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Predictability and irrational decision making from prospect theory to behavioral finance

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ABSTRACT

According to traditional financial theory, the world and its participants are, for the most part, rational "wealth maximizers". However, there are many instances where emotion and psychology persuade our decisions, causing us to act in irregular or irrational ways. Behavioral finance is a rather new area that seeks to combine behavioral and cognitive psychological theory with conventional economics and finance to provide explanations for why people make irrational financial decisions. There are some irregularities that conventional financial theories have failed to explain. And what are the original reasons and biases that cause some people to behave irrationally and often in opposition to their top benefits. When using the labels "conventional" or "modern" to describe finance, we are talking about the type of finance that is based on rational and logical theories, such as the capital asset pricing model (CAPM) and the efficient market hypothesis (EMH). These theories assume that people, for the most part, behave rationally and predictable in making decisions.

Introduction

One of the most interesting areas of research in finance is that which examines and seeks to explain how and why individuals make decisions. The most commonly accepted model of rational choice today is the theory of utility of wealth developed by Von Neuman and Morgenstern (1953). Questions have arisen in recent times, however, regarding the completeness of this theory. These questions have given force to competing theories that try to clarify individual behavior under conditions of uncertainty. Prospect theory was formulated first by Kahneman and Tversky (1979) as a substitute method to explain choices made by individuals under the situation of risk. It was designed, in essence, as a substitute for expected utility theory. Kahneman and Tversky realized the fact that the expected utility theory model did not fully describe the manner in which individuals make decisions in risky situations and that therefore, there were instances in which a decision-makers choice could not be predicted. For example, they point out that expected utility theory does not explain the manner in which framing can change the decision of the individual, nor does it explain why individuals exhibit risk seeking behavior in some instances and risk averse behavior in others.

Important Contributors

Daniel Kahneman and Amos Tversky Cognitive psychologists Daniel Kahneman and Amos Tversky are considered the fathers of behavioral economics/finance. Since their initial collaborations in the late 1960s, this duo has published about 200 works, most of which relate to psychological concepts with implications for behavioral finance. In 2002, Kahneman received the Nobel Memorial Prize in Economic Sciences for his contributions to the study of rationality in economics. Kahneman and Tversky have focused much of their research on the cognitive biases and heuristics (i.e. approaches to problem solving) that cause people to engage in unanticipated irrational behavior. Their most popular and notable works include writings about prospect theory and loss aversion.

Richard Thaler While Kahneman and Tversky provided the early psychological theories that would be the foundation for behavioral finance, this field would not have evolved if it weren't for economist Richard Thaler. During his studies, Thaler became more and more aware of the shortcomings in conventional economic theories as they relate to people's behaviors. After reading a draft version of Kahneman and Tversky's work on prospect theory, Thaler realized that, unlike conventional economic theory, psychological theory could account for the irrationality in behaviors

Literature Review

Selden (1912) wrote Psychology of the Stock Market. He based the book upon the belief that the fluctuations of prices on the exchanges are dependent to a very considerable extent on the psychological approach of the investing and trading public i.e. investors can overreact and under react according to their attitudes rather than based on conventional economic theories.

Tversky and Kahneman (1973) introduced the availability heuristic a judgmental heuristic in which a person evaluates the frequency of classes or the probability of events by availability, i.e. by the ease with which relevant instances come to mind.' The reliance on the availability heuristic leads to systematic biases.

In 1974, Amos Tversky and Daniel Kahneman, described three heuristics that are used when making judgments under ambiguity (Tversky and Kahneman 1974): ***representativeness*** When individuals are asked to evaluate the possibility that an object or event A belongs to class or process B, probabilities are evaluated by the level to which A is representative of B, that is, by the level to which A resembles B.

Availability When individuals are asked to evaluate the frequency of a class or the possibility of an event, they do so by

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the ease with which instances or occurrences can be brought to mind.

Anchoring and adjustment In numerical forecast, when a related value is available, people make estimates by starting from an initial value that is adjusted to yield the final answer. The anchor may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically inadequate.

Kahneman and Tversky (1979) presented a critique of expected utility theory also called von-Neumann Morgenstern utility (Bernoulli 1738; von Neumann and Morgenstern 1944; Bernoulli 1954) as a descriptive model of decision making under risk and develop an another model, which they call prospect theory. Expected utility theory is unable to clarify why individuals are often at the same time attracted to both insurance and gambling. Kahneman and Tversky found empirically that people underweight outcomes that are only probable in comparison with outcomes that are obtained with certainty; also that people usually abandon components that are shared by all predictions under consideration. In prospect theory, importance is given to gains and losses rather than to final assets; also probabilities are replaced by decision weights. The value function is defined on deviations from a reference point and is normally concave for gains (implying risk aversion), commonly convex for losses (risk seeking) and is generally steeper for losses than for gains (loss aversion). Decision weights are generally lower than the corresponding probabilities, except in the range of low probabilities

Thaler (1980) argues that there are circumstances when consumers act in a manner that is inconsistent with economic theory and he proposes that Kanneman and Tversky's prospect theory be used as the basis for an alternative descriptive theory. Topics discussed are: underweighting of opportunity costs, failure to ignore sunk costs, search behavior, choosing not to choose and regret, and pre commitment and self-control. The paper introduced the notion of mental accounting. Tversky and Kahneman (1979) Prospect theory differs from expected utility theory in many fundamental ways. To begin with, it distinguishes two phases in the decision-making process: an editing phase, which is a preliminary analysis of the offered prospects, and an evaluation phase, which is when the prospect with the highest value is chosen from among the edited prospects.

Tversky and Kahneman (1981) introduced framing. They showed that the psychological principles that govern the perception of decision problems and the evaluation of probabilities and outcomes produce predictable shifts of preference when the same problem is framed in different ways. Tversky and Kahneman (1986) apply the psychophysical principles of evaluation that were included in their original model to examine the effect of framing and the violation of the principle of invariance that underlies the rational theory of choice.

Dawes (2001) a theory that incorporates such framing effects has been proposed by Kahneman and Tversky (1979). Termed *prospect theory*, it has been extraordinarily influential. It is based on the idea that people evaluate gains or losses in prospect theory from some neutral or status quo point, an assumption consistent with the adaptation-level findings that occur not just in perception but in virtually all experience. That is, we adapt to a constant level of virtually any psychological dimension and find it to be neutral. In a similar way, we adapt to the reduced light in a movie theater when we enter it finding it not particularly dark after a few seconds and then readapt to the much brighter light outside when we leave the theater finding it not to be unusually bright after a few seconds. But since choice varies by framing it as a gain or a loss, it cannot reveal underlying preferences.

Newman (1980) explains how academicians, practitioners, and policymakers are impacted by prospect theory. He contends that, where as expected utility theory is deductive, or based on an explicit set of axioms, prospect theory is inductive, or based on *observations of behavior*.

Arkes and Blumer (1985) apply prospect theory to examine the irrational behavior of individuals who continue with a losing prospect simply because they have already invested money in that project. They argue that the concept of individuals throwing good money after bad is appropriately described by prospect theory.

Uecker, Schepanski, and Shin (1985) test four models of the principal's information evaluation behavior in a private, pre-decision, principal-agency setting. The four models are expected utility theory, prospect theory, a linear model, and a multiplicative model. Uecker, et. al. (1985) find that prospect theory does gain credibility over utility theory because it withstands tests of falsification where utility theory fails.

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