The Unheralded Contributions of Markowitz to Behavioral Portfolio Theory

"I split my contributions 50/50 between bonds and equities," Harry Markowitz said in a famous 1998 interview with Jason Zweig.[1] Markowitz readily admitted that he did not compute co-variances and draw a mean-variance efficient frontier. "Instead, I visualized my grief if the stock market went way up, and I wasn't in it — or if it went way down and I was completely in it. My intention was to minimize my future regret."

Many have interpreted Markowitz's words as implying no benefit in pushing portfolios up to the mean-variance efficient frontier. This interpretation is incorrect. To me, however, Markowitz's most important words are, "My intention was to minimize my future regret."

I met Markowitz for the first time at a 1995 conference and shared lunch and conversation with him. He has been my mentor, co-author and friend ever since, and I remain grateful to him now that he has passed away almost 30 years later.

Markowitz was justly proud of the mean-variance portfolio theory he offered in 1952.[2] That theory earned him his share of the 1990 Nobel Prize in economics and remains a foundational block of modern portfolio theory, also known as standard finance, or what I call finance for rational investors.

Two portfolio variables determine the mean-variance efficient frontier, a portfolio's expected return and its risk, measured as the standard deviation of the portfolio's returns. The efficient frontier comprises the portfolios with the highest expected return for each given risk or the lowest risk for each given expected return.

Meir Statman, Ph.D.
Consultant to Avantis Investors

Meir Statman is the Glenn Klimek Professor of Finance at Santa Clara University and a consultant to Avantis Investors.

His research focuses on behavioral finance. He attempts to understand how investors and managers make financial decisions and how these decisions are reflected in financial markets.

His most recent book is *Behavioral Finance: The Second Generation*, published by the CFA Institute Research Foundation.

Standard deviation: A statistical measurement of variations from the average, it's often used to measure risk when risk is measured or defined in terms of volatility. In general, more risk means more volatility and more volatility means a higher standard deviation—there's more variation from the average of the data being measured. In this context, reducing risk means seeking a lower standard deviation.

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Markowitz and the Foundational Insights for Behavioral Portfolio Theory

Regret plays no role in mean-variance portfolio theory and no role in the thinking of rational investors. But regret plays a major role in the thinking of normal investors, including their thinking as they construct their portfolios.

Markowitz knew mathematics, statistics and the thinking of rational investors as well or better than any adherent to standard finance, but unlike many of them, he also knew normal investors and their thinking. Many adherents to standard finance can separate their models, rooted in finance for rational people, from their own thinking and behavior, rooted in finance for normal people. Markowitz was not one of them.

I was on a team of members of the Advisory Board of the *Journal of Investment Consulting* who interviewed Markowitz for a Masters Series in 2009.[3] I asked, "The second half of Jason Zweig's story is that you did what you did in 1952 because you were anticipating the regret that you would feel if one of the funds went up and it was not the one you had chosen. Does regret play a role in your portfolio when you construct it now?"

Markowitz responded, "The question is, how do you pick a point off the efficient frontier? We do invest in a large number of municipal bonds, which provide enough money so that we can just live. I don't know whether that makes our portfolio on the frontier or off the frontier. Meir, you caught me red-handed. I guess I'm just behavioral. I tell myself that if worse comes to worst, we can live."

Markowitz's answer brings me to his second 1952 article, "The Utility of Wealth," where he offered a foundation block for "Behavioral Portfolio Theory," developed much later by Hersh Shefrin and me.[4]

In 1948, Milton Friedman and Leonard Savage wrote an article, "The Utility Analysis of Choices Involving Risk."[5] They were prompted into their analysis by the puzzling observation that people who buy insurance policies often also buy lottery tickets. People indicate that they are risk-averse by buying insurance policies, yet indicate they are risk-seeking by buying lottery tickets.

Friedman and Savage offered a solution to the puzzle in a utility function where utility is a function of wealth. The function is concave everywhere except for a particular region of wealth that is convex. People display risk aversion in the concave regions of wealth but risk-seeking in the convex region.

Markowitz modified this depiction in his other 1952 article.[6] He argued that the convex region of the utility function is centered not at a particular level of wealth common to all people but at "customary wealth" specific to each person.

Markowitz's depiction of the utility function seems simple, but it reveals profound behavioral insights into the thinking of normal investors. Normal investors think of wealth in relative terms, focused on gains and losses relative to their "customary wealth." An investor with $100,000 of wealth is happy when he gains $1,000 and sad when he loses $1,000. An investor with $100 million of wealth is happy when she gains $1 million and sad when she loses $1 million.

Daniel Kahneman and Amos Tversky built on the insights of Friedman, Savage and Markowitz in their 1979 article, "Prospect Theory: An Analysis of Decision under Risk," whereby utility is determined by wealth relative to reference wealth.[7] That reference wealth might be customary wealth, but it might also be aspired wealth.

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Mental Accounts and the Efficient Frontier

Normal investors described in behavioral portfolio theory divide their portfolios into "mental accounts" associated with goals. One might be a "not being poor" mental account, and the other might be a "being rich" mental account.

Markowitz did this when he divided his portfolio into a not-being-poor mental account "in a large number of municipal bonds, which provide enough money so that we can just live" and left the rest in stocks and other assets in a being-rich mental account. "I guess I'm just behavioral," he said. Indeed.

"Do investors think of their portfolios as a whole, as in mean-variance portfolio theory, or as a collection of mental accounts, as in behavioral portfolio theory?"

"It's your observation, Meir — not mine — that they think about their portfolios in terms of mental accounts," Markowitz answered. "There's an article that you can probably cite that says if you go about things properly, you can talk to people in terms of their mental accounts, their aspirations for their mental accounts, and how well you've met those aspirations. Nevertheless, the portfolio as a whole will be near mean-variance efficient. That's the lesson I learned from you, Meir."

That article is titled "Portfolio Optimization with Mental Accounts," by Markowitz, me and two of our colleagues, Sanjiv Das and Jonathan Scheid, and its companion article, "Portfolios for Investors Who Want to Reach Their Goals While Staying on the Mean–Variance Efficient Frontier."[8]

Indeed, financial advisers do well when they talk to their clients in terms of mental accounts, identifying their goals and aspirations, and keeping their portfolios as a whole near the mean-variance efficient frontier.

Endnotes

[1] Jason Zweig, "What Harry Markowitz Meant," JasonZweig.com, October 2, 2017.

[2] Harry Markowitz, "Portfolio Selection," *Journal of Finance* 7, No. 1 (March 1952): 77-91.

[3] "Ideas and Innovation Across Multiple Disciplines: A Discussion with Nobel Laureate Harry M. Markowitz, PhD," *Journal of Investment Consulting* 10, No. 1 (Summer 2009): 6-16.

[4] Hersh Shefrin and Meir Statman, "Behavioral Portfolio Theory," *Journal of Financial and Qualitative Analysis* 35, No. 2 (June 2000): 127-151.

[5] Milton Friedman and Leonard J. Savage, "The Utility Analysis of Choices Involving Risk," *Journal of Political Economy* 56, No. 4 (August 1948): 279–304.

[6] Harry Markowitz, "The Utility of Wealth," *Journal of Political Economy* 60, No. 2 (April 1952): 151-158.

[7] Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk," *Econometrica* 47, No 2 (March 1979): 263-292.

[8] Sanjiv Das, Harry Markowitz, Jonathan Scheid and Meir Statman, "Portfolio Optimization with Mental Accounts," *Journal of Financial and Quantitative Analysis*, 45, No. 2 (April 2010): 311-334; Sanjiv Das, Harry Markowitz, Jonathan Scheid and Meir Statman, "Portfolios for Investors Who Want to Reach Their Goals While Staying on the Mean–Variance Efficient Frontier." *Journal of Wealth Management* 14, Vol. 2 (July 2011): 25-31.