



ackert *&* deaves

BEHAVIORAL FINANCE

Psychology, Decision-Making,
and Markets

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BEHAVIORAL FINANCE

Psychology, Decision-Making, and Markets

To Bryan, Moira, William, and Rory

—Lucy Ackert

To Karen and André

—Richard Deaves

PREFACE

Writing an overview of a burgeoning field is a daunting task. When we started our project, existing research in behavioral finance was already abundant. Since then, new work has appeared virtually daily. The only reasonable approach was to be selective. While we hope this book is a comprehensive treatment of the more important contributions in the field of behavioral finance, worthy research has certainly been excluded.

In writing this book, the students we have taught and the professional audiences we have addressed were a driving force. It is our hope that the material covered in this book will allow readers to consider financial decision-making in a new light. While a number of useful books that cover topics in behavioral finance are available to the interested reader, our goal was to write a book that would provide an accessible overview of the field, while at the same time illustrating how behavioral finance can be applied in real-world settings. With this in mind, the level of rigor has been kept low and theory has been kept to a minimum.

It is our belief that this book is suitable for undergraduate and graduate students in business and economics, as well as interested practitioners. The book can be used for a dedicated elective course or as a supplement to a more traditional corporate or managerial finance course.

To support the instructor and promote student learning an Instructor's Manual (IM) accompanies this book. The IM includes three parts: Solutions to Discussion Questions and Problems; Teaching Exercises; and Lecture Slides. Each of the 20 chapters in the book contains a number of Discussion Questions and Problems and the first part of the IM provides suggested solutions to each exercise. The second part of this manual presents Teaching Exercises that are designed to promote hands-on learning including experiments, cases and other items, running the gamut from Trading Simulators to Star Trek, from a price prediction game to a dice game, from a risk-taking survey to the Super Bowl, from Barings Bank to Royal

Dutch Shell, and so on. Finally, to give the instructor a head-start in the classroom, we have assembled a series of Lecture Slides.

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Though we are certainly forgetting numerous names, some of the researchers whose work has been influential and who appear prominently in these pages are: Maurice Allais, Marc Alpert, Solomon Asch, Clifford Asness, Malcolm Baker, Nardin Baker, Guido Baltussen, Brad Barber, Nicholas Barberis, Sanjoy Basu, Max Bazerman, Shlomo Benartzi, Itzhak Ben-David, Douglas Bernheim, Bruno Biais, Fischer Black, Robert Bloomfield, Nancy Brekke, Stephen Brown, Colin Camerer, Walter Cannon, David Centerbar, Louis Chan, John Conlisk, Michael Cooper, Joshua Coval, David Cutler, Antonio Damasio, Kent Daniel, Bradford De Long, Stéphanie Desrosiers, John Dickhaut, Orlin Dimitrov, John Doukas, Darren Duxbury, Jon Elster, Richard Fairchild, Eugene Fama, Ernst Fehr, Urs Fischbacher, Baruch Fischhoff, Christina Fong, Kenneth French, Laura Frieder, Simon Gächter, Simon Gervais, Gerd Gigerenzer, Thomas Gilovich, Markus Glaser, William Goetzmann, John Graham, David Grether, Dale Griffin, Mark Grinblatt, Dirk Hackbarth, Jeffrey Hales, Bing Han, Campbell Harvey, Robert Haugen, Chip Heath, Denis Hilton, David Hirshleifer, Charles Holt, Harrison Hong, Christopher Hsee, Ming Huang, Gur Huberman, William James, Narasimhan Jegadeesh, Wei Jiang, Eric Johnson, Charles Jones, Matti Keloharju, Thomas Kida, Alok Kumar, Josef Lakonishok, Owen Lamont, Rafael La Porta, Henry Latane, Susan Laury, Charles Lee, Jonathan Lewellen, Jean-François L'Her, Andrew Lo, George Loewenstein, Dan Lovallo, Brigitte Madrian, Ulrike Malmendier, Karine Mazurier, Rajinish Mehra, Stanley Milgram, Olivia Mitchell, Kimberly Moreno, Tobias Moskowitz, Margaret Neale, John Nofsinger, Gregory Northcraft, Terrance Odean, Dimitris Petmezas, Joseph Piotroski, Jean-François Plante, Michael Pompian, Thierry Post, James Poterba, Sébastien Pouget, Edward Prescott, Howard Raiffa, Raghavendra Rau, Marc Reinganum, Richard Rendleman, Mark Riepe, Stephen Ross, Yuval Rottenstreich, Richard Ruback, William Samuelson, Tano Santos, Stanley Schachter, Myron Scholes, William Schwert, Dennis Shea, Jeremy Siegel, Herbert Simon, Jerome Singer, James Smith, Brett Steenbarger, Avinandhar Subrahmanyam, Gerry Suchanek, Barbara Summers, Larry Summers, Bhaskaran Swaminathan, Geoffrey Tate, Robert Vallone, Martijn van den Assem, Robert Vishny, Robert Waldmann, Martin Weber, Arlington Williams, Timothy Wilson, Jeffrey Wurgler, Wei Xiong, Robert Zajonc, and Ganggang Zhang. While a number of these researchers are not overly sympathetic to the behavioral perspective, it is fair to say that all have contributed to the debate.

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Lucy Ackert (in Atlanta) and Richard Deaves (in Burlington), May 22, 2009

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In 1993 Dr. Ackert received a Smith Breeden Prize for Distinguished Paper in the *Journal of Finance*. Her research has received funding from various organizations including the Center for the Study of Futures Markets at Columbia University, the Chicago Board of Trade, the Canadian Investment Review, and the Social Sciences and Humanities Research Council of Canada. In 2008 Dr. Ackert received the Kennesaw State University Distinguished Graduate Scholarship Award.

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Richard Deaves earned his Ph.D. from the University of Toronto and currently teaches at the DeGroote School of Business, McMaster University in Hamilton, Canada. In addition to McMaster, Dr. Deaves has been a visiting professor at the University of Toronto, Concordia University, and Rollins College. He has taught a variety of courses, including Behavioral Finance, Security Analysis, Portfolio Management, Derivatives and Applied Investment Management.

Dr. Deaves's research publications have appeared in numerous journals, such as the *Journal of Financial and Quantitative Analysis*, the *Journal of Banking and Finance*, and the *Journal of Monetary Economics*. He has conducted research in such areas as investor knowledge and pension fund design, experimental asset markets, investment fund performance, fixed-income return enhancement, modeling and predicting interest rates, pricing and hedging futures contracts, and the relationship between financial markets and the macroeconomy.

Dr. Deaves has consulted for large and small private firms and government agencies, and has appeared as an expert witness, in such diverse areas as market efficiency, the behavioral aspects of investment, saving and pension design, the predictability of interest rates, the design of risk management programs, and capital market performance.

INTRODUCTION

The rapidly growing field of behavioral finance uses insights from psychology to understand how human behavior influences the decisions of individual and professional investors, markets, and managers. We are all human, which means that our behavior is influenced by psychology. Some decisions are simple, day-to-day choices, such as how hard we are going to study for the next test, or what brand of soda we are going to buy, but others significantly impact our financial well-being, such as whether we should buy a particular stock, or how we should allocate our 401(k) money among various investment funds. The purpose of this book is to present what we have learned about financial decision-making from behavioral finance research, while recognizing the challenges that remain.

Looking ahead, we will see that behavioral finance is very useful in helping us understand certain puzzles at the level of the investor. For example, why do people tend to invest in local companies? Why do investors confuse a good company and a good stock? Why do people increase the amount of risk they are willing to take on if they have experienced good *or* bad portfolio performance? Why are they reluctant to eliminate poorly performing investments from their portfolios? Why do many investors trade as often as they do? Why do they insufficiently diversify their asset holdings? Why do people follow the crowd?

While it would be difficult to find anyone who would seriously question the contention that psychology impacts individual financial decisions, there is less agreement on whether market outcomes are also impacted. This is because the belief that human psychology affects markets is inconsistent with the traditional view that market forces lead to efficient outcomes. Nevertheless, if human psychology can lead to individual behavior that is not optimal and such errors are sometimes correlated, and there are limits to arbitrage, then, provided there limits to arbitrage, the traditional view of markets is likely an incomplete story.

More recently, behavioral finance has also made strides in providing insight into the behavior of managers. Given what we have learned about investor psychology, it would be surprising if behavioral factors did not play a role in managerial decision-making. On the one hand, can managers take information relating to individual psychology into account in an effort to achieve improvements in personal performance? On the other hand, do managers, being themselves human, fall prey to their own behavioral errors?

PLAN OF THE BOOK

To make sense of how human psychology impacts individuals and markets, we need to take a few steps back. We begin, in Part I of the book, by reviewing the foundations of modern finance, its inability to account for various paradoxes and anomalies, and the genesis of behavioral finance as reflected in prospect theory and the limits to arbitrage perspective. Expected utility theory, reviewed in Chapter 1, is an axiomatic, normative model that demonstrates how people *should* behave when facing decisions involving risk. In comparing prospects, which are simply probability distributions of final wealth levels, the basic procedure is to assign a utility level to each possible wealth outcome, weight each utility value by the associated probability, and choose the prospect with the highest expected utility.

Although expected utility theory has been very useful in modeling individual decision-making, financial theorists required a paradigm to describe how investors evaluated risk and determined prices in markets. Mean-variance analysis and the CAPM, reviewed in Chapter 2, were central developments, providing for the first time guidance on how risk should be measured and risky assets priced. At around the same time, the notion of market efficiency became prominent. This is the view that, because competitive markets embody all relevant information, the price of an asset should be virtually identical to its fundamental value. The realization that information was not costless, along with the impossibility theorem of Grossman and Stiglitz, caused this to be altered to the contention that nobody should be able to earn excess (risk-adjusted) returns on a consistent basis.¹ Importantly, market efficiency is inextricably linked to asset pricing models because of the joint hypothesis problem, the fact that tests of market efficiency also require the use of a particular risk-adjustment mechanism.

Despite the elegance of these foundations, it was not long before holes were found. Careful analysis of people's actual choices revealed a number of violations of expected utility theory. For example, while risk aversion was the norm for many, at times risk-seeking behavior was patently obvious, people's willingness to buy lottery tickets being a prime example. It soon became evident that a new theory of individual choice was required, one that would be grounded in actual behavior and research in psychology. Among alternative models that have been proposed, Kahneman and Tversky's prospect theory has attracted the most attention.² Positive rather than normative in nature, prospect theory is reviewed in Chapter 3. For some purposes, prospect theory is supplemented with mental accounting, an important thrust of which is path dependence. The key elements of these models include evaluating outcomes relative to a reference point (such as the status quo), a strong aversion to losses, and context-dependent risk attitudes.

Modern finance also came under siege as it became clear that CAPM and market efficiency were often at odds with empirical evidence using naturally occurring data. Chapter 4 begins by reviewing several anomalies, which are defined as findings inconsistent with the *simultaneous* validity of both the CAPM and efficiency. Theoretical developments also played a role. While in the past people were inclined to argue that profit opportunities could always be easily “arbitraged away” in competitive markets, some began to question whether arbitrage was as simple and risk free as the textbooks seemed to suggest. This school of thought argued that there were significant limits to arbitrage. These limits were driven by such factors as noise-trader risk (the possibility that wrong prices might get worse in the short run); fundamental risk (which exists when substitute securities do not exist); and significant implementation costs (trading costs and the potential unavailability of the security that must be short-sold).

Behavioral finance more than other branches of finance is interdisciplinary. It borrows heavily from the academic literature in accounting, economics, statistics, psychology, and sociology. The psychology literature is particularly useful in revealing how people make decisions and where biases may reveal themselves. In Part II, we provide the necessary foundations from psychology. The taxonomy we adopt slots potential psychologically based behaviors into three silos: cognitive limitations and heuristics, overconfidence, and emotion. We begin, in Chapter 5, by noting that modern economic and financial models often seem to be predicated on the existence of an emotionless decision-maker possessing virtually unlimited cerebral RAM. Such a decision-maker considers all relevant information, arriving at the optimal choice in a process known as constrained optimization. And yet a host of cognitive limitations are evident, including faulty and selective perception and memory, inattention, and frame influence. Complicated problems must be simplified, and heuristics, or rules-of-thumb, are designed for this purpose. Evolutionary survival pressures have led to the crafting of a host of such procedures. While they usually lead to judicious actions, at times man’s “toolkit” may be faulty. This is particularly so when decisions must be made in a complex modern environment, when many of the procedures were first developed to find and ensure food and shelter. We look at various classes of heuristics, including those impacting preference primarily via comfort-seeking and those designed to estimate probability. While there is abundant evidence of error, some, especially those espousing the “fast and frugal” heuristics view, have argued that heuristics perform much better than they are often given credit for.

Next, in Chapter 6, we recognize people’s tendency toward overconfidence. Overconfident people overestimate their knowledge, abilities, and the precision of their information, or are overly sanguine of the future and their ability to control it. Overconfidence takes on such forms as miscalibration (the tendency to believe that your knowledge is more precise than it really is), the better-than-average effect, illusion of control (an unfounded belief that you can influence matters), and excessive optimism. Overconfidence can encourage action when caution is warranted.

Finally, in Chapter 7, we consider what emotions are and how they impact decision-making. A lot of money, not to mention careers, is at stake when financial decisions are made, and high stakes can only raise the emotional thermometer.

There is certainly a presumption on the part of the media that emotions influence markets, which of course implies that they first impact individual decisions. While it is true that rampant emotion can be a bad thing, a balanced emotional state (as opposed to an emotionless state) can actually foster judicious decision-making.

Armed with this psychological background, Part III turns to an examination of how psychology impacts financial decision-making at the level of the individual. For the time being, our gaze is fixed on investors and related capital market practitioners rather than the managers of corporations. We begin, in Chapter 8, by investigating the extent to which the faulty use of heuristics leads to suboptimal financial decision-making. For example, the representativeness heuristic can persuade people that good companies are good investments, and companies with good recent stock market performance are good buys. Familiarity can lead to excessive domestic and local investment. The availability bias pushes people into concentrating investments in securities where information is freely available. Anchoring causes individuals to be excessively anchored to available cues, instead of relying on their own opinion or expertise.

In Chapter 9, we explore the extent to which overconfidence can lead to suboptimal behavior on the part of investors and capital market participants. The tendency to believe that one's analysis is more accurate than is actually so appears to cause investors to trade too much. Other documented problems linked to overconfidence are underdiversification and taking on too much risk.

The final chapter of this section, Chapter 10, examines how emotion impacts financial decisions. The evidence appears strongest for the break even effect, the house money effect, and the disposition effect. It is notable that these observed behaviors have competing explanations based on prospect theory. What they have in common is that they are all in some sense based on path dependence. In the first two cases, results worse than or better than expectations may lead to an increase in risk taking: in the first case, because people, who hate to lose, want to get back to square one; and, in the second case, because people, after a windfall, know they can take on a high amount of risk without flirting with a loss. As for the disposition effect, a losing investment may be held too long because people fear the regret that would result if their poor investment is sold off.

In Part IV, we turn to an examination of how social forces impact the choices people make. This is an important issue in behavioral finance because investors, financial practitioners, and managers do not make decisions in isolation. We begin in Chapter 11 with evidence that social forces matter for people in distinct cultures around the world and in the business realm. While conventional theory postulates that man is a rational, self-interested decision-maker, the evidence suggests that human beings sometimes choose actions that are not in their material self-interest, and that social interests influence how people make decisions, including what we call other-regarding preferences, such as fairness and reciprocity. To illustrate their importance, we show how social forces can impact competition in markets and contract design.

Next, in Chapter 12, to illustrate the importance of social forces, we show that such forces contributed to the fall of a large American corporation, Enron. Of particular focus are two important sets of participants: the corporate board and professional financial analysts. The corporate board is charged with providing

internal governance to the firm, but how do social forces impact its effectiveness? Financial analysts are important information intermediaries for investors and managers, but can their opinions be shaped by the social group?

In Part V, we consider what behavioral finance can tell us about observed market outcomes. Following up on Chapters 2 and 4, where we noted that the first tests of market efficiency were largely supportive, while later tests produced evidence that was often at odds with the theory, we return, in Chapter 13, to a discussion of these anomalies, but now the focus is on describing potential behaviorally based explanations for them. Two anomalies in particular, the value advantage and momentum, are most troubling, and for this reason receive special attention.

Chapter 14 addresses some central stock market puzzles. Over the last number of years, researchers have begun to question whether observed stock market valuation levels and price volatility are consistent with the predictions of theory. Of particular note is that in the 1990s the entire U.S. market seems to have deviated far from valuations based on economic fundamentals. In addition to considering the basis for market valuations, we review evidence regarding the level of stock market volatility. Additionally, the equity premium puzzle, the historical tendency for equities to outperform fixed-income investment by more than their differential risk would seem to require, is also addressed in this chapter.

Part VI describes how psychological biases have the potential to impact the behavior of managers. How we think about the outcomes depends on whether the behavior of markets or managers is the source of bias. Both the abilities of rational managers to take actions when markets are believed to reflect irrationality and the possibility that managers are themselves the source of bias are addressed. Chapter 15 argues that there is evidence that rational managers at times take advantage of the valuation mistakes made by irrational investors. We begin with a heuristic model, which shows that rational managers in a world with irrational investors have conflicts between short-run and long-run goals. These conflicts can lead to choices that maximize price rather than value. We also describe examples of catering to investors, including changing the company name to something more appealing to investors and responding to dividend payout preferences. Empirical evidence consistent with these tendencies is presented.

Chapter 16 focuses on the potential for suboptimal financial decisions by corporate decision-makers and entrepreneurs. We first consider possible mistakes in the capital budgeting process caused by cognitive and emotional forces. Overconfidence may also impact managerial decisions deleteriously. In this regard, we address overinvestment, investment sensitivity to cash flows, mergers and acquisitions, and start-ups. Finally, we consider whether managerial overconfidence can sometimes play a positive role.

In Part VII we turn to retirement, pensions, education, debiasing, and client management. This is a key area where the lessons of behavioral finance are increasingly being put to good use. In Chapter 17, the focus is on retirement and pensions. Around the world, as firms have moved from defined benefit to defined contribution pension plans, affected workers have been forced to deal with the challenge of trying to optimally manage retirement savings. Unfortunately, such individuals are often susceptible to self-control problems, procrastination, and

confusion regarding asset allocation. Nevertheless, there is evidence that innovation in pension design can lead to better outcomes.

In Chapter 18, we look at various debiasing strategies that can improve financial decision-making. It is possible that a significant payoff can be obtained from a careful financial education program. We argue that education can be enhanced with knowledge of the psychological mindset of the investor. Finally, we provide insight for wealth managers whose clients may be subject to bias and emotion.

The book closes with Part VIII, which is designed to be of most use to investors and traders. Behavioral investing, the topic of Chapter 19, is the attempt to enhance portfolio performance by applying lessons learned from behavioral finance research. Given that empirical regularities such as momentum and the value advantage appear robust, improving portfolio performance by tilting toward stocks embodying these attributes seems to be called for. Nevertheless, matters are seldom as simple as one might initially believe. Complications and opportunities include anomaly attenuation, style peer groups, style investing, and various refinements to simplistic anomaly capture. We close this chapter by considering whether objective evidence exists that behavioral investing can lead to desirable results.

The final chapter of the book, Chapter 20, focuses on what it takes to be a highly skilled professional trader. By looking at how the brain reacts during various activities, scientists learn how the brain functions and solves problems. Neurofinance researchers use neurotechnology to examine how the brain behaves while a person is making financial decisions. Potential insights include information regarding which kinds of responses are controlled and which are automatic. It takes many hours of training for any professional to become skilled. In addition to practice, we consider the knowledge that traders can take from behavioral finance research to generate better performance.

APPROACH AND METHODOLOGY OF BEHAVIORAL FINANCE

In any science, advancements are made through the interplay of theory and empirics. Observation suggests appropriate theory, and models are tested using data. When the data are inconsistent with theory, new models are formulated. The communication between theory and evidence is the ebb and flow of science, and academic finance works in the same way. As you will see as you progress through this book, behavioral finance is rather eclectic in the tools used for observation. The data may be naturally occurring, generated from controlled experiments in the lab, or obtained through surveys. Experimental finance and economics use the laboratory method to test the validity of existing theories and examine the impact of new mechanisms. In the tradition of psychology, surveys are often conducted by researchers in behavioral finance.

Some conventional finance researchers are skeptical of behavioral finance as they see it as proposing a new theory to fit every new finding.³ Of course, if a parsimonious model could predict human behavior, things certainly would be less complicated. But, how many of us really believe that all human actions can be summarized in a simple way? At the same time, we believe it is important to possess skepticism. We hope to present a full treatment of the evidence and let you, the reader, decide.