Modern Portfolio Theory: Hardly Modern

By Brian Dightman

I have to laugh whenever I hear someone still touting Modern Portfolio Theory as a preferred investment strategy. The notion represents the one business sector to have eluded innovation over the past half century. Truth be told, much of the financial services world has ignored advances in portfolio risk management technology. Clinging to a tired theory as a viable means of managing client assets is the equivalent of making a 2010 transatlantic flight on a DC-8 prop.

MPT may provide a useful framework for promoting asset allocation, but it fails to address the frequency and magnitude of extreme downside events and the damage they cause investor portfolios. Within the dynamic environment of investments, MPT is a static prescription for an outcome well into the future. But investors are concerned with their wealth and changing conditions in the interim, not just ten years from now.

Advances in portfolio theory and the computational power to quickly produce outcomes have overcome the limitations previously faced by the financial services industry. Why has the retail side of the business been so slow to adopt these new methods?

The industry is driven by productivity. MPT is easy to understand, although I would argue some retail associates have a tough time calculating the return range for a one standard deviation event. Given proper implementation and disclosure, MPT offers a low liability template as least so far. Using the term modern to describe a 50-year-old theory is a stretch, at best.

MPT has known deficiencies, such as the use of standard deviation as a measure of risk. Another shortcoming is the application of Normal Distributions and Mean Variance Optimization.

Normal distributions, the math behind MPT, breaks down in the non-normal distribution world of investment returns. Over long time periods, regular and irregular distributions of investment returns are close enough to warrant the MPT model, but it fails miserably to model the frequency of extreme events over shorter time frames. Under normal distribution, 99.7% of returns take place within three standard deviations. Stock market history demonstrates negative returns of greater than three standard deviations occur far more frequently than the normal distribution math of MPT suggests.

The Alternative

One potential solution is Post-Modern Portfolio Theory, (PMPT). It extends MPT by focusing on the downside risk, that is, on the return behavior of an investment below its target return rate. Think of downside risk as the annualized standard deviation of returns below the target rate. If an investment has a target return of 10%, any year where the return is below that number represents downside risk.

PMPT also addresses volatility distortion. MPT assumes returns are symmetrical with volatility distortion equaling 1.0 for all assets; that means returns are evenly distributed above and below the mean. PMPT identifies the distortion associated with a historical return pattern and assigns a distortion value. Values higher than 1.0 represent positive distortion and those below 1.0 represent negative distortion. By analyzing return distortion more closely, managers can construct portfolios with investments that tend to deliver greater positive distortion and lower downside risk.

Another more recent asset allocation model is called Dynamic Portfolio Optimization (DPO), It promotes dynamic risk based investing, which contends better risk methodologies and return forecasting models exist which enable portfolios to be more intelligently managed.

By defining a universe of global securities, typically ETFs and mutual funds the goal is to identify two or three favorable investments for a specific sector, industry or asset class. Filters include fees, price spreads, trading volume, tracking error, performance and other fundamentals. New candidates are continuously screened. Those likely to receive a small or no allocation during the current period (usually monthly) are removed. Those remaining are subjected to a series of simulation runs using Univariate, Bivariate and Multivariate modeling to obtain the optimal asset allocation mix for the investment period.

The Univariate step uses a non-normal 'Student-t Distributions' to more accurately measure risk and identify outliers that would be missed with normal distribution methods. Then GARCH is used to time-weight the data through cluster analysis. GARCH creates a Doppler radar effect whereas traditional models using mean variance act like a Farmer's Almanac.

The Bivariate process focuses on security correlation. Low correlation is considered your friend in asset allocation, that is until you need it most — during extreme events where correlation produces what is known in financial engineering as a "volatility smile." Correlation shortcomings are compensated for using an advanced method called Copula Dependency to identify the dynamic relationships between two securities as volatility and prices change.

The final step in the optimization process involves a multivariate model, which ranks the Bivariate models to create the optimal portfolio mix. Where MPT ranks linear correlations to determine the Efficient Frontier, the more complex process used by

Smart results in the optimal portfolio mix for the targeted time period at a defined risk level.

Attribute	Modern Portfolio Theory	Extreme Value Theory
Measuring Risk	Standard Deviation	Expected Shortfall
Forecasting Returns	Mean-Variance	GARCH w/Monte-Carlo
Diversification of Assets	Linear Correlation	Copula Dependency
Data Distribution	Normal Distribution	Stable "Student's t-Distributions"
Model Features	Static	Dynamic

(Table courtesy of Smart Portfolios)

Regardless of the technique employed, individual investors can benefit from more sophisticated strategies for dealing with downside risk. Whether voluntarily or by necessity, most other industries have modernized and innovated, seeking to maintain a competitive edge. Retail investment management, meanwhile, remains mired in the past, like a Conestoga wagon creeping down a modern superhighway.

Given the availability of PMPT to deliver tools on a workstation for over 10 years, why have so few financial services companies adopted it? Regulation, biases, conflicts of interest and entrenched leadership pose significant challenges toward implementing the changes desperately needed by the investing public. Could it be those on the front lines of financial services are ill equipped for describing and implementing strategies based on advanced math theories? It's unfortunate that the training emphasis for new recruits at financial services firms is focused almost exclusively on the sales process. What are the FPA, NAPFA, IMCA and other industry organizations doing to advance portfolio theory beyond MPT? Let's get ahead of the curve and not let the use of the term "modern" be the next foul cry by the investing public.

The most recent attempt to add value to the retail investor was the ballyhooed launch of life cycle funds, a predictable disaster. It's time the industry align its product development efforts with client realities. Extreme downside risk can be crippling for any investor, particularly so for retirees, and discouraging for early savers. And it happens far more often than Modern Portfolio Theory suggests.

<u>Bio</u>

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