Risk Parity – An Alternative View of Diversification

[Editor’s Note: This is a guest post from Phillip Guerra, DO, a “Risk Parity Portfolio Manager” with PhysicianCapitalPartners.com. He practices anesthesiology full-time and is working on a CFA. While I don’t agree with everything in this guest post (see my note at the end) I thought it was an important topic to cover on the blog. Phillip’s firm applied to be a paid advertiser on the site but I turned it down as I’m not at this time sufficiently convinced of the merits of risk parity to wholeheartedly recommend it as an investing strategy to my readers. Thus, we have no financial relationship at this time. Since he mentions his own firm late in the post, he wanted this disclaimer attached to it: Past performance does not guarantee future returns. Any investment with Physician Capital Partners may lose value.]

Most investors would consider themselves well diversified with a portfolio of 20-30 stocks; the risk of any single stock is manageable at that level. Even the father of value investing, Ben Graham, said as much in his book, The Intelligent Investor. With all due respect to Ben Graham however, the problem with this kind of “diversification” is that the
portfolio is exposed to pure, systematic, undiversifiable, market risk – aka “beta” – aka the sensitivity of a security to market volatility. For example, owning shares of Apple, Microsoft and Google doesn’t really offer much diversification if they all fall in lockstep during a bear market or in a correction or recession. Stocks can be highly volatile, and while their long-term returns make them worthwhile investments, stocks just don’t perform well in all economic environments such as during a recession when GDP is falling. Or when inflation is out of control. Or with a relentless deflationary period like Japan’s Lost Decade.

Issues with Concentration Risk

But there is another, hidden problem with this “diversification”, and that’s because stocks generally exhibit at least three times the volatility – aka risk – that bonds do. Historically, stocks have had a volatility of around 15% and bonds around 5%. So after knowing this important fact, what happens to your portfolio’s risk if you allocate 60% of your portfolio to stocks – as in a 60/40 portfolio – Since stocks are 3 times more volatile than bonds, your 60/40 portfolio very strongly exhibits what is known as “concentration risk”. In other words, the risk of your entire 60/40 portfolio is completely dominated by its equity allocation.

However, the concentration risk in this resulting “beta portfolio” leads to an inefficient boom/bust risk profile since the portfolio’s entire risk is skewed heavily towards the equity component, and it decreases the portfolio’s risk-adjusted returns as a result. Worse still is that it can very negatively affect an investor’s retirement funds – especially if an investor just happens to retire right before a recession, a deflationary period, a hyperinflationary period, or any economic environments in which stocks do not do well.
By now, most people realize that stocks as an asset class don’t work well 100% of the time and in all economic scenarios (such as the Great Recession or the 2000-2002 bear market.) So why then should you choose a risk-concentrated 60/40 “set it and forget it” passive index portfolio? Aside from pursuing low fees and the difficulty for active managers to beat the market – both of which are very valid reasons – the best answer in my opinion is that your willingness to take on concentration risk should depend on market valuations such stock market cap vs. GDP as well as prevailing interest rates and the risk-free rate. For example, if market valuations are cheap, then concentration risk is very acceptable, and I think Ben Graham would agree on this. On the other hand if market valuations are fair or high – well, even Ben Graham mentioned that a defensive investor should consider a 25% stock / 75% bond portfolio.

But the real-life answer is probably that you, your financial advisor, or your new “robo” adviser may not even realize that there are other ways that may actually be better suited for an investor’s risk tolerance – and/or they just don’t want to take the time to calculate it all out. Yet this “beta portfolio” and its associated “concentration risk” is what most financial advisers and robo-advisers keep recommending to all their clients time and again. The only thing that really
varies is the percent allocation to stocks. In fact, there’s even an overly simplistic formula that’s commonly cited: 110 – Age = the percent allocation to stocks that you should have. This is concentration risk at its finest – at least until you’re like 98 years old.

Risk Parity As A Solution to Concentration Risk

Is there another way? Yes, there is. It’s called risk parity, and it can be thought of as a cousin to traditional asset allocation. Its greatest advantage lies in its elegant mechanism for achieving true diversification while its greatest disadvantage is due to its difficulty in constantly monitoring risk and calculating the precise allocations such that the risks of every asset class in a portfolio are equal.

Risk parity means forcing yourself to focus on the portfolio’s overall risk – not the percent allocation to stocks as a function of your age, time horizon, or some 110-Age formula. Risk parity means risk-weighting a portfolio – which is not the same thing as a 60/40 aka a capital-weighted portfolio. Risk parity is really just a fancy way of saying “I don’t want concentration risk in my portfolio anymore. I value looking for a different way of doing things even if it means going against robo and traditional advisers’ investing dogma. I choose to have equal risk among the asset classes in my portfolio – and I want to include all the asset classes in my portfolio that represent all the various economic scenarios that can occur – so that the portfolio can at least have a chance at working in all economic environments.” Having equal risk leads to true diversification – not diversification from owning 1000’s of stocks or 100’s of multi-family apartment units.
Fig. 1. Traditional vs Risk Parity (simplified) portfolios in terms of their asset allocation percentage and its corresponding risk contribution.

Notice in Fig 1. that the Traditional portfolio is a 60/40 portfolio, but due to concentration risk (because stocks are at least 3x more volatile than bonds), the Traditional portfolio is not risk balanced because the risk contribution of the stock allocation dominates nearly the entire portfolio. On the other hand, the Risk Parity portfolio – in this implementation of it (there are many variations of risk parity!) – seems to have roughly 12% allocated to stocks. However as a result of very precise stock allocation with deft attention to an allocation’s corresponding volatility, the risk contributions of each asset class to the overall portfolio are equal resulting in a truly diversified portfolio.
— one that is more immune to market volatility and generally has a lower correlation to the market along with higher risk-adjusted returns. This maximize the free lunch that diversification provides.

**Achieving Risk Parity**

How do I get a portfolio’s individual asset class risks to parity? Any passive, “set-it-and-forget it” portfolio whether risk parity or traditional 60/40 – or their active (i.e. dynamic) equivalents including an active, tactical risk parity portfolio or an active, traditionally-managed globally diversified tactical asset allocation portfolio – should be prepared for the various economic regimes that throughout time consistently affect a portfolio regardless of the economic cycle. The result is a true, risk diversified portfolio that at least has a chance to succeed no matter what situation the economy is experiencing at the time. In addition, having the ability to backtest a portfolio – a retrospective observational study similar to a case-control study in medicine – can add confidence to a strategy’s robustness while always keeping in mind that past performance does not guarantee future results. Running portfolios live is like a clinical trail and adds further, stronger evidence for a successful application.
Fig 2. Designing a portfolio to succeed in the four, main economic risk scenarios irrespective of the economic cycle. A risk-unbalanced portfolio such as a passive 60/40, “beta” portfolio with concentration risk exposure tends to struggle in the red squares.

To arrive at parity for a portfolio’s individual asset class risks is beyond the scope of this article. That said, there are three general ways to do it, and the reader is encouraged to do further research on his/her own- the simple way, the complicated way, and hiring someone else to do it for you.

**The Simple Way**

The simple way: Although there are many ways to define and
estimate risk, the easy way is just to use volatility. This is called naïve risk parity, and the formula in a two-asset class portfolio is:

\[ W_a = \frac{1 / \sigma_a}{(1 / \sigma_a) + (1 / \sigma_b)} \]

where

- \( W_a \) = weight of asset class a
- \( \sigma_a \) = std. dev of returns of asset class a
- \( \sigma_b \) = std. dev of returns of asset class b
- \( W_b = 1 - W_a \)

Unfortunately to do the simple way, you’d have to have some way to measure volatility either historical or implied over some rolling period, and you’d have to do it for several asset classes – not just two – because you’d want a portfolio designed to have a chance for success during any part of the economic cycle noted in Fig 2 (except during the rare situation where all asset classes return less than the cash rate). This difficulty in risk parity’s monitoring and calculation is probably the one hurdle that puts risk parity out of reach for nearly everybody – and this is supposed to be the simple way.

**The Complicated Way**

The complicated way is exactly that – complicated. There are
many different versions of risk parity with each firm’s secret sauce being a function of different asset class mixes, covariance estimation, and varying levels of granularity within each asset class. For example, hedge fund Bridgewater is said to trade in 120 different markets. Since Einstein said to make things as simple as possible – but no simpler – we should probably just skip going over the complicated way, and this is likely good enough advice for most people if it’s good enough for Einstein. For the more daring, you can find all kinds of optimization formulas on this topic after determining marginal risk contributions. Here’s a start.

Having a professional manager do it for you is probably most people’s best bet. However each manager has their own quirks, and these quirks may exclude many investors:

1. Closed to new investors
2. $5,000,000 minimums to avoid sales loads
3. Poor, inefficient performance
4. High fees
5. Non-transparency
6. Not liquid (as in a risk parity hedge fund)

If an investor can find a risk parity pro that makes no compromises and fits an investor’s goals in every aspect, that investor should look deeper to see if that manager is right for them.

Our firm which runs a factor-based risk parity version ran tests to see how the portfolio would have performed during the last rising rate environment around 2002-2005 – and results have been encouraging. I believe our results are more tilted towards success because our strategy is based on scholarly, evidenced-based investment principles including factor-based investing which, although unusual for a risk parity firm, is a well researched subject of study. For example, Fama and French won the Nobel Prize in Economics in 2013 – and both of them contributed greatly to our understanding of how factors
explain a security’s performance. Both our active and passive long-only versions and our active long/short risk parity version are based on these factor tilts. The active versions of our risk parity portfolios help prevent holding asset classes that are performing poorly, which is one of the weaknesses in traditional risk parity portfolios.

Benefits of Risk Parity

What should I expect by adding a little risk parity to my current total portfolio? An investor should expect for a risk parity portfolio to zig when the markets zag. That is, an investor should not be surprised to underperform during a bull market. If the market is rising at 20% per year, risk parity isn’t going to keep up with those kinds of returns. This is simply the nature of alternative assets with low correlation to the market. However, this is also the exact characteristic an investor wants to have when the markets are trading sideways or falling. The first rule of investing is not to lose money according to Buffet. His second rule is to see rule number 1. The worst yearly start since the Great Depression is seen in the first two weeks of January 2016. An example of how this kind of volatility is made more tolerable for an investor by strategically allocating a portion of capital to Physician Capital Partner’s Active, Factor-Based Risk Parity with 7% Volatility-Target which at the time of this writing (1.24.2016) decided that the best bet was to hold a huge allocation of Short Term Treasuries and a touch of real estate investment trusts based on the firm’s algorithms. Remember the first rule of investing – don’t lose money. A Long/Short version of the portfolio was recently started the first quarter of 2016 and based on preliminary evidence is up around 4.1%. Recall that the market is down about 8-10% at the time of this writing. [This post was submitted to me the last week of January-ed.]
Fig. 3. A real life example of using low-correlated assets to improve an investor’s overall risk-adjusted returns. This investor has approximately 10% of his capital invested in PCP’s Active, factor-based risk parity with 7% volatility target. (Note: Past performance is no guarantee of future results.)

**All of None?**

So, does risk parity replace a traditional asset allocation? Not necessarily. While I’m comfortable using risk parity as a replacement, I prefer to think of it as a complement to a traditional asset allocation. Putting as little as 10% of your total portfolio can make a meaningful reduction in your portfolio’s volatility and measurable improvement in risk-adjusted returns.

**Avoiding “Deworse-ification”**
In traditional portfolios, an investor’s risk tolerance is adjusted for by, you guessed it, adjusting one’s allocation to stocks. So those investors with higher risk tolerances or longer time horizons are typically placed in portfolios with higher stock allocations. However, along with higher allocations to stocks comes the disadvantage of higher exposures to volatility, further portfolio inefficiency, and a boom/bust risk profile.

Risk parity portfolios on the other hand are inherently for the risk averse investor. The result of true diversification is “the free lunch” that puts a portfolio along the “efficient frontier.” In modern portfolio theory this means the investor is getting the highest amount of return for a given amount of risk. But true diversification and high portfolio efficiency also results in low volatility, low beta and low expected returns. Some people call this “deworse-ification”. [This term is also used slightly differently, and usually derisively toward index investors by active stock pickers and direct real estate investors since index fund investors own both the good and the bad stocks.-ed] What can be done about this for investors who have higher risk tolerances or a longer time until retirement?

**Using Leverage**

The answer is to leverage the entire risk parity portfolio up to the desired volatility of the investor. Since we are leveraging an efficient portfolio, all the expected characteristics – beta, volatility, expected returns – simply become a multiplier of the non-leveraged risk parity portfolio. So for example, if a non-leveraged risk parity portfolio has a volatility of 3.5% and an expected return of 4%, leveraging this efficient portfolio up to 2x notional value would result in about 7% volatility and about 8% expected return (the returns include 2x the dividend of the non-leveraged risk parity portfolio). “Gearing up” the portfolio 3x the non-leveraged version would tend to result in
3x the volatility and expected return and so on. In the past, a 60/40 portfolio has exhibited a volatility of around 10-11% and a 7% return. Typical leverage amounts in risk parity portfolios are 2-3.5X.

The disadvantage of leverage is that it can only be performed with brokers who offer low margin rates. In our experience, TD Ameritrade has very high margin rates resulting in negative returns. On the other hand, Interactive Brokers has extremely low margin rates – allowing an investor to gear up a portfolio profitably. The other disadvantage of using leverage is the increasing risk of a margin call the more one takes on leverage. But this is a risk that an investor with moderate or high risk tolerance can endure because of the nature of risk parity portfolios having lower betas and lower volatilities compared to a traditional portfolio. i.e. Risk parity portfolios offer a smoother ride with less drawdowns and volatility than traditional portfolios.

Yet another disadvantage is that most investors exhibit a knee-jerk response to the word leverage. This may be because they are completely unfamiliar with risk parity and just have a general understanding that leveraging a traditional portfolio would induce stomach-churning volatility. This type of anchoring reflects a misunderstanding of the difference between leveraging an efficient, risk parity portfolio versus what most investors are familiar with already, a traditional but volatile portfolio exhibiting concentration risk.

It should also be noted that as interest rates rise, less leverage is necessary since the dividends of the fixed income allocation of the portfolio tend to increase as well – and depending on your risk parity manager, this could mean more monthly and quarterly income with higher interest rates. This makes it a little strange to think that you’d actually want interest rates to increase slowly and within market
expectations. [No surprise there, higher interest rates are good for bond investors in the long run, as long as they doesn’t come with higher inflation-ed.]

Volatility Targeting

Volatility targeting is one huge benefit that risk parity investors can enjoy and should not be underestimated. It is a way of objectively describing and targeting an investor’s risk tolerance rather than the old-fashioned, subjective way of just saying, “low, moderate or high” risk tolerance and allocating to “25%, 50%, 75% stocks” – and then just accepting whatever volatility your traditional financial advisor and the market gives you. On the other hand, when volatility is targeted, an active risk parity portfolio along with the dynamic use of leverage, the results can be profound and something that can add to an individual investor’s peace of mind in the markets. And that peace of mind is something that simply cannot be bought – nor overemphasized.

[Editor’s Note: Interesting concept, huh? There are a few downsides worth thinking about before committing to a strategy like this one.

# 1 This is a relatively new idea. While people have been talking about risk parity for quite a while, only a tiny percentage of investments have been invested in this sort of strategy, and we have precious little data about performance. I mean, take a look at Exhibit A- this is Dr. Guerra’s first year managing money. 76-99% of their 26-50 clients are not high net worth individuals. The firm manages just $37 Million. Basically, this firm is just getting started. It may not even be here in 5 years. Now, Exhibit B is some mutual funds that have been using risk parity. The linked article notes six of these, the oldest of which started in 2009 and all of which have an expense ratio of over 1%. Now, I don’t necessarily require a decades long track record from everything I invest in if everything else about it looks okay. But it is certainly
a strike against this strategy in my book. In medicine, you are advised not to be the first nor the last to adopt a new treatment strategy. That applies to other areas of life too, such as investing. Perhaps I’m wrong, and everyone will be using a risk parity portfolio in 20 years. But if I had to bet on it, I would bet this is more of an investing fad that will fade over time.

#2 The expenses are not insignificant. The mutual funds noted have expense ratios averaging over 1%. Philip’s firm also does not work for free. Once you start adding on expenses like that, the new strategy has to not only be better, but it has to be at least 1% better. The Cost Matters Hypothesis is basic math— the more you pay the less you keep.

#3 One nice thing about a “know-nothing”/Boglehead/Fixed asset allocation of low-cost index funds is that you don’t have to run manager risk. With risk parity, as Dr. Guerra notes, it’s probably too complex to do it on your own. So not only do you have to pay for a manager, but you’ve got to pick the winning one. If that’s anything like picking a winning mutual fund manager, it’s going to be a tough task. Especially when almost no one has even been doing this for a decade. How are you going to choose without becoming an expert yourself?

#4 Why should risk be equal among asset classes? I’m not even sold on the basic concept, that you should take just as much risk with the bonds in your portfolio as with the stocks. Some very smart people, such as Larry Swedroe and Bill Bernstein, are quite adamant about taking your risk on the equity side and keeping your bonds short-term and high-quality. While I do take some risk on the bond side (notably P2PL), I think there is a lot of wisdom there. People have been making portfolios using risky and riskless assets for decades and it has worked just fine.

#5 There is too much focus on “shallow risk.” Stock market
volatility has been used to scare investors into all kinds of expensive active management schemes in the past. I’m much more concerned about the more long-term risks that can affect my portfolio, such as inflation, deflation, confiscation, and devastation. Perhaps most importantly, the risk of my money not growing fast enough to reach my goals. As Phil Demuth has said:

> Even if risk tolerance existed and could be measured accurately, why would it be an important factor to consult when considering how to invest? You should invest in the way that has the greatest prospect to fulfill your investment goals. That might mean taking more or less risk than you would prefer. If you are a sensitive soul who can brook no paper losses, the solution is to get a grip, not to invest “safely” if that locks in running out of money when you are old.

#6 I am leary of leverage. I suspect that debt has caused more businesses, investment schemes, and families to fail over time than any other factor. This is a “knee-jerk” reaction for a reason. Since a risk parity portfolio is 80-90% bonds, and bonds have a lower expected return, the only way you are going to achieve returns high enough to reach the goals of most people is to heavily leverage the portfolio. What could possibly go wrong? Adding leverage introduces a new risk that an unlevered investor doesn’t have to worry about at all. I’m not convinced that it is better to run the risk of leverage than equity risk.

#7 I’m not convinced that your goal should be a portfolio that does well in all market conditions. A number of investment schemes have been proposed to deal with the fact that economic situations change, such as the permanent portfolio (25% stocks, 25% long bonds, 25% cash, and 25% short bonds.) The problem with these schemes is that the long-term returns fall short of those available with a more conventional strategy. I
don’t need my portfolio to do well every year or even every decade. I need it to meet my goals over 30-60 years.]

What do you think? Do you have a risk parity portfolio? What do you like or dislike about it? Would you consider investing all or some of your portfolio in this sort of a strategy? Why or why not? Comment below!