

“Traditionally, much of economic research has relied on the assumption of “homo oeconomicus” motivated by self-interest and capable of rational decision-making. Economics has also been widely considered a non-experimental science, relying on observation of real-world economies rather than controlled laboratory experiments. Nowadays, however, a growing body of research is devoted to modifying and testing basic economic assumptions; moreover, economic research relies increasingly on data collected in the lab rather than in the field. This research has its roots in two distinct, but currently converging, areas: the analysis of human judgment and decision-making by cognitive psychologists, and the empirical testing of predictions from economic theory by experimental economists.”

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“for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty”

The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel 2002,
awarded to Daniel Kahneman, Princeton University, USA

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1 Introduction

Financial markets exhibit dynamics and behavior which are not completely explainable by traditional economic concepts. Even though there is strong evidence that financial markets are highly efficient, the existence of these “anomalies” is well accepted. In the last decades academic studies have revealed dozens of examples of repeated patterns of irrationality, inconsistency, and errors in judgment when human beings are required to reach decisions while faced with the condition of uncertainty (see for example Simon, 1955 and 1982; Kahneman and Tversky, 1974 and 1979; Statman, 1997; Dörner, 1997; Gigerenzer et al., 1999; Barberis and Thaler, 2003).

Behavioral finance incorporates this body of knowledge and argues that these financial phenomena can plausibly be understood using models in which agents are not fully rational. On the contrary neoclassical economic theory is based on the assumption of rationally acting agents (lovingly named “Homo Oeconomicus”). Used in this context rationality usually means two things. First, agents are able to update their beliefs correctly following the rules described by Bayes’ law (see section 4.1.2). Second, agents make choices which are consistent with Savage’s notion of Subjective Expected Utility (Savage, 1954). Savage’s work has once been described by Fishburn (1970) as “the most brilliant axiomatic theory of utility ever developed”, and by Kreps (1988) as “the crowning achievement of single-person decision theory”. Since in reality probabilities are rarely objectively known, Savage (1954) developed a counterpart to expected utility theory (von Neumann and Morgenstern, 1944) known as Subjective Expected Utility. Under certain axioms of Subjective Expected Utility, preferences can be represented by the expectation of a utility function weighted by an individual’s subjective probability assessment. Nevertheless experimental work in the last few decades has been as unkind to Subjective Expected Utility as it was to expected utility (see section 4.3.4).

Moreover in traditional economics most models of asset pricing use the rational expectations equilibrium framework, which assumes consistent beliefs in addition to individual rationality (Sargent, 1993). This means that the subjective distribution an agent uses to forecast future realizations of unknown variables equals the distribution that those realizations are drawn from. Hence agents’ beliefs are correct if they are able

to process new information correctly and if they are able to consider enough information in their decision-making process to find out the correct distribution for the unknown variables they are interested in. These traditional economic assumptions are appealingly simple, but after decades of research, it has become clear that basic facts about the aggregate stock market, the cross-section of average returns and individual trading behavior are not easily understood within this framework (Barberis and Thaler, 2003).

As an early critic on economic agents with unlimited information processing capabilities Herbert Simon (1955 and 1982) suggested the term “bounded rationality” to describe a more realistic approach to cover human problem solving competence. It has long been recognized that a source of judgment and decision biases is that cognitive resources such as time, memory, and attention are limited. Since human information processing capacity is not infinite, there is a need for imperfect decision making procedures, or heuristics that arrive at reasonably good decisions cheaply (see for example Simon, 1955; Tversky and Kahneman, 1974). The necessary abbreviation of decision processes can be called heuristic simplification (Daniel, Hirshleifer, and Teoh, 2002; see section 4.1). Indeed, the complexity of human behavior suggests that a choice model should explicitly capture uncertainty factors. Real economic agents are restricted at least in their cognitive (for example knowledge) and computational abilities (Mullainathan and Thaler, 2000).

Behavioral Finance is a “new” approach to financial markets. To overcome the difficulties faced by the traditional paradigm, behavioral finance argues that some financial phenomena can be better understood using models in which (some) agents are not fully rational. More specifically, it analyzes what happens when the assumptions that underlie individual rationality are relaxed. For example, if agents fail to update their beliefs correctly or agents apply Bayes’ law properly but make choices that are normatively questionable since they are incompatible with Subjective Expected Utility (Barberis and Thaler, 2003).

The book is organized as follows. In the first part of the book, seminal theoretical and experimental work on behavioral finance and market anomalies will be reviewed. Furthermore the underlying psychological mechanisms and empirical evidence of robust and systematic effects observed in experiments and over a wide area of financial markets data are emphasized (chapters 2 to 5).

The second part of the book is dedicated to the controversial issue of promising trading strategies, which are able to generate excess returns by successful exploitation of these market anomalies based on empirical findings of behavioral finance. The focus is on momentum trading, contrarian (reversal) strategies, the daylight saving anomaly, the seasonal affective disorder or SAD anomaly, and recently introduced integrated markets strategies, i.e. strategies that involve both the consumer and the financial market, based on the recognition heuristic.

Finally, the novel methodology of agent-based computational economics will be described. This technique provides a framework to study an economic system in a controlled computational environment and is well suited for testing behavioral theories (see chapter 7). Moreover a significant feature of agent-based models is the ability to explicitly model “boundedly rational” agents (Simon, 1982). These agents have explicit limitations on their memory, knowledge or computational abilities. An agent-based model can serve as a testbed, which allows the investigation of market dynamics under conditions, which are too complex to be addressed analytically.