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Publication Date

2002-04-02

Beliefs, Fears, & Feelings of Guilt in Securities Investing ⁺

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Abstract: This Article studies how beliefs about strategic behavior interact with such emotions as guilt and fear in securities investment. Most investors lack the inclination, knowledge, or time to actively manage their investments full-time. Instead, most investors hire a financial professional to manage their portfolios. There are well-known incentive and behavioral problems with such a principal-agent relationship. This Article focuses on some novel emotional consequences of the fiduciary investing relationship. This Article applies psychological games of trust and herd-like behavior to explain how the duties of loyalty and care alter beliefs about strategic behavior, emotions that depend on those beliefs, and strategic behavior itself. This Article also discusses the applicability of such models to corporate law and other fiduciary settings.

⁺ Thanks to Scott Altman, Colin Camerer, Bob Cooter, Rachel Croson, Ron Garet, Rebecca Huss, Kimberly D. Krawiec, Don C. Langevoort, Tom Lyon, Ed McCaffery, Matt L. Spitzer, Dan Simon, Chris Stone, Warren Schwartz, and audience members of the American Law and Economics Association annual meetings, the Olin law and economics workshop at Boalt Law School, and the Olin law and economics workshop at Georgetown University Law Center for their very helpful discussions and insightful comments on earlier versions of this Article. Special thanks to Catherine T. Struve for detailed suggestions and mathematical assistance.

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Introduction

The rational actors who inhabit law and economics models live by maximizing their fixed subjective individual expected utility functions in the presence of budget and other constraints.¹ But, scholars in such diverse fields as critical legal studies,² critical race theory,³ economic anthropology,⁴ feminist economics,⁵ game theory,⁶ hedonic psychology,⁷ law and psychology,⁸ law and philosophy,⁹ psychology,¹⁰ the social sciences,¹¹ and sociology¹² have observed that such a conception of human behavior lacks descriptive realism. Indeed, even among economists, empirical evidence, experimental observation, and personal introspection reveal that human behavior is more complex and subtle than depicted in the fictional world of rational choice models.

¹ ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 10-11 (3d ed. 2000) (discussing how microeconomics assumes that rational decision-makers optimize some objective function subject to constraints).

² MARK KELMAN, *A GUIDE TO CRITICAL LEGAL STUDIES* 151-85 (1987) (criticizing the conservative nature of the preferences of some practitioners of law and economics).

³ *CRITICAL RACE THEORY: THE CUTTING EDGE* (RICHARD DELGADO, ed.) (1995).

⁴ RICHARD R. WILK, *ECONOMIES & CULTURES: FOUNDATIONS OF ECONOMIC ANTHROPOLOGY* 43-72 (1996).

⁵ *BEYOND ECONOMIC MAN: FEMINIST THEORY AND ECONOMICS* (MARIANNE A. FERBER & JULIE A. NELSON, eds.) (1993).

⁶ Martin Shubik, *5 Game Theory: Some Observations*, Yale School of Management Working Paper # 132, July 2000 (available on-line at http://papers.ssrn.com/paper.taf?abstract_id=238964).

⁷ *WELL-BEING: THE FOUNDATIONS OF HEDONIC PSYCHOLOGY* (DANIEL KAHNEMAN, ED DIENER, & NORBERT SCHWARZ, eds.) (1999).

⁸ *PSYCHOLOGY AND THE LAW: THE STATE OF THE DISCIPLINE* (RONALD ROESCH, STEPHEN D. HART, & JAMES R. P. OGLOFF, eds.) (1999).

⁹ ELIZABETH ANDERSON, 31 *VALUE IN ETHICS AND ECONOMICS* (1993) (contrasting the “standard decision theoretic account of rational action” with her expressive theory of rational action); Claire Finkelstein, *Threats and Preemptive Practices*, 5 *LEGAL THEORY*, 311, 318-19 (1999), Martin Hollis, *A Rational Agents Gotta Do What a Rational Agent’s Gotta Do!*, 80 *REASON IN ACTION* (19??); Gregory Kavka, *The Toxin Puzzle*, 43 *ANALYSIS* 33 (1983); EDWARD F. MCCLENNEN, *RATIONALITY AND DYNAMIC CHOICE: FOUNDATIONAL EXPLORATIONS* (1990).

¹⁰ *RATIONAL CHOICE: THE CONTRAST BETWEEN ECONOMICS AND PSYCHOLOGY* (ROBIN M. HOGARTH & MELVIN W. REDER, eds.) (1986); *JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* ((DANIEL KAHNEMAN, PAUL SLOVIC & AMOS TVRSKY, eds.) (1982).

¹¹ *BEYOND SELF-INTEREST* (JANE J. MANSBRIDGE, ed.) (1990).

¹² RICHARD SWEDBERG, *ECONOMICS AND SOCIOLOGY* (1990).

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Of course, much of the appeal, nature, and power of economics lies in the parsimony of its fundamental assumptions. Another technical reason why economists sometimes refer to economics as the “queen of the social sciences” is the analytical tractability and mathematical rigor of the models that economic theorists build.¹³ Modern economic theory appears to be at once forbidding to some and scientific to some because of its formal and mathematical nature, often written in the style of definition-theorem-proof.¹⁴ Modern econometrics provides a sense of apparent precision from statistical tests reported to several decimal places.¹⁵ Thus, modern economics in both its theoretical and empirical forms offers a sense of certainty that fulfills a basic human desire to avoid indeterminacy. In particular, what is known as the Chicago school of law and economics applies the partial equilibrium analysis of microeconomics to generate manageable if not simple answers to complicated problems.¹⁶

An extension of neoclassical economics known as behavioral economics has gained popularity and prestige in recent years.¹⁷ The adjective behavioral indicates that its practitioners draw on insights from cognitive and social psychology about decision-making and judgment in envisioning a richer conception of human behavior.¹⁸ Recently, some legal scholars have

¹³ JOHN SUTTON, *MARSHALL’S TENDENCIES: WHAT CAN ECONOMISTS KNOW?* (2000) (exploring the strengths and weaknesses of the standard economic paradigm).

¹⁴ William Thompson, *The Young Person’s Guide to Writing Economic Theory*, 37 J. ECON. LITERATURE 157 (2000).

¹⁵ Sanjai Bhagat & Roberta Romano, *Event Studies and the Law*, AM. L. & ECON. REV. (forthcoming, 2001) (providing a survey of the methodology of event studies and their use and limits in legal policy analysis); JOHN Y. CAMPBELL, ANDREW W. LO, & A. CRAIG MACKINLAY, *THE ECONOMETRICS OF FINANCIAL MARKETS* (1997).

¹⁶ RICHARD EPSTEIN, *SIMPLE RULES FOR A COMPLEX WORLD* (1995).

¹⁷ Roger Lowenstein, *Exuberance is Rational Or At Least Human*, NY TIMES, Feb. 11, 2001 § 6 (Magazine), at 66-71 (reporting on Richard Thaler’s pioneering contributions to behavioral economics); Louis Uchitelle, *Following the Money, but Also the Mind: Some Economists Call Behavior a Key*, NY TIMES, Feb. 11, 2001 § 3 (Money & Business), at 1, 11 (reporting on the hiring by the economics departments of Harvard University and the Massachusetts Institute of Technology of young behavioral economists).

¹⁸ See generally, ROBYN M. DAWES, *RATIONAL CHOICE IN AN UNCERTAIN WORLD* (1988); CHOICES, VALUES, AND FRAMES (DANIEL KAHNEMAN & AMOS TVRSKY, eds.) (2000); SCOTT PLOUS, *THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING* (1993),

considered the implications of behavioral economics for analyzing legal rules and institutions.¹⁹ These legal scholars consider the policy and regulatory implications of legal decision-makers exhibiting cognitive limitations by drawing on a literature about heuristics and information processing errors.²⁰ But, the appropriateness, generality, and normative significance of such legal applications remain quite controversial, unresolved and the subject of continuing debate.²¹

It remains an open question as to whether behavioral law and economics will eventually become more than an interesting, but diffuse set of empirical anomalies that vary across different contexts in ways that are theoretically not yet well-understood. Behavioral economics offers a plethora of notions that are useful for interpreting human behavior. But, many of the organizing principles of behavioral economics are more simplistic than even those of subjective expected utility theory's foundations. For example, what determines the strength of an endowment effect? In other words, exactly how and why is the distinction between something that you have and something that you do not have likely to yield profound and robust insights into human behavior

¹⁹ See Christine Jolls, *Behavioral Economic Analysis of Redistributive Legal Rules*, 51 VAND. L. REV. 1653 (1998) (providing a novel behavioral economics justification for using legal rules to redistribute income); Christine Jolls, Cass R. Sunstein, & Richard H. Thaler, *Behavioral Law and Economics*, STAN. L. REV. (1999) (offering a survey of the insights of behavioral economics for the analysis of legal rules and institutions); Daniel A. Farber, *Toward A New Legal Realism*, REVIEW OF BEHAVIORAL LAW AND ECONOMICS (CASS R. SUNSTEIN, ED.) (2000), U. CHI. L. REV. 279 (2001) (scrutinizing the advent of behavioral law and economics in legal scholarship); Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 CAL. L. REV. 1051 (2000) (discussing and criticizing the rational actor model); Donald C. Langevoort, *Behavioral Theories of Judgment and Decision Making in Legal Scholarship: A Literature Review*, 51 VAND. L. REV. 1499 (1998) (presenting an early survey of legal articles that draw on insights from behavioral theories of decision making). See generally, BEHAVIORAL LAW & ECONOMICS (CASS R. SUNSTEIN, ed.) (2000).

²⁰ See, e.g. Barton L. Lipman, *Information Processing and Bounded Rationality: A Survey*, 28 CANADIAN J. ECON. 42 (2000) (surveying theoretical models of bounded rationality due to limitations in the ability of humans to process information).

²¹ See Jennifer Arlen, *Comment: The Future of Behavioral Economic Analysis of Law*, 51 VAND. L. REV. 1765 (1998) (noting the lack of a general theory of behavioral law and economics); GERD GIGERENZER, PETER M. TODD & THE ABC RESEARCH GROUP, SIMPLE HEURISTICS THAT MAKE US SMART (1999) (demonstrating that fast and simple procedures for making decisions possess ecological rationality); Samuel Issacharoff, *Can There Be a Behavioral Law and Economics*, 51 VAND. L. REV. 1729 (1998) (providing a critical assessment of behavioral law and economics); Jeffrey J. Rachlinski, *The 'New' Law and Psychology: A Reply to Critics, Skeptics, and Cautious Supporters*, 85 CORNELL L.

that are not context-dependent?²² In a nutshell, the current state of behavioral law and economics lacks a unified theoretical framework and structure.

Behavioral economics proposes a theoretically coherent alternative to expected utility theory, namely prospect theory.²³ Prospect theory can be summarized in terms of its three central insights. First, people judge wealth not in absolute terms, but with respect to some reference point of wealth. This point can be a status quo level of wealth or some other aspiration figure. In other words, people have preferences not over absolute levels of wealth, but instead over levels of wealth relative to some particular amount of wealth. Second, individuals evaluate their gains and losses from their benchmark level of wealth asymmetrically. In other words, there is a kink at the origin in people's utility function over changes in wealth. Third, people's utility over gains in wealth is a concave function, while their utility over losses in wealth is a convex function. In other words, people are risk-averse over gains, but seek risk when losses are involved. While prospect theory is quite appealing, it does not account for all the many experimental findings that behavioral economics has generated. For example, often the loss aversion of prospect theory is combined with such other hypotheses as myopia to yield empirically testable predictions.²⁴

In addition, while behavioral economics builds upon the rational actor model of economics, it does this predominantly in terms of cognitive biases and heuristics. But, a large

REV. 739 (2000) (defending behavioral law and economics).

²² Jennifer Arlen, Eric L. Talley, & Matthew L. Spitzer, Endowment Effects, Other-Regarding Preferences, and Corporate Law (University of Southern California Law School Olin Working Paper No. 00-02, 2000) <http://papers.ssrn.com/paper.taf?ABSTRACT_ID=224435> (providing experimental evidence that corporate contexts dampen endowment effects and other-regarding preferences, but differentially across demographic subgroups). Another study (**Forest?** – **CITE?**) found an endowment effect with cups, but not coupons for cups.

²³ Daniel Kahnemann & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979).

²⁴ See, e.g., Shlomo Benartzi & Richard H. Thaler, *Myopic Loss Aversion and the Equity Premium Puzzle*, 110 Q. J. ECON. 73 (1995) (providing and testing a novel psychological model based on loss

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part of human behavior is not only cognitive, but also emotional. People routinely feel many emotions before, during, and after they make decisions.²⁵ Of course, the fact that people experience feelings like anxiety and remorse concerning the consequences of their choices is neither a surprising nor a novel observation. Emotions can and have been studied from the fields of anthropology,²⁶ cognitive psychology,²⁷ evolutionary psychology,²⁸ marketing,²⁹ negotiation theory,³⁰ neurobiology,³¹ neurophysiology,³² philosophy,³³ psychology,³⁴ social psychology,³⁵

aversion and myopia that explains an empirical fact known as the equity premium that over the last century, stocks have outperformed bonds by a very large margin).

²⁵ For a state-of-art survey of current research about emotions, see THE HANDBOOK OF THE EMOTIONS (MICHAEL LEWIS & JEANETTE M. HAVILAND-JONES, eds.) (2000).

²⁶ C. Lutz & G. M. White, *The Anthropology of Emotions*, 15 ANNUAL REV. ANTHROPOLOGY 405 (1986) (reviewing anthropological research on emotions).

²⁷ ANDREW ORTONY, GERALD L. CLORE, & ALLAN COLLINS, THE COGNITIVE STRUCTURE OF THE EMOTIONS (1998).

²⁸ JEROME H. BARKOW, LEDA COSMIDES, & JOHN TOOBY, THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE (1992); VICTOR S. JOHNSTON, WHY WE FEEL: THE SCIENCE OF HUMAN EMOTIONS 167-80 (1999) (explaining the evolutionary value of certain emotions in repeated prisoner's dilemmas and other situations).

²⁹ Patti A. Williams & Jennifer L. Aaker, The Peaceful Co-Existence of Conflicting Emotions: Examining Differential Responses to Mixed Emotion Appeals, Stanford Graduate School of Business Research Paper No. 1637, June 2000 (reporting on experiments concerning the psychological impact of mixed emotions on attitudes); Julie A. Edell & Marian Chapman Burke, *The Power of Feelings in Understanding Advertising Effects*, 14 J. CONSUMER RES. 421 (1987).

³⁰ ROBERT H. MNOOKIN, SCOTT R. PEPPET, & ANDREW S. TULUMELLO, BEYOND WINNING: NEGOTIATING TO CREATE VALUE IN DEALS AND DISPUTES 166-67, 200-01 (2000) (discussing how emotions "can run high in legal disputes and deal-making."); J. KEITH MURNIGHAN, BARGAINING GAMES: A NEW APPROACH TO STRATEGIC THINKING IN NEGOTIATIONS 47-66 (1992) (explaining how emotions such as anger can lead to rash negotiations); DOUGLAS STONE, BRUCE PATTON, & SHEILA HEEN, DIFFICULT CONVERSATIONS: HOW TO DISCUSS WHAT MATTERS MOST THINKING IN NEGOTIATIONS 7-8, 12-14, 85-108 (1999) (stressing the importance of managing strong emotions that one and others have in tough discussions); LEIGH THOMPSON, THE MIND AND HEART OF THE NEGOTIATOR, 2d ed. (2000).

³¹ ANTONIO R. DAMASIO, DESCARTES' ERROR: EMOTION, REASON, AND THE HUMAN BRAIN 53-54 (1994) (offering clinical evidence of patients who suffered certain brain injuries having trouble feeling emotions and making decisions in spite of retaining their cognitive powers); ANTONIO R. DAMASIO, THE FEELING OF WHAT HAPPENS: BODY AND EMOTION IN THE MAKING OF CONSCIOUSNESS 294-95 (1999) (providing recent experimental evidence that emotions help humans and rats learn new facts); JOSEPH LEDOUX, THE EMOTIONAL BRAIN (1996) (providing an overview of how emotions come from the brain).

³² AMELIE OKSENBERG RORTY, EXPLAINING EMOTIONS (1980).

³³ RONALD DE SOUSA, 18 THE RATIONALITY OF EMOTIONS (1987) (noting that "[e]motion generates problems in all major areas of philosophy"); PAUL E. GRIFFITHS, WHAT EMOTIONS REALLY ARE (1997).

³⁴ RICHARD S. LAZARUS, EMOTION AND ADAPTATION (1991).

³⁵ JACK KATZ, HOW EMOTIONS WORK (1999).

and sociology.³⁶ In addition, there are interdisciplinary approaches to research on emotions.³⁷ The fact that people feel emotions may raise some novel questions about legal rules and institutions. This Article considers possible answers to such questions in securities regulation. A better understanding of how emotions affect investment decisions can inform and improve public policy towards financial intermediaries.

This Article draws on these interdisciplinary and multidisciplinary perspectives to better understand the various roles that certain emotions play in financial decision-making. In doing so, this Article is able to consider normative and policy questions based upon theories of investors and securities professionals as multidimensional people.³⁸

A small number of scholars have recently begun to explore the multi-faceted roles that emotions play in legal systems.³⁹ But, at least as far back as Adam Smith, economists have been interested in studying emotions.⁴⁰ In fact, neoclassical economics already incorporates emotions in several ways. First, emotions can be viewed as tastes or non-monetary utility in the sense of ordinal preferences that are not simply the identity function over wealth.⁴¹ For example, an economic definition of love is that Courtney loves Pedro if Courtney's utility is an increasing

³⁶ THEODORE D. KEMPER, RESEARCH AGENDAS IN THE SOCIOLOGY OF EMOTIONS (1990) (providing a diverse collection of sociological approaches to emotions).

³⁷ AARON BEN-ZE'EV, THE SUBTLETY OF EMOTIONS (2000).

³⁸ Edward J. McCaffery, *Why People Play Lotteries and Why It Matters*, 1994 WIS. L. REV. 71, 122 (1994) (arguing for a deeper and richer theory of consumer behavior).

³⁹ SUSAN A. BANDES, THE PASSIONS OF LAW (1999) (offering an anthology of essays discussing the pervasive roles that various emotions play in the law); Jennifer Gerarda Brown, *The Role of Hope in Negotiation*, 44 UCLA L. REV. 1661 (1997) (presenting satiation and optimism theories of hope and their policy implications and addressing empirical questions about manipulating hope); Heidi L. Feldman, *Foreword: Symposium on Law, Psychology, and the Emotions*, 74 CHI.-KENT L. REV. 1423, 1426 (2000) (suggesting that legal scholars should "pay careful attention to the reality of how human beings think and feel."); Eric A. Posner, *Law and the Emotions*, GEO. L.J. (forthcoming June 2001) (viewing emotions as temporary, but predictable changes in preferences, abilities, or beliefs that people can rationally anticipate how they will act under and suggesting how the law in diverse fields should take such effects into account).

⁴⁰ ADAM SMITH, THE THEORY OF MORAL SENTIMENTS (1759).

⁴¹ GARY BECKER, *Spouses and Beggars: Love and Sympathy*, 231-37 ACCOUNTING FOR TASTES (1996) (proposing formal analytical models of emotions in terms of interdependent utility functions).

function of Pedro's consumption, utility, or wealth. Similarly, an economic definition of hate is that Kris hates Kermit if Kris' utility is a decreasing function of Kermit's consumption, utility, or wealth. Second, several economists⁴² have observed that emotions might have been evolutionarily useful as commitment devices in resolving problems of the consistency of preferences over time or across multiple selves.⁴³ Third, economists have introduced psychological games to analytically model a particular category of emotions, namely those preferences that depend on beliefs about strategic behavior.⁴⁴ Psychological game theory offers a formal mathematical apparatus for studying interactive situations in which at least one individual's utility is a function not just of strategic decisions, but also of some individual's beliefs over (possibly another individual's beliefs over, and so forth) strategy choices.⁴⁵ Fears and hopes are two emotions that by their very nature depend on the beliefs an individual has concerning the future. Often, those beliefs are over the strategic decisions of another individual. For example, second marriages are often said to involve "the triumph of hope over experience."

An economist has applied psychological game-theoretic models of monopoly pricing and employment practices to explain why firms do not always charge monopoly prices when they

⁴² ROBERT H. FRANK, *PASSIONS WITHIN REASON: THE STRATEGIC ROLE OF THE EMOTIONS* (1988) (explaining that certain emotional dispositions could have been selected in humans for their survival value in strategic interactions); Jack Hirshleifer, *On the Emotions as Guarantors of Threats and Promises*, in *THE LATEST ON THE BEST: ESSAYS IN EVOLUTION AND OPTIMALITY* 307, 311-21 (John Dupré ed., 1987) (containing formal analytical models of the strategic value of certain emotions); JACK HIRSHLEIFER, *THE AFFECTIONS AND THE PASSIONS: THEIR ECONOMIC LOGIC* (University of California, Los Angeles, Department of Economics Working Paper No. 652, 1992) (same). *But see* Paul M. Romer, *Thinking and Feeling*, 90 *AM. ECON. REV.* 439, 441-43 (2000) (observing that some feelings may induce actions that actually reduce one's reproductive success when facing novel situations).

⁴³ *THE MULTIPLE SELF* (JON ELSTER, ed.) (1985); JON ELSTER, *ULYSSES AND THE SIRENS: STUDIES IN RATIONALITY AND IRRATIONALITY* (1979).

⁴⁴ *EMOTIONS AND BELIEFS: HOW FEELINGS INFLUENCE THOUGHTS* (NICO H. FRIJDA, ANTONY S. R. MANSTEAD, & SACHA BEM ORTONY, GERALD L. CLORE, eds.) (2000).

⁴⁵ John D. Geanakoplos, et al., *Psychological Games and Sequential Rationality*, 1 *GAMES & ECON. BEHAV.* 60, 65, 70-74 (1989) (introducing the original definitions of psychological games); Van Kolpin, *Equilibrium Refinement in Psychological Games*, 4 *GAMES & ECON. BEHAV.* 218, 220-21, 229-31 (1992) (refining and extending psychological game theory).

can nor behave with respect to workers as neoclassical economics predicts.⁴⁶ Another economist has analyzed two-person, psychological games of gift giving involving such belief-dependent emotions as disappointment, embarrassment, surprise, and pride.⁴⁷ Such models have implications for the giving of holiday gifts, industrial relations, and tipping service providers.⁴⁸ Law and economics researchers have provided formal analytical models of emotions in studying commodification and incommensurability,⁴⁹ genetic engineering,⁵⁰ property rights bargaining,⁵¹ organizational cultures or social norms,⁵² and litigation.⁵³

Lately, there has been a revival of interest among certain economists regarding emotions.⁵⁴ A recent survey of how economic theory views emotions illustrates this renewed interest.⁵⁵ That survey, however, criticized the interpretation of emotions as psychological benefits and costs.⁵⁶ Indeed, some psychologists argue that (certain) emotions are examples of visceral factors that short circuit or trump normal logical reasoning.⁵⁷ For example, an investor

⁴⁶ Matthew Rabin, *Incorporating Fairness into Game Theory and Economics*, 83 AM. ECON. REV. 1284-90, 1292-96 (1993) (constructing strategic form psychological games that involve fairness to study the prices that monopolists actually charge and the personnel policies that firms actually employ).

⁴⁷ Bradley J. Ruffle, *Gift Giving with Emotions*, 39 J. ECON. BEHAV. & ORG. 399 (1993).

⁴⁸ *Id.* at 412-16.

⁴⁹ Peter H. Huang, *Dangers of Monetary Incommensurability: A Psychological Game Model of Contagion*, 146 U. PA. L. REV. 1701 (1998) (analyzing the domino concern that commodification and monetary commensurability will become universal).

⁵⁰ Peter H. Huang, *Herd Behavior in Designer Genes*, 34 WAKE FOREST L. REV. 639 (1999) (studying ethical, legal, and social implications of utilizing free markets in reproductive technologies and genetic engineering).

⁵¹ Peter H. Huang, *Reasons within Passions: Emotions and Intentions in Property Rights Bargaining*, 79 OR. L. REV. 435 (2000) (analyzing emotions in bargaining games over property rights).

⁵² Peter H. Huang & Ho-Mou Wu, *More Order without More Law: A Theory of Social Norms and Organizational Cultures*, 10 J.L. ECON. & ORG. 390 (1994) (studying the role that guilt can play in sustaining the honoring of trust in principal-agent relationships).

⁵³ Peter H. Huang & Ho-Mou Wu, *Emotional Responses in Litigation*, 12 INT'L REV. L. & ECON. 31 (1992) (modeling the impact of emotions in decisions to sue, settle, or go to trial).

⁵⁴ Paul M. Romer, *Thinking and Feeling*, 90 AM. ECON. REV. 439, 439-43 (2000) (distinguishing between decision mechanisms based on thoughts and those based on feelings and arguing for more symmetric treatment by economists of thought and feelings).

⁵⁵ Jon Elster, *Emotions and Economic Theory*, 36 J. ECON. LITERATURE 47, 48, 73 (1998) (providing a survey of the role that emotions play in understanding human behavior).

⁵⁶ *Id.* at 63, 72-20 (1998) (criticizing a psychic cost benefit model of emotions).

⁵⁷ George Lowenstein, *Out of Control: Visceral Influences on Behavior*, 65 ORG. BEHAV. & HUMAN

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that loves a particular security may view that investment with rose-colored vision or clouded judgment. In addition, intuition suggests that the more that an investor loved a stock when initially investing in it, the more that investor will hate that stock if and when its price drops.

This Article focuses on some emotions related to investment decisions and some of the implications of such emotions for whether and how to regulate the relationships between financial intermediaries and their clients. In particular, this Article develops the legal implications of guilt and fear that depend on beliefs about financial investment strategies for securities regulations. Recently, a law and economics scholar has normatively evaluated the regulation of securities professionals.⁵⁸ But, that analysis was based upon a non-emotional economic theory of asymmetric information.⁵⁹

One of the very important features of the U.S. federal securities regulations is the mandatory disclosure of material information.⁶⁰ This regulatory paradigm is aptly summarized by a famous quotation: “sunlight is said to be the best of disinfectants; electric light the most efficient policeman.”⁶¹ The majority of U.S. federal⁶² securities laws envision implicitly, if not

DECISION PROCESSES 272, 288 (1996) (explaining how visceral factors such as certain emotions can lead human behavior to deviate from perceived self-interest); George Lowenstein, *Emotions in Economic Theory and Economic Behavior*, 90 AM. ECON. REV. 426, 426-31 (2000) (defining visceral factors including negative emotions as state-dependent preferences and explaining their significance, effects and consequences for economic behavior). See also Robert S. Adler, Benson Rosen, & Elliot M. Silverstein, *Emotions in Negotiation: How to Manage Fear and Anger*, APR. NEGOTIATION J. 161, 168-74 (1998) (arguing that such emotions as fear and anger can disrupt normal rational thinking and reasoning abilities).

⁵⁸ Alessio M. Paccos, *Financial Intermediation in the Securities Markets: Law and Economics of Conduct of Business Regulation*, 20 INT'L REV. L. & ECON. 479 (2000) (providing a law and economics analysis of anti-churning and suitability rules based on the economics of asymmetric information).

⁵⁹ Alan Schwartz & Louis L. Wilde, *Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis*, 127 U. PA. L. REV. 630, 658-59 ftnote 69 (1979) (discussing a taxonomy of goods, namely search goods versus experience goods) initially suggested by Philip Nelson, *Information and Consumer Behavior*, 78 J. POL. ECON. 311 (1970); Michael Darby & Edi Karni, *Free Competition and the Optimal Amount of Fraud*, 16 J. L. & ECON. 67, 68-69 (1973) (introducing a trichotomy of quality characteristics, namely search, experience, and credence).

⁶⁰ Alternative regulatory philosophies range from caveat emptor to regulators providing lists of securities that are meritorious of investment.

⁶¹ LOUIS BRANDEIS, *OTHER PEOPLE'S MONEY* 62 (Torchbook ed. 1967) (1914).

explicitly, rational investors who can decide for themselves how, what, and when to invest once they have the requisite material information.⁶³ Most academic legal scholarship about securities regulation assumes that investors and other market participants are the prototypical rational actors of law and economics that do not suffer any cognitive biases.⁶⁴ A leading finance scholar recently provided empirical evidence that financial markets are minimally rational in the sense that profitable arbitrage opportunities are scarce, even if not every financial market participant is rational and even when financial markets do not behave as if every participant is rational.⁶⁵

It is true that investors, especially institutional ones, can increasingly make financial decisions with the aid of artificial intelligence, nonlinear chaotic models, genetic algorithms, neural network time series forecasting, and sophisticated quantitative computer valuation

⁶² On the other hand, many state blue sky laws (so-called because of the fact that historically some investments have promised returns as high as the blue sky) apparently view their state's investors as being sufficiently irrational to require that state's paternalistic protection in the form of merit regulation that makes value judgments regarding the risk of securities offered in that state.

⁶³ For a notable alternative viewpoint, see Robert B. Thompson, *Securities Regulation in an Electronic Age: The Impact of Cognitive Psychology*, 75 WASH. U. L. Q. 779, 780-89 (1997) (illustrating how insights from cognitive psychology enrich the understanding of securities regulation that the rational actor model of neoclassical economics provides).

⁶⁴ For example, the academic debate over mandatory disclosure revolves around whether such market failures as externalities and public good aspects of information cause too little, too much, the wrong kind of, or lack of ongoing voluntary disclosure. See John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 VA. L. REV. 717 (1984) (justifying mandatory disclosure in securities markets in terms of enhancing the informational accuracy of prices); Frank H. Easterbrook & Daniel R. Fischel, *Mandatory Disclosure and the Protection of Investors*, 70 VA. L. REV. 669 (1984) (providing an informational efficiency based argument in favor of mandatory disclosure in securities markets); Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 601 (1984) (explaining how mandatory disclosure economizes on the costs of information acquisition); Marcel Kahan, *Securities Laws and the Social Costs of "Inaccurate" Stock Prices*, 41 DUKE L.J. 977, 979 (1992) (providing a systematic analysis of the purposes served by accurate stock prices); Paul G. Mahoney, *Mandatory Disclosure as A Solution to Agency Problems*, 62 U. CHI. L. REV. 1047 (1995) (presenting an alternative efficiency justification for mandatory disclosure in securities markets based on reducing agency costs); EDWARD B. ROCK, *SECURITIES REGULATION AS LOBSTER TRAP: A CREDIBLE COMMITMENT THEORY OF MANDATORY DISCLOSURE* (Inst. for Law and Econ., Univ. of Penn. Law Sch., Working Paper No. 269, 1999) (explaining how mandatory disclosure in U.S. securities markets disclosure provides a mechanism for companies to make a credible commitment to provide ongoing material information). But, see Stephen M. Bainbridge, *Mandatory Disclosure: A Behavioral Analysis*, 68 U. CIN. L. REV. 1023, 1037-49 (2000) (considering whether behavioral phenomena such as herd behavior, habit, or the status quo bias justify mandatory disclosure in securities markets).

⁶⁵ Mark Rubinstein, *Rational Markets: Yes or No? The Affirmative Case*, FIN. ANALYSTS J.

models.⁶⁶ But, in the final analysis, investors are still flesh and blood creatures. Ultimately, humans make the asset allocation decisions and portfolio choices of even institutional investors. Academic financial scholarship under the rubric of behavioral finance increasingly considers investors who experience cognitive limitations.⁶⁷ For example, many investors and even some financial practitioners over-react to information as well as to what they believe others will do. Some behavioral financial models assume that there are noise traders, who are unable to differentiate between payoff-irrelevant information or noise and payoff-relevant information, perhaps due to cognitive biases in processing information.⁶⁸ An increasing number of legal scholars analyze securities regulation utilizing cognitive insights from behavioral economics.⁶⁹ For example, one legal scholar explains how behavioral finance has policy implications for the delivery and content of investor education; regulation of investment suitability, churning, day

(forthcoming 2001) (providing alternative definitions of market rationality and finding empirical support for minimal rationality of financial markets).

⁶⁶ See, e.g., PAUL WILMOTT, PAUL WILMOTT ON QUANTITATIVE FINANCE, VOLUME 1 & 2 (2000).

⁶⁷ See, e.g., Benartzi & Thaler, *supra* note 24 (constructing a model based upon loss aversion and the tendency of investors to frequently evaluate their portfolios even if those are held over a long time period); Nick Barberis, Ming Huang, & Tanos Santos, *Prospect Theory and Asset Prices*, 116 Q. J. ECON. 1 (2001) (proposing a model of stock returns where that model is consistent with experimental evidence and prospect theory).

⁶⁸ See, e.g. ANDREI SHLEIFER, INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE 33-46 (2000) (defining noise traders and presenting a model of how the risk presented by noise traders limits arbitrage).

⁶⁹ See e.g. LESLIE HODDER, LISA KOONCE, & MARY LEA MCANALLY, BEHAVIORAL IMPLICATIONS OF THE SEC MARKET RISK DISCLOSURES (unpublished manuscript Feb. 2000, available on-line at http://papers.ssrn.com/paper.taf?ABSTRACT_ID=213474) (examining implications of the SEC's Financial Reporting Release No. 48 about derivative and market risk disclosures by drawing on insights from cognitive psychology); Kimberly D. Krawiec, *Accounting for Greed: Norms, Psychology, and the Rogue Trader*, 79 OR. L. REV. 301 (2000) (explaining the persistence of rogue traders in terms of cognitive biases and institutional norms); Donald C. Langevoort, *The Epistemology of Corporate-Securities Lawyering: Beliefs, Biases and Organizational Behavior*, 63 BROOK. L. REV. 629, 631-73 (1996) (considering problems in compliance with securities laws by drawing on cognitive and social psychology); Donald C. Langevoort, *Selling Hope, Selling Risk: Some Lessons for Law From Behavioral Economics About Stockbrokers and Sophisticated Customers*, 84 CAL. L. REV. 627, 634-701 (1996) (analyzing regulation of securities brokers in light of behavioral insights about risk taking, self-serving biases, and cognition); Donald C. Langevoort, *Organized Illusions: A Behavioral Theory of Why Corporations Mislead Stock Market Investors (and Cause Other Social Harms)*, 146 U. PA. L. REV. 101, 130-63 (1997) (explaining securities fraud in terms of cognitive and informational difficulties that organizations face); Donald C. Langevoort, *Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited*, 140 U. PA. L. REV. 851, 902-15 (1992) (examining the

trading, margin requirements, and circuit breakers; corporate financing decisions, and corporate and securities litigation.⁷⁰

One can be agnostic over the degree of rationality that investors possess and recognize that investors may differ in their levels of rationality while still observing that even professional traders react emotionally to financial decisions, information, and outcomes.⁷¹ Indeed, most investors at some point in their investing lives experience anticipation, anxiety, dreaming, regret, yearning, and wishful thinking over their investment choices.⁷² People often make investment choices motivated by the fear of losing money⁷³ or the fear of regret of not keeping up with others or being left out of a bull market.⁷⁴ Fear of regret also explains why investors often select conventional stock choices, use full-commission brokers rather than discount brokers (the former may give useless advice, but also provide easy scapegoats), and hold onto losing stocks too long.⁷⁵ The flip side of regret, namely pride, helps explain why investors may sell their winning stocks too quickly, namely to convert paper winnings into real ones at the expense of favorable

implications for securities fraud litigation of noisy stock markets).

⁷⁰ LAWRENCE A. CUNNINGHAM, *BEHAVIORAL FINANCE AND INVESTOR GOVERNANCE* (Cardozo Law School, Public Law Research Paper No. 32, Jan. 2001) (promoting expanded investor education and proposing legal reforms that draw on behavioral finance challenges to the efficient capital markets hypothesis).

⁷¹ See MICHAEL LEWIS, *LIAR'S POKER* 15 (1989), "He had, I think, a profound ability to control the two emotions that commonly destroy traders – fear and greed – and it made him as noble as a man who pursues his self-interest so fiercely can be." (assessing the founder and head of Salomon's legendary bond trading Arbitrage Group, John Meriwether); ROGER LOWENSTEIN, *WHEN GENIUS FAILED: THE RISE AND FALL OF LONG-TERM CAPITAL MANAGEMENT* 176-77 (2000) (describing the feelings and emotional toll on some principals of the hedge fund, Long-Term Capital Management, during its mounting losses in September 1998).

⁷² See, e.g., LOWENSTEIN, *supra* note 71 at 75 (observing that "Long-Term's traders were *not* automatons. They debated, sometimes hotly, for hours every week, about what the models implied and whether to do what the models recommended." Italics in original).

⁷³ The robust experimental finding that people can be very loss averse and treat out-of-pocket losses differently than opportunity costs obviously has implications for the way that people actually invest.

⁷⁴ Thomas Gilovich & Victoria Husted Medvec, *The Experience of Regret: What, When, and Why*, 102 *PSYCHOL. REV.* 379 (1995) (reviewing evidence of a temporal pattern to regret).

⁷⁵ Hersh M. Shefrin & Meir Statman, *How Not to Make Money in the Stock Market*, *PSYCHOL. TODAY* Feb. 1986, at 52, 56-57 (providing these explanations); HERSH M. SHEFRIN, *BEYOND GREED AND FEAR: UNDERSTANDING BEHAVIORAL FINANCE AND THE PSYCHOLOGY OF INVESTING* 222-224 (2000) (discussing the roles of regret and responsibility in active versus passive money management).

tax treatment.⁷⁶ Anxiety has implications for portfolio decisions, asset prices, the equity premium puzzle, and retirement investing.⁷⁷ Psychological experimental results about hedonic profiles and the rules that people actually employ for integrating experiences that are felt over time would obviously have applications to financial decisions.⁷⁸

This Article considers how guilt and fear can motivate investment decisions and have legal implications for the regulation of securities and investment professionals. The U.S. federal securities laws impose very high standards of professional conduct upon how financial intermediaries can and should deal with their clients. These standards are often based on traditional fiduciary principles.⁷⁹ This Article applies the analytical tool of psychological games to analyze how the legal responsibilities that investment professionals have towards their clients may change those behavioral norms. Law can select among multiple behaviors, norms, and belief-dependent emotions on the part of financial intermediaries or their clients.

This Article applies psychological games to analytically model the role that beliefs, guilt and fear play in financial decision-making. The Article formally analyzes guilt and fear that depend on beliefs about investment strategies. In so doing, this Article increases the scope, domain, and realism of applying behavioral economics and finance to securities regulation. The rest of this Article is organized as follows. Section 1 provides a formal analytical model of the

⁷⁶ Shefrin & Statman, *supra* note 75 at 57 (providing this explanation).

⁷⁷ Andrew Caplin & John Leahy, *Psychological Expected Utility Theory and Anticipatory Feelings*, 116 Q. J. ECON. 55, 66-69, 72 (2001).

⁷⁸ Dan Ariely & Gal Zauberman, *On the Making of an Experience: The Effects of Breaking and Combining Experiences on their Overall Evaluation*, 13 J. BEHAV. DECISION MAKING 219 (2000) (providing and testing ideas that an experience's perceived level of cohesiveness and whether people continuously measure momentary evaluations affect its overall evaluation); Barbara E. Kahn, Rebeca K. Ratner, & Daniel Kahneman, *Patterns of Hedonic Consumption Over Time*, 8 MARKETING LETTERS 85 (1997) (presenting experimental evidence that variety-seeking behavior in listening to songs reflects neither global nor local maximization).

⁷⁹ See, e.g. JAMES D. COX, ROBERT W. HILLMAN, & DONALD C. LANGEVOORT, *SECURITIES REGULATION: CASES AND MATERIALS*, 2D ED. 1093-1118 (1997) (discussing whether brokers owe their customers fiduciary duties with applications to suitability and churning doctrines); *Brown v. E.F. Hutton Group Inc.*, 991 F.2d 1020 (2d Cir. 1993) (providing a suitability case); *Merrill Lynch, Pierce,*

duty of loyalty in a fiduciary investment relationship. It accomplishes this by applying psychological games of trust in a principal-agent relationship to analyze the relationship between investors and their financial intermediaries. Such games were first introduced to analyze social norms and organizational cultures.⁸⁰ The responsibilities that brokers have towards their customers draw on traditional fiduciary principles.⁸¹ If stocks or other securities are involved, Rule 10b-5 of the Securities Exchange Act of 1934 provides a basis for private litigation and SEC enforcement actions.⁸² Case law also draws on the shingle theory, which views the very act of being a broker-dealer to involve an implicit representation of dealing fairly with clients.⁸³

The formal model in section I of the Article suggests that imposing a fiduciary duty on broker-dealers can mitigate or deter the misappropriation of investments not just via financial or monetary penalties, but also by appealing to a desire to avoid feeling remorse or guilt. It considers how the imposition of a fiduciary duty of loyalty can alter the behavior of both fiduciary investors and their beneficiaries. The psychological game-theoretic models of trust permit a formal method of modeling the duty of loyalty. Section II considers a possible dark side of the duty of care on fiduciary investing, namely herding behavior on the part of broker-dealers and other financial intermediaries motivated by fear of not doing the same thing as other fiduciaries. It does this by applying psychological games of herding to analyze the possible normative consequences of the duties of care. These psychological game-theoretic models of

Fenner & Smith v. Arceneaux, 767 F.2d 1498 (11th Cir. 1985) (providing a churning case).

⁸⁰ Huang & Wu, *supra* note 52 at 394-97 (introducing psychological games of trust).

⁸¹ Robert D. Cooter & Bradley J. Freedman, *The Fiduciary Relationship: Its Economic Character and Legal Consequences*, 66 N.Y.U. L. REV. 1045 (1991); Robert D. Cooter & Bradley J. Freedman, *An Economic Model of the Fiduciary's Duty of Loyalty*, 10 TEL AVIV STUDIES IN LAW 297 (1991).

⁸² Arnold S. Jacobs, *The Impact of Securities Exchange Act Rule 10b-5 on Broker-Dealers*, 57 CORNELL L. REV. 869, 876 (1972); John M. Salmanowitz, NOTE, *Broker Investment Recommendations and the Efficient Capital Market Hypothesis: A Proposed Cautionary Legend*, 29 STAN. L. REV. 1077, 1084 (1977).

⁸³ *Charles Hughes & Co. v. SEC*, 139 F.2d 434 (2d Cir. 1943), *cert. denied*, 321 U.S. 786 (1944) (containing the judicial origin of the shingle theory).

herding due to popularity contests, positional goods, or status competition were first introduced to analyze incommensurability and commodification.⁸⁴ Such psychological herd games can also be applied to study the potential inefficiency of a free market system for the allocation of genetic engineering and reproductive technologies in enhancing and selecting particular traits.⁸⁵ These psychological games are related to games involving network externalities that economists utilize to model such network industries as the airlines, banks, broadcasting, computer hardware and software, e-mail, the Internet, legal services, music and video players, telecommunication.⁸⁶ Section III extends the analysis to discuss the importance and prevalence of belief-dependent emotions not only in fiduciary investing, but also in other types fiduciary relationships. A conclusion summarizes the Article.

I. How the Duty of Loyalty Affects Fiduciaries' Beliefs, Preferences and Behavior

Cooter and Freedman⁸⁷ employ a neoclassical model of a principal-agent relationship to differentiate between a fiduciary's duty of loyalty versus a fiduciary's duty of care in preventing misappropriation versus carelessness. In the corporate law context, courts are much more deferential to corporate directors and officers when it comes to questions regarding the duty of care than courts are when it comes to questions regarding the duty of loyalty. The business judgment rule standard of review of the duty of care standard of conduct avoids requiring that

⁸⁴ Huang, *supra* note 49.

⁸⁵ Huang, *supra* note 50.

⁸⁶ OZ SHY, *THE ECONOMICS OF NETWORK INDUSTRIES* (2001)

⁸⁷ Robert D. Cooter & Bradley J. Freedman. *The Fiduciary Relationship: Its Economic Character and Legal Consequences*, 66 N.Y.U. L. REV. 1045 (1991).

courts second-guess business decisions. One possible behavioral interpretation of the business judgment rule is judicial hindsight bias.⁸⁸

In contrast, Cooter and Freedman mention the moral overtones of disloyalty allegations.⁸⁹ "[A]n allegation of breach of fiduciary duty carries with it the stench of dishonesty - if not deceit, then of constructive fraud."⁹⁰ As Judge Cardozo remarked in a famous passage: "A trustee is held to something stricter than the morals of the marketplace. Not honesty alone, but the punctilio of an honor the most sensitive, is then the standard of behavior."⁹¹ This duty of loyalty is often seen to be the centerpiece of the fiduciary relationship.⁹² ERISA augments the common law of duty by explicitly forbidding self-dealing.⁹³ By way of contrast, corporate law does not prohibit self-dealing. Instead, it just raises the level of judicial scrutiny by reviewing self-interested transactions by managers under a fairness test.

Figure 1 of Cooter and Freedman's appropriation-incentive model⁹⁴ can be simplified into a modification of Kreps' game of trust:⁹⁵

Figure 1: A Non Psychological and Non-Emotional Fiduciary Investing Game

⁸⁸ *Francis v. United Jersey Bank*, 87 N.J. 15, 432 A.2d 814; *Joy v. North*, 692 F.2d 880 (2d Cir. 1982), cert. Denied, *Citytrust v. Joy*, 460 U.S. 1051, 103 S.Ct. 1498, 75 L.Ed.2d 930 (1983).

⁸⁹ *Id.* at 1073-74.

⁹⁰ *Girardet v. Crease & Co.*, 11 B.C.L.R. 361, 362 (B.C.S.C. 1987).

⁹¹ *Meinhard v. Salmon*, 249 N.Y. 458, 464, 164 N.E. 545, 546.

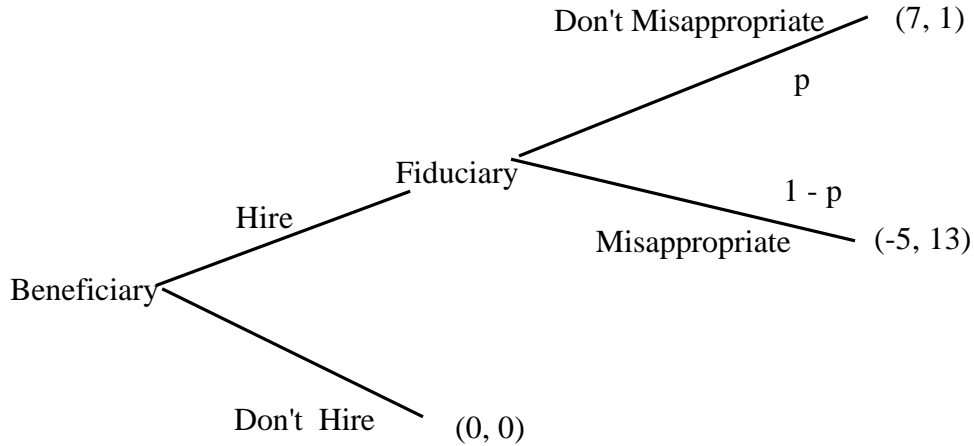
⁹² A. SCOTT, ON TRUSTS § 170, at 311 (4th ed. 1987); J. Shepherd, THE LAW OF FIDUCIARIES (1981) 48; A. Scott, *The Fiduciary Principle*, 37 CAL. L. REV. 539, 1 (1949).

⁹³ ERISA § 404(a)(1), 29 U.S.C. § 1104(A)(1) (1988 & Supp. III 1991); ERISA § 406, 29 U.S.C. § 1106 (1988).

⁹⁴ Cooter & Freedman, *supra* note 87 at 1050.

⁹⁵ David M. Kreps, *Corporate Culture and Economic Theory*, in PERSPECTIVES ON POSITIVE POLITICAL ECONOMY 90, 100 (JAMES K. ALT & KENNETH E. SCHEPSLE, eds. 1990).

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In the above game tree, the beneficiary can decide to not hire the fiduciary and without loss of generality, the status quo payoffs are normalized to be \$0 for both. Alternatively, the beneficiary can hire the fiduciary and make a \$5 million investment, which can lead to a gross return of \$13 million. If the fiduciary reports truthfully to the beneficiary the results of the investment, then the beneficiary earns a net return of \$7 million after paying the fiduciary a \$1 million fee because the gross return is \$13 million and the initial investment is \$5 million. Alternatively, the fiduciary can appropriate the investment by reporting falsely the results of the beneficiary's investment, claiming no gross returns; in which case, the beneficiary is out the \$5 million initial investment and the fiduciary absconds with the whole \$13 million. Denote by the letter p the endogenously chosen probability that a fiduciary misappropriates the investment. In light of the difficulty of enforcement, one possible interpretation of the legal duty of loyalty is that it affects the fiduciary's expectations over the beneficiary's expectations concerning whether the fiduciary will be loyal. This dynamic game has a unique (subgame-perfect⁹⁶) Nash

⁹⁶ The subgame-perfect restriction essentially rules out behavior that is not consistent over time. In other words, a Nash equilibrium is subgame-perfect if it involves only sequentially rational behavior on behalf of all players.

equilibrium,⁹⁷ namely the fiduciary misappropriates if hired and the beneficiary does not hire the fiduciary in the first place.

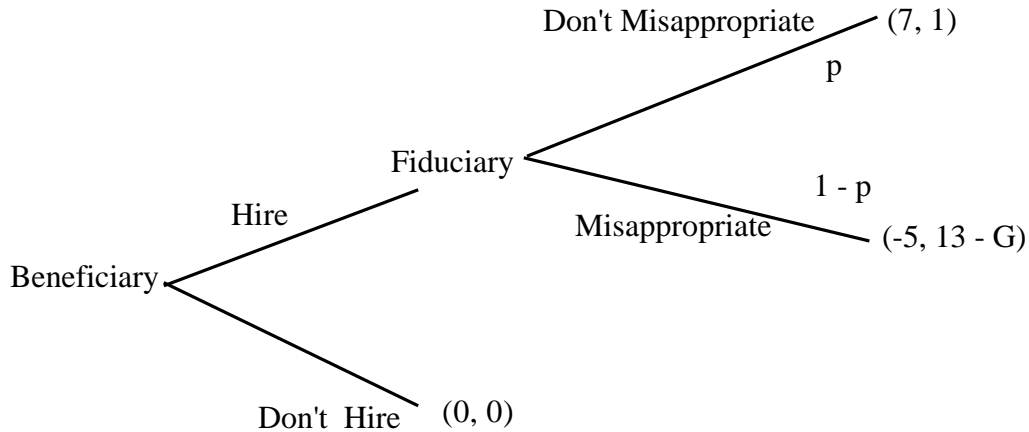
In reality, fiduciary investment relationships do exist. One reason that beneficiaries hire investment fiduciaries is that financial intermediaries have the motivation of developing and protecting reputations for not breaching a duty of loyalty. In other words, there are market forces that discipline if not prevent misappropriation by financial intermediaries. Of course, such repeat play considerations do not exist if the fiduciary is in the "last period" or suffers from the "endgame problem" as is likely to be so if the fiduciary is about to misappropriate a particularly large sum of money. The sort of emotional preferences that are described below can reduce misappropriation even if the fiduciary relationship has just one period remaining.

Consider an investment fiduciary that experiences guilt from engaging in misappropriation as depicted in figure 2. The only difference from the payoffs depicted in figure 1 is that for the fiduciary upon engaging in misappropriation. Instead of receiving \$13 million, our emotional fiduciary has a total payoff of $13-G$, where G is the monetary equivalent of guilt or $13-G$, where both 13 and G are in terms of utility. Clearly, depending on the size of G , this new game has the following equilibrium outcomes. If $G < 12$, the only equilibrium remains that of the game in figure 1 where the beneficiary does not hire the fiduciary who would appropriate if given the opportunity by being hired. If $G > 12$, the only equilibrium is a new one where the beneficiary hires the fiduciary who does not appropriate because the guilt from doing so is big enough to swamp the monetary gain of misappropriating. If $G = 12$, there are infinitely many equilibrium outcomes.⁹⁸

⁹⁷ A Nash equilibrium is a set of strategies, one for each player, that are best responses to each other. In other words, no player has a unilateral incentive to deviate from her strategy choice.

⁹⁸ These are computed by setting $7p - 5(1-p) = 0$. The resulting equilibrium outcomes involve the fiduciary hiring if the beneficiary chooses to not appropriate with probability $p > 5/12$; the fiduciary

Figure 2: An Emotional but not Psychological Fiduciary Investing Game



The game in figure 2 begs the questions of where does the guilt that the fiduciary experiences come from and what determines the magnitude of that guilt. People will vary in their exogenous propensities to feel guilt based upon such demographic variables as their, age, culture, ethnicity, gender, and upbringing, as well as other unobservable differences. It is also unclear whether beneficiaries feel guilt from a fear of getting caught for breaking the law or morally disappointing their beneficiaries. The first sort of guilt is an instrumental one, while the second type of guilt is an intrinsic or ethical one. The next game focuses on the moral disappointment aspect or component of guilt. It also provides a model of guilt that depends on strategic beliefs about investment behavior. The fiduciary's payoffs are motivated by the notion that the fiduciary cares about being loyal if the beneficiary expects that, but not otherwise. Assume that the degree of remorse, guilt, or sorrow that a fiduciary experiences from abusing the trust of a beneficiary depends on the fiduciary's beliefs over the beneficiary's beliefs over the

not hiring if the beneficiary chooses to not appropriate with probability $p < 5/12$; and the fiduciary

likelihood that particular fiduciary would not misappropriate if given the opportunity to do so by being hired.

Suppose that a beneficiary and fiduciary are playing modified fiduciary investment game that is depicted in figure 3.⁹⁹ Remember that p denotes the probability that a particular fiduciary does not abuse the beneficiary's trust. Let q denote the beneficiary's expectation of the variable p . In other words, q is the mean of the beneficiary's subjective distribution over the probability p . Let r denote the fiduciary's expectation of q . The variable r is an example of what is known as a second-order belief, while the variable q is an example of what is known as a first-order belief.¹⁰⁰ For the sake of simplicity, we assume that psychological guilt depends linearly on r , the fiduciary's beliefs over the beneficiary's mean expectations over the probability that the fiduciary will not abuse trust if entrusted. The linearity assumption is for the purpose of analytical tractability, while the assumption that a fiduciary's guilt from appropriation depends on the size of r captures a psychological component of guilt.

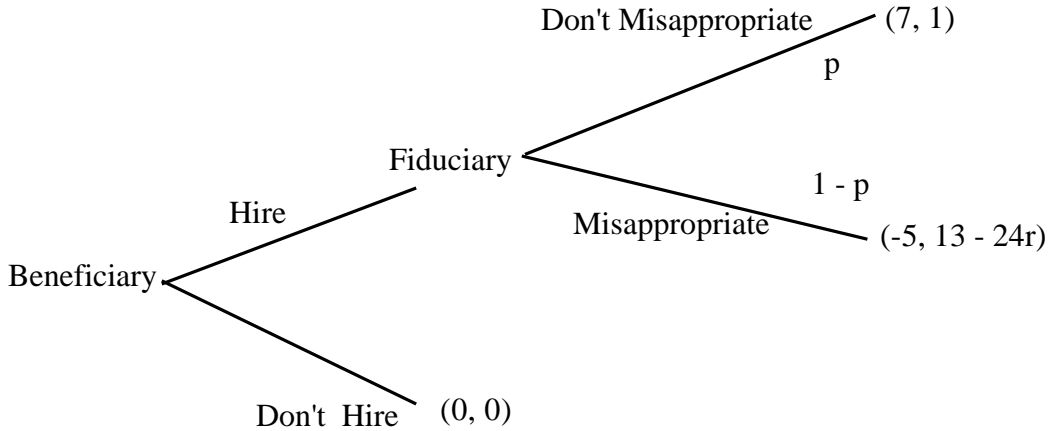
Figure 3: A Psychological Emotional Fiduciary Investing Game

being indifferent when the beneficiary chooses to not appropriate with probability $p = 5/12$.

⁹⁹ This game is akin to the psychological game of trust in figure 2 of Huang & Wu, *supra* note 52 at 394. The differences are the numerical values for payoffs and the interpretation of p here being the actual probability of not appropriating by the fiduciary, while p in the psychological trust game is the proportion of a population of agents who choose not to abuse trust.

¹⁰⁰ See Geanakoplos, et al., *supra* note 45 for a discussion of higher-order strategic beliefs.

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Note: r = Fiduciary's belief of Beneficiary's belief over q

In order to fulfill the condition of rational expectations required by a psychological equilibrium, $p = q = r$ in equilibrium. There are three psychological equilibrium outcomes.¹⁰¹ The first equilibrium involves the beneficiary choosing to hire the fiduciary and $p = q = r = 1$, or the fiduciary choosing with probability one to not misappropriate the investment. The associated payoffs are (7, 1). A second equilibrium involves the beneficiary choosing never to hire a fiduciary and $p = q = r = 0$, or a fiduciary choosing to misappropriate the investment if given that opportunity. The associated payoffs are (0, 0). The third equilibrium has the beneficiary choosing to hire the fiduciary and $p = q = r = 1/2$, or half of the time the fiduciary choosing to misappropriate the investment if given that opportunity. The associated payoffs are (1, 1). The third and only completely mixed strategy equilibrium is found by setting the fiduciary's payoffs from engaging in misappropriation and not engaging in it equal: $1 = 13 - 24r$ and setting $p = r$.

In the first equilibrium, the fiduciary relationship occurs and the fiduciary does not misappropriate the investment because she believes the beneficiary expects the fiduciary not to misappropriate. If a fiduciary were to misappropriate the investment, she would experience guilt

¹⁰¹ A psychological equilibrium requires not only the usual Nash equilibrium property that players' strategies are best responses to each other, but also that players' expectations are correct in equilibrium.

to such a degree that she would rather not misappropriate. In the second equilibrium, the fiduciary relationship does not occur and fiduciaries would misappropriate if given the opportunity due to their beliefs that beneficiaries expect such misappropriation and their consequent lack of guilt upon misappropriating. Misappropriation leads a fiduciary to feel guilt but only to such a small degree that misappropriating dominates not misappropriating. In the third equilibrium, the fiduciary relationship occurs despite the beneficiary will misappropriate half of the time because that still makes the beneficiary strictly better off than not hiring the fiduciary. The fiduciary is indifferent between misappropriating and not misappropriating.

One can think of the three different equilibrium beliefs as reflecting how strong a duty of loyalty there is for this relationship. Equilibrium one occurs when the duty of loyalty is strongest. Equilibrium two occurs when the duty of loyalty is weakest (nonexistent). Equilibrium three occurs when the duty of loyalty is intermediate in strength. In contrast to the unique equilibrium for the original fiduciary investing game without psychological payoffs in Figure 1, the presence of psychological guilt makes possible multiple equilibrium outcomes, in particular, the first and third equilibrium outcomes. In these two equilibrium outcomes, the corresponding equilibrium beliefs and psychological emotional payoffs are what support reduced misappropriation. The moral of this model is that fiduciary law can strengthen the perceived duty of loyalty and in doing so, change endogenously both the beliefs of fiduciaries and beneficiaries about fiduciary behavior and fiduciary behavior itself. Such beliefs can become self-enforcing should fiduciaries have the sort of preferences described above.

The question that remains then is whether empirically fiduciaries have the above sort of preferences. The language of a fiduciary duty of loyalty itself suggests that the law is trying to create such preferences if they do not already exist. Notice that what is important is that not only

See Geanakoplos, et al., *supra* note 45 for the formal definition of a psychological equilibrium.

do fiduciaries experience guilt from breaching a duty of loyalty, but also that guilt is sufficiently dependent on their belief about how strong that duty of loyalty is perceived to be by the beneficiary.

II. How Duties of Care Affect Fiduciaries' Beliefs, Preferences and Behavior

Investing is, by its very nature, an uncertain process. The uncertainty that an investor faces can be divided into two categories: intrinsic and extrinsic uncertainty. Extrinsic uncertainty refers to that about such exogenous market fundamentals as technology, tastes, and initial endowments. An example would be the amount of rainfall, which influences the size of crops and prices of agricultural futures contracts. Intrinsic uncertainty refers to that about such endogenous market variables as prices, volume, and other market actors' decisions. We believe that duties of care mean that fiduciaries are concerned with a particular type of intrinsic uncertainty, namely how beneficiaries believe other fiduciaries would behave. There are three reasons that what an investor believes other fiduciaries will or should do makes a difference. First, investment fiduciaries are often evaluated by their performance relative to other investment fiduciaries, both explicitly and implicitly. Second, an investor may be more likely to sue upon suffering a huge financial loss if that investor observes that her investment fiduciary chose a financial strategy that no other investment fiduciary did. Third, court will consider whether an investment fiduciary's behavior deviated from common industry practice in evaluating its appropriateness.

The compensation of broker-dealers and other investment professionals within financial intermediaries is often based on relative performance. Formal or informal tournaments for

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promotion and bonuses within organizations can also lead to a fiduciary having preferences that favor imitating one's colleagues or cohorts. For example, the financial press ranks mutual fund managers every quarter by the value of their portfolios relative to all other mutual fund managers.¹⁰² Loss aversion on the part of investment professionals creates an additional strong pressure not so much to outperform other investment professionals, but to not underperform other investment professionals or even aggregate financial market indices. If one believes in the efficient capital markets hypothesis, this push towards indexing is desirable. But, it also means there are fewer differences between and less market discipline upon investment professionals.¹⁰³

A fiduciary may also reasonably believe there is safety in numbers in the sense that common industry practices are less likely than uncommon ones to lead an investor who has experienced a financial setback to seek redress in the courts. The same is true for litigation by regulatory agencies or disciplinary proceedings by self-regulatory organizations. The potential plaintiff might attribute carelessness from performance when an investment professional is a "lone wolf".

The common law prudent investor rule means that fiduciaries have "to observe how men of prudence, discretion and intelligence manage their own affairs, not in regard to speculation, but in regard to the permanent disposition of their funds."¹⁰⁴ The prudent investor rule states that a "trustee [is] under a duty to beneficiaries to invest and manage the funds of the trust as a prudent investor would, in light of the purposes, terms, distribution requirements and other circumstances of the trust."¹⁰⁵ ERISA investment duties require that fiduciaries behave "with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent man

¹⁰² Judith Chevalier & Glenn Ellison, *Career Concerns of Mutual Fund Managers*, 114 Q. J. ECON 389, 409-16, 420, 430 (1999).

¹⁰³ See generally, ROBERT C. POZEN, *THE MUTUAL FUND BUSINESS* 6 (2000).

¹⁰⁴ *Harvard College v. Amory*, 26 Mass. (9 Pick.) 446, 461 (1830).

acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims."¹⁰⁶

As with the duty of care in corporate law, the operational meaning of the duty of care in fiduciary investing is amorphous, if not elusive, both *ex ante* for a fiduciary and *ex post* for a court. One possible way to ascertain what a prudent investor would choose to do is by introspection. Another potential method for determining if a particular investment strategy is one that a prudent investor would select is to notice whether other fiduciary investors are choosing to employ that investment strategy. In other words, both fiduciaries *ex ante* and courts *ex post* can observe whether a particular investment strategy is part of standard industry practice. Although the fact that a particular investment strategy complies with industry custom does not necessarily mean that it will be socially desirable, it arguably is one that can pass the prudent investor rule test. In a sense, the prudent investor rule is analogous to a reasonable precaution in tort law. Judge Learned Hand's rule for cost-justified precautions provided a famous algebraic discussion of what are cost-justified precautions.¹⁰⁷ Judge Hand stated in an earlier torts case opinion that "[I]n most cases, reasonable prudence is in fact common prudence; but strictly it is never its measure."¹⁰⁸ But, "[j]udicial decisions reveal broad differences of opinion on the proper role of custom in setting the standard of care."¹⁰⁹

Thus, there are both market and legal reasons why fiduciaries are likely to have payoffs that depend on their beliefs about what a beneficiary believes other fiduciaries will do. In equilibrium, those beliefs are required to be correct. Suppose there is a population of fiduciaries,

¹⁰⁵ Restatement (Third) of Trusts, Introduction, at 5, 6 (1990).

¹⁰⁶ ERISA § 404(a)(1)(B), 29 U.S.C. § 1104(A)(1)(B) (1988).

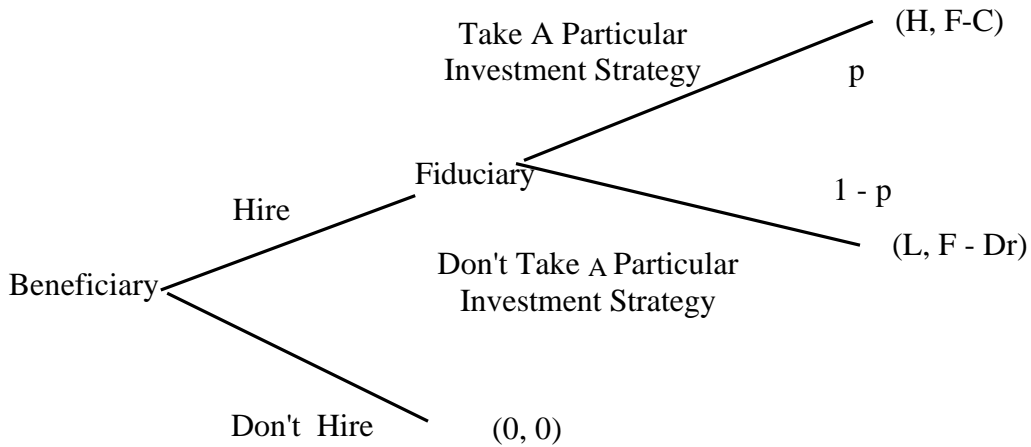
¹⁰⁷ *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947). The American Law Institute defines negligence in the RESTATEMENT (SECOND) OF TORTS by utilizing the Hand rule.

¹⁰⁸ *T. J. Hooper*, 60 F.2d 737 (2d Cir. 1932).

¹⁰⁹ RICHARD A. EPSTEIN, 175 CASES AND MATERIALS ON TORTS (1990).

each of whose payoffs depend on their beliefs about a beneficiary's beliefs about what proportion of fiduciaries will engage in a particular investment strategy. The more likely that other fiduciaries are to engage in a particular investment strategy, the more likely that a beneficiary is to view such behavior as meeting the duty of care. In other words, the less likely that other fiduciaries are to engage in a particular investment strategy, the less likely that a beneficiary is to view such behavior as meeting the duty of care. This means that a duty of care might result in the following psychological game:¹¹⁰

Figure 4: A Relative Performance Fiduciary Investing Game



In this game, the beneficiary can decide not to hire the fiduciary and without loss of generality, the status quo payoffs are normalized to be \$0 for both. Alternatively, a beneficiary can hire a fiduciary and make an investment with a net return of \$H million if that fiduciary undertakes the investment strategy in question. In that case, the fiduciary earns a net fee of \$(F-C) million, where C is the cost to the fiduciary of

¹¹⁰ This game is akin to the generalized psychological game of trust in figure 3 of Huang and Wu, *supra*

undertaking the investment action. On the other hand, the fiduciary can choose not to undertake the investment strategy in question; in which case, the beneficiary earns a net return of $\$L$ million and the fiduciary has a payoff of $\$F$ million. Denote by p the endogenous proportion of the fiduciary population that engages in a specific investment action. Let q denote a particular beneficiary's beliefs over p . Let r denote a specific fiduciary's belief over q . Finally, let D denote the parameter that captures how sensitive fear is to beliefs. For example, $D = 0$ is the case where there is no belief-dependent fear. The size of D can vary across contexts in the sense that D might be quite low or even zero if the financial intermediary does not know the identity of the beneficiary. The size of D could be quite high if the financial intermediary knows the beneficiary very intimately. In fact, D captures the degree of intimacy of the fiduciary relationship, ranging from arms-length impersonal, faceless and nameless beneficiaries to close and personal friends with a long relational history.¹¹¹

Assume that all of the parameters H , L , C , and $D > 0$ and that $H > L$; $C < D$ (if $C > D$, then in equilibrium $p = 1$ and there is no problem of fiduciaries not taking the investment action in question. If $r = q = 0$, then $p = 0$ and not engaging in the investment action in question is a psychological dominant strategy for fiduciaries.¹¹² If $r = q = 1$, then $p = 1$ and engaging in the investment strategy in question is a psychological dominant strategy for fiduciaries. Setting $F - C = F - Dr$ and $p = r$ solves for the mixed strategy psychological equilibrium with $p = q = r = C/D$.¹¹³ Notice that

note 52.

¹¹¹ **CITE** to study recently reported in the Wall St. J. that people are less polite over e-mail.

¹¹² A psychological dominant strategy is a strategy that if it is anticipated correctly becomes a dominant strategy.

¹¹³ This model implies apparently counterintuitive qualitative comparative statics at the mixed strategy equilibrium, namely, these inequalities, $\partial p / \partial C = 1/D > 0$ and $\partial p / \partial D = C > 0$. But, upon realizing the

because $C < D$, it follows that $p < 1$. Also, $p > 0$ because $C > 0$ and $D > 0$.

This model demonstrates how quickly and easily what constitutes careful fiduciary investor behavior can shift. This is not surprising and should be expected because the above model exhibits network externalities. The well-known problems of excess inertia or excess momentum are thus possible. In the context of fiduciary investing, this means that fiduciaries may rush too quickly or slowly to adopt investment strategies that would benefit beneficiaries. Sometimes, the mere fact that no other fiduciary has adopted a new idea may delay other fiduciaries from doing so for fear of being sued and the safety in numbers by following the pack. Even if the act in question would actually be desirable, it may not be put into practice. This may be the case with the use of derivatives¹¹⁴ or drawdown analysis.¹¹⁵ Many investment practices once thought to be imprudent have subsequently come to be accepted as prudent. Three examples are investing in stocks, tax planning, and diversification.¹¹⁶ Alternatively, nobody may have even thought of the idea yet. Similarly, the mere fact that a particular investment strategy is very popular at one time does not mean that later on it may become very unpopular. History is

mixed strategy equilibrium probability of engaging in the investment strategy in question has to make fiduciaries indifferent between engaging and not engaging in that strategy, the signs of the comparative statics results are more understandable. A higher cost C from undertaking the investment strategy in question must be offset by a higher equilibrium p and a higher degree D of sensitivity of guilt to beliefs must be offset by a higher equilibrium p . It is important to remember these results only hold when comparing mixed strategy equilibrium probabilities because the intrinsic belief-independent gain to not engaging in the investment strategy in question or the sensitivity of payoffs to beliefs change. Observe that for beneficiaries to hire fiduciaries, this inequality must hold: $pH + (1-p)L > 0$, or $p > L/(H-L)$. Thus, the inequality $C/D > L/(H-L)$, or $L < CH/(C+D)$ has to be satisfied for the fiduciaries to have a chance to move in the mixed strategy equilibrium. Because $C < D$, $C < C+D$ also and $C/(C+D) < 1$; thus the inequality $L < CH/(C+D)$ is a more restrictive condition than the assumption that $L < H$. Finally, notice that a mixed strategy psychological equilibrium is locally stable in the sense that for fixed values of the parameters H , L , C , and D ; a small deviation from the interior equilibrium p results in p moving back towards that equilibrium. Such a perturbation, of course, differs from the comparative statics results involving changes in the values of the parameters C or D .

¹¹⁴ George Crawford, *A Fiduciary Duty to Use Derivatives?*, 1 STAN. J. L. BUS. & FIN. 307, 328-32 (1995).

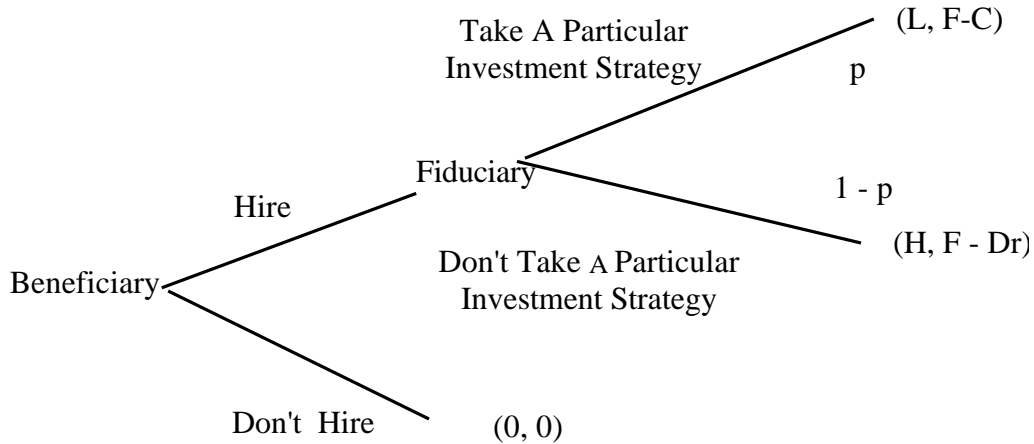
¹¹⁵ C. B. Garcia & F. J. Gould, *A Note on the Measurement of Risk in a Portfolio*, FIN. ANALYSTS J. 61 (1987).

¹¹⁶ Crawford, *supra* note 114 at 323-26.

full of examples, ranging from state lists of permissible investments to perhaps excess diversification.

The possibility of inefficiency can easily demonstrated by the psychological game in figure 4 which is just the game in figure 5 with the beneficiary's payoffs when the fiduciary is hired interchanged. The games in figures 4 and 5 have the same three psychological equilibrium outcomes.

Figure 5: Another Relative Performance Fiduciary Investing Game



The only difference between the two games is that in this game, the investment activity in question actually hurts the beneficiary (because $L < H$), yet it will be undertaken by some or all of the fiduciaries in two of the equilibrium outcomes. Thus, fiduciaries engage in costly investment actions that lead beneficiaries receiving lower returns on their investment. This is clearly inefficient from the viewpoint of both fiduciaries and beneficiaries. The possible inefficiency that results is analogous to inefficient corporate contracts due to network

externalities.¹¹⁷ No individual fiduciary nor beneficiary can unilaterally deviate from such equilibrium outcomes though. Of course, whether these outcomes are socially efficient or not depends on size of the costs to a fiduciary of undertaking the investment strategy. Such costs include the transaction costs of lawyers, delegation, or time.

III. Belief-Dependent Emotions and Fiduciary Relationships in General

Fiduciary relationships in general provide examples of situations that fit our two models because of the open-ended nature of the obligations that fiduciaries have by virtue of their fiduciary relationships. For example, O'Neill suggested that the law should permit owner-managed firms to be dissolved by any owner-manager at will in order to foster the value of caring in such relationships.¹¹⁸ Her suggestion can be interpreted as having default rules that encourage the sort of preferences described by the models above. O'Neill also considered the common law's imposition of a fiduciary duty of loyalty by employees to employers and the arguments for and against a reciprocal duty of loyalty owed by corporate directors to their employees.¹¹⁹ Although this discussion has been couched in terms of the corporate constituency debate, O'Neill concluded that all employers (whether corporate or not) should owe a duty of loyalty to their employees. Bilateral duties of loyalty would create beliefs regarding the behavior of both parties in an employment relationship. Such expectations could lead to behavior on the part of employees and employers that protect employees from plant closings or layoffs due to

¹¹⁷ Michael Klausner, *Corporations, Corporate Law, and Networks of Contracts*, 81 VA. L. REV. 757, 808-812, 815-825 (1995).

¹¹⁸ Terry A. O'Neill, *Self-Interest and Concern for Others in the Owner-Managed Firm: A Suggested Approach to Dissolution and Fiduciary Obligation in Close Corporations*, 22 SETON HALL L. REV. 646 (1992).

¹¹⁹ Terry A. O'Neill, *Employees' Duty of Loyalty and the Corporate Constituency Debate*, 25 CONN. L. REV. 681 (1993).

corporate reorganizations. Greenfield argues that it is efficient to address these issues with corporate law rather than employment law, in part because of the globalization of markets.¹²⁰ O'Neill proposed that all business enterprises be viewed as lying on a spectrum ranging from impersonal, adversarial ones to personal, unitary ones.¹²¹ In terms of the model in figures 4 and 5 of this paper, the size of D can serve to index the position along this business enterprise spectrum. She argued that partnership law, such as the Uniform Partnership Act, presupposes that the relationship between partners is built on personal trust, involves commonalty of interests, and reflects norms of consensual decision-making. Bratton applies Kreps' repeated game-theoretic model of the firm to reconsider the corporate duty of loyalty.¹²² Most recently, Blair and Stout also relate corporate behavior and trust behavior.¹²³

Easterbrook and Fischel argued for the merits of economic analysis over non-economic approaches to explaining fiduciary duty law.¹²⁴ They noted that agency relations involving fiduciaries are diverse in their details and scope: (pension) trustee-beneficiary, investment advisor-client, corporate manager-equity investor, attorney-client, labor union leader-employee, lender-borrower, guardian-ward, franchiser-franchisee, and majority-minority stockholder.¹²⁵ Romano questioned the claim that fiduciary duty law is nothing more than contract law by observing that Easterbrook and Fischel's theory should be developed in more detail.¹²⁶ The

¹²⁰ Kent Greenfield, *Using Behavioral Economics to Show the Power and Efficiency of Corporate Law as Regulatory Tool*, working paper (Feb. 2001).

¹²¹ Terry A. O'Neill, *Toward a New Theory of the Closely-Held Firm*, 24 SETON HALL L. REV. 603 (1993).

¹²² William W. Bratton, *Game Theory and the Restoration of Honor to Corporate Law's Duty of Loyalty*, in PROGRESSIVE CORPORATE LAW 139, 153-69 (Lawrence E. Mitchell, ed.) (1995).

¹²³ Margaret M. Blair & Lynn A. Stout, *Trust, Trustworthiness, and the Behavioral Foundations of Corporate Law*, U. PA. L. REV. (forthcoming, 2001).

¹²⁴ Frank H. Easterbrook & Daniel R. Fischel, *Contract and Fiduciary Duty*, 36 J.L. & ECON. 425 (1993).

¹²⁵ The parameter D in games 3 and 4 provides a natural way differentiate between alternative fiduciary relationships both across and even within legal contexts or settings.

¹²⁶ Roberta Romano, *Comment on Easterbrook and Fischel, Contract and Fiduciary Duty*, 36 J. L. &

above models in this Article suggest an elaboration of a calculating economic analysis, which incorporates guilt-avoidance and views fiduciary duties as providing focal points for selecting among multiple equilibrium outcomes. In so doing, fiduciary law provides deterrence not only via legal and financial penalties, but also via expressive and symbolic roles that involve emotional incentives.

Because fiduciary investors are subject under law to a fiduciary duty of loyalty and fiduciary duty of care, their preferences and hence their behavior depend on their beliefs about beneficiary's expectations over either that particular fiduciary's behavior or the behavior of other similar fiduciaries. Fiduciary preferences are endogenous because they depend on beliefs that are determined endogenously in equilibrium. The endogenous nature of preferences means that fiduciary law can influence fiduciary preferences and fiduciary behavior by selecting particular beliefs as focal points. This role that fiduciary law can play is analogous to the preference-shaping role of criminal law.¹²⁷ In the duty of loyalty context, this endogenous nature of fiduciary preferences can (but does not have to) mitigate the problem of misappropriation. But, in the duty of prudence context, this endogenous nature of fiduciary preferences may help as well as hurt beneficiaries.

Although fiduciary investors are required or led by law to have preferences that depend on beliefs about strategic actions, non-fiduciary investors may also have preferences that depend on beliefs about strategic actions. A well-known example of the view that psychological factors are important in investing is Keynes' famous analogy of the stock market to a newspaper beautiful baby contest, in which readers voted for the most attractive contestant, where the reader

ECON. 447 (1993).

¹²⁷ See Kenneth G. Dau-Schmidt, *Opportunity Shaping, Preference Shaping, and the Theory of Criminal Law*, in MORALITY, RATIONALITY, AND EFFICIENCY: NEW PERSPECTIVES ON SOCIO-ECONOMICS 41 (R. M. COUGHLIN, ed. 1991); *An Economic Analysis of Criminal Law as Preference-*

that voted for the contestant with the most votes wins.¹²⁸ In such a game, a voter's optimal strategy is not to vote for that contestant she personally believes is the most attractive. It is instead to vote for the contestant which she believes that other voters think is the most attractive or think others think is the most attractive (and so forth, ad infinitum and possibly ad nauseum). Such a view of financial markets suggests that fundamental analysis of stock values is not as important as trying to figure out what other investors believe that other investors are going to do.¹²⁹ Stout finds that even when investors do not suffer from any cognitive imperfections, changes in the price of a company's stock might not accurately nor fully reflect changes in that company's value and hence total social wealth.¹³⁰ Another example of the interplay between strategic decisions and beliefs over such behavior is the so-called Groucho Marx theorem or no-speculation or no-trade result in asymmetric information game theory.¹³¹ This result states that under certain restrictive conditions, any investor should not trade in equilibrium because the mere offer to trade by another investor suggests that other investor has private information leading that other investor to be willing to choose to enter the market on the opposite of this investor.¹³² This theoretical result may not hold in the real world, however, because investors

Shaping Policy, DUKE L. J. 1 (1990).

¹²⁸ JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY* 155 (1935).

¹²⁹ Kenneth J. Arrow, *Risk Perception in Psychology and Economics*, 20 *ECON. INQUIRY* 1 (1982).

¹³⁰ LYNN A. STOUT, *STOCK PRICES AND SOCIAL WEALTH* (Harvard Law and Economics Discussion Paper No. 301; Georgetown Law and Economics Research Paper No. 249991, Nov. 2000) (criticizing the belief that stock prices correspond to firm values and societal wealth).

¹³¹ Robert J. Aumann, *Agreeing to Disagree*, 4 *ANNALS STAT.* 1236 (1976); John D. Geanakoplos & Heraklis M. Polemarchakis, *We Can't Disagree Forever*, 28 *J. ECON. THEORY* 192 (1982); Paul Milgrom & Nancy Stokey, *Information, Trade, and Common Knowledge*, 26 *J. ECON. THEORY* 17 (1982).

¹³² The result assumes common knowledge of concordant beliefs. See Paul G. Mahoney, *Is There A Cure for "Excessive" Trading?*, 81 *VA. L. REV.* 713, 715 (1995). But see Lynn A. Stout, *Irrational Expectations*, 3 *LEGAL THEORY* 227, 239-47 (1997) (arguing that common knowledge is a very strong restriction that not only everybody knows, but they know others know, and so forth ad infinitum as well as ad nauseum and that concordant beliefs is another very strong assumption that all investors process information the same way and would hold identical beliefs if they had the same underlying information).

can have heterogeneous beliefs about market fundamentals.¹³³ Nonetheless, such investors can also share homogeneous and rational beliefs about what other investors will do. Those other investors may simply believe that others are wrong and/or suffer from hubris, overconfidence, or cognitive biases.

CONCLUSIONS

Most people do not make their initial and subsequent investment decisions in the manner that is envisioned by modern financial theories because they lack the inclination, knowledge and time required for doing that. Surprisingly, many people find quite counterintuitive even seemingly elementary financial concepts like present discounted value, the return versus risk tradeoff, idiosyncratic risk, portfolio diversification, and hedging.¹³⁴ Instead of actively managing their portfolios, most individuals delegate that job and responsibility to market professionals. Some people, like day traders, manage their own investments (perhaps too) actively, but in ways that do not seem easy to reconcile with models of rational investment behavior. Most individuals and institutional investors (other than financial organizations) do not invest directly themselves, but instead invest through a financial intermediary.

This Article has considered the relationship between investors and their financial intermediaries. In particular, this Article has focused on how law can alter beliefs about strategic investment behavior. These changed beliefs, in turn, alter such emotions as guilt and fear on the part of individual actors in financial intermediaries. The resulting emotions affect the behavior

¹³³ Lynn A. Stout, *Agreeing to Disagree Over Excessive Trading*, 81 VA. L. REV. 751, 753 (1995).

¹³⁴ Peter H. Huang, Kimberly Krawiec, & Frank Partnoy, 4 GREEN BAG 2d. 255 (2001).

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of investment professionals as well as that of investors. The general framework of this Article has implications for the legal policy towards fiduciaries in general and for corporate law.