

## Risk Tolerance: Investments Versus Insurance

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Over the past several years, few financial planning topics have generated as much interest among practitioners and academics in the United States as risk tolerance. Apparently, the interest has crossed the pond, too. The Royal Swedish Academy of Sciences awarded the 2002 Nobel Prize in Economics to Daniel Kahneman, a psychology professor, “for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty.”

### Risk Tolerance in Investments

Decades earlier, Harry Markowitz based his famous portfolio selection model on the notion that portfolio risk can be represented as variance or its square root, standard deviation. According to modern portfolio theory, investors are presumed to maximize expected utility, and MPT presents utility—and by extension, investor risk tolerance—in terms of expected return and standard deviation. That is, investor utility functions (typically shown as quadratic equations) that determine which portfolio is preferred also use standard deviation as the measure of risk. Of course, standard deviation considers outcomes that exceed the expected value as well as those that are below the expected value.

Kahneman and his collaborator, the late Amos Tversky, took issue with this basic precept. They pointed out something that should have been self-evident—when evaluating risk, investors are more concerned about outcomes below the expected value than outcomes above it. In other words, when people evaluate risk, they look primarily at the downside component, and they should be characterized as loss averse rather than risk averse. Supporters of this line of thinking have promoted semivariance as an alternative measure of risk since it considers only outcomes below the expected value. Markowitz himself suggested in his own Nobel Prize acceptance speech that semivariance might be a more plausible measure of risk.

It turns out, though, that use of semivariance instead of variance doesn't matter that much within the bounds of MPT. Consider the assumption in the Markowitz model that return distributions are symmetrical and normal—the traditional bell curve. If two sets of returns are symmetrical and normal, the one that has the larger variance will also have the larger semivariance since the left side of the bell (returns below the mean) is a mirror image of the right side (returns above the mean).

Does it make a difference that security returns aren't exactly symmetrical and normal as specified in the Markowitz model? Research investigating empirical data from the Morgan Stanley Capital Indices for both developed and emerging markets found a correlation coefficient of 0.98 between the standard deviation and semideviation. (Semideviation is related to standard deviation in the same way that semivariance is related to variance.) In other words, when the theory is applied to the real world, it doesn't matter much whether we look at total variability—both upside risk and downside risk—or just at downside risk. The two rankings are almost identical.

### Dueling Nobels?

So what's the point? Is this a distinction without a difference? Is there potential for dueling Nobels, or is it just so much academic musing?

Kahneman's notion of emphasizing downside risk doesn't seem to matter when evaluating equity securities because conditions in active securities markets are sufficiently close to MPT assumptions that the emphasis on downside risk provides no improvement on the model.

Not all investments, however, involve actively traded securities. Many securities are thinly traded or less mature, and many other investments don't involve securities at all. Such opportunities typically have a relatively high probability of a total loss and a small, albeit enticing, probability of an extremely high gain. (Can you say "Microsoft"?) In other words, their return distribution bears little resemblance to the symmetrical bell curve assumed in MPT. Evaluating such investments with respect to risk tolerance criteria that emphasize downside risk seems especially appropriate.

## Risk Tolerance in Insurance

As I pondered the relevance of Kahneman's work to investments, it occurred to me that financial planners tend to think of risk tolerance primarily with regard to asset allocation and selection. Although risk tolerance has become one of the hottest topics in financial planning, in almost every article, it is presented with respect to investments.

Take a look at a few risk tolerance questionnaires. They seek to determine how much risk the client can accept in an investment portfolio. Why don't they consider risk tolerance as it relates to insurance topics?

Most risk tolerance surveys generate some sort of description that summarizes the subject's risk tolerance characteristics. For example, he or she is moderately conservative, or rates a 42 on a scale of 1 to 100. Then the planner uses that information to recommend an asset allocation. This is the real-world proxy for plotting a utility function in Markowitz's mean-variance space to identify the optimal portfolio.

Most planners present insurance in light of the degree of risk incurred, but without reference to a risk tolerance evaluation. For example, "You can pay X dollars for a long-term care policy with a maximum benefit period of three years, or Y dollars for a policy that will pay for as long as you live. Which one do you want?"

Not many planners present a specific policy recommendation based on the client's risk tolerance score. "You are a 75 on the risk tolerance scale; therefore, you should select a \$1,000 deductible on your auto insurance." Instead, they put the cart before the horse, inadvertently inferring the client's risk tolerance by observing which policy is selected.

## What Planners Need

In short, financial planners have become comfortable with the idea of applying quantitative risk tolerance concepts to investments, but they take a seat-of-the-pants or rule-of-thumb approach when it comes to insurance.

What planners need is an easily applicable, theoretically sound risk tolerance measure that considers potential financial losses that are insurable and is applicable to the purchase of insurance. For those who doubt the relevance or importance of this proposal, remember that for many clients there is far more money at stake for insurable losses than for their portfolios, especially when we consider potential loss of earning capacity.

Is there something special about insurance that makes risk tolerance data inapplicable? Is it possible that risk tolerance as it relates to insurable losses is somehow different from risk tolerance as it relates to potential asset returns?

Re-enter Daniel Kahneman. If individuals evaluate risk according to the downside rather than the variability around the mean, then what better example of exposure to downside risk than an insurable potential loss?

If clients' risk tolerance differs when viewing investments versus insurance, perhaps it is because investment

implies optimism and insurance implies pessimism. Investment involves the expectation of an improvement in one's wealth, whereas insurance represents an expense—a decrease in wealth. Indeed, the purchase of insurance has a negative expected return, since the aggregate dollar value of insurance claims has to be far smaller than the dollar value of premiums, or else insurance companies can't keep their doors open.

Consumers are willing to accept that negative expected return because buying insurance cuts off the bad tail of the distribution, eliminating catastrophe from the financial equation. Note, though, that there is no “good tail” of the distribution for insurance purchases because the distribution is truncated. Insurance companies will make us whole, but they won't allow us to profit from an insured loss. Thus, the probability distribution is not symmetrical and normal, so Kahneman's concept of loss aversion seems far more applicable.

## Where to Go from Here

Scores of stock brokerage companies and mutual funds have developed risk tolerance surveys. Frankly, most seem to have been created more as a marketing tool or a potential due-diligence legal defense than as a theoretically sound evaluation. Insurance companies haven't been nearly as prolific, but one suspects that their efforts would also be more influenced by marketers and lawyers than psychologists. In any case, such surveys would obviously be directed at insurance purchases, not investments.

Has anyone developed a theoretically sound questionnaire that considers both the investment and insurance aspects of risk tolerance, perhaps one that incorporates Kahneman and Tversky's loss aversion concept? If so, I'd like to see it. If not, maybe I'll develop one myself. Then I'll start working on my Nobel Prize acceptance speech.

## Endnotes

1. Press release, [www.nobel.se/economics/laureates/2002/press.html](http://www.nobel.se/economics/laureates/2002/press.html).
2. Harry Markowitz, “Portfolio Selection,” *Journal of Finance*, 7 (1952): 77–91.
3. Daniel Kahneman and Amos Tversky, “Prospect Theory: An Analysis of Decision under Risk,” *Econometrica*, 47 (1979): 263–291.
4. Kahneman contends that the concept of loss aversion was his and Tversky's greatest contribution to the study of decision-making. [www.nobel.se/economics/laureates/2002/kahneman-autobio.html](http://www.nobel.se/economics/laureates/2002/kahneman-autobio.html).
5. Harry Markowitz, “Foundations of Portfolio Theory,” *Journal of Finance*, 46 (1991): 469–477.
6. Javier Estrada, “Mean-Variance Behavior: The D-CAPM,” research paper number 493, University of Navarra, IESE Business School, February 2003.

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