Introduction: Risk and Return

A goal of foundations in general is to achieve a level of return that is adequate to further their missions at an acceptable risk level, or in other words, they do not wish to take on more risk than is necessary to accomplish the goal. During bear markets, foundations are typically concerned about rapid and severe reductions in asset values. Alternatively, during bull markets, foundations may take on more risk than they need to achieve their long term goals. Over the long term, however, it is important to have a disciplined strategy and not overreact to short-term trends.

Depending upon the current climate, investors often focus too much on either risk or return. During severe recessions, for example, investors have a strong tendency to over-focus on risk. Since risk and return tend to be related, investors must consider both at the same time. The constant challenge is how to achieve returns that are adequate for foundations to meet their ongoing grant-making obligations while controlling their exposure to undo risk at the same time.

This paper explores three concepts to help you more effectively manage risk and return:

1) How to achieve effective diversification by developing a detailed asset allocation strategy
2) The importance of the role of Modern Portfolio Theory (MPT)
3) The benefits of a formal rebalancing policy

From UMIFA to UPMIFA

When you are responsible for other people's money, you are a fiduciary.

The Uniform Management of Institutional Funds Act (UMIFA) did not have clear guidelines for the “prudent investor.” However, the successor to UMIFA, the Uniform Prudent Management of Institutional Funds Act (UPMIFA), has additional guidance in this area and most states have now adopted UPMIFA as the new fiduciary standard.

As we think about asset allocation policy, there are two very important concepts that are now more fully recognized by UPMIFA, and a third that we believe is equally as important:

First: The express duty to diversify. We will explore some ideas on how to build an effective asset allocation strategy to accomplish diversification.

Second: The recognition of Modern Portfolio Theory (MPT). A principal theory of MPT is that combinations of assets together act much better than each asset on its own. Interpretations of UMIFA's concept of prudent investing meant that each investment in the portfolio was judged on its own to be prudent or not. UPMIFA recognizes
that each new investment should be evaluated based on its contribution to the portfolio (how it correlates to other assets in the portfolio), not just its standalone characteristics.

**Third:** Although UPMIFA does not specifically require portfolio rebalancing, we believe that this is a powerful concept that allows investors to take advantage of asset class volatility.

**Importance of Asset Allocation Policy**

While most professional investment advisors agree that asset allocation policy is the primary determinant of portfolio return, the implementation of this concept varies widely in practice. Asset allocation policy requires an investor to answer a few key questions, such as the following:

1) How many asset classes should be included in the portfolio?
2) Which asset classes should be included?
3) What percentage of the portfolio should be allocated to each asset class?

To begin to answer these questions, investors must clearly define their investment objective. For a foundation, the objective should be articulated in the investment policy statement (IPS). Once the investor has chosen the specific type and number of asset classes, a more complex issue arises. What percentage of the portfolio should be allocated to each class? Also, once asset class targets are set, there are differences of opinion on whether or not there should be some tactical overlay. An investor who applies a tactical overlay adjusts targets periodically to reflect short- or intermediate-term projections of economic activity or market behavior. An investor who follows what we will call a “strategic approach” sets policy allocation targets and does not adjust them for short- or intermediate-term market considerations. In order to effectively illustrate the principles of asset allocation and rebalancing, we will discuss the application of the strategic approach.

How can we apply the concept of asset allocation to the question of balancing risk and return? Do risk and return really move in lockstep, or are there ways we can achieve higher levels of return without taking on more risk? For our purposes here, risk is defined as standard deviation. Standard deviation is the amount of volatility experienced above or below an average return over a given time period.

Graph 1 illustrates a basket of five asset classes that some would consider a well-diversified portfolio. The illustration uses historical data from June 1992 through June 2008 (16 years). Our task is to determine what percentages to use for each of these asset classes.

Before we begin, we need to point out an important word of caution. We are using historical data. History helps us to better understand tendencies of various asset classes and enhances our perspective—but does not allow us to predict the future. History does give us some useful indications of how asset classes correlate to each other, which is very helpful in designing an asset allocation strategy. The essence of asset allocation is to use a basket of asset classes that are not highly correlated, meaning they do not move at the same rates at the same times. Some assets move in opposite directions. This is referred to as inverse correlation. However, assets have a tendency to move in surprisingly similar ways during certain cycles. A recent example was 2008, when almost all equity classes moved in the same direction. This is not the first time this has happened and it probably will not be the last. Furthermore, if you only use historical data in your decision-making, you may get portfolio combinations that will not make sense going forward. Other tools must be applied and informed judgments must be made.
Graph 1: Asset Allocation—Base Case

Line 1 in Graph 1 is known as the efficient frontier. It represents a series of efficient portfolio combinations of these five base case asset classes, including U.S. Bonds, U.S. Large Cap Equities, U.S. Small Cap Equities, Foreign Large Cap Equities and Foreign Small Cap Equities. Simply, the efficient frontier represents the most efficient combinations of these asset classes. In this example, there are no combinations of these asset classes that would provide more return with the same amount of risk or less risk with the same amount of return. An investor should choose a portfolio combination that meets their investment objective within acceptable risk constraints. Our example portfolio, represented where the two arrows meet, gives us, historically, an approximate 10% standard deviation (risk) with an approximate 10% return. There is no combination of these five asset classes that will give us more return at the same level of risk.

Is there any way to potentially add return without adding risk? What happens if we add an asset class to our base case portfolio? Remember the discussion about UPMIFA’s recognition of Modern Portfolio Theory (MPT)? Graph 2 illustrates a great example of this by adding commodities to our hypothetical portfolio. In the old “prudent investor” concept, a commodities asset class may not have been qualified as a prudent investment because it has very high volatility on its own, just as small cap equities have high volatility as a standalone investment. But what happens if we add it to our existing basket of asset classes? It moves our efficient frontier up as displayed by line 2 in Graph 2. You may move the efficient frontier up by adding new asset classes; it is not a wall. This allows us the potential for higher returns at the same risk level. Again, with MPT, you would judge the addition of a very volatile asset class as a prudent move if its contribution to the overall portfolio was positive.

What really gets interesting is if you add both commodities and real estate to the portfolio (see Graph 3). When introducing MPT, we talked about how combinations of assets act much differently when combined than they do
on their own. By adding two asset classes at once, we move the efficient frontier even higher (line 4, Graph 3) than when we just added one or the other.

Graph 2: Adding an Additional Asset Class—Commodities

Graph 3: Combining Additional Asset Classes—Commodities and Real Estate
In fact historically, based on this example, you would have received approximately two percentage points more in return at approximately the same level of risk. This is the essence of what asset allocation strategies are designed to achieve. What does that mean to you? Two additional percentage points of return, on average, over the 16-year period we researched could have a very positive effect on grant making and portfolio values over time.

**Opportunistic Rebalancing**

Is there anything else we can do to generate more return without increasing risk? How about rebalancing policy? Simply put, rebalancing is buying or selling asset classes that fall below or rise above a predefined long-term target for each asset class. Rebalancing fosters the discipline of “buy low and sell high.” In theory, buying low and selling high seems simple, but in practice emotions tend to dictate an investor’s actions. Opportunities to buy (when an asset class falls below its target) are often created when bad news or negative market predictions depress prices. Conversely, opportunities to sell (when an asset class rises above its target) may be created by good news and positive predictions of the future for that asset class. In our experience, without adequate education, many investors will buy their best performing asset classes and sell their worst performing asset classes typically at just the wrong time. If this pattern is repeated over time, the portfolio value and subsequent grant making will be less than desired.

Rebalancing policy has been the subject of debate for quite some time. There have been numerous articles written about how and when to rebalance, and about whether or not rebalancing is beneficial. An inherent risk with an investment policy statement that lacks a rebalancing strategy is that the portfolio's risk characteristics could change dramatically over time. During a strong bull market for equities, a portfolio’s effective percentage allocation to equities will increase if the portfolio is not rebalanced. This lack of rebalancing may cause the portfolio to become more aggressively postured than was originally intended. For example, a portfolio with intended targets of 60% in equities and 40% in fixed income may drift to a mix of 70/30 or even 80/20 depending upon the strength of the upswing in equity prices. The result of not rebalancing is that there may be more downside risk for the overall portfolio when equities correct. During a precipitous bear market, the percentage allocations to asset classes such as bonds (particularly government issues) and cash will increase, causing the portfolio to become much more conservatively postured than its original intent. This may result in less upside for the overall portfolio when equity markets recover.

If we believe that some type of rebalancing is essential to the maintenance of our strategic asset allocation and assumed risk posture, how and when should we rebalance? Should we rebalance when a specific time period has passed? Should we wait until the portfolio is close to the minimum or maximum limits our committee set? Should we rebalance whenever an asset class target is violated, even if only by a small amount? Should we wait until the market “settles down” and then rebalance?

This process can be further slowed if a committee needs to approve each rebalancing event rather than establishing policies up front to determine what triggers a rebalancing event. A drawback of using a time cycle is that the end of the cycle may miss the optimal opportunity to rebalance. In other words, equities may have a dramatic one-day recovery in the middle of a cycle and the chance to buy more toward the bottom may be lost. What if we were able to rebalance based on market moves and not simply the passage of time? Would that allow us to capture better buying and selling opportunities?
2008 Rebalancing Study

A 2008 study by Gobind Daryanani uncovered some interesting ideas about rebalancing (see Opportunistic Rebalancing: A New Paradigm for Wealth Managers, Journal of Financial Planning, January 2008). The study required daily data on prices of asset classes, which he was able to find for five classes: U.S. Large Cap Stocks, U.S. Small Cap Stocks, Real Estate, Commodities and Bonds. The daily data was important because the hypothesis was based on capturing market moves at the most opportune time. This idea required that you look (review the portfolio) for opportunities to rebalance often enough to capture those most opportune moves. Results for Mr. Daryanani’s baseline case are shown in Table 1.

The study tested looking once per year (every 250 trading days), twice per year (every six months) as well as every 60, 20, 10 and 5 days and looking daily. The conclusion was that looking every 10 trading days was often enough to capture the most value (see Graph 4). Remember, you are not rebalancing (buying or selling) every 10 trading days rather you are looking for opportunities to rebalance.

A second important test was performed to determine how wide the variances above or below the asset class targets should be. The test concluded that triggering a rebalance once an asset class varied by 20% (20% Band line in Graph 4) above or below the targets delivered the best results. Note, this 20% is a percent of target, not 20 percentage points (see Graph 4). Why was this so? It turns out that momentum is very important. He discovered this by shuffling (see Table 2) the data (sometimes called bootstrapping). He took the daily returns and shuffled them so they were no longer in order. The returns and standard deviations remained the same, but the advantage of how often you look for rebalancing opportunities was eliminated. It did not matter if you looked every day or once per year. Mr. Daryanani had more specific language to describe this, but it turns out that often what goes up continues to go up for a time, and the pattern is the same for declines.

### Table 1: Rebalanced Returns and Benefits for 1992-2004

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### Table 2: Rebalanced Returns and Benefits for Shuffle Experiment

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*The best three algorithms are shown in grey. The bottom row is the no-rebalance case.*
Through 2006, our rebalancing methodology was to review our portfolios every quarter and rebalance based on a 15% rebalancing band. As a result of an early version of Mr. Daryanani’s study, we revised our strategy in 2006 to use a 20% band and a 10-day review cycle. Technology has played a revolutionary role in most businesses including investment management. Following his study, Mr. Daryanani developed software to allow investment advisors to implement this rebalancing methodology.

Graph 4: Return Rebalance Benefit vs. Look-Frequency and Bands
“Rebalancing in a Volatile Market”: Summary Description

As a result of the market crash of 2008 and 2009 we were interested in testing how our strategy actually performed. In order to do so, we analyzed our rebalancing strategy at the portfolio level for the 18 months beginning June 30, 2008 and ending December 31, 2009. We created two model portfolios with one of our asset allocation models and our, third-party, Mason-approved funds at the time of the study. Portfolio 1 was not rebalanced and was allowed to drift over the 18-month period, while Portfolio 2 was reviewed for rebalancing opportunities every two weeks. While Portfolio 2 was reviewed every two weeks, it was rebalanced only when an asset class violated our predefined 20% rebalancing bands. So, how did these portfolios perform? Over the 18-month period, the rebalanced portfolio outperformed the “unrebalanced” portfolio by 2.26% or 226 basis points.

In Graph 5 below, we provide the results of this study.

For more information, please see our website: www.masoncompanies.com/research.asp, which features our comprehensive white paper from this study.

Graph 5: Rebalanced Portfolio Compared to an Unrebalanced Portfolio
**2011 Mason Study on Rebalancing**

Between 2006 and 2011, our rebalancing strategy was to review our clients’ portfolios every 10 trading days and rebalance based on a 20% rebalancing band. In 2011, we conducted our own study on rebalancing. To do so, we designed a model to further evaluate the impact of alternative rebalancing strategies by using more asset classes and longer time periods than were used in Gobind Daryanani's 2008 study. The Mason study model used actual daily returns from October of 1991 through October of 2010. October 1991 was the earliest date for which we could obtain daily data for each of the 20 asset classes used across our recommended portfolios. This data covers a total of 19 full years and includes a total of 4,786 trading days.

**Rebalancing Frequency**

We tested three rebalancing frequencies, every 5, 10 or 20 trading days, which equate to, approximately, weekly, bi-weekly or monthly account reviews. In addition, we tested quarterly and annual rebalancing, but in these cases, we rebalanced each asset class back to target. Our analysis confirmed our previous practice of a 10-day review cycle. The 10-day review frequency produced the highest return and ending value of the policies tested. Additionally, in some cases, the 10-day policy would have led to lower volatility as measured by standard deviation. As a result of this study, we reconfirmed that the 10-day review cycle was the most optimal. Note that these are historical results, not predictions of future results. We believe that history can be used as a tool in designing our strategies. Please see Graph 6 below.

The chart above displays the additional return (or “excess return rebalance benefit”) over a portfolio in which all asset classes were rebalanced each quarter back to target. As indicated by the green colored bar, a portfolio utilizing 30% rebalancing parameters for each asset class generated an additional annualized 0.40% return, compared to a portfolio that was rebalanced every quarter.

**Graph 6**
Rebalancing Bands

During the first phase of our 2011 study we tested our 20 percent rebalance band approach versus a 10 percent and 30 percent rebalance band approach. The 30 percent rebalancing band led to returns higher than those attained using both the 10 and the 20 percent band approach. Over the 19 years analyzed, the 30 percent band approach would have led to 0.40% higher annual returns versus rebalancing to target every quarter.

In additional phases of our study, we tested 25 and 40 percent bands as well, using the 10-day review cycle. Results of the study are below. We believe that with higher potential performance and lower potential standard deviation, this approach to rebalancing is worth the consideration of organizations interested in improving their overall performance. Please see Graph 7 below.

Graph 7: Risk and Risk Adjusted Performance Results
Conclusion

It is particularly important to remember that historical patterns may again be repeated in the future, including strong bear markets and panics as well as strong bull markets and euphoria. In 2008 and 2009 we experienced a historic decline in equities only exceeded during the Great Depression. We believe that having a formal rebalancing policy, clearly described in your investment policy statement, was very important during this time period, and we believe it will continue to be going forward. A proper policy will guide you to make adjustments as asset classes shift. During 2008, energy and commodities increased dramatically through the middle of the year. By the beginning of that year some prognosticators were calling for oil to go to $200 per barrel. As we all know now, oil actually crashed. A rebalancing policy, properly applied, would most likely have called for selling oil during its run up, taking advantage of what in hindsight were unrealistically high prices. During the crash in equity asset classes, bonds on a relative basis held their values, allowing a source to cash in and buy equities as they severely declined in value. This does not mean you sell at the top and buy at the bottom. It means that, on average, you buy and sell at better prices than you otherwise would. Do not be deterred by the fact that you can’t get the timing exactly correct. Follow your plan.

It is also important to remember that most investment theories are developed based on history and historical relationships. If you expect history to predict the future, particularly in the short term (three years or less), you are going to be disappointed and may fail to stick with your long-term plan. However, a historical perspective is a very important tool. Those perspectives, properly studied, will very often uncover cyclical relationships that recur, on average, over time. This means not every time, but more often than not. Investors who have a detailed asset allocation strategy combined with a disciplined rebalancing plan know exactly what they should do in times of panic and euphoria. This is especially helpful when emotions run high, possibly influencing them to do the opposite of what they should. As we all saw in 2008 and into 2009, it was very difficult to maintain discipline in a time of global market meltdown. This paper was designed to provide committees and foundation executives with some basis for the next event that tests their mettle. For investors with a long-term time horizon, a well-executed plan can help to manage the uncertainty.

For more information on Mason’s rebalancing strategies, please see:
www.masoncompanies.com/research.asp

For more information on Gobind Daryanani’s research paper, please see:
www.irebal.com/docs/Opportunistic_Rebalancing.pdf