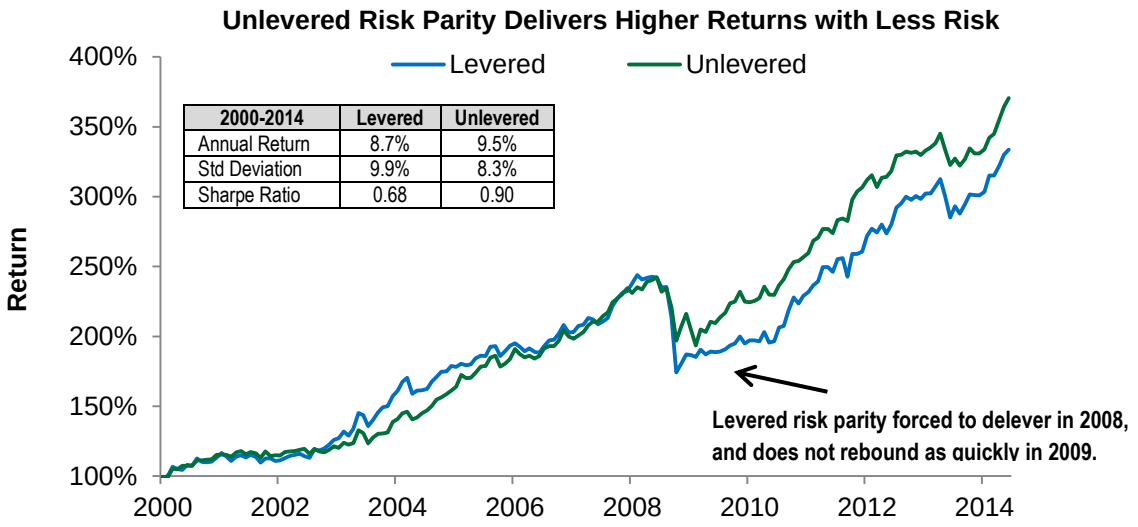
This result should not be surprising. Traditional portfolios are concentrated in equities with a smattering of low return, low risk assets that lower both the return and risk of an otherwise all equity portfolio. On the other hand, unlevered risk parity, is a combination of assets all offering equity-like returns hence resulting in a portfolio offering higher returns as well. Risk parity uses the power of dependable diversification to significantly reduce risk without giving up return, rather than traditional portfolios that lower risk primarily by lowering expected returns.

Can an unlevered implementation outperform a comparable levered portfolio? If we compare the simulations in the earlier chart showing levered portfolio returns of 12% compared to the almost 11% above, it would appear that the unlevered portfolio does not keep pace. But these back tests do not include all of the costs, return drags, and risks of using financial leverage that we have discussed and therefore likely overstate what we would have experienced and should expect in the future from the levered portfolio. Furthermore, if we take a closer look at the results of both portfolios since 2000, which includes two periods of significant equity drawdowns and removes biases of older and simulated asset class data (e.g. US TIPS did not exist before 1997) we see what we believe is a more realistic result and a better informed expectation of the future.

The chart below compares the returns of levered risk parity to an unlevered portfolio with comparable exposures. We can see that the results for both portfolios are very similar except during the global financial crisis in 2008 and 2009. During this short period, the levered portfolio incurred a larger drawdown and was forced to reduce exposures at the bottom. It therefore did not recover as well in 2009 when asset returns turned positive again. This is exactly the environment when the use of leverage leads to permanent loss of capital. Additionally, this simulation does not incorporate the added return drags incurred by a levered portfolio, which would have only resulted in greater losses.



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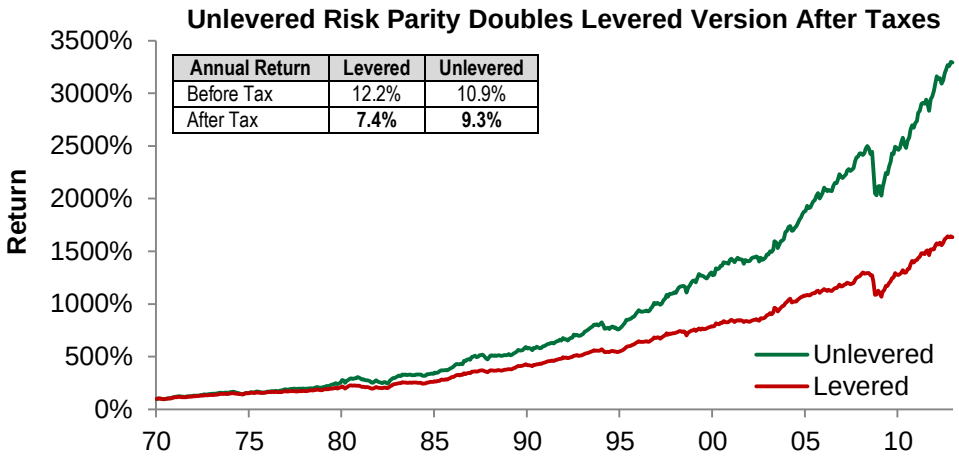
Despite having recently lived through a period where the catastrophic effects of financial leverage came dangerously close to taking our entire financial system down, the rapid growth in levered strategies suggest this period has become a forgotten memory for many.

An unlevered portfolio is more cost efficient and has no risk of forced sales after incurring losses. This is the making of a truly timeless strategy for earning the higher return for your assumed risk, which is the promise of the risk parity framework

Tax Efficiency and Other Benefits

There is an additional significant advantage to taxable investors of holding securities instead of trading derivatives. The simple truth about taxes is that if you can lower your tax rate and defer taxes for longer,

you improve your after-tax returns, exponentially. Naturally then an unlevered portfolio of securities that permits incurring taxes at lower long-term capital gains rates instead of short-term income tax rates and deferring taxes for multiple years (which derivatives do not permit) is far better for the bottom line of taxable investors. The chart below shows that over time we ***expect an unlevered risk parity portfolio to earn almost 2% higher returns per year after tax. This is twice the net profits over 40 years.***



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The advantages to an unlevered portfolio of minimal risk of permanent loss and improved tax efficiency are only the start. ***Investing in an unlevered portfolio of securities instead of leveraged portfolio of derivatives also offers additional diversification and customization potential.*** There are far more securities than there are derivative contracts (in sheer number, not notional value) allowing a portfolio manager more flexibility to build better portfolios than even the ones shown in the above hypothetical results. One example is within the equity markets. The derivative markets (at least the most liquid ones) are largely market capitalization weighted index futures such as S&P 500 contract. It is well known that the single biggest flaw with such indices is their tendency to become concentrated in a single stock or sector (e.g. tech sector in 2000) at the exact time when these securities are most overvalued. Risk parity portfolios that use such derivatives are susceptible to this concentration risk and the resulting lower returns. Managing individual stocks and sizing them based on a framework that increases diversification should further improve the results for an unlevered portfolio by forcing diversification at all times.

For taxable investors, another benefit of using individual securities is the freedom to customize and achieve even greater tax efficiency. For example, one could substitute tax-free municipal bonds for the nominal government bond and credit exposure within a risk parity portfolio to further improve tax efficiency while still delivering the consistent returns of the risk parity approach. Other techniques such as tax loss harvesting can also more flexibly be incorporated when there are more individual securities in a portfolio that are relatively lowly correlated to each other.

Conclusion

The Risk parity framework is a leap forward for portfolio construction. The original goal of the framework was to overcome the risk of frequent and prolonged drawdowns incurred by traditional equity heavy portfolios. Said another way, the framework allows one to prepare for an uncertain economic future

without needing to predict it. But ***levered implementations that rely on derivatives introduce a risk of ruin that we believe goes against this original goal.***

Using leverage and derivatives comes with many risks and costs. The most important being the risk of forced selling *after* incurring losses in order to maintain leverage targets. The improved diversification and higher returns promised by applying financial leverage to lower risk and return assets can be achieved through utilizing the economic leverage embedded in securities and without any of the associated financial and operational risks and costs.

This is not to say that an unlevered portfolio will always be better than using leverage and derivatives. Derivative markets, due to their extremely large notional size and high liquidity, serve a purpose in efficient hedging of unwanted risks and in strategies that require frequent trading. For implementing a short-term trading strategy in large size, derivatives may be the most efficient choice for implementation. Also, as we could see in the results comparing the different risk parity implementations, the levered portfolios performance will vary some from an unlevered version, and therefore, have occasional periods of outperformance. But over the long term, through the most volatile market environments, it is only logical that an unlevered portfolio should win out.

Investing involves assuming risk. Building a margin of safety into every layer of your investment process is a critical step in successfully and most efficiently taking risk. ***A margin of safety starts with building a fundamentally diversified portfolio, which the risk parity framework is designed to do.*** It also requires prudent implementation using an unlevered approach that can truly withstand the test of time.

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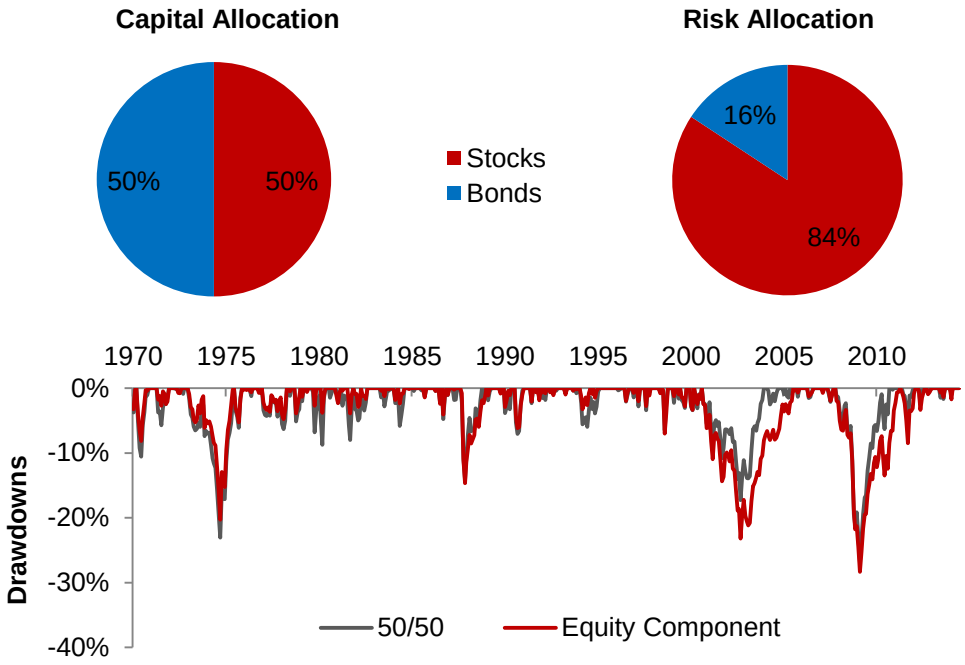
Appendix: Traditional Asset Allocation

Traditional approaches to asset allocation and portfolio construction are centered on concentrating portfolios in asset classes that are expected to offer returns near the target return desired by an investor. Diversification is secondary and often thought of as allocating small allocations to lower risk and lower return asset classes in order to bring total portfolio risk down at the cost of also lowering total portfolio return. This approach typically results in bond-heavy allocations for investors needing lower returns and equity-heavy allocations for investors needing higher returns. But the problem with all of these portfolios is that they are not diversified - their risk is concentrated in a single asset class. Therefore, if that asset experiences a decade or longer stretch of poor performance (as all asset classes have experienced over time), the resulting low returns for the investor will almost certainly reduce the likelihood of the investor reaching their long-term goals.

While these traditional portfolios may have seemed adequate during the rising markets and high growth and tame inflation of the 1990's, only when volatility reared its ugly head did the risk of being overly concentrated become more widely apparent. Below we illustrate this concentration risk by showing the difference between the capital allocation of a 50/50 stock + bond portfolio and its risk allocation. As you can see, the portfolio's risk is dominated by stocks and therefore, not diversified. As expected, the return pattern was similar to a portfolio of all stocks.

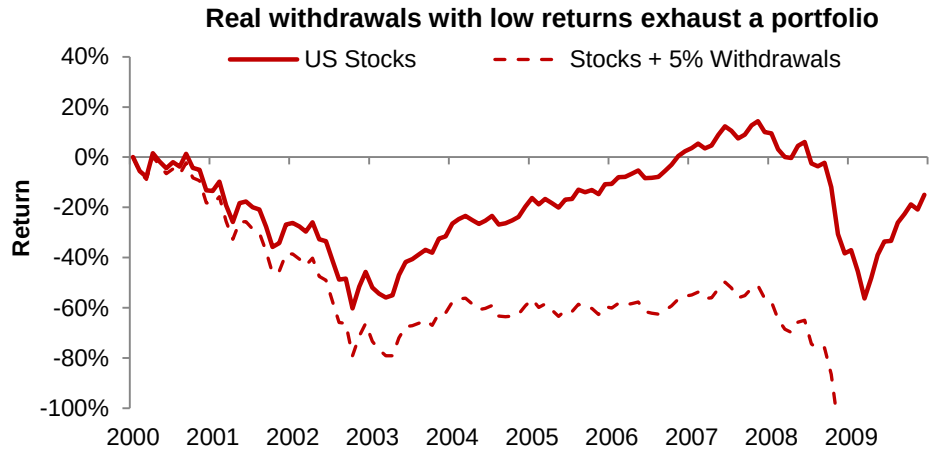
Traditional Allocations Are Like Single Asset Portfolios



For illustrative purposes only. Stocks is the MSCI USA Equity Index. Bonds is the Barclays US Aggregate Bond Index. Source: MSCI, Barclays. Data from Jan 1970 to Jun 2014.

Not only has this concentrated allocation performed poorly more recently, but as one can see from the chart, it has suffered significant losses approximately every decade. Therefore ***investors' recent experience of volatility and large losses should not have been a surprise as such periods have been common throughout history*** and we expect the future to bring more of the same. Such is the nature of taking risk.

Concentrated portfolios have an even more significant flaw than being subject to market volatility. Most concentrated portfolios are mismatched against the liabilities they are expected to support. Like a pension fund which has obligations to beneficiaries, or a retiree living off a fixed pool of assets, both need to spend from their pool of assets The volatility from a concentrated asset is the most common cause of early depletion of assets when regular distributions are required. The chart below shows the performance of a portfolio of equities during the decade of the 2000's and the same portfolio that needed to meet 5% real annual withdrawals (growing with inflation). The extended drawdowns during this decade would have led to a complete depletion of assets for this investor, and at the worst possible time, just before markets rebounded quickly in 2009. The need to spend from a portfolio exacerbates the pain of drawdowns, and highlights the limits of using a long term average return for an investor who needs to withdraw from their portfolio.



Past performance is not a guarantee of future results. US Stocks is the MSCI USA Equity Index. Assumes monthly withdrawals of 5% (annualized) of starting portfolio value. Source: MSCI. Data from Jan 2000 to Dec 2009.

The most effective solution to reducing concentration without giving up return is fundamental diversification. Risk parity, which has been thoroughly tried and tested, is the most logical framework for building diversified portfolios without sacrificing returns.

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Greenline Partners is headquartered in New York, NY. For more information, please visit http://www.glinepartners.com or email info@glinepartners.com.

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