iSectors® LLC
THE FUTURE OF INVESTING

iSectors® Post-MPT Allocations White Paper

Improved Application of Modern Portfolio Theory

Vernon C. Sumnicht, MBA and CFP®
CEO, iSectors®, LLC
www.isectors.com
(800) 473-2867
Rev. August 2024

iSectors® Post-MPT Allocations
Improved Application of Modern Portfolio Theory
By Vern Sumnicht MBA, CFP®

Executive Summary

- Modern Portfolio Theory (MPT), published in the late 1950's, contains what are considered the core scientific principles of investing.

- Post Modern Portfolio Theory (Post-MPT) is the science of investing published since the 1950's.

- Principles of Post-MPT are used to improve upon the way MPT has traditionally been applied to managing investment portfolios.

- iSectors® Post-MPT Allocation strategies use the investment principles of MPT and Post-MPT to manage investment portfolios.

- Some of the problems Post-MPT has identified with the traditional approach to asset allocation called mean variance optimization (MVO) are:
    - The need to determine expected returns
    - Standard deviation as a measure of risk
    - Diversifying among highly correlated asset classes

- iSectors® Post-MPT Allocations do not use expected return, standard deviation or correlated asset classes to determine asset allocation.

- iSectors® Post-MPT Allocations use a completely objective, quantitative, repeatable and scalable approach to optimize and monthly re-optimize portfolio allocation.

- iSectors® also uses advances in computer technology and the availability of index-based exchange-traded funds to reduce the cost of investing, increase liquidity, and improve transparency.

Modern portfolio theory: profound improvements in the science of investment portfolio management

More than fifty years ago, in 1959, Harry Markowitz, one of the founding fathers of modern portfolio theory, published Portfolio Selection[i]. The work on modern portfolio theory won Markowitz his share of a Nobel Prize. Merton Miller, along with Harry Markowitz and William Sharpe, were awarded the 1990 Nobel Prize in Economics for research on theories of "financial economics."[ii]

It would be difficult to overstate the influence of MPT's core principles on the manner in which investments are managed today. For insights into principles of portfolio management derived directly or indirectly from the research of Miller, Markowitz, Sharpe and their colleagues, see Exhibit A.

Post Modern Portfolio Theory research on investment management since the 1950s

Post-Modern Portfolio Theory, including research in Behavioral Finance, has pointed the way to applications and technologies that can improve investment results and catapult the principles of MPT to a new level of usefulness. A sample of the research and Principles from Behavioral Finance can be found in Exhibit B.

Part One: The Problems with State-of-the-Art Asset Allocation

Post-MPT identified issues with the MVO approach to asset allocation

The Limits of Mean Variance Optimization (MVO)

The current state-of-the-art in the investment industry for determining the optimal allocation of an investment portfolio is a formula called mean variance optimization. MVO was conceived and was appropriate for proving theories of MPT. However, MVO was never intended to be used for determining an actual investor's optimal asset allocation.[iii] Post-MPT has identified many problems with determining an investor's optimal asset allocation portfolio using the (MVO) formula. See Exhibit C for information on the problems with MVO software programs.

Determining expected returns of asset classes

Your Guess is As Good as Mine

One of the key variables required in the MVO formula is the expected return. In order to determine the optimal asset allocation using the MVO formula, an expected return must be determined for each asset class. Unfortunately, MVO provides no objective way to determine expected return. If we do not have an accurate expected return, how reliable can MVO be in determining the optimal asset allocation of a portfolio?

No one can know the future return of any asset class with reliability. The necessity of providing a subjective input in order to solve an objective formula pushes the investor to revert to two questionable practices, i.e., mean reversion or trend following. See Exhibit D for more detail on the fallacies of trend following and mean reversion.

Standard deviation as a measure of risk

Risk and the Real-Life Investor

Another variable necessary for determining investment portfolio allocation using MVO is standard deviation (SD). SD is used in the MVO formula as a measure of risk. Defining risk as SD leads to unreliable conclusions about avoiding risk. Using standard deviation as a measure of risk assumes any volatility from the expected return is bad. That is, SD assumes, absurdly, that unexpected gains are as bad (risky) as unexpected losses.

However, the probability of experiencing an unexpected gain is not what a real-life investor considers risk. An *unexpected loss* is the type of risk investors are concerned about. In other words, *making* money unexpectedly isn't risky: *Losing* money is risky; people just don't want to lose money (see Exhibit B which discuses Behavioral Finance).

Markowitz himself said that "downside semi-variance" would build better portfolios than standard deviation. But as Sharpe notes, "in light of the formidable computational problems...he based his analysis on the variance and standard deviation."[iv] Translation: they didn't have any choice back in the 1950's, Markowitz did not have a laptop with an Intel quad core processer running at 2.6 GHz and a 1TB hard drive or Microsoft Excel spreadsheet software. They had to do the math by hand and SD was the only choice. SD was fine for proving their hypnosis but SD

isn't a choice for managing investor portfolios. See Exhibit E for more detail regarding the problems with using standard deviation to measure risk.

High correlation between popular asset classes and the danger of "correlation convergence"

Facing the correlation problem for better diversification

The third and final variable needed to determine asset allocation when using MVO is correlation. Correlation is a statistical measure that enables an investor to determine how similar two investments are to each other. See Exhibit F for more detail on correlation.

Consider the following example: The domestic equity asset classes that most investors recognize as the norm for allocating assets are the following:

- Large capitalization (cap) growth stocks
- Large cap value stocks
- Mid-cap growth stocks
- Mid-cap value stocks
- Small cap growth stocks
- Small cap value stocks

Over the past 20 years, especially, these equity asset classes have become highly correlated, (see **Figure 1**). The more the correlation among these asset classes converges on 1, the more we lose the ability of diversification to reduce the risk of losses in an investment portfolio.

Unfortunately, these investments have become too similar to each other (see **Figure 1**) to reduce risk. This type of investment diversification is similar to a New York City street vendor who sells only umbrellas. To diversify he decides to add raincoats as well. Yes, he has diversified, but he hasn't reduced his risk of losing money when the sun is shining. The New York City street vendor would be much better off with umbrellas and sunglasses. In a similar way, an investor should diversify his or her asset mix in a way that uses asset classes that are not too similar to each other.

The use of asset classes with substantially lower correlation improves the risk adjusted return results of any asset allocation portfolio[v].

Figure 1

Traditional Market Sector Correlation (Last 5 Years)						
	Large Growth Stocks	Large Value Stocks	Small Growth Stocks	Small Value Stocks	Mid Growth Stocks	Mid Value Stocks
Large Growth Stocks	1					
Large Value Stocks	0.81	1				
Small Growth Stocks	0.85	0.84	1			
Small Value Stocks	0.73	0.93	0.90	1		
Mid Growth Stocks	0.93	0.85	0.95	0.82	1	
Mid Value Stocks	0.80	0.98	0.88	0.96	0.87	1

High Correlation; *≥.80*

Modest Correlation; *between .50 - .79*

Low Correlation; *between 1 and .49*

Negative Correlation; *≤0*

Figure 1 provides the correlation matrix for the domestic asset classes most investment advisors recommend to clients today. Note that these asset classes have become highly correlated (that is, diversifying an investment portfolio among these asset classes won't reduce risk).

To make matters worse, research shows that, in a down market, when diversification is most important, these asset classes become even *more* highly correlated. Various explanations have been given for the increased convergence of correlation variables. A herd mentality (especially in down markets) has been documented.[vi] It has also been hypothesized that years of relatively low stock market volatility can contribute to correlation convergence.

The Trouble with Mutual Funds

High management, transaction and tax costs of mutual funds
Many investors use managed mutual funds to allocate their investment portfolio. Although mutual funds offer a basket of professionally managed and diversified securities, they also have significant problems, including high fees, hidden costs, uncertainty of holdings and uncertainty of taxes.

When investors diversify their investments by putting their money in one or several mutual funds, they typically are unaware of the substantial costs. Actively-managed equity-based mutual funds charge about 1-1.5% each year, to manage and operate the fund. In addition, transaction costs to buy and sell the stocks that the fund owns adds another 1-1.5% to an investor's cost each year (these costs do not require disclosure except in the statement of additional information).

In addition to these management and transaction costs of mutual funds, investors are allocated taxable capital gains each year. When investors decide to liquidate their shares, the fund must sell stocks often realizing capital gains. Now every investor that stays in the fund must pay their prorated share of the taxes from that realized gain, (whether the investor has been a shareholder for ten years or ten days). That tax cost can be an additional 1.5% of total investment each year.

Add it all up and the annual cost of mutual fund investments can easily be 3.5% annually or more, not including any front-end, back-end, or 12b-1 load fees, if the fund was purchased through a broker and a commission was charged for the purchase.[vii] See Exhibit G for more information on the high cost of mutual funds.

The need for a more robust and comprehensive model

The problem with limiting asset allocation criteria to standard deviation, expected return and correlation In Coaker, William J. Jr. 2006. The Volatility of Correlation: Important Implications for the Asset Allocation Decision, Journal of Financial Planning 19, no. 2 (February): 58–69 he demonstrates the instability of correlation variables and concludes that, "rather than rely on historical correlations, a more comprehensive and dynamic approach is needed in making asset allocation decisions." [viii] Coaker's findings reflect the fact that the investment environment is constantly changing in a random fashion. The securities markets are affected by more than expected return, SD (volatility) and correlation. Some of the economic and capital market factors that affect the ups and downs of various asset classes include, but are not limited to:

- money supply
- capacity utilization
- GDP growth
- inflation
- dividend yields
- interest rates
- unemployment
- etc.

These variables and others need to be brought into the algorithm for creating optimally allocated portfolios and on-going rebalancing decisions.

Part Two: Solutions: Catapulting MPT to a New Level of Effectiveness

From theory to practice: iSectors® Post-MPT Allocation Models

The goal of the iSectors® Post-MPT Allocation models is to eliminate the problems identified with the current approach to asset allocation using MVO. The intent is to implement the enhancements to asset allocation optimization identified by Post-Modern Portfolio Theory. Bottom line, we want to improve the risk-adjusted returns for investors.

An Improved Optimally-Allocated Portfolio Model

iSectors® Post-MPT Allocation models include the following essential principles:

- A truly objective strategy applied consistently to optimally allocate (risk/return) and to monthly re-optimize the asset allocation.
- The strategy for determining optimal portfolio allocation relies on monthly changes in more than a dozen economic and capital market factors empirically proven to effect changes in stock and bond markets.
- No need to estimate (guess) the expected return of asset classes. (we don't need expected returns)
- A more relevant approach to managing risk - a risk tolerance threshold set to zero or no downside loss, replaces standard deviation.
- The allocation optimization strategy is applied to allocate nine asset classes (primary sectors) that are representative of the entire market universe. These nine asset classes have low correlation to one another, that is, they are different from each other, allowing our diversification to reduce risk.
- The model is applied using fee-sensitive index-based exchange-traded funds to mitigate costs as much as possible.

An objective model eliminates estimating expected returns

In the iSectors® Post-MPT models' allocation optimization algorithm, the asset allocation decisions are directly tied to the changes in empirically proven, influential economic and capital market factors. The asset allocation and rebalancing decisions rely on a more comprehensive set of factors than standard deviation (risk), expected return and a correlation matrix (such as that used by MVO). The model is truly objective; the simplistic subjective inputs of MVO are eliminated.

iSectors® Post-MPT Allocation optimization model is robust enough to include the effect of monthly changes in more than a dozen market and economic factors. Reoptimizing the portfolio every month allows iSectors® Post-MPT models to maneuver the portfolio allocations through time. It is important to understand iSectors® Post-MPT Allocation models are not econometric models, mean reversion, momentum or sector rotation, nor are they trend followers or market timers. iSectors® Post-MPT models use the basic principles of MPT to develop an efficient frontier each month which identifies the optimal risk-adjusted return allocations.

An important part of the iSectors® Post-MPT Allocation optimization models, is the ability to determine which changing macro-economic factors affect the markets. There is no magic formula to determine effective capital market and economic factors. Deciding on which factors will be operative is the result of disciplined research. That is, researching various books, papers and articles with the intent to identify empirical evidence of statistically significant relationships … between changes in a particular economic factor, and corresponding changes in the prices of various asset classes. Disciplined regression and multifactor regression analysis, error analysis, etc. is then applied to determine proper lead time for changes related to the factors.

A more relevant measure of risk: downside loss

Insights and observations into the psychology of investing can enhance the understanding and measure of risk. A core innovation of Post-MPT is its recognition that standard deviation is a poor proxy for how human beings experience risk. Risk is an emotional condition — fear of a bad outcome such as fear of loss, fear of underperformance, or fear of failing to achieve a financial goal. iSectors® Post-MPT's asset allocation model manages risk by setting a zero tolerance of going below zero, rather than measuring risk using standard deviation. This approach also deals with non-symmetric (skewed) return distributions. Managing risk using a threshold of zero recognizes that losing money is the risk investors want to reduce.

Asset classes that have truly low correlation to one another

The standard approach for diversification among U.S. stocks includes: large growth stocks (or a large growth stock mutual fund), some large value stocks (or large value mutual fund), some medium size growth stocks and value stocks, along with some small growth and small value stocks as well. These asset classes are shown in **Figure 1** to be highly correlated to each other.

In order to obtain consistently low correlation between asset classes, the iSectors® Post-MPT Allocations keyed segmentation not to capitalization, but rather to determining the primary sectors, or asset classes, that represent the entire market universe but are least correlated to each other. For example, consumer durables, chemicals, defense, and basic materials are all highly correlated. However, in this case, basic materials is least correlated to the other 8 primary sectors or asset classes and therefore, basic materials is used as one of the 9 asset classes in the iSectors® Post-MPT Allocations to diversify the portfolio. The other asset classes used include, but are not limited to, energy, real estate, financials, basic materials, health care and technology (see **Figure 2**). By comparing the matrix in **Figure 1** to the matrix in **Figure 2**, it becomes quite obvious that iSectors® is reducing risk of loss through diversification by allocating to asset classes with low correlation.

An investment that mitigates management, trading and tax costs

iSectors' approach to asset allocation and optimization allows for the use of fee-sensitive investment vehicles. As we have seen, an investor using managed equity mutual funds can lose 3% – 4% of his assets annually to a combination of management fees, transaction expenses and taxes. This is before any front-end or back-end commissions and/or 12b-1 fees, or advisory services. In order to reduce costs associated with actively managed mutual funds, iSectors® Post-MPT uses index-based ETFs.

Figure 2

iSECTORS® ASSET CLASS CORRELATION MATRIX
(OVER THE LAST 5 YEARS)

	Bonds	Gold	Energy	Finance	Health	Tech	Materials	Real Est.	Utilities
Bonds	1								
Gold	0.41	1							
Energy	-0.29	-0.10	1						
Finance	-0.02	-0.01	0.74	1					
Health	0.19	0.21	0.50	0.65	1				
Tech	0.30	0.18	0.44	0.70	0.72	1			
Materials	0.09	0.23	0.65	0.86	0.77	0.75	1		
Real Est.	0.35	0.22	0.49	0.77	0.72	0.75	0.82	1	
Utilities	0.22	0.35	0.31	0.49	0.59	0.48	0.64	0.69	1

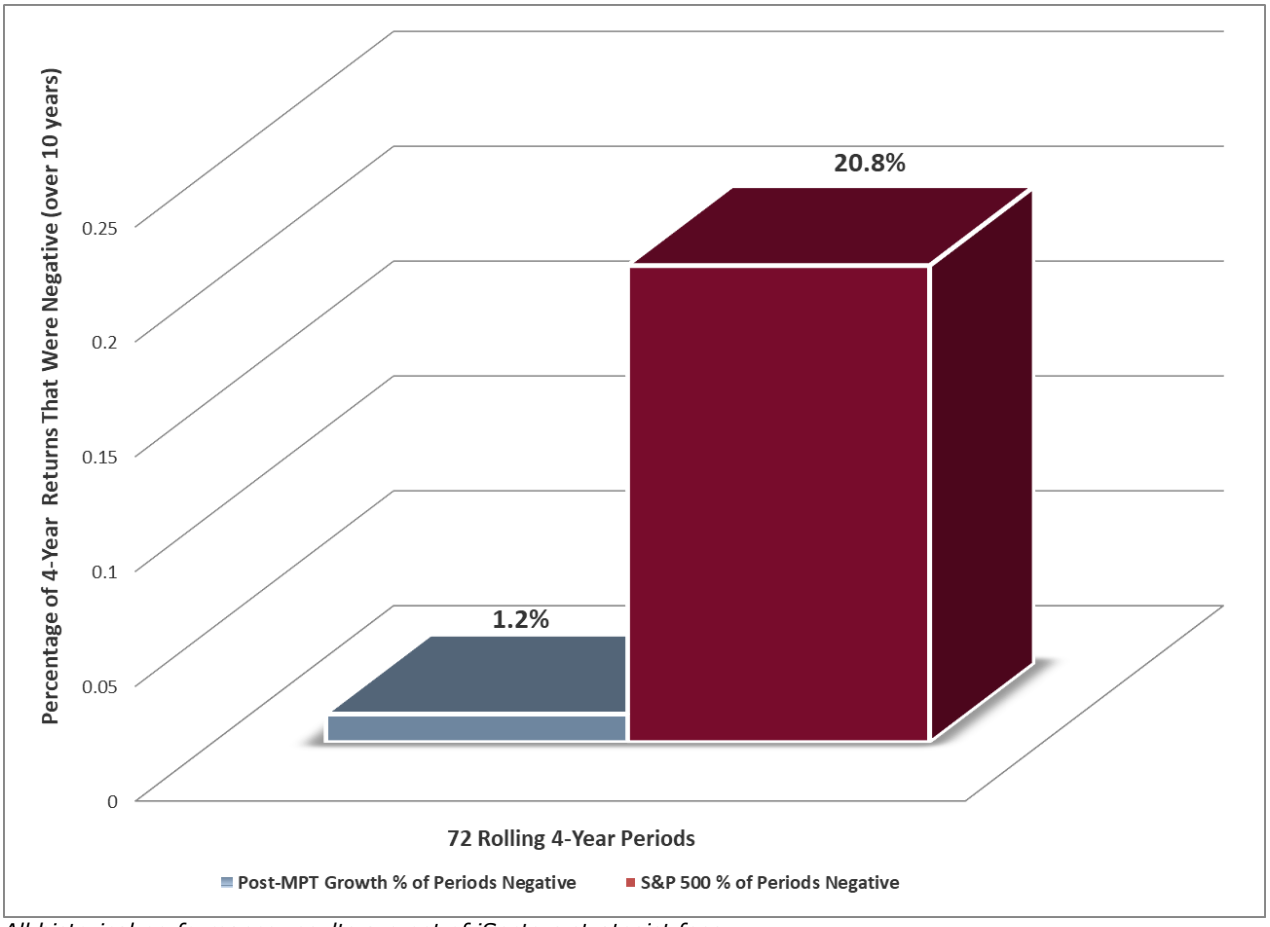
Correlation Legend
- Negative Correlation
- Little or No Correleation
- Moderate Correlation
- High Correlation

Part Three: Performance Results

Ten years of actual performance results

Timing an investment in iSectors® Post-MPT Growth Allocation should not be a concern. The graph in **Figure 3** compares an investment in iSectors® Post-MPT Growth Allocation to that of the S&P 500 Index. The comparison looks at 72 rolling 4-year periods over 10 years, net iSectors' management fee. As long as an investment in iSectors® Post-MPT Growth Allocation was held for 4 years, there was only a 1.2% chance of losing money. On the other hand, an investment in the S&P 500 Index held over the same 4-year period would have lost money 20.8 % of the time.

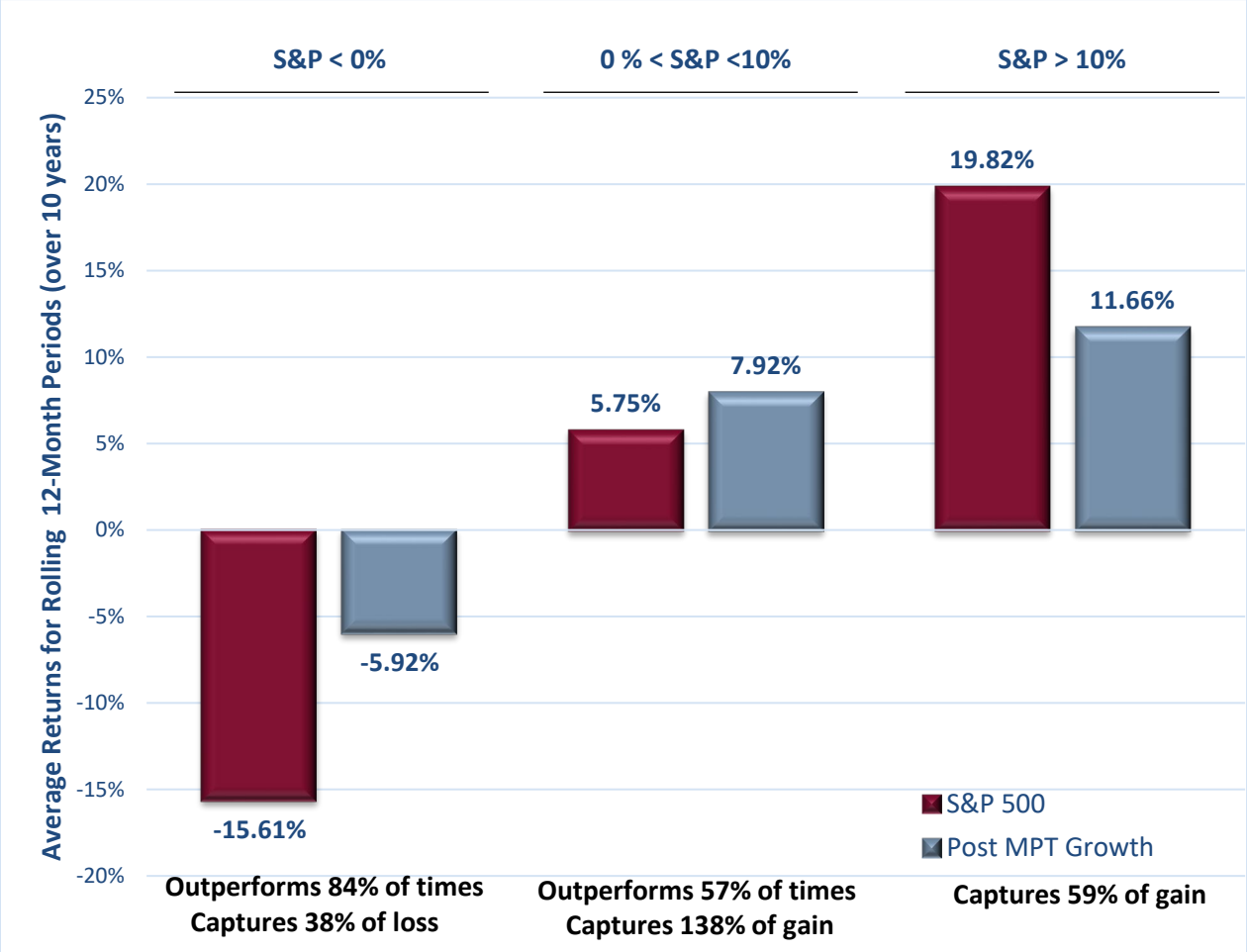
Figure 3



All historical performance results are net of iSectors strategist fees.

The graph in **Figure 4** compares an investment in iSectors® Post-MPT Growth Allocation to that of the S&P 500 Index. Average returns for rolling 12-month periods of each investment over 10 years are presented, net iSectors' management fee. When the S&P 500 is negative, the iSectors® Post-MPT Growth Allocation outperforms 84% of the time and captures only 38% of the loss. When the S&P is positive, but with a gain of less than 10%, the iSectors® Post-MPT Growth Allocation outperforms 57% of the time while capturing 138% of the gain. When the S&P gains over 10% in a 12-month period, iSectors® Post-MPT Growth Allocation still manages to capture 59% of the gain.

Figure 4



All historical performance results are net of iSectors strategist fees.

Summary

The research in portfolio management and behavioral finance published after MPT was published in the 1950's is referred to as Post Modern Portfolio Theory (Post-MPT). Post-MPT instructs investors to reconsider how they apply the principles of MPT. The approach to asset allocation traditionally applied and used today is mean variance optimization (MVO). Post-MPT research teaches us a number of things we can do to improve an investor's risk adjusted returns by using an approach to asset allocation other than MVO:

- The current MVO approach to measuring an investment portfolio's risk is the use of a statistical measure called standard deviation. This is a measure of volatility. If volatility (standard deviation) is used to measure risk, it would imply that unexpected investment losses are as much of a concern to investors as are unexpected investment gains. This assumption violates common sense and logic which tells us investors are much more concerned with losses and are actually pleased to receive unexpected gains.

- Diversification, that is, "don't put all your eggs in one basket", is a tried and true common sense approach to reducing investment risk. When it comes to investing, this means using investments that are different from each other. The current MVO approach to diversification used in the investment industry dictates diversifying among the following asset classes: large value, large growth, mid-cap value, mid-cap growth, small-cap value, and small-cap growth, on a global basis. The problem is that these investments have become too similar to each other and therefore, diversifying among these asset classes does not reduce risk, especially in down markets when all of the asset classes go down at the same time. Investors need to diversify among asset classes that are truly different from each other to reduce risk.

- The current approach to asset allocation uses a mathematical model called mean variance optimization (MVO). This model uses only 3 variables: volatility (standard deviation), expected return (a guess at best), and correlation (a measure of how similar investments are to each other). Along with the obvious problems associated with the use of these variables, it is also obvious that the economy, investment markets, and investment risk are all affected by more than these 3 variables. Therefore, asset allocation formulas need to be more robust and include the changes that are constantly occurring in many other, more relevant economic factors, such as inflation, interest rates, money supply, unemployment, etc.

- Finally, managed mutual funds have a high total fee structure (including pass through capital gains taxes) that can be reduced or eliminated to improve client returns by using index-based exchange-traded funds.

Conclusion

Post-Modern Portfolio Theory and research in Behavioral Finance have pointed the way to applications and technologies that can improve investment results and catapult the principles of MPT to a new level of usefulness. These improvements are what iSectors® Post-MPT Allocations take advantage of in order to improve the risk adjusted returns for investors. To summarize, iSectors® Post-MPT Allocations:

- Use an allocation optimization formula that can be applied objectively without subjective inputs like expected return or subjective manipulation of minimum and maximum investments in any one asset class.
- Instead of using standard deviation to measure risk, the iSectors® Post-MPT Allocation model applies a risk management tolerance of zero (don't lose money; no negative returns). This is based on the fact that most investors consider the risk of investing to be the loss of money; upside volatility is not considered risk.
- Use month-to-month changes in more than a dozen different economic factors, such as inflation, interest rates, money supply, unemployment, etc., to determine optimal asset allocation and to monthly re-optimize the allocation of an investment portfolio.
- Diversify investment portfolios among investments that are different from one another (low correlation) so that the process of diversification will truly reduce the risk of investment losses.
- Reduce the cost of investing by using technology and allocating portfolios among index-based exchange-traded funds (ETFs) rather than the more expensive approach that uses more expensive managed mutual funds.

Exhibit A

Modern Portfolio Theory research

Modern Portfolio Theory (MPT) asserted that investors expect to be compensated for taking risk, and that an infinite number of "efficient" portfolios exist along a curve defined by risk and return. Every possible asset combination can be plotted in risk-return space, and the collection of all such portfolios defines a universe of possibilities in this space.

The efficient-frontier consists of the portfolios in this space with the maximum return for a given level of risk or the minimum risk for a desired return. Here is a short summary of some principles derived from MPT.

Investors are risk-adverse. The only acceptable risk is that which is adequately compensated by potential portfolio returns.

Markets are efficient. For the most part, stocks are fairly priced because so many people research stocks all factors are already reflected in the price. Therefore, it is difficult to find undervalued or mispriced securities or to know ahead of time (with any degree of certainty) the next price move of any individual security.

The portfolio, as a whole (asset allocation) is more important than individual security selection. The appropriate allocation of capital among asset classes (stocks, bonds, cash etc.) will have far more influence on long-term portfolio results than the selection of individual securities or market timing.

Investing should be for the long term. Investment horizons of ten years or more are critical to investment success because it allows the long-term characteristics of the markets to surface.

Every level of risk has an optimal allocation of asset classes that will maximize returns. Conversely, for every level of return there is an optimal allocation of asset classes that can be determined to minimize risk.

Allocating investments among assets with low correlation to each other reduces risk. Correlation is a statistical measure that gives an indication of the extent to which two assets are similar to or different from each other.

Exhibit B

Behavioral Finance: The psychology of investing

The systematic study of investor behavior is called Behavioral Finance and researchers in this field have developed a rich view of risk as it manifests in the decision-making of real-life investors[viii]. An overview of the relevant findings on risk follows.

Fear of Loss is Exponential. Anxiety over a loss increases exponentially as the magnitude of the loss increases.

Upside Marginal Utility Leakage. Happiness over a gain decreases as the magnitude of the gain increases. The investor's utility or "usefulness" for very high returns is not much higher than for merely good returns (there is utility "leakage").

Jump Discontinuity. There is a sudden leap in anxiety when returns go below a threshold, such as zero. This is called a "jump discontinuity" in the utility curve because the investor's utility for the returns "jumps" downward when the return is even the smallest fraction below zero (or the investor's minimum acceptable return).

Risk is Asymmetrical. The way we feel about losses is not the mirror image of how we feel about gains. The shape of the utility curve is different on the left than it is on the right.

Risk is Situational and Investor Specific. Standard deviation assumes every investor in the world views risk identically. Yet we know that people vary, and that even the same person views risk differently in different scenarios.

Risk is Relative to a Personal Benchmark, or MAR (Minimally Acceptable Return). This benchmark is not the mean or average return. Investors have goals they want to achieve and a rate of return that will accomplish those goals. The MAR, is therefore an investor-specific "hard target" such as 6 percent or 7 percent. Returns below the MAR are what investors fear.

Exhibit C

MVO-derived portfolio optimization software lacks objectivity

Any investment adviser who regularly uses MVO asset allocation software soon confronts its idiosyncrasies. The software tends to allocate assets to the one or two best investment options only, (in terms of risk-adjusted returns), recommending that all or virtually all assets be placed in one or two investment options, depending on the level of risk to be maintained.

This is why MVO asset allocation software comes with a module for "freezing" or limiting the minimum and/or maximum allocation to every asset class.

For example, by freezing certain minimum required investments, you then guarantee a greater number of asset classes in the portfolio. In addition, it has become commonplace to think of a client's attitude toward risk as being some combination of stocks and bonds. That is, one may describe a client as having a 60/40 stock/bond comfort level with risk. This client might then be considered a moderate risk taker.

By the same token, a conservative risk taker may be defined as a 20/80 stock/bond allocation. Likewise, an aggressive risk taker is pegged as an 80/20 stock/bond investor and a 100% stock investor may be labeled very aggressive. This perception of risk has led to the bond allocation being frozen at 20%, 40%, 60%, etc. within the optimization software. Modern Portfolio Theory; however, does not support this attempt to subjectively influence the "efficient frontier."

Some of the issues with the software could be addressed using Monte Carlo simulation and/or Black-Litterman models in conjunction with MVO. Unfortunately, these fixes don't address the more fundamental problems associated with the variables MVO uses to calculate asset allocation.

Exhibit D

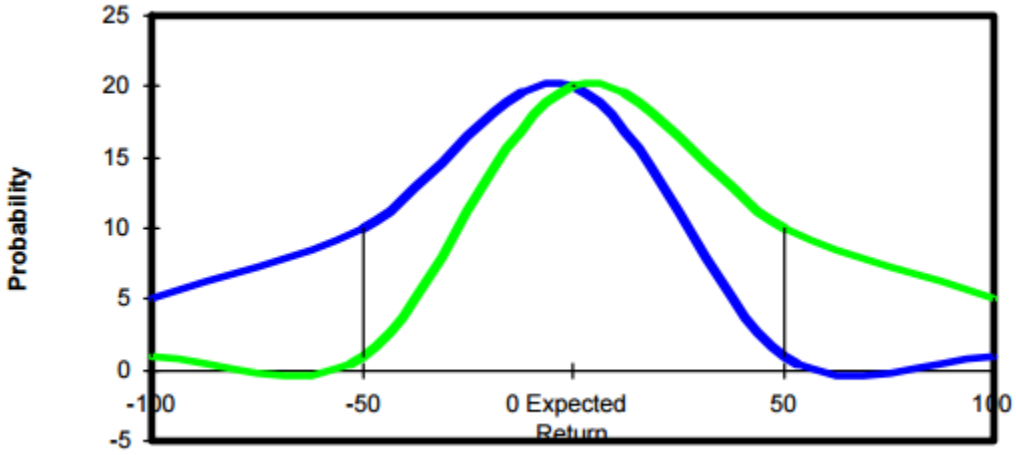
The fallacies of trend following and mean reversion

For instance, assume large cap growth stocks have generated higher than long-term average returns for the last two years. What expected return do we use to calculate asset allocation for next year? Is it prudent to assume an expected return higher than the long-term average again for next year ... in effect sticking with the trend? Or is it better to assume an expected return next year that is a bit below the long-term average? Which is in effect deciding on mean reversion — the notion that all investment returns will eventually revert to the mean or long-term average return?

The confused logic of these two very tempting tendencies of thought can be shown with the example of the flip of a coin. Suppose you are betting on the flip of a coin and heads comes up 10 times in a row … what do you do next? Bet on tails, in effect assuming mean reversion, or bet on heads, in effect following the trend? Answer: it doesn't matter. The next flip has the exact same odds as any other flip: 50/50. The past results, whatever they were, can tell you nothing predictive about the results of the future.[ix] Heads are as random as tails, and whether the market follows a trend or reverts to the mean is an event just as random as the result of the flip of a coin.

Exhibit E

Using standard deviation to measure risk



If I were to analyze each of the investments represented by the green frequency of returns curve and the blue frequency of returns curve using MVO and standard deviation, I'd consider them both equal. Both these investments have the same expected return and standard deviation.

Both investments have the same SD because they are equally volatile. That is, they both deviate from the expected return equally. Yet these are not equal investments: green's volatility is upside and blue's volatility is downside.

Using SD as a measure of risk under MVO, I would have overlooked a great investment simply because it had unexpectedly positive upside returns. This happens because when using standard deviation, upside volatility gets penalized the same as downside volatility. The idea that unexpected gain is as risky as unexpected loss shows the limits of the theoretical construct to appropriate what risk really means to the real-life investor.

Standard deviation as a measure of risk is not consistent with the way the concept of risk actually operates when an investor makes investment decisions. To the degree that MVO assumes risk can be measured by standard deviation, MVO will fail to account for the psychological or behavioral aspects of investor decision-making. A portfolio optimization formula that incorporates an investor's concerns about losing money would be more appropriate than MVO's use of standard deviation as a measure of risk.

Exhibit F

Correlation

A positive correlation means that the two investments tend to rise and fall together over time. A negative correlation indicates that the investments act differently, and when one investment is rising, the other tends to fall. Correlation is on a scale from 1 to -1. A value of 1 indicates perfect positive correlation; it means that the two investments behave exactly alike.

A correlation of -1 indicates perfect negative correlation; this means that the two investments behave exactly opposite to each other. Similarly, a correlation of zero means they act randomly with respect to one another, which is to say there is no correlation.

To reduce the risk of loss through diversification it is necessary to identify investments with low or even negative correlation to each other. If all other variables are held constant … the lower the correlation between A and B, the more our risk of loss is reduced in an environment that causes either A or B to experience a loss.

Exhibit G

High cost of mutual funds

Volumes have been dedicated to explaining and uncovering the costs of mutual funds,[xi] and there is little to add to the comprehensive critique provided by the writing career of John Bogle, father of The Vanguard Family of Index Funds, for instance. Nevertheless, there are a few points that are germane to this discussion.

In general, the individual investor has little understanding of the impact of these fees on net return. "Just 43% of investors said they understood their adviser's fee structure 'completely' or 'fairly well,' according to a survey by Boston-based State Street Corp.'s investment management arm, and Knowledge@Wharton[xii], a business journal at the Wharton School of Business.

Fortunately, there are a number of services that can provide assistance in this area. One particular source that I recommend investors examine when reviewing their mutual fund holdings (or prospective holdings) is a website: http://www.personalfund.com. Here you can put in the name or symbol of your mutual fund to discover the true cost of ownership.[xii]

Mutual Funds and Fear of the Unknown

Another problem with mutual funds stems from an investor's fear of the unknown, what has been observed in Behavioral Finance as, "aversion to ambiguity." [xiv] With the explosion of investment vehicles such as derivatives, aversion to ambiguity has caused investors to demand more transparency in their portfolios.

Arguably the greatest uncertainty problem that mutual funds cause is taxes. Mutual funds pass through all of the income and capital gains to shareholders; yet, *they cannot pass along losses*. In addition, shareholders typically aren't aware of these tax consequences until late in the year. Many funds wait until December each year to make their capital gains distributions known. That doesn't give the investor enough time to make adjustments to his/her investment and/or tax planning.

[i] Harry M. Markowitz, *Portfolio Selection*, (New Haven, CT: Yale University Press, 1959).

[ii] For details of the 1990 Nobel Prize in economics and its three winners, go to www.nobelprize.org

[iii]See, *Post-Modern Portfolio Theory*, by Pete Swisher and Gregory W. Kasten, FPA Journal, September 2005. See also, Richard Oberuc, *Dynamic Portfolio Theory and Management: Using Active Asset Allocation to Improve Profits and Reduce Risk*, (McGraw-Hill Companies).

[iv] Harry M. Markowitz, *Portfolio Selection*, (New Haven, CT: Yale University Press, 1959).

[v] Emphasizing Low-Correlated Assets: The Volatility of Correlation *by William J. Coaker II, (Journal of Financial Planning, September 2007.*

[vi] See Charles Ellis, *Winning the Losers Game*, McGraw Hill Professional, 2002.

[vii] See Richard Rutner, *The Trouble with Mutual Funds*, (North America Press, 2004), currently out of print.

[viii] See William J. Coaker, *The Volatility of Correlation Important Implications for the Asset Allocation Decision*, Journal of Financial Planning.

[x] See *Post-Modern Portfolio Theory*, by Pete Swisher, and Gregory W. Kasten, FPA Journal, September of 2005 . See also, *Market Timing*, December 1, 2005, Revised: September 1, 2006 at: FPA Journal - Post-Modern Portfolio Theory (archive.org)

[xi] John Bogle's most comprehensive work on mutual funds is, *Bogle on Mutual Funds: New Perspectives for the Intelligent Investor,* (Dell Publishing, 2000).

[xii] Today's Research Question: Why do Investors Choose High-fee Mutual Funds Despite the Lower Returns?

[xiii] This website has received many favorable reviews. For example: *Consumer Federation of America*: "This site provides investors with important information that could potentially save them thousands of dollars."

[xiv] Hersh Shefrin, *Beyond Greed and Fear*, (Oxford University Press).

General Disclosure

iSectors® is a suite of proprietary asset allocation models and services. iSectors®, LLC is an affiliate of Sumnicht & Associates, LLC (Sumnicht) and, as such, iSectors® and Sumnicht share certain employee services. iSectors® became registered as an investment advisor in August 2008. iSectors® is a registered trademark of Sumnicht Holdings, LLC. The contents of this presentation are for informational purposes only. Content should not be construed as financial or investment advice on any subject matter. This is neither an offer nor a solicitation to buy and/or sell securities. Information pertaining to iSectors® operations, services, and fees is set forth in its current disclosure statement (Form ADV, Part 2 Brochure), a copy of which is available upon request.

iSectors® asset allocation models are not guaranteed and involve risk of loss. At any given point in time, the value of iSectors® asset allocation model portfolios may be worth more or less than the amount invested. Different types of investments and/or investment strategies involve varying levels of risk, and there can be no assurance that any specific investment or investment strategy (including the investments and/or investment strategies devised or undertaken by iSectors®) will be either suitable or profitable. Financial professionals are responsible for evaluating investments risks independently and for exercising independent judgement in determining whether investments are appropriate for their clients.

Past performance may not be indicative of future results. Therefore, no current or prospective investor should assume that future performance will be profitable, or equal either the performance results reflected or any corresponding historical index. Asset allocation and diversification concepts do not ensure a profit nor protect against loss in a declining market.

The historical benchmark index performance results are provided exclusively for comparison purposes to assist an advisor in determining whether the performance of a specific investment meets their respective client's investment objective(s). It should not be assumed that any account holdings will correspond directly to any comparative index. Index performance results do not reflect the impact of taxes. Indexes are not available for direct investment. Index performance results are compiled directly by each respective index and obtained by iSectors® from reliable sources. Index performance has not been independently verified by iSectors®. iSectors® models are based primarily on index ETFs that can neither outperform nor underperform their benchmark index. We provide benchmark indexes that are well known for comparison purposes only.

Net Performance results reflect the deduction of the iSectors® Strategist Fee. Actual client results will be lower based on fees for platform, advisory, transaction, and custodial services that are not set at (and may not be known at) the iSectors® level. Additionally, if your account (through your adviser or otherwise) does not fully follow a specific iSectors® model, performance would also, of course, further differ. Please consult your financial adviser for fees applicable to your account. ERISA (group retirement) accounts are subject to additional recordkeeping and/or administrative fees.

Sumnicht & Associates / iSectors® (the "Firm") claims compliance with the Global Investment Performance Standards (GIPS®). GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant accuracy or quality of the content contained herein. To obtain a GIPS® composite report and/or the Firm's list of composite descriptions contact John Koch, Senior Investment Analyst, at (920) 257-5170.

You should not assume that any discussion or information contained in this presentation serves as the receipt of, or as a substitute for, personalized investment advice from an investment professional.

This presentation has not been reviewed, submitted for review before, or otherwise approved by FINRA, the SEC or any state or provincial securities regulators.