The Mathematics of Investment Return

Why limiting downside market capture is important for achieving your targeted investment return.

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About Post Oak Private Wealth Advisors

Post Oak Private Wealth Advisors is a leading money management and advisory firm based in Houston, Texas. We are highly specialized fee-based managers who serve in a fiduciary role on behalf of our clients.

Post Oak offers particular expertise in the areas of advanced risk management strategies, innovative cash flow design and retirement distribution planning.

Every investor dreams of finding the "holy grail": an investment that offers high returns with no risk. Of course, such an investment does not exist. All investments come with some degree of risk, defined as the possibility of loss or harm.

So if an investor cannot choose a no-risk, high return investment, what is the next best option? What would be the composition of return that would create solid investment growth over an extended period? Is it frequent large gains with an occasional big loss, such as the return typical for aggressive growth stocks? Is it small but steady returns, such as those commonly found in fixed income strategies? Or is it something in between, modest gains over time with relatively few small losses?

Markets are irrational.

Mathematics is not.

Many investors do not consider the importance of these questions when they set expectations for investment return. These questions reflect how the mathematics of investment return affects the performance investors ultimately achieve. In addition, investment outcomes are greatly impacted by the volatility investors experience along the way. For example, when volatility is high, it becomes more likely for investors to abandon their investment plans and take money out of the market, diminishing the power of compound growth.

This report will explain the two most important principles for building and sustaining wealth: first, the power of compounding; second, the importance of limiting large losses (defined in this discussion as "downside capture".)

The power of compounding.

The ability to compound returns over time is key to asset growth and wealth accumulation—the ability to generate current earnings on top of previous earnings allows investors to grow substantial assets over time.

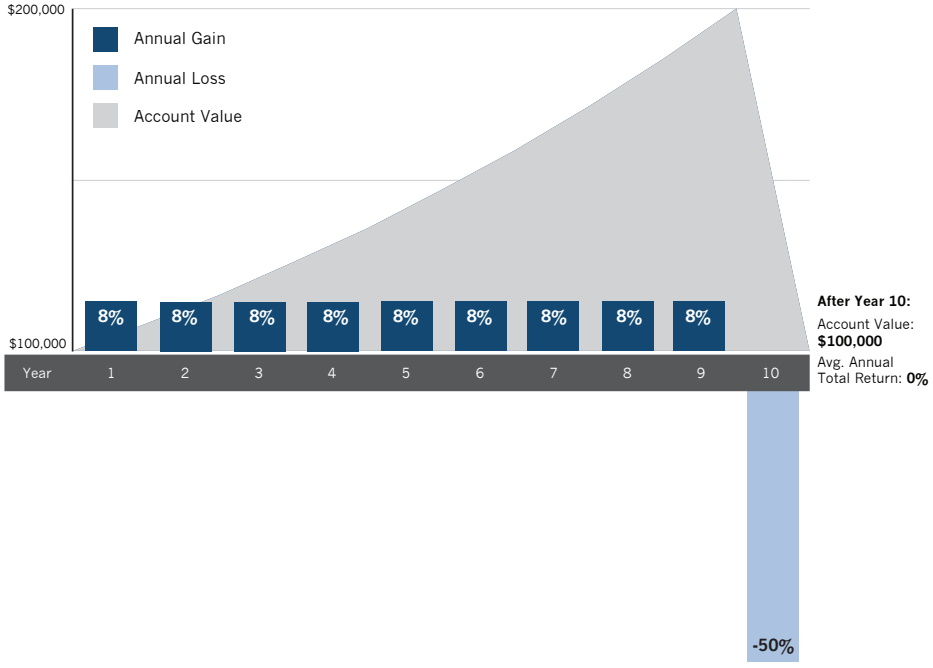
The power of compounding works best when returns are consistent and positive. Of course, financial markets are anything but consistent. They are also frequently positive but occasionally not. Periods of negative returns are common and many times losses are significant. Any investor who has spent a substantial amount of time in the markets has invariably experienced losses and knows well what a full-blown downturn and bear markets feel like.

In the mathematics of return, large losses can erase years of investment progress. The financial markets may offer unlimited opportunities, but investors are bound by the rationality of mathematics and the finiteness of time.

One bad year can spoil an entire decade.

Large investment losses are painful in the short term, but in the long term they can be devastating. As an example, a loss of 50% over one year can wipe out nine years of steady annual returns of 8%. (See Exhibit 1 below.) In other words, one bad year in a decade of consistent, positive returns can put an investor back to where they started 10 years earlier.

Exhibit 1: How one significant loss can erase years of steady gains



While the market does recover over time, most people—particularly those who are in or near retirement—don't have the luxury of unlimited time. Investors only have so many years in the market to tap the power of compounding returns. Losing 10 years can make it difficult to achieve long-term investment goals, unless an investor is willing to assume greater risks to seek higher return. Often, assuming these greater risks only compounds the problem.

It's easy to conclude that avoiding significant losses is the key to realizing long-term investment success. This conclusion, however, is contrary to the emphasis many investors place on capturing the market's upside potential.

The importance of limiting large losses.

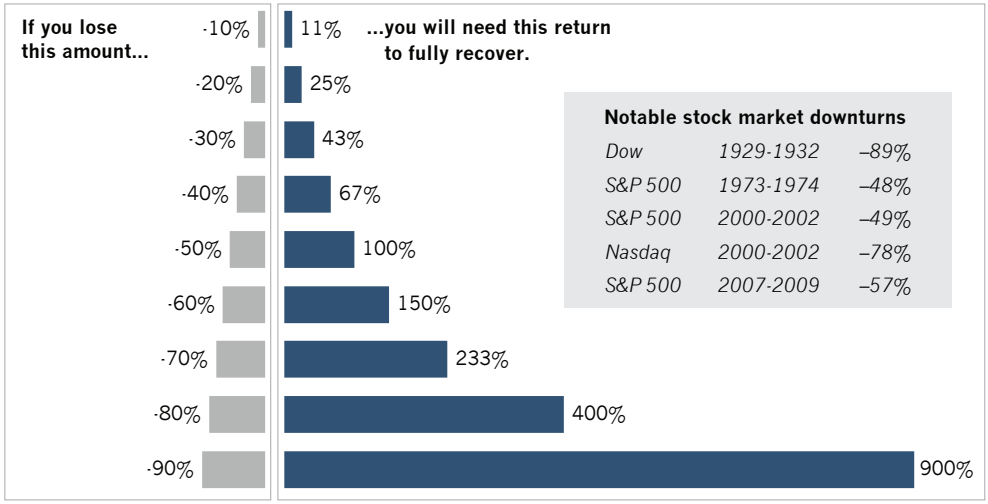
Investors are taught (perhaps conditioned) to focus on the upside potential of the investment markets. This is one of the reasons why index funds have grown in popularity. They offer investors a low-cost way to participate in 100% of the market's upside potential (i.e., upside capture).

But as investors focus too much on the benefits of upside capture, they may not be familiar with the perils of downside capture. Index funds participate in 100% of market downturns when they occur. The market's upside potential can help them recover their losses, but many investors are not taught the math behind recoveries—***to recover fully from a drop in investment value requires a gain in excess of the loss captured.***

Avoiding losses is equal to achieving returns.

This point is made clear in Exhibit 2 below, which shows how the amount of return required for full recovery increases exponentially as losses grow larger. For example, a 20% loss (the minimum threshold of a bear market) would require a subsequent return of 25% to fully recover—a significant gain but not unrealistic, even over the course of one year. (The S&P 500 Index has gained at least 25% in 23 calendar years from 1928-2016, or once every four years.)

Exhibit 2: Catching up from significant losses



Source for chart data: Crestmont Research

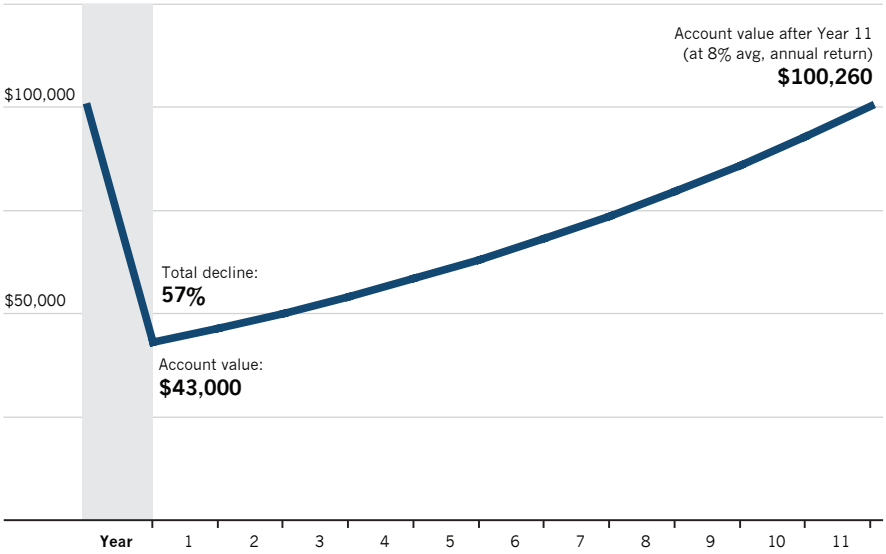
A 40% loss, however, requires a subsequent return of 67% to fully recover, which is highly unlikely to occur in a single 12-month period. (The highest calendar year return for the S&P 500 was 52% in 1954.) At a more realistic 8% annual return rate, it would take seven years to fully recover from a 40% loss.

For a recent real life example of downside capture, let's consider the stock market crash of 2007-2009 surrounding the global financial crisis.

Over the 17-month downturn from October 2007 (market peak) to March 2009 (market bottom), the S&P 500 Index declined around 57%. If you had $100,000 invested in an S&P 500 Index fund, the value of your invested would have dropped to around $43,000 by the end of the downturn.

How long would it take to achieve a full recovery if you earned a realistic 8% average annual return? As Exhibit 3 below shows, not until a full decade later.

Exhibit 3: How long can it take to recover from a significant loss



Investors who focus on limiting downside capture as much as participating in upside capture are, contrary to conventional wisdom, behaving prudently. That's because, as the previous chart demonstrates, ***avoiding a loss is equal to achieving a gain of greater magnitude.***

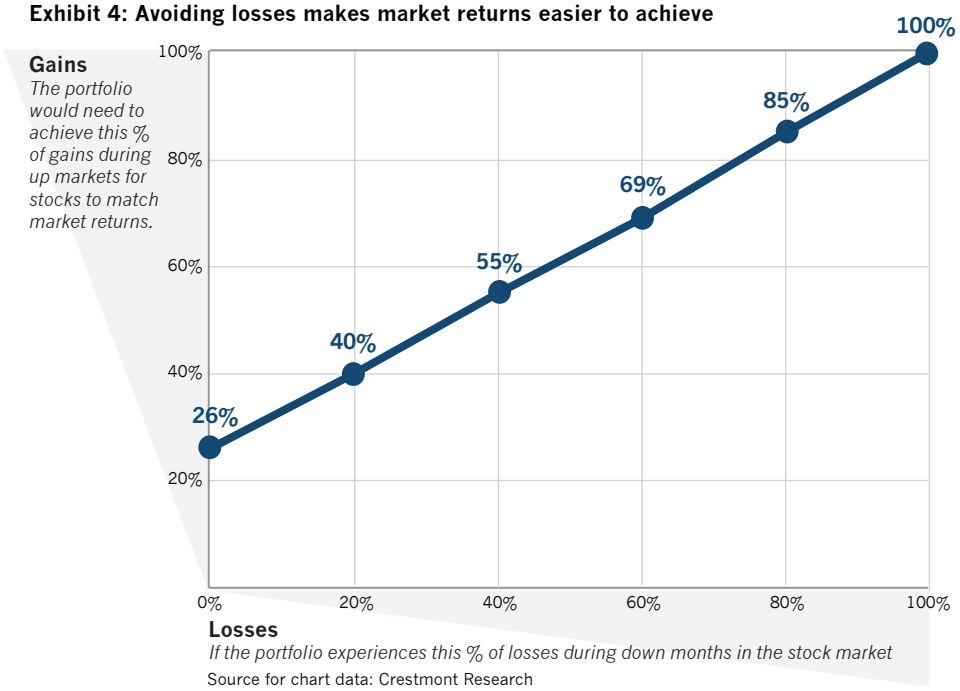
More risk doesn't equal higher returns.

Investors who focus primarily on upside market capture participate fully in all market gains and losses. In other words, they capture 100% of the market's upside but also 100% of the downside too. Ultimately, they may achieve returns that match the market, but along the way have to endure all of the volatility that comes with full participation in the market's ups and downs.

With a strategy that seeks to avoid market losses, it's not necessary to capture all of the market's upside in order to achieve market-matching returns. Understanding the math behind this concept, as illustrated in Exhibit 4 on the following page, often comes as a revelation to many investors.

If investors are able to avoid all losses (capturing 0% of the market's downside), they would only need to capture 26% of the market's upside to achieve market returns. Of course, it's nearly impossible to avoid all market losses. A more realistic outcome is a mix of upside and downside capture. For instance, at just 40% of downside capture (participating in 40% of downturns,) investors only have to capture 55% of upside gains to achieve market returns.

Exhibit 4: Avoiding losses makes market returns easier to achieve



Source for chart data: Crestmont Research

One implication of this lesson is that it's not necessary to assume high levels of risk (at least not as much risk as full market participation) to achieve market returns, if you follow a strategy that seeks to reduce downside capture. It's even possible to "beat the market" if investors are able to capture more upside potential while they seek to avoid the majority of market downturns.

When you can limit downside capture, you don't need to capture as much upside return. This concept challenges the conventional wisdom that more risk equals higher potential gains. The mathematics behind this confirms that the opposite is true. Reducing exposure to risk and market volatility can help make the investing experience less stressful for individual investors.

Strategies to limit downside capture.

So how do investors go about reducing exposure to risk and limiting downside capture, when bear markets happen every 3.5 years and wipe out 35% of market value on average? (That's according to S&P 500 data going back to 1929.)

The most common strategy is through strategic asset allocation—diversifying a portfolio with investments from different asset classes (e.g., growth stocks, value stocks, small company stocks, international, bonds, etc.) that are non-correlated. In other words, these investments tend not to move in tandem at the same time and should help reduce the volatility of returns and limit the likelihood of large losses. This strategy serves as the premise behind the proliferation of target date funds in the marketplace.

The shortcomings of diversification

Asset allocation and diversification work well in theory, but only when actual performance of various asset classes is truly non-correlated. Most of the studies on asset class correlation are based on historical data, which is like driving with your eyes fixed on the rear-view mirror. The familiar caveats about past performance apply: they are not indicative of future performance.

Strategies based solely on strategic asset allocation place investors in the uncomfortable position of hoping the different investments in their portfolios don't all decline in value at the same time. This is, in our opinion, not a practical way to manage risk.

The shortcomings of diversification become apparent during market downturns—the very time when investors are looking to this strategy to reduce their exposure to losses and downside capture. Different asset classes may show low correlations during up markets. (See Exhibit 5a below.) But in down markets, they tend to move in near lock-step with each other as correlations run higher. (See Exhibit 5b on the following page.) Higher correlations weaken the potential for diversification to lower portfolio risk and exposure to large losses.

Exhibit 5a: Diversification works...
Asset class examples using Vanguard mutual funds

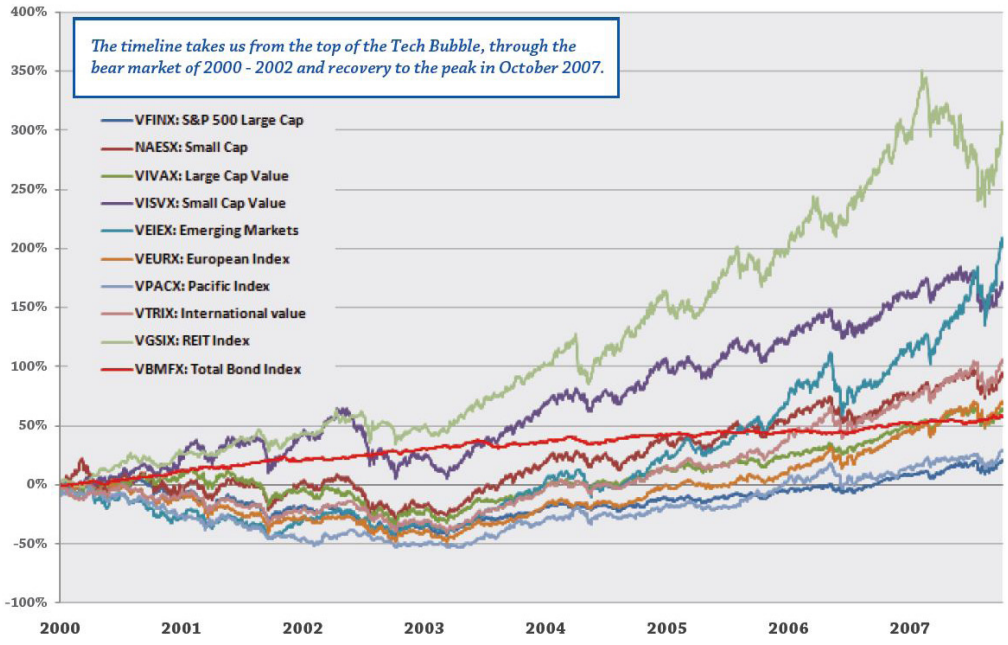
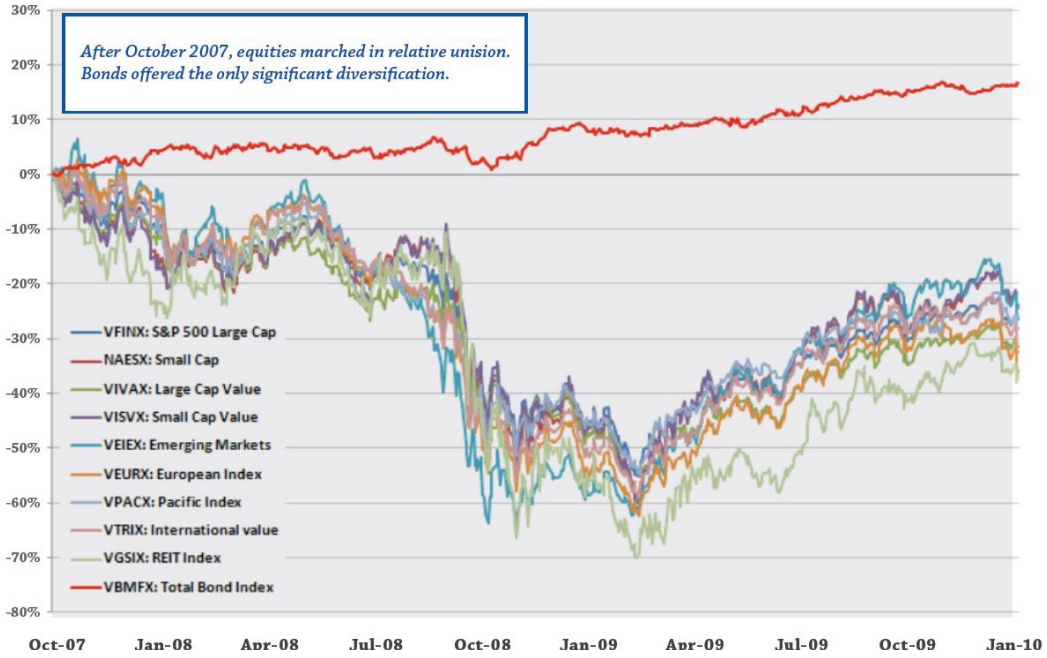


Exhibit 5b: ...until it doesn't!
Asset class examples using Vanguard mutual funds



Can bonds help manage risk?

Many investors, advisors and mutual fund companies address risk by including bonds in the asset allocation of their portfolios. This strategy has merit—in 2008 the stock market was down 38% for the year, but the average "balanced" portfolio of 60% equities and 40% bonds was only down 24% for the same time.

However, there are some very tangible flaws with the strategy. First, a 24% loss is still very significant, particularly to investors who are in or nearing retirement.

Second, bond allocations are meant to dampen volatility but in the current environment pose significant risk and may in fact act as a drag on overall return. That's because interest rates are poised to increase, potentially ending a decades-long trend of decline, and bond values, which have appreciated over many years, will start to fall. (Remember, bond prices and yields have an inverse relationship—when interest rates/yields rise, bond prices fall.)

The simple math behind interest rate increases works like this: for every 1% increase in long-term interest rates, bond prices fall approximately 10%. Exhibit 6 on the following page demonstrates the relationship. Because interest rates are all but certain to rise over the next few years, the "conservative" portion of a typical 60/40 portfolio is in a very precarious position.

Exhibit 6: Decades-long bull market in bonds as yields fell, 1979-2016

The Federal Reserve has already initiated what will likely be a series of interest rate hikes. They have also signaled at recent Fed meetings that additional rate hikes are expected in 2017. If these increases come to pass, bond values will fall. The only uncertainty is how much and how quickly.

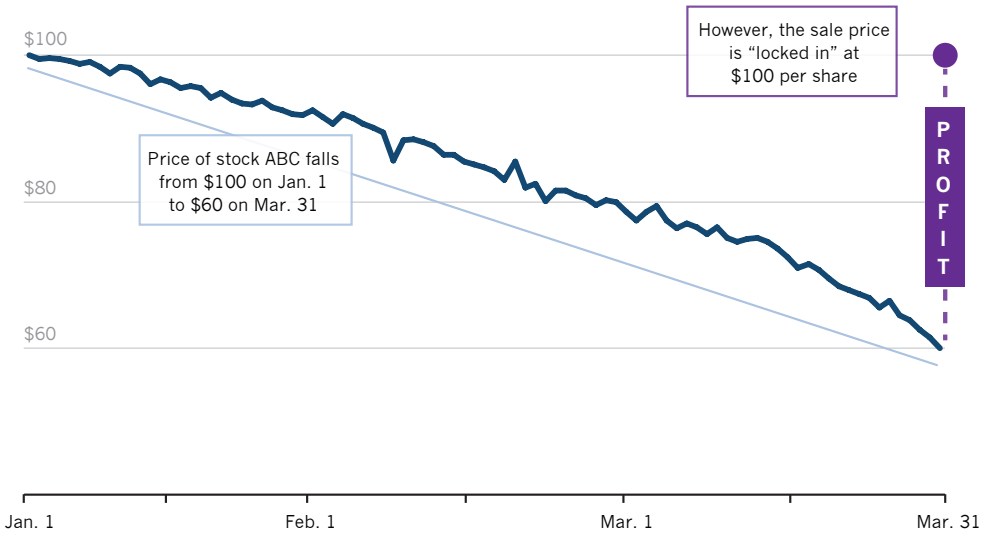
A different approach: Protective hedges.

A different way to limit downside capture and reduce the risk of portfolio losses is through a protective hedging strategy. Protective hedges are common tools used in industries and business beyond investment management: oil companies and airlines use oil price hedges to protect their businesses from fluctuations in the energy markets; farmers use commodity hedges to protect their crops from the risk of catastrophic losses; and insurance companies use financial hedges to manage the risk of incurring large losses when natural disasters strike.

Individuals hedge against the risk of losses in their personal life, by purchasing homeowners and auto insurance, for example. Yet, for their largest and most important asset—their life's savings—there is often no such protection. Many people simply rely on hope—hoping the investment markets do not correct, the financial system does not crash, or that the various investments in their portfolio will miraculously offset one another with equal gains and losses. History has proven this to be unlikely.

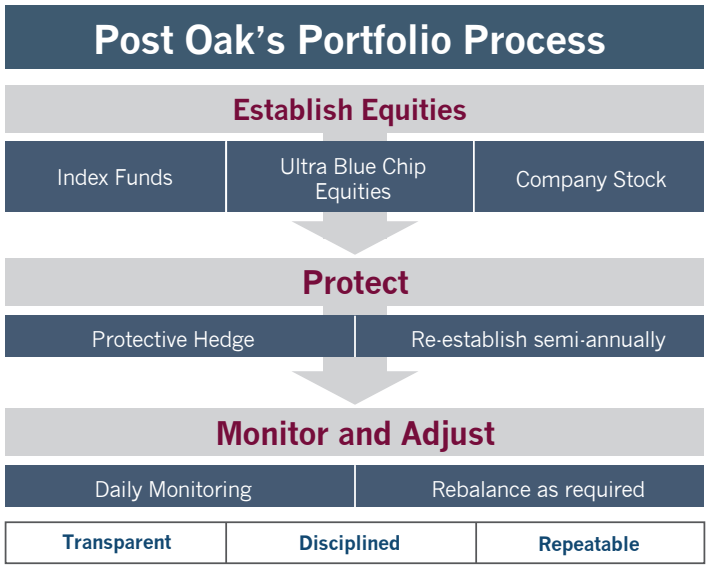
Investors can use protective hedges in much the same way, as a strategy to reduce their exposure to risk in fluctuating stock and bond markets and protect their wealth from large losses in market downturns. We use protective hedges in the form of index put options that give us the right (but not the obligation) to sell the S&P 500 at a pre-determined price. So if the market falls below our pre-determined (or strike) price, we can exercise our right to sell the asset at a higher price than quoted in the market and limit our downside capture.

Exhibit 7: How a protective hedge strategy can work



Invest with the value of protection

Post Oak brings qualified experience and unique expertise to the application of protective hedges in client portfolios. We believe the allocation of the underlying portfolio is important, but it's even more important to protect client asset values from catastrophic losses through our hedging strategy.



Whether clients choose one of Post Oak's portfolio strategies or allow us to manage existing assets, we use protective hedges as a means of helping clients achieve their investment goals through limiting downside capture and avoiding significant market losses.

Past performance does not guarantee future results. There is no guarantee that any investment strategy or account will be profitable or will not incur loss.

Investors should consider the investment objectives, risks, charges and expenses that make up this investment strategy carefully before investing. Investing involves risk, including the possible loss of principal. Share price, principal value, and return on investments will vary, and you may have a gain or a loss when you sell your investment.

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