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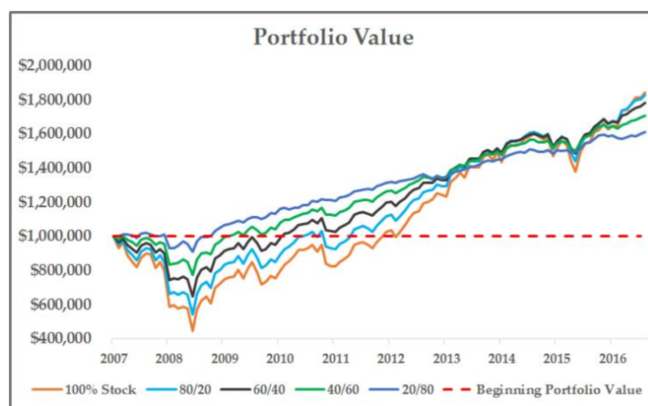
The power of diversification in portfolio management is often overlooked. To illustrate its significance I highlight the performance of hypothetical model portfolios with varying asset allocations, each with different risk profiles, from the peak of the market in October 2007, through the great recession, and up to the present.

Diversification Benefits Illustrated

Financial pundits often tout the benefits of diversification in a portfolio, but in bull markets investors often chase performance and struggle to remember the benefits of holding multiple asset classes. Not only can diversification reduce portfolio volatility, but adding assets with certain characteristics may also increase expected returns. To illustrate the impact, a sample portfolio of $1,000,000 is invested in five different models. Each model portfolio consists of varying amounts of equities and fixed income.

The following chart displays values of each portfolio between the market peak in October 2007 and June 2017. The high risk/return profile associated with an all-equity portfolio is demonstrated by the gold line. The portfolio



consisting entirely of equities suffered not only the largest loss during the market decline but also took the longest to regain its original value.

Stocks/Bonds	Maximum Loss	Time to Breakeven
20/80	(9%)	22 months
40/60	(23%)	25 months
60/40	(35%)	37 months
80/20	(46%)	42 months
100% Stock	(55%)	59 months

Alternatively, during the same time frame, a diversified portfolio with 60% stocks and 40% bonds would have only experienced a loss of 35% and recovered peak value 22 months faster than a 100% stock portfolio that did not recover its initial portfolio value for almost six years.

Diversified portfolios can benefit from reduced volatility and recoup losses faster than more aggressive strategies. Although more modest long-term returns on bonds, when compared with equities, can skew investors to allocate more to equities, the low volatility of bond returns is one of their most coveted characteristics.

The chart below compares one month returns between the U.S. stock and bond markets. As clearly shown by the range of returns, bond market returns are far less volatile than equity returns. During the period presented in the chart above, the stock market had a monthly return range of (26.3%) to 27.9%, while the bond market's returns were within a much narrower range of (3.6%) to 2.8%. When using

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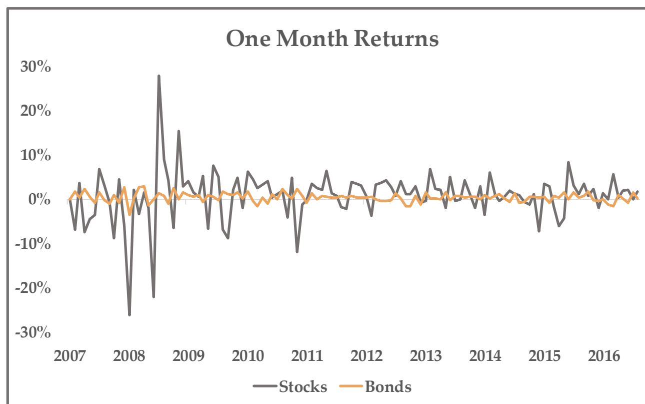
the range as a measure of volatility, the stock market was almost 8.5 times more volatile than the bond market. By simply increasing a portfolio's allocation to lower volatility assets, an investor can reduce the risk to their portfolio's value.

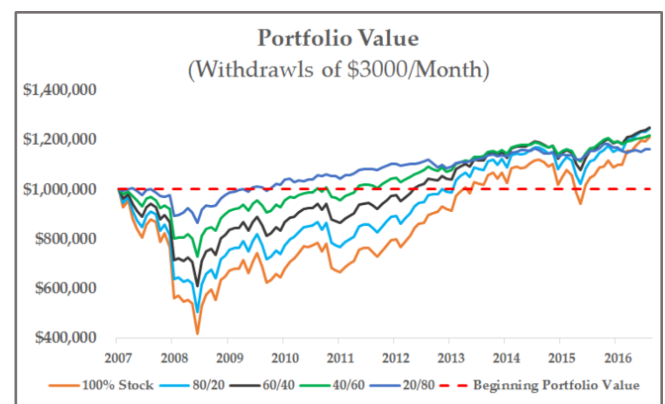


In addition to looking at the absolute level of volatility when creating an efficient portfolio, investors must also consider how each asset may move in relation to one another. For example, by adding an asset class that has high volatility but moves in the opposite direction of the overall portfolio, expected returns can increase without increasing expected volatility.

The benefits from diversification are more pronounced for investors with short time horizons. An investor who planned to liquidate their portfolio one year after the market peak in October 2007 would have saved 15%, or $150,000 on a $1,000,000 portfolio, by using a balanced portfolio of 60% stocks and 40% bonds compared to an all equity portfolio. By withdrawing assets at depressed levels, the short-term investor is realizing losses rather than allowing the portfolio to recover. Longer-term investors can invest more aggressively because they have the time necessary to allow asset prices to recover. In our study above, the all-equity portfolio (gold line) finally overtakes each of the alternative portfolios in value, implying that a more aggressive investment strategy can be beneficial for investors who do not plan to take any significant withdrawals.

Effects of Withdrawals on Portfolio Recovery

The benefits of diversification increase substantially for portfolios with ongoing withdrawals. Taking withdrawals during a market decline can have varying effects on your portfolio's value, depending on how your assets are allocated. The chart below shows the same five portfolios from before, but each portfolio now includes monthly withdrawals of $3,000.



Each portfolios' value is not only significantly lower as of today's date but the time to recover the initial portfolio value is much longer.

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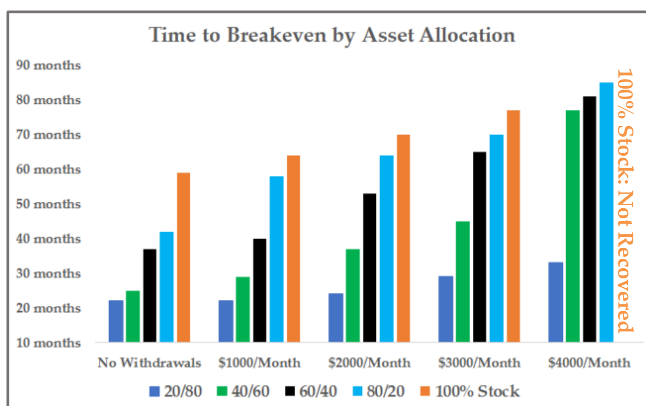
Decreasing the amount of withdrawals during market declines in order to maintain portfolio value is a rational but often impossible response, as investors often need these withdrawals for their own living expenses, which have not declined. An increase in withdrawals has an even stronger negative effect when asset prices are depressed. More assets are required to be sold in a down market, to create the same value, than at previous levels.

The following chart illustrates the benefit of diversification to maintain portfolio value when investors rely on their investments to produce a stable stream of income. There is a clear positive relationship between the amount withdrawn, the amount of stock in the portfolio, and the amount of time it may take for a portfolio to recover in value.



To clarify, during a bear market the maximum loss in your portfolio, and the time it takes to recover, are larger and longer for portfolios with a higher percentage of equities and withdrawals. For example, with no withdrawals a 60/40 portfolio took 68% longer to recover than a 20/80 portfolio, 37 vs. 22 months. However, with monthly withdrawals of $4,000 the 60/40 portfolio took 245% longer to recover, 81 vs. 33 months.

Value added by Rebalancing a Portfolio

As investment values change, so does the exposure to each asset class within the portfolio. Portfolio managers can choose to either rebalance the portfolio to the predetermined model by selling overvalued asset classes and buying undervalued asset classes, or to do nothing and allow the portfolio to "drift".

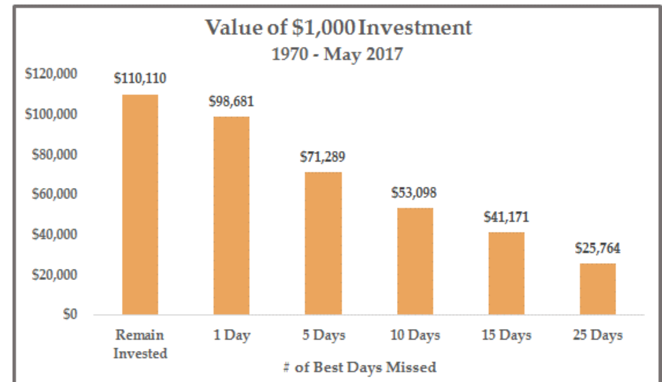
There are two simple but significant benefits of rebalancing the portfolio. First, rebalancing will keep the portfolio from taking on more or less risk than originally desired. If the equity portion within the portfolio increased from 60% to 80% after equities increased or bond investments decreased in value, the portfolio would be taking on a higher level of risk than previously desired. The second benefit of rebalancing the portfolio comes from the premise of mean reversion or contrarian investing. In other words, the more an investment increases, the greater chance the investment will eventually decrease. Although investments can continue to increase in value for extended periods of time, no investment increases forever without a pullback. Essentially, rebalancing captures a portion of

the gains from investments that have outperformed and places them in investments that have underperformed, forcing the investor to sell high and buy low.

The table below illustrates the value of rebalancing throughout the most recent economic cycle. As shown, each portfolio had a higher ending value when rebalancing occurred than the portfolio without rebalancing.

Current Portfolio Value			
Stocks/Bonds	Rebalancing	No Rebalancing	Value of Rebalancing
20/80	$1,607,490	$1,560,185	$47,305.08
40/60	$1,706,115	$1,630,514	$75,600.09
60/40	$1,780,726	$1,700,844	$79,882.07
80/20	$1,826,976	$1,771,173	$55,802.91

The general premise behind rebalancing, buying investments when they are down and selling when they are up, is easy to understand - at least in theory. However, due to investor behavioral biases it is much harder for individual investors to implement. Emotions often lead investors in the opposite direction, wanting to own more of what has gone up and less of what has gone down. Or, investors think they can time the exact bottom or top in markets and make significant bets based on those views. In reality, attempting to time the market can be dangerous. Investors often miss out on some of the best days in the market, which often come soon after the worst days. The following chart represents the current value of a $1,000 investment made in 1970, depending on how many of the best days in the market the investor missed.



As shown, missing only a few of the best days severely impacts long-term investment returns. Therefore, it is imperative to have a rebalancing strategy and to stick with it, even when emotions tell us otherwise.

Summary

Diversification is a tool to maximize the return of portfolios given a certain level of risk. Diversification can also reduce losses by adding uncorrelated assets that may increase in value when other assets experience losses.

Investors who understand how withdrawals impact their portfolio when the market is down are better positioned to make the necessary decisions regarding their budgetary priorities.

Although attempting to time the market bottom is nearly impossible, rebalancing is a powerful tool which allows investors to add value to their portfolio by trimming gains in one appreciated asset and moving them into

another depreciated asset. Over time these small movements between appreciated and depreciated assets can create significant value. Investors who attempt to time the market may miss out on some of the best days in the market, which can have a large detrimental effect on the portfolio.

Details Regarding the Models Used

The portfolio models in this study used the Russell 3000 Index to represent stocks and the Bloomberg Barclays U.S. Aggregate Total Return Index to represent bonds. These are hypothetical models and are for illustrative purposes only. No specific investments were used. Changes in portfolio value were measured on the ninth of each month, between October 9th, 2007 and May 9th, 2017. For charts relating to the performance with and without withdrawals, rebalancing was assumed monthly. All models were created using data from Bloomberg.

The value determined by rebalancing was calculated by taking the difference between a portfolio that was rebalanced monthly and another portfolio that was never rebalanced.

To find the value of missing a certain number of best days in the market the model calculated the initial investment multiplied by the S&P 500 daily returns between January 2nd, 1970 – June 5th, 2017). The model kept the value of the portfolio flat if the investor missed one of the days in the market.

Asset allocation and/or Diversification programs do not assure a profit or protect against loss in declining markets. No program can guarantee that any objective or goal will be achieved.

All indices are unmanaged and investors cannot actually invest directly into an index. Unlike investments, indices do not incur management fees, charges, or expenses. Past performance does not guarantee future results. The S&P 500 Index is a broad-based measurement of changes in stock market conditions based on the average performance of 500 widely held common stocks. The Russell 3000 is a market capitalization weighted equity index encompassing the 3,000 largest U.S. stocks. The Bloomberg Barclays US Aggregate Bond Index is a broad-based index that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market.

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