RIVERPARK FUNDS

The Benefits of Making Systematic Trade-Offs Between Risk and Return

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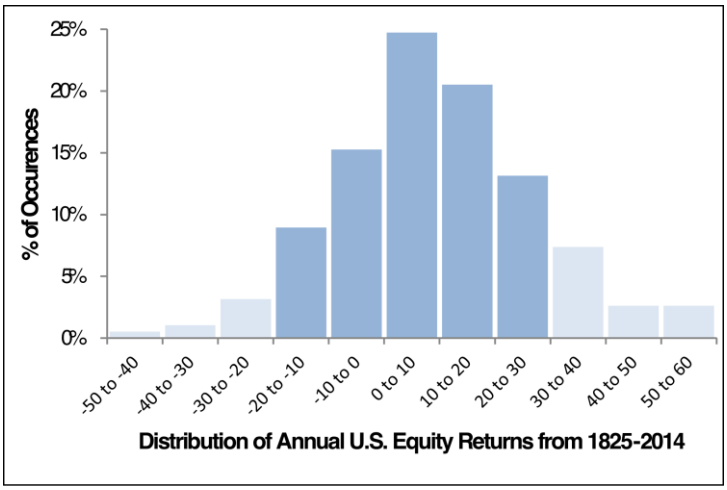
Abstract: *The Rolling Stones famously sang that "you can't always get what you want, but if you try sometimes, you just might find you get what you need." We all make trade-offs in our everyday lives, focusing on our needs while deferring our want. The idea of having it all may be a myth, but from an investment perspective, that is exactly what most investors get when they invest in the stock market, whether by purchasing an index like the S&P 500 or actively selecting individual stocks – all the upside and all the downside. While this may be what they get, it may not be what investors want or need. Many investors would gladly trade off some of the upside for protection from some of the downside, suggesting that the utility gain for some investors from more upside may be less than the utility lost by greater downside. Being exposed to all of the downside risk in order to have the chance for unlimited upside potential is not an ideal position for some market participants. Further complicating the issue, as many behavioral finance studies have shown, during periods of market duress, investors often take actions to make a bad situation worse. Fear takes over and they sell close to the bottom of a market cycle, thereby locking in losses and depriving them of the opportunity to participate in gains once markets recover. Whether it is to counter the fear of loss or to lessen the likelihood of ill-timed decisions in reaction to market downturns, some investors would clearly benefit from lower volatility. While there is no perfect investment strategy in terms of maximizing gains while eliminating losses, we believe there are some very accessible ways by which an investor can enhance risk-adjusted returns, while remaining fully invested in equity markets. The purpose of this paper is to introduce option-based portfolio strategies that can shift the distributions of returns and provide investors with alternatives that may better match their individual risk tolerances. The risks involved with making these trade-offs will also be discussed.*

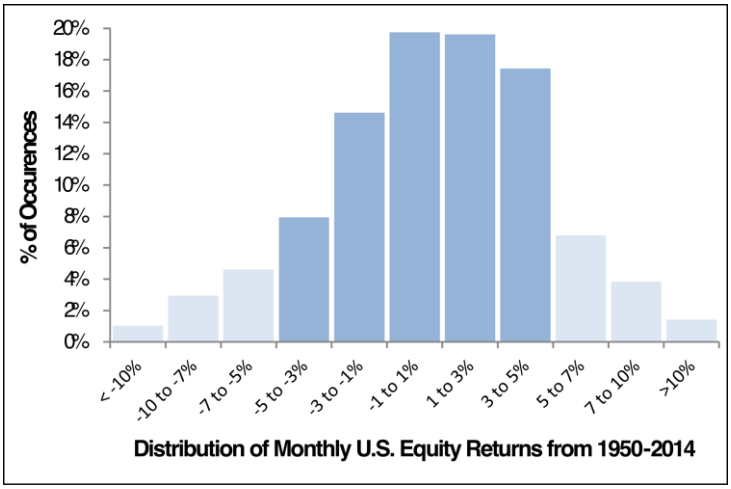
Shifting the Distribution of Returns



* Source: International Center for Finance at the Yale School of Management / NYSE History Research Project

The normal distribution of returns is not ideal for most investors. As this chart depicting historical return distributions for equities illustrates, since 1825, 83% of annual equity returns have been between -20% and +30%. Monthly returns show a similar distribution, with 79% of monthly returns since 1950 falling in the range of between -5% and +5%. Since most returns fall into this range, investors might benefit from a strategy that trades away some of the unlimited (but rarely realized) upside return potential in exchange for some protection against market declines.

Why might this be desirable for many investors? The answer lies in three interconnected points. First, and most obvious, is that everyone has a different tolerance for risk. This difference in risk tolerance leads us to analyze the merits of risk and return differently. Personal risk tolerance is usually attributable to two factors: (1) the ultimate investment objective and (2) the time needed to reach that objective. Some investors may find full upside and downside exposure tolerable because they have the resources or the time horizon to overcome a potential temporary impairment to capital. These investors are not likely to panic when markets temporarily turn against them (although the financial crisis of 2008 showed that even investors with substantial resources and a time horizon measured in decades are susceptible to bouts of fear). Investors with limited resources and/or shorter time horizons often must be more conservative when it comes to analyzing risk. For these investors, trading away some upside potential for some downside protection allows them to remain invested during market cycles in which they would otherwise not participate. This leads us to the second point, which is that shifting the distribution of returns is a good way to combat the behavioral bias of loss aversion.



* Source: Standard and Poor's, S&P 500 Historical Price Returns

While we all have different tolerances for risk and different time frames for our investment goals, nearly all of us share common behavioral traits that can negatively impact our investment decisions. The groundbreaking work done by Amos Tversky and Daniel Kahneman in 1979[1] illustrated that people choose to avoid loss rather than seek further gains. In terms of investing, this behavioral bias often contributes to the difficulty in making rational decisions during periods of market stress. For example, investors are often guilty of abandoning an otherwise well thought out financial plan near market bottoms because they cannot handle the stress of market volatility. Establishing an investment strategy that makes calculated and explicit trade-offs between risk and return can smooth-out these periods of market volatility.

Mitigating volatility makes it easier to resist our hard-wired behavioral bias against loss, which in turn increases the probability that we will stick with our investment plan throughout a variety of market conditions. The ability to remain invested is the key to any good financial plan, which brings us to our third point.

Financial planning is a difficult and complex undertaking because, among other things, it seeks to address the impact that time will have on our investments. While we can modify investment goals and adjust how much we spend, save, and to a lesser extent, earn, we cannot know the future. A planning-based approach toward investing typically assumes conservative rates of return to compensate for the unknown but likely fluctuations which could negatively impact asset values over time. While financial planners can run endless simulations to demonstrate how a diversified portfolio would have behaved in the past, there is no way to address the potential impact of future negative events. Planning-based approaches that only address diversification between asset classes cannot solve the potential problems of higher correlations during periods of swift market declines, or prolonged periods of lower than forecasted returns. There is no predictive approach that can prevent a plan from failing, or guarantee that an investor will follow that plan during periods of market stress. Systematically making trade-offs between upside participation and downside protection, however, can reduce these risks by lowering portfolio volatility. The resulting increased predictability of returns may make it easier to construct durable portfolios that are able to withstand changing market cycles.

The behavioral benefits that accrue from tailoring risk and return for individual needs is what makes shifting the distribution of returns so appealing. Shifting the distribution of risk and return is both a basic and often overlooked methodology for generating more consistent and stable returns over time. By losing less when markets decline, the negative effect that volatility can have on an investor's decision making process is mitigated. Shifting return distributions by making trade-offs between upside participation and downside protection can therefore accomplish two important things. First, it structurally limits the magnitude of loss. Second, it also makes it easier for investors to fight their natural loss aversion bias.

[1] "Prospect Theory: An Analysis of Decision under Risk" by Daniel Kahneman & Amos Tversky Econometrica, 47(2), pp. 263-291, March 1979

Using Options to Shift the Distribution of Returns

The non-linear profile of options makes them an excellent tool for investors who desire to make trade-offs between risk and return. We believe that a more tailored way of owning the majority of asset classes can be achieved by using options to structure the appropriate amount of risk commensurate with the desired return. By utilizing options in a structured, systematic, and controlled fashion, we believe it is possible to generate a smoother distribution of returns and a more targeted approach to risk and reward.

Some investors use the purchase of put options as a form of insurance. The simple analogy being that investors desire to pay an annual premium in an attempt to protect their portfolio against some predetermined amount of loss. This option-based strategy has the benefit of low volatility and protection against undesirable losses. Our research suggests, however, that the cost of insurance is high relative to the amount of protection being purchased. Consequently, we do not believe that purchasing portfolio insurance through the purchase of put options provides investors with superior risk adjusted expected returns.

Another basic way in which an investor can express a trade-off between risk and return is through the writing of covered calls. A covered call is the combination of a long equity position and a short call position. The covered call writer sells potential upside in exchange for a premium which is received upfront. Covered call strategies allow investors to increase their yield on equity positions in exchange for giving up some of the potential upside in the underlying security. While covered call strategies underperform equities in fast rising markets, they tend to outperform outright equity ownership in flat, down, and slightly up market conditions. Covered call strategies can also dampen the effects of general market volatility, to the extent that the premium received provides a cushion during market declines. We believe that covered call strategies are an effective tool for shifting the distribution of returns and reducing volatility, but that in combination with other more complex strategies using option spreads, risk adjusted returns can be further enhanced.

The Creation of Structural Alpha

We recognize that there is no single strategy that will yield superior results under all market conditions. However, we believe that the key to the long-term success of any strategy is the ability to generate repeatable returns through a variety of market conditions. In our opinion, solutions that make consistent and calculated trade-offs between upside exposure and downside protection by applying the concepts of covered call writing offer a better alternative. The following examples build on the basic attributes of covered call writing by adding a combination of enhanced upside and buffered downside positions.

The examples in the table below reflect the initiation of a trade at the beginning of each calendar year that matures at the end of the year. Using the S&P 500 Index[2], we constructed a portfolio that does the following: (1) trades an S&P 500 Index options package that is 1-year in maturity, (2) provides a zone of protection (also known as a buffer zone)[2] at maturity that varies based on market conditions, and (3) provides two times the performance of the market (at maturity) up to a maximum return of 15%. For the purposes of this analysis, we assume that each year, transaction costs equal 30 basis points. Transaction costs include commissions as well as an assumption on the pricing spread of the options. The returns for the S&P 500 index in the table reflect the price return of the index.

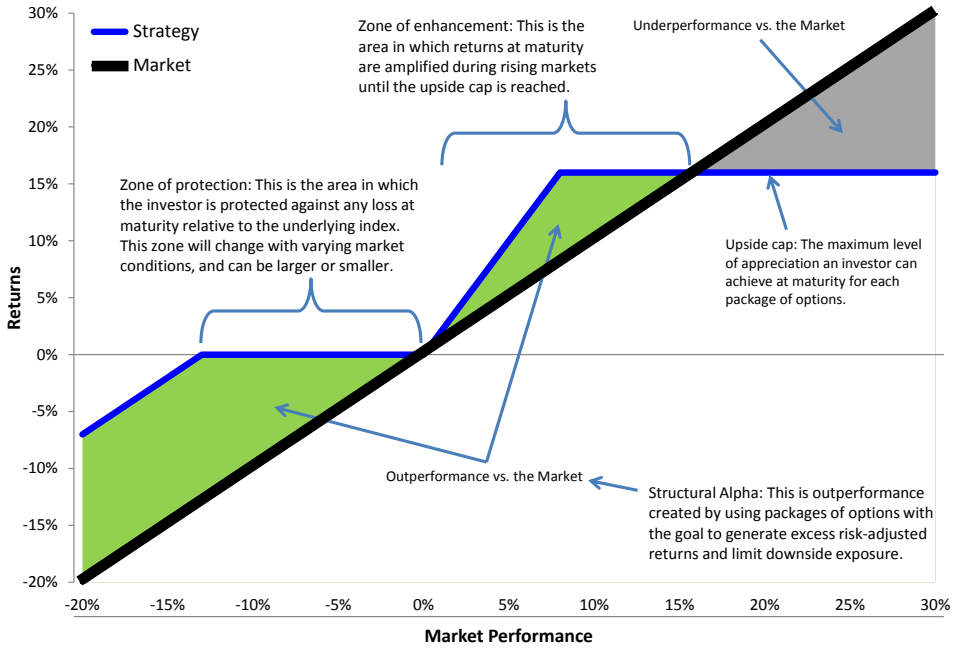
We selected four historical examples that highlight the potential benefits and drawbacks of using a strategy that creates zones of protection, zones of enhancement[2], and capped return[2]. These examples are a sampling of the kinds of market conditions investors may experience in the future, and highlight the four different types of outcomes at maturity that an investor could expect at the inception of the trade. Structurally, each of these examples is one year in duration and has two-times enhancement to a maximum return of 15%. The size of the zone of protection in the following examples was calculated based on market conditions at the time the trade was initiated, including the cost of the options and the prevailing interest rates.

Year	S&P 500 return	S&P 500 result	Buffer Zone	Trade return	Performance relative to S&P 500
2008	-38.49%	Below buffer	12.5%	-26.00%	+12.5%
1990	-6.56%	In buffer	20.0%	0.00%	+6.56%
1993	7.06%	2x enhanced	7.5%	14.12%	+7.06%
1999	19.53%	Above cap	19.0%	15.00%	-4.53%

**Source: RiverPark Advisors, based on data from Bloomberg, Yahoo! Finance, and iVolatility.com*

In 2008, when markets fell sharply, the zone of protection would have mitigated those losses significantly (-26.00% vs. -38.49%). In a single digit decline like 1990, the zone of protection would have eliminated the loss altogether (0.00% vs. -6.56%). In the 1993 example, a modest increase in the market meant that the 2x enhancement generated significant alpha (+14.12% vs. +7.06%). In 1999, when the market rose dramatically, the trade still generated upside, but lagged the market's return (+15.00% vs. +19.53%).

[2] Please see glossary for definitions.



It is important to note that, while these examples hold one variable (upside cap of 15%) constant, many other permutations can be created based on risk tolerance. For example, an investor who is focused on downside protection may wish for a larger buffer zone at the expense of possible upside return, while an aggressive investor may choose no downside protection but have more enhancements to the upside within a zone. Investors can easily dial up or down potential risk and return with the tools discussed above.

Risks to Making Trade-Offs Through the Use of Options

Central to the concept of making systematic trade-offs between risk and return is the understanding that some potential upside participation will be sacrificed in exchange for establishing the zones of protection and the zones of enhancement. In order to implement a strategy that systematically exchanges reward for risk management, an investor must accept that some potential gains will be sacrificed, and that underperformance relative to a benchmark is likely during periods when the market gains are large and persistent. It is also important to reiterate that these packages of options will have mark-to-market risk prior to their expirations. Any discussion of potential returns associated with this strategy refers to returns at maturity, as daily option pricing prior to maturity will be sensitive to changes in market conditions. In practice, our experience suggests that the biggest risk to successfully implementing the strategy comes from a poor initial assessment of risk tolerance, which may ultimately lead to an emotionally driven decision to deviate from the strategy when market conditions turn less favorable.

The concept of capital preservation is often counter intuitive. When markets are rallying, the perceived need for mitigating downside risk diminishes and the cost for such protection is cheap. However, history suggests that this is exactly the time when investors would be best served by hedging their portfolios. Instead, the demand for protection typically spikes immediately following a sharp decline, after most of the damage has been done. During these periods of heightened volatility, protection also becomes more expensive.

We believe that due to these factors, strategies that seek to preserve capital through the use of non-systematic overlays to an existing portfolio tend to be less effective than strategies which incorporate trade-offs between upside participation and downside protection on a systematic basis. Over different time frames and varying market conditions, the systematic nature of how the portfolio is structured may allow for greater predictability of returns. Nevertheless, the implementation and timeliness of trading activity will cause realized returns to vary for each participant, as will the impact of transaction costs. As is true with any investment strategy, there can be no guarantee that past performance will be indicative of future returns.

Conclusion

Accepting full upside potential for full downside exposure in an investment may not be the best strategy for every investor. We believe that making trade-offs between upside participation and downside protection is an effective risk management strategy that addresses the behavioral catalysts which often lead investors to make poor, emotionally driven decisions. Options are effective and efficient tools that investors can use in order to get equity exposure that reflects their personal tolerance for risk. Investors who can make honest assessments of their own risk tolerance may be able to incorporate these trade-offs in a systematic, index-based investment approach. Such an approach may minimize the potentially negative impact of variables such as market timing and security selection. As with any strategy, there are certain market conditions that will prove more challenging than others. During these times, investors must remain disciplined in order to accrue the long term benefits that making systematic trade-offs can yield.

Data shown above are for illustrative purposes only and do not represent any particular security. Past performance is no guarantee of future results.

Options involve risk and are not suitable for all investors. The information in this document is provided solely for general education and information purposes and therefore should not be considered complete, precise, or current. Many of the matters discussed are subject to detailed rules, regulations, and statutory provisions that should be referred to for additional detail and are subject to changes that may not be reflected in this document. The information in this document is not intended and should not be construed to constitute investment advice or recommendations to purchase or sell securities.

Glossary of Terms:

- **The S&P 500 Index** is a market-value, weighted index consisting of 500 stocks chosen for market size, liquidity, and industry group representation, with each stock's weight in the Index proportionate to its market value.
- **Zone of protection** (also known as a buffer zone) is the range of negative returns of the underlying index within which the investor is protected against loss at maturity. The size of the zone can be tailored to any level desired by the investor, although the cost of purchasing the underlying instruments will vary depending upon prevailing market conditions.
- **Zone of Enhancement** is the range of positive returns of the underlying index that are amplified by a pre-determined factor (2x, 3x, etc...) at maturity. The zone of enhancement and the amplification factor may be tailored by the investor, although the cost of purchasing the underlying instruments will vary depending upon prevailing market conditions.
- **Capped Return** is the maximum level of appreciation an investor can achieve at maturity for each package of options.