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Regulating Irrational Exuberance and Anxiety in Securities Markets

Peter H. Huang*

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Abstract: This chapter analyzes the regulatory implications of irrational exuberance and anxiety in securities markets. U.S. federal securities laws mandate the disclosure of certain information, but regulate only the cognitive form and content of that information. An important and unstudied question is how to regulate securities markets where some investors respond not only cognitively to the form and content of information, but also emotionally to the form and content of information. This chapter investigates that question when some investors feel exuberance or anxiety that is unjustified by cognitive processing of the available information. This chapter develops the implications for mandatory securities disclosure of irrational exuberance and anxiety.

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INTRODUCTION

Investing, especially by institutions, can increasingly take advantage of artificial intelligence, nonlinear chaotic models, genetic algorithms, neural network time series forecasting, pattern recognition software, and sophisticated quantitative computer valuation models.¹ Thus, it seems that investing could become progressively more like the behavior described by the rational actor model of law and economics. But, even for institutions, ultimately humans are responsible for investing and feel emotions during investing. Yet, the rational actor model postulates that humans unemotionally maximize expected utility functions.²

Behavioral economics advances an alternative to expected utility theory, namely prospect theory.³ The fact that Professor Kahneman was the co-recipient of the 2002 Nobel Prize in Economic Sciences to is the latest example of the ascendancy of behavioral economics.⁴ Behavioral economics has gained much popularity and prestige in recent years.⁵ Recently, some legal scholars have applied behavioral economics to analyze legal rules and institutions.⁶ These

Klepper, Kent Olson, Cathy Palombi, Barbie Selby, and Joseph J. Wynne for their extraordinary bibliographic assistance.

¹ See generally, PAUL WILMOTT, PAUL WILMOTT INTRODUCES QUANTITATIVE FINANCE (2001); PAUL WILMOTT, PAUL WILMOTT ON QUANTITATIVE FINANCE (2000).

² Matthew D. Adler, Claire Finkelstein, & Peter H. Huang, *Introduction to Symposium, Preferences and Rational Choice: New Perspectives and Legal Implications*, 151 U. PA. L. REV. (forthcoming 2003). See generally JOHN VON NEUMANN & OSKAR MORGENTHAU, *THE THEORY OF GAMES ECONOMIC BEHAVIOR* (2d ed. 1947).

³ Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979) (introducing prospect theory). See also Chris Guthrie, *Prospect Theory, Risk Preference and the Law*, __ NW. U. L. REV. __ (forthcoming 2003) (surveying applications of prospect theory to law).

⁴ Jon E. Hilsenrath, *Nobel Winners for Economics Are New Breed*, WALL ST. J., Oct. 10, 2002 at B1 (explaining that “Kahneman pioneered the field of behavioral economics”).

⁵ George A. Akerlof, *Behavioral Macroeconomics and Macroeconomic Behavior*, 92 *AM. ECON. REV.* 411, 424-428 (2002) (arguing in a revised version of the lecture he presented upon receiving the 2001 Nobel Prize in economic sciences (Dec. 8, 2001) that macroeconomics should be behavioral and that JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY* (1936) is the “progenitor of the modern behavioral finance view of asset markets”); Roger Loewenstein, *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).

⁶ See, e.g., 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

legal scholars consider the policy and regulatory implications of cognitive limitations by drawing on a literature about information processing errors.⁷ But, the scope and normative implications of such legal applications remains the subject of continuing debate.⁸

In addition, while prospect theory provides an alternative model of choice under risk to expected utility theory; prospect theory, expected utility theory, and “virtually all current theories of choice under risk or uncertainty are cognitive and consequentialist.”⁹ But, human behavior is not only cognitive, but also emotional;¹⁰ moreover, cognition and emotion are interrelated.¹¹ For

Jolls, et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471 (1998) (offering a survey of the insights of behavioral economics for the analysis of legal rules and institutions). *See generally* Symposium, *Research Conference on Behavioral Law and Economics in the Workplace*, 77 N.Y.U. L. REV. 1 (2002).

⁷ *See, e.g.*, Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: The Problem of Market Manipulation*, 74 N.Y.U. L. REV. 630, 640-93 (1999) (providing an overview of behavioral research); 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).

⁸ *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, *ADAPTIVE THINKING: RATIONALITY IN THE REAL WORLD* (2000) (rethinking rationality as adaptive thinking); GERD GIGERENZER ET AL., *SIMPLE HEURISTICS THAT MAKE US SMART* (1999) (demonstrating that fast and simple procedures for making decisions possess ecological rationality); Hanson & Kysar, *Taking Behavioralism Seriously: A Response to Market Manipulation*, 6 ROGER WILLIAMS U. L. REV. 259, 266-386 (arguing that cognitive psychology supports adopting enterprise liability for product-related torts); James A. Henderson, Jr. & Jeffrey J. Rachlinski, *Product-Related Risk and Cognitive Biases: The Shortcomings of Enterprise Liability*, 6 ROGER WILLIAMS U. L. REV. 213, 218-58 (2000) (arguing that cognitive psychology does not support adopting enterprise liability for product-related torts); Robert A. Hillman, *The Limits of Behavioral Decision Theory in Legal Analysis: The Case of Liquidated Damages*, 85 CORNELL L. REV. 717, 738 (2000) (recommending that judges and scholars use caution in applying behavioral decision theory to legal analysis); 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); Gregory Mitchell, *Why Law and Economics' Perfect Rationality Should Not Be Traded for Behavioral Law and Economics' Equal Incompetence*, GEO. L.J. (forthcoming 2002) (criticizing behavioral law and economics for overlooking substantial empirical evidence on individual and situational variability in the rationality of behavior). *But see* Jeffrey J. Rachlinski, *The 'New' Law and Psychology: A Reply to Critics, Skeptics, and Cautious Supporters*, 85 CORNELL L. REV. 739 (2000) (defending behavioral law and economics); Jeffrey J. Rachlinski, *The Uneasy Psychological Case for Paternalism* (Fall 2002) (unpublished manuscript, on file with the author) (arguing that legal scholarship mistakes the principal message of cognitive psychology to be that people make systematic decision-making errors instead of that people develop complex, contextual strategies for making choices).

⁹ George F. Loewenstein et al., *Risk-as-Feelings*, 127 PSYCHOL. BULL. 267 (2001).

¹⁰ *See generally* Colin Camerer, et al., *Gray Matters: How Neuroscience Can Inform Economics*, J. ECON. PERSPECTIVES (forthcoming, 2003); Colin Camerer & George F. Loewenstein, *Behavioral Economics: Past, Present, and Future*, in *ADVANCES IN BEHAVIORAL ECONOMICS* (Colin Camerer, et al. eds., forthcoming, 2003); George F. Loewenstein & Jennifer S. Lerner, *The Role of Affect in Decision Making*, in *HANDBOOK OF AFFECTIVE SCIENCE* 619 (Richard J. Davidson ed., et al., 2003).

¹¹ *See, e.g.*, Louis C. Charland, *Is Mr. Spock Mentally Competent? Competence to Consent and Emotion*, 5 PHIL. PSYCHIATRY, & PSYCHOL. 67, 71-72 (1998) (describing recent neurophysiological, philosophical, and psychological research suggesting that emotions are fundamentally cognitive); Yaniv Hanoch, “*Neither An Angel Nor An Ant*”:

example, investors may be overconfident due to hubris. Yet, “research from clinical, physiological, and other subfields of psychology, ... show that emotional reactions to risky situations often diverge from cognitive assessments of those risks. When such divergence occurs, emotional reactions often drive behavior.”¹²

Behavioral finance, which is behavioral economics over time and under conditions of risk, has revolutionized academic finance.¹³ But, while behavioral finance sometimes refers to such emotions as greed and fear, behavioral finance only considers emotions to explain why some investors utilize cognitive biases and heuristics.¹⁴ The main focus of behavioral finance is to demonstrate how investing driven by cognitive limitations explains observed anomalies in asset pricing and impacts asset pricing.¹⁵

Emotion As An Aid To Bounded Rationality, 23 J. ECON. PSYCHOL. 1, 3 (2002) (arguing that emotions assist people in processing information); J. MARK G. WILLIAMS, ET AL., COGNITIVE PSYCHOLOGY AND EMOTIONAL DISORDERS 2-4 (2d ed. 1997) (discussing the relationship between cognition and emotion).

¹² Loewenstein, *supra* note 9 at .267.

¹³ Robert J. Shiller, *From Efficient Markets Theory to Behavioral Finance*, 17 J. ECON. PERSPECTIVES 83, 90-91 (2003) (discussing how academic finance has evolved from widespread acceptance of the so-called efficient markets hypothesis to behavioral finance becoming one of its most vital research programs). See generally Werner F.M. De Bondt & Richard H. Thaler, *Financial Decision-Making in Markets and Firms: A Behavioral Perspective*, in 9 FINANCE 385-410 (Robert A. Jarrow, et al. eds., 1995); I-IV HERSH SHEFRIN, BEHAVIORAL FINANCE (THE INTERNATIONAL LIBRARY OF CRITICAL WRITINGS IN FINANCIAL ECONOMICS) (2001); RICHARD H. THALER, ADVANCES IN BEHAVIORAL FINANCE II (2003).

¹⁴ JOHN R. NOFSINGER, THE PSYCHOLOGY OF THE INVESTING xi (2002) (stating that “[a]n old Wall Street adage states that two factors move the market: fear and greed. Although true, this characterization is far too simplistic. The human mind is very sophisticated, and human emotions are very complex. The emotions of fear and greed just don’t adequately describe the psychology that affects people.”); HERSH M. SHEFRIN, BEYOND GREED AND FEAR: UNDERSTANDING BEHAVIORAL FINANCE AND THE PSYCHOLOGY OF INVESTING (2000) (providing a guide for financial practitioners to behavioral finance).

¹⁵ See, e.g., Nick Barberis et al., *Prospect Theory and Asset Prices*, 116 Q. J. ECON. 1 (2001) (proposing a stock return model that is consistent with experimental evidence and prospect theory); Nick Barberis & Richard H. Thaler, *A Survey of Behavioral Finance*, in HANDBOOK OF THE ECONOMICS OF FINANCE (George Constantinides, et al. eds., forthcoming 2003) (reviewing and evaluating recent work in behavioral finance); Shlomo Benartzi & Richard H. Thaler, *Myopic Loss Aversion and the Equity Premium Puzzle*, 110 Q. J. ECON. 73 (1995) (providing and testing a psychological model based on loss aversion and myopia in the sense of the tendency of investors to frequently evaluate their portfolios even if those are held over a long time period; their model explains an empirical fact known as the equity premium that over the last century, stocks have outperformed bonds by a very large margin); Kent D. Daniel et al., *Investor Psychology in Capital Markets: Evidence and Policy Implications* (Aug. 3, 2001) (unpublished manuscript, on file with the author) (reviewing extensive empirical evidence about how psychological biases affect investor behavior and capital market prices); David A. Hirshleifer, *Investor Psychology and Asset Prices*, 56 J. FIN. 1533 (2001) (surveying recent models of investor psychology affecting asset prices); JOHN R. NOFSINGER, INVESTMENT BLUNDERS OF THE RICH AND FAMOUS ... AND WHAT YOU CAN LEARN FROM THEM 13-28 (2002) (reviewing behavioral finance literature on psychological biases and resulting investment blunders).

For example, many individuals and even some financial practitioners over-react to information as well as to what they believe others will do.¹⁶ Some behavioral finance models assume there are noise traders, who are unable to differentiate between payoff-irrelevant information (that is, noise) and payoff-relevant information, due usually to cognitive biases in processing information.¹⁷ Recently, scholars have begun to consider the implications of cognitive biases for securities regulation.¹⁸ This chapter builds upon such legal scholarship that focuses primarily on cognitive biases and heuristics by focusing instead on emotional investing.

Most U.S. federal securities laws focus on the cognitive form and content of certain information.¹⁹ In contrast, many investors respond emotionally to both the form and content of information and while investing, experience a series of “successive emotional states of hope, joy, craving and euphoria,”²⁰ sometimes followed by anxiety and fear. It is thus not surprising that a moment of introspection reveals that people usually feel many emotions before, during, and after they invest. In fact, certain emotions might exemplify visceral factors that short circuit or trump

¹⁶ Kent D. Daniel et al., *Investor Psychology and Security Market Under- and Over- Reactions*, 53 J. FIN. 1839 (1998).

¹⁷ 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).

¹⁸ Stephen J. Choi & Adam C. Pritchard, *Behavioral Economics and the SEC*, STAN. L. REV. (forthcoming 2003) (arguing for a series of presumptions against interventions by such behaviorally-flawed regulators as the SEC); Lawrence A. Cunningham, *Behavioral Finance and Investor Governance*, 59 WASH. & LEE L. REV. 767, 786-837 (2002) (explaining the policy implications for corporate governance of behavioral finance); Leslie Hodder et al., *SEC Market Risk Disclosures: Implications for Judgment and Decision Making*, 15 ACCOUNTING HORIZONS 49 (2001) (drawing on insights from cognitive psychology to examine the implications of the SEC’s Financial Reporting Release No. 48 about derivative and market risk disclosures); Donald C. Langevoort, *Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation*, 97 NW. U. L. REV. 135 (2002) (discussing implications of four cognitive biases of investors for three areas of securities regulation); Robert Prentice, *Whither Securities Regulation? Some Behavioral Observations Regarding Proposals for its Future*, 51 DUKE L.J. 1397, 1410-1510 (2002) (discussing behavioral reasons to question recently proposed securities deregulation); Robert B. Thompson, *Securities Regulation in an Electronic Age: The Impact of Cognitive Psychology*, 75 WASH. U. L.Q. 779, 779-89 (1997) (discussing analysis of securities regulation utilizing insights from neo-classical economics based on expected utility model versus insights from behavioral economics based upon cognitive psychology).

¹⁹ See, e.g., *A.C. Frost & Co. v. Coeur D’Alene Mines Corporation*, 312 U.S. 38, 43, n.2 (1941) (stating that the fundamental purpose of the Securities Act is to protect investors by mandating full disclosure of the information that is thought necessary for investors to make informed investment decisions); *Feit v. Leasco Data Processing Equipment Corp.*, 332 F.Supp. 544, 563 (E.D.N.Y. 1971) (stating “that without complete, accurate and intelligible information about a company, investors cannot make intelligent investment decisions with regard to its securities”).

normal logical reasoning.²¹ For example, an investor feeling exuberant may optimistically misperceive or even ignore completely the risk factors associated with a particular security during her investment decision process. Similarly, an investor who feels anxious over a string of accounting scandals and instances of corporate malfeasance may pessimistically misperceive or even ignore completely any sound fundamentals associated with a particular security during her investment decision process. This chapter analyzes the regulatory implications of irrational exuberance and anxiety in securities markets.

People usually answer the question, “what is emotion?” with these synonyms: affect, feelings, or mood.²² Even today, the precise definition of an emotion remains contested among researchers.²³ But, there is a consensus that emotions involve a number of related characteristics, namely great intensity, instability, relative brevity, and a partial perspective.²⁴ Before proceeding further, it helps to distinguish among these three related but distinct concepts: emotions, affect, and mood. Emotions describe particular states, like fear, anger, or happiness, that are “intense, short-lived, and usually have a definite cause and clear cognitive content.”²⁵ Affect refers to “a feeling state that people experience, such as happiness or sadness. It may also

²⁰ JOACHIM GOLDBERG & RUDIGER VON NITZSCH, BEHAVIORAL FINANCE 19 (Adriana Morris, trans., 2001) (1999).

²¹ JON ELSTER, STRONG FEELINGS: EMOTION, ADDICTION, AND HUMAN BEHAVIOR 154-65 (1999) (noting the similarities between research on addiction and that about emotions); George Loewenstein, *Out of Control: Visceral Influences on Behavior*, 65 ORG. BEHAV. & HUMAN DECISION PROCESSES 272, 288 (1996) (explaining how visceral factors such as certain emotions can lead human behavior to deviate from perceived self-interest); George Loewenstein, *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 et al., *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).

²² ANTONIO DAMASIO, LOOKING FOR SPINOZA: JOY, SORROW, AND THE FEELING BRAIN 27-80 (2003) (arguing that emotions differ from mood and precede feelings).

²³ DYLAN EVANS, EMOTION: THE SCIENCE OF SENTIMENT 148 (2001).

²⁴ AARON BEN-ZE'EV, THE SUBTLETY OF EMOTIONS 13 (2000).

²⁵ Joseph P. Forgas, *Affect in Social Judgments and Decisions: A Multiprocess Model*, in ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 227, 230 (Mark P. Zanna ed., 1992).

be viewed as a quality (e.g. goodness or badness) associated with a stimulus.”²⁶ Mood refers to “a feeling (such as having the blues) that is low in intensity, can last for a few minutes or several weeks, has no object or has fleeting objects, and does not have to have a specific antecedent cause or cognitive content.”²⁷ Scholars often describe the stock market as experiencing (bipolar) mood swings.²⁸ There is experimental evidence that happy and sad moods have large and consistent effects on estimating subjective probabilities of positive and negative events.²⁹

There are (at least) two principal alternative ways to conceive of emotions. First, there is a tradition dating back to Aristotle, Socrates, and Plato that conceives of emotions as factors that disturb rational deliberation, thought, and reflection.³⁰ Second, there is a more recent view informed by cognitive neuroscience that conceives of emotions as factors that complement rationality in effective decision-making.³¹ Naturally, these different conceptions of emotions have diametrically opposed implications for whether and if so, how the law can or should respond to emotional human behavior. The first viewpoint implies that law should be designed to protect us from our emotions,³² while the second viewpoint implies that law should take a more *laissez faire* attitude towards our emotions.

²⁶ Melissa L. Finucane, et al., *The Affect Heuristic in Judgments of Risks and Benefits*, 13 J. BEHAV. DECISION MAKING 1, 2 n.1 (2000).

²⁷ Melissa L. Finucane, et al., *Judgment and Decision Making: The Dance of Affect and Reason*, in EMERGING PERSPECTIVES ON DECISION RESEARCH (Sandra L. Schneider & James Shanteau eds., forthcoming).

²⁸ See, e.g., LAWRENCE A. CUNNINGHAM, OUTSMARTING THE SMART MONEY: UNDERSTAND HOW MARKETS REALLY WORK AND WIN THE WEALTH GAME 59 (2002) (noting that “astute investors such as [Benjamin] Graham recognized the moodiness of the market”); LAWRENCE A. CUNNINGHAM, HOW TO THINK LIKE BENJAMIN GRAHAM AND INVEST LIKE WARREN BUFFET 3 (2001) (describing the stock market in terms of a “patient exhibit[ing] classic manic depression – or bipolar disorder – combining episodes of euphoria with irritation”); Langevoort, *supra* note 18, at 181 (“significant mood swings in stock prices”).

²⁹ William F. Wright & Gordon H. Bower, *Mood Effects on Subjective Probability Assessment*, 52 ORG. BEHAV. & HUMAN DECISION PROCESSES 276, 280-88 (1992) (documenting such mood effects).

³⁰ See, e.g., ARISTOTLE, THE POLITICS OF ARISTOTLE 146 (Ernest Baker trans. 1946) (stating that “[l]aw ... may be defined as ‘Reason free from all passion.’”)

³¹ See, e.g., MICHAEL S. GAZZANIGA, ET AL., COGNITIVE NEUROSCIENCE: THE BIOLOGY OF THE MIND 547-53 (2d ed., 2002) (describing recent research on the positive role that emotions can play in decision-making).

³² See, e.g., THE FEDERALIST NO. 10, at 48 (James Madison) (Clinton Rossiter ed., 1999) (“Where a majority is included in a faction, the form of popular government . . . enables it to sacrifice to its ruling passion or interest both the public good and the rights of other citizens.”).

Asking whether emotional decision-making is socially desirable is akin to asking whether self-interested decision-making is socially desirable. Under certain strong conditions, including but not limited to complete markets and perfect competition, the pursuit of self-interest can lead to socially desirable results in the sense of Pareto efficient outcomes. In other situations, including but not limited to the presence of externalities or public goods and in certain strategic interactions, the pursuit of self-interest can lead to socially undesirable results in the sense of Pareto inefficient outcomes.

Existing legal doctrines provide numerous examples of both conceptions of emotions. Criminal law considers excuses based upon extreme emotional disturbance, the battered woman syndrome, and post-traumatic stress disorder; but it also encourages compassion, mercy, and sympathy. Tort law recognizes some, but not all forms of emotional harm and suffering. Contract law recognizes the formation defense of procedural unconscionability, which can be due to distress, transactional incapacity, or unfair persuasion.³³ The Federal Trade Commission promulgated a rule granting consumers a three day “cooling-off period” during which buyers can rescind their contracts with door-to-door salespeople.³⁴ There is a similar three day cooling-off period for home equity loans providing buyers with a limited right to rescind certain credit transactions involving their principal dwelling as a security interest.³⁵ Congress imposed a seven day waiting period on any employee waiver of rights under the Age Discrimination in Employment Act (ADEA).³⁶ The family law statutes of many states require that (perhaps very

³³ See, e.g., generally Melvin Eisenberg, *The Bargain Principle and Its Limits*, 95 HARV. L. REV. 741 (1982) (providing a unifying explication of the doctrine of procedural unconscionability).

³⁴ See *FTC Rule Concerning Cooling-Off Period Made for Sales at Homes or at Certain Other Locations*, 16 C.F.R. § 429.1(a) (2002) (mandating that a contract’s front page state that the buyer “may cancel this transaction at any time prior to midnight of the third business day”).

³⁵ See 15 U.S.C. § 1635(a) (2000) (granting borrowers the right to cancel any consumer credit transaction involving their principal dwelling as a security interest before midnight of the third business day after the completion of the contract).

³⁶ See 29 U.S.C. § 626(f)(1)(G) (2000) (mandating that an agreement to waive one’s rights may be revoked up to seven days after its inception).

“yippy skippy”) couples must wait awhile after the issuance of a marriage certificate before they can marry.³⁷ Some of these states also require that a couple may not divorce until after the passage of a mandatory waiting period, that usually exceeds the mandatory prenuptial waiting period.³⁸

Asking whether emotions are good or bad for decision-making is analogous to asking if heuristics are good or bad for decision-making. Sometimes emotions are good for making decisions, while at other times emotions are bad for making decisions; just as sometimes heuristics are good for making decisions, while at other times heuristics are bad for making decisions. The reason for this mixed or nuanced answer is the same in the case of both emotions and heuristics, namely emotions and heuristics act faster than rational deliberation, but precisely because of their speed, emotions and heuristics can mislead us into systematic errors in making decisions.

This chapter focuses on emotions before or during investing, and therefore complements my previous work on anticipated emotions, which are fully and correctly anticipated before or during the decision making process.³⁹ A difficulty with anticipated emotions is that people may

³⁷ See, e.g., N.Y. DOM. REL. LAW § 13-b (McKinney 1999) (“A marriage shall not be solemnized within twenty-four hours after the issuance of the marriage license . . .”).

³⁸ See, e.g., CONN. GEN. STAT. ANN. § 46b-67(a) (West 1995) (mandating that married couples must wait ninety days after filing a complaint for dissolution or legal separation before the court may proceed).

³⁹ Peter H. Huang, *Trust, Guilt and Securities Regulation*, 151 U. PA. L. REV. 1059 (forthcoming 2003) (demonstrating analytically how guilt can mitigate opportunistic behavior by broker-dealers and other corporate actors); Peter H. Huang, *International Environmental Law and Emotional Rational Choice*, 31 J. LEGAL STUD. S237 (2002) (demonstrating formally how fear of losing face can induce compliance with international environmental law); Peter H. Huang, *Reasons within Passions: Emotions and Intentions in Property Rights Bargaining*, 79 OR. L. REV. 435 (2000) (analyzing the impact of anger and shame in Coasian bargaining); Peter H. Huang, *Herd Behavior in Designer Genes*, 34 WAKE FOREST L. REV. 639 (1999) (considering emotions that may occur when utilizing markets to allocate reproductive technologies and genetic engineering); Peter H. Huang, *Dangers of Monetary Incommensurability: A Psychological Game Model of Contagion*, 146 U. PA. L. REV. 1701 (1998) (discussing emotions that arise from commodification and monetary commensurability); 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) (explaining how guilt may sustain the honoring of trust in principal-agent relationships); Peter H. Huang & Ho-Mou Wu, *Emotional Responses in Litigation*, 12 INT’L REV. L. & ECON. 31 (1992) (considering how emotions influence decisions to sue, settle, or proceed to trial).

systematically make prediction errors regarding their future interim or ex post feelings.⁴⁰ Because irrational exuberance and anxiety occur before or during the process of decision making, there are no such difficulties with irrational exuberance and anxiety.

The rest of this chapter is organized as follows. Part I provides empirical and experimental evidence of, a case study of, and theoretical models of irrational exuberance and anxiety in securities markets. Part II contributes to the debate over mandatory securities disclosures by examining the implications of irrational exuberance and anxiety for such disclosures. Part II also develops implications of the fact that securities regulators, including but not limited to the SEC, juries, and private litigants themselves experience irrational exuberance and anxiety. Part III provides conclusions.

I. IRRATIONAL EXUBERANCE AND ANXIETY IN SECURITIES MARKETS

The chairman of the Federal Reserve Board in Washington, D.C., Alan Greenspan, described stock market investor behavior with the phrase “irrational exuberance” in his now infamous December 5, 1996 speech. Those two words resonated with many commentators in the

⁴⁰ George Loewenstein, et al., *The Effect of Sexual Arousal on Expectations of Sexual Forcefulness*, 34 J. RES. CRIME & DELINQ. 443, 445-47 (1997) (applying empathy gap to a rational choice model of crime by testing how young males in various states of sexual arousal predict how coercive they will be in sexual settings); George Loewenstein, et al., *Projection Bias in Predicting Future Utility* (Univ. of Calif. Berkeley Dept. of Econ., Working Paper No. E00-284) (unpublished manuscript, Mar. 21, 2000) (presenting evidence of and a formal model of people underappreciating how their own behavior and exogenous influences affect their future utility); George Loewenstein & David Schkade, *Wouldn't It Be Nice? Predicting Future Feelings*, in WELL-BEING: THE FOUNDATIONS OF HEDONIC PSYCHOLOGY 85, 88-100 (1999) (reviewing empirical findings of such misprediction, discussing the sources of such errors, and considering policy implications); Leaf Van Boven & George Loewenstein, *Social Projection of Transient Visceral Feelings*, PERSONALITY & SOC. PSYCHOL. BULL. (forthcoming, 2003) (discussing the effects of hot-cold empathy gaps of having difficulty imagining oneself while in a hot state to be in a cold state); See also Daniel T. Gilbert et al., *Durability Bias in Affective Forecasting*, in HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 292, 297-312 (Thomas Gilovich et al. eds., 2002) (discussing experimental evidence that people misestimate the duration of their future feelings); Daniel T. Gilbert et al., *Immune Neglect: A Source of Durability Bias in Affective Forecasting*, 75 J. PERSONALITY & SOC. PSYCHOL. 617, 620-36 (1998) (same); Daniel T. Gilbert & Timothy D. Wilson, *Miswanting: Some Problems in the Forecasting of Future Affective States*, in FEELING AND THINKING: THE ROLE OF AFFECT IN SOCIAL COGNITION 178, 185-94 (Joseph P. Forgas ed., 2000) (discussing these findings).

media and with the public worldwide. The publication of a book entitled *Irrational Exuberance* cemented the permanence of that phrase in the popular lexicon about securities markets.⁴¹ What exactly, though, does irrational exuberance mean, as opposed to rational exuberance or irrational anxiety? In this chapter, the phrase irrational exuberance refers to exuberance that is not justified by merely cognitive processing of the available information about securities markets. Thus, rational exuberance refers to exuberance that is warranted by merely cognitive processing of securities disclosures and risks. Irrational anxiety refers to anxiety that is unwarranted by merely cognitive analyses of securities markets fundamentals. Rational anxiety refers to anxiety that is supported by merely cognitive assessments of the costs and benefits of securities investing.

Most people at some point during investing experience fear or hope over their investments. People often make investments motivated by fears. There is the fear of losing money.⁴² There is the fear of not keeping up with others or being left out of a bull market.⁴³ The fear of regret also partially 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.⁴⁴ People often avoid purchasing such volatile securities as those of biotech or Internet companies to minimize anxiety.⁴⁵ On the other hand, some investors, such as day traders, might engage in risky

⁴¹ ROBERT J. SHILLER, *IRRATIONAL EXUBERANCE* (2000).

⁴² The robust experimental findings that people can be very loss averse and treat out-of-pocket losses differently than opportunity costs have clear implications for the way that people actually invest.

⁴³ 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).

⁴⁴ 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); SHEFRIN, *supra* note 14, at 222-224 (discussing the roles of regret and responsibility in active versus passive money management).

⁴⁵ It is crucial to distinguish anxiety from risk aversion. Anxiety is a dynamic notion that arises because some decision-makers may prefer to not live with a feeling of uncertainty across time periods. Risk aversion is a static notion related to how curved a decision-maker's utility function over wealth is within a fixed period of time. See Elke U. Weber & Christopher Hsee, *Cross-Cultural Differences in Risk Perception, but Cross-Cultural Similarities in Attitudes Towards Perceived Risk*, 44 *MGMT. SCI.* 1205 (1998) (reporting that respondents in the U. S., Germany, the P.R.C., and Poland differed in their risk preferences, but are similar in their attitudes towards perceived risk).

portfolio strategies partly for their excitement. One legal scholar likens euphoric financial market transactions to gambling.⁴⁶ That same legal scholar believes that laws may reduce the irrational exuberance of securities markets.⁴⁷ Arguably, certain policies of the SEC and the Federal Reserve facilitate investor enthusiasm about stocks.⁴⁸ Not only financial rewards, but also excitement and general optimism often motivate the issuers of securities, original investors in initial public offerings (IPOs),⁴⁹ and subsequent early investors.

Irrational exuberance and anxiety raise a couple of questions, namely how and why does irrational exuberance and anxiety persist in light of so-called learning effects and selection effects. Learning effects occur if people learn from their own personal investing experience or those of others and get better at investing over time, as they discover that relying on irrational exuberance and anxiety can yield investment returns that they subsequently realize are financially suboptimal. As with Bill Murray's character, Phil, in the movie *Groundhog Day*, noiseless feedback and stationary environments promote learning effects.⁵⁰ But, investing yields very noisy feedback because people can quite naturally (and perhaps even subconsciously) confuse their investment successes with financial insight and confuse their investment failures with bad luck. In addition, empirical evidence suggests that securities markets are highly non-stationary environments. It might seem that institutional and organizational structures can foster

⁴⁶ Theresa A. Gabaldon, *John Law, with a Tulip, in the South Seas: Gambling and the Regulation of Euphoric Market Transactions*, 26 J. CORP. L. 225, 227 (2001).

⁴⁷ *Id.* at 278-84 (identifying specific regulatory methods for mitigating irrational exuberance in securities markets); Theresa A. Gabaldon, *The Role of Law in Managing Market Moods: The Whole Story of Jason Who Bought High*, 69 GEO. WASH. L. REV. 111, 123-34 (2000) (reviewing ROBERT J. SHILLER, *IRRATIONAL EXUBERANCE* (2000)) (making specific legal proposals for mitigating irrational exuberance in securities markets).

⁴⁸ Henry T. C. Hu, *Faith and Magic: Investor Beliefs and Government Neutrality*, 78 TEX. L. REV. 777, 837-84 (2000) (arguing that the SEC and the Fed have contributed to investors' optimism about stocks and suggesting how to remedy that situation).

⁴⁹ The original investors in IPOs are typically not individual investors, but institutional investors. See Hillary A. Sale, *Disappearing without A Trace: Sections 11 and 12(a)(2) of the 1833 Securities Act*, 75 WASH. L. REV. 429, 441 (2000) (observing that the class of "first buyers of the securities issued (Original Shareholders)...is usually very limited, including only institutional investors, members of Congress, and those with connections to underwriters.")

⁵⁰ *GROUNDHOG DAY* (Columbia Pictures Corporation 1993).

learning effects and thus dampen irrational exuberance and anxiety in a manner analogous to how framing dampens endowment effects in corporate agency contexts.⁵¹ But, irrational exuberance and anxiety are not really biases to be unlearned.

Selection effects occur if securities market pressures weed out irrational exuberance and anxiety. Even when some investors continue to feel irrational exuberance and anxiety over time, perhaps the overall impact of irrational exuberance and anxiety on securities markets will decrease over time due to arbitrage. It might seem that arbitrage is a powerful force that selects for (more) rational investing decision-making and weeds out irrational exuberance and anxiety. But, as is well-known by now, there are costs and limits to arbitrage.⁵² Also, arbitrage is a strong engine of information transfer that travels in two directions. In other words, just as those investors who do not feel irrational exuberance and anxiety can arbitrage away the impact of those investors who do feel irrational exuberance and anxiety, similarly those investors who feel irrational exuberance and anxiety can arbitrage away the impact of those investors who do not feel irrational exuberance and anxiety. The often cited observation that securities markets are the archetypical model of perfectly competitive markets is a true, but moot point if even institutional, professional, or sophisticated investors also feel irrational exuberance and anxiety. In fact, there is anthropological, economic, ethnographic, and sociological evidence that documents how the corporate cultures of many institutional investors foster irrational exuberance and anxiety.⁵³ Finally, recent empirical evidence finds that securities market professionals feel the same

⁵¹ Jennifer Arlen, et al., *Endowment Effects with Corporate Agency Relationships*, 31 J. LEGAL STUD. 1 (2002) (finding that the endowment effect is significantly dampened in experimental agency contexts).

⁵² Andrei Shleifer & Robert W. Vishny, *The Limits of Arbitrage*, 52 J. FIN. 35 (1997) (proving this formally).

⁵³ See, e.g., generally MITCHEL Y. ABOLAFIA, *MAKING MARKETS: OPPORTUNISM AND RESTRAINT ON WALL STREET* (1996) (providing such evidence).

emotions as individual investors do.⁵⁴ Finally, there is anecdotal evidence that even institutional investors feel strong emotions over their investments.⁵⁵

Although securities markets are highly competitive, valuation in securities markets is an extremely subjective process. Emotional factors often influence the assessment of securities values across investors, just as emotions often affect subjective appraisals of the value of residential properties across home-buyers and homeowners. In fact, because securities, unlike consumer durables and real estate, are never consumed; securities markets, even more than other durable goods markets, involve subjective, often ephemeral and potentially very emotional anticipations of the future. While reasonable people may agree on the past and the present (although there is reason to be skeptical of even these propositions as evidenced by the well-known fallibility of eyewitness testimony and memory), reasonable people often disagree on the future, both in terms of the set of contemplated outcomes and their various relative likelihoods. People are repeatedly caught off guard upon the realization of previously subjectively unforeseen contingencies.

Even before the Securities Act of 1933 and the Securities Exchange Act in 1934 were enacted, and certainly ever since then, it would not be surprising to note that many emotional factors affect investor behavior. The legislative history of both Acts that are the centerpiece of U.S. federal securities regulation contains numerous horror stories. Many of the cognitive psychological insights of behavioral finance were already an accepted part of the folk-wisdom that formed the basis and rationale for our federal system of securities regulation. U.S. securities laws can be understood as an attempt to alter the manner in which investors make decisions by

⁵⁴ Andrew W. Lo & Dmitry V. Repin, *The Psychophysiology of Real-Time Financial Risk Processing*, National Bureau Econ. Res. Working Paper No. W8508 (unpublished manuscript, Oct. 2001) (providing such evidence).

⁵⁵ See, e.g., ROGER LOWENSTEIN, *WHEN GENIUS FAILED: THE RISE AND FALL OF LONG-TERM CAPITAL MANAGEMENT* 75 (2000) (observing that “Long-Term’s traders were *not* automatons. They debated, sometimes

helping, or forcing, them to make better decisions. For example, the Securities Act of 1933 goes to extremely great lengths to try to structure the investment process/decision into a hyper-rational process in which a reasonable investor, sitting in the calm of her study, reviews only the prospectus of the registration statement, without being influenced unduly by pushy stockbrokers, high-pressure scare tactics, glossy ads or promotional materials, or anything else. The puffery defense attempts to minimize the distortions that can be caused by puffery by placing investors on legal notice that they should ignore puffery, assuming that they can do so. The quiet period; the prohibitions against “conditioning” securities markets by engaging in so-called “gun-jumping” during the period before the filing of a registration statement with the SEC;⁵⁶ and the mandatory disclosures required of a securities registration statement are all designed to improve investor decision-making by limiting the influence of distortions on the rational investment process.

But, in light of not only the persistence of, but also the recent growth in irrational exuberance and anxiety, existing federal securities regulations have clearly failed to sufficiently protect investors from their emotional selves or from emotional others. This chapter thus critiques our current federal securities laws on two accounts. First, U.S. federal securities laws fail to incorporate the best model of decision-making, namely one that incorporates the realities and robustness of human emotions. Second, U.S. federal securities laws fail to incorporate the best techniques for teaching investors how to improve their decision-making skills, e.g., the law should be teaching investors to make decisions based on different factors, such as, more forward-looking, rather than backward-looking, information.

hotly, for hours every week, about what the models implied and whether to do what the models recommended.” *Italics in original*).

The rest of this section of the chapter analyzes the recent experimental and empirical evidence of and theoretical models about irrational exuberance and anxiety in securities markets. A recent, comprehensive synthesis of the research on how feelings influence stock pricing also suggests future directions of research, proposes richer hypotheses, and raises open questions about how investors' feelings impact securities prices.⁵⁷

A. EMPIRICAL EVIDENCE

An important finding of research on the perception of risk is that “[r]isk is multi-attribute in nature. It involves such elements as feelings of control, dread, and knowledge. ... Risk always contains an emotional or affective dimension.”⁵⁸ Investing is clearly risky. Survey evidence indicates that such emotional factors as catastrophic potential, control, and dread figure prominently in the perception of financial risks,⁵⁹ and that “emotional dimensions such as dread are important in the perceived risk of financial gambles.”⁶⁰ Studies demonstrate that moods induced by reading brief newspaper stories reporting on tragic or happy incidents produce large and pervasive changes in estimates on the frequency of risks, independent of whether the stories and risks are similar.⁶¹ Evidence of the prevalence of affect in forming risk perceptions occurs in many diverse settings.⁶²

⁵⁶ See Guidelines for the Release of Information by Issuers Whose Securities Are in Registration, SEC Release No. 5180, 1 Fed Sec L Rptr (CCH) at 3056 (Aug. 16, 1971) (detailing the rationales for prohibiting gun-jumping in terms of curbing the practice of conditioning of securities markets).

⁵⁷ Michael Dowling & Brian M. Lucey, *The Role of Feelings in Investor Decision-Making* (Jan. 2003) (unpublished manuscript, on file with the author) (synthesizing empirical research on the impact of emotions on stock prices and developing a theoretical basis for understanding that empirical research).

⁵⁸ Robert A. Olsen, *Behavioral Finance as Science: Implications from the Research of Paul Slovic*, 2 J. PSYCHOL. & FIN. MARKETS 157, 159 (2001).

⁵⁹ David R. Holtgrave & Elke U. Weber, *Dimensions of Risk Perception for Financial and Health Risks*, 13 RISK ANALYSIS 553, 556-58 (1993).

⁶⁰ *Id.* at 558.

⁶¹ Eric J. Johnson & Amos Tversky, *Affect, Generalization, and the Perception of Risk*, 45 J. PERSONALITY & SOC. PSYCHOL. 20, 23-30 (1983).

⁶² PAUL SLOVIC, *THE PERCEPTION OF RISK*, xxxii, 278-80, 331-38 (2000) (providing such evidence).

Emotional investing exemplifies Professor Damasio's theory of the role of emotion in decision-making.⁶³ Professor Damasio believes that "[t]he factual knowledge required for reasoning and decision making comes to the mind in the form of images."⁶⁴ Professor Damasio's somatic marker hypothesis is that with experience, these images become "marked" by positive and negative feelings linked directly or indirectly to somatic or bodily states.⁶⁵ Professor Damasio's research documents clinical evidence of patients with damage to the ventromedial frontal cortices of their brains having trouble feeling emotions, associating those feelings with the anticipated consequences of their actions, and making decisions in spite of retaining their basic intelligence, memory, and capabilities for analytical reasoning and for logical thought.⁶⁶ Neurobiological and psychological research demonstrates that people recall new facts better if certain emotions are present during learning than if they are not.⁶⁷ The rest of this section of the chapter analyzes the empirical evidence of emotional investing in experiments, by securities professionals, and in response to on-line brokerage ads.

1. EXPERIMENTAL EVIDENCE

The fact that Professor Smith was the co-recipient of the 2002 Nobel Prize in Economic Sciences to is the latest example of the ascendancy of experimental economics.⁶⁸ There is both an increasing appreciation for and application of empirical and experimental methodology to

⁶³ ANTONIO R. DAMASIO, *DESCARTES' ERROR: EMOTION, REASON, AND THE HUMAN BRAIN* (1994).

⁶⁴ *Id.* at 96.

⁶⁵ *Id.* at 173-75, 179-80.

⁶⁶ *Id.* at 53-54; Antonio R. Damasio et al., *Individuals with Sociopathic Behavior Caused by Frontal Damage Fail to Respond Autonomically to Social Stimuli*, 41 *BEHAV. BRAIN RES.* 81 (1990).

⁶⁷ ANTONIO R. DAMASIO, *THE FEELING OF WHAT HAPPENS: BODY AND EMOTION IN THE MAKING OF CONSCIOUSNESS* 294 (1999) (discussing this experimental evidence); Alan M. Lerner, *Using Our Brains: What Cognitive Science Tells Us About Teaching Problem Solving and Professional Responsibility*, *CLINICAL L. REV.* (forthcoming) (discussing the implications of emotion and recall for experiential teaching of ethical and moral judgment in law school).

⁶⁸ Hilsenrath, *supra* note 4.

study legal rules and institutions.⁶⁹ A particular laboratory experiment investigated the behavior of investors when they face what is known as global risk, namely a risk independent of their decisions.⁷⁰ Political risk that is not country specific is an example of global risk. The study found that global risk significantly and substantially decreases average investment. This finding is not consistent with such theories of rational decision making in the presence of risk as expected utility theory,⁷¹ prospect theory,⁷² disappointment theory,⁷³ and regret theory.⁷⁴ This experimental result is consistent with psychological evidence that anxious people make pessimistic probability estimates, are biased in terms of the amounts and types of information they utilize, and are thus motivated to reduce the level of risks they face.⁷⁵

2. EMPIRICAL EVIDENCE INVOLVING SECURITIES PROFESSIONALS

A recent study of professional derivative securities traders documents the importance of emotional responses in their decision-making processes.⁷⁶ The study measured physiological characteristics, such as body temperature, cardiovascular data, electromyographical signals, respiration rate, and skin conductance response, during actual trading sessions. The study found

⁶⁹ Symposium, *Empirical and Experimental Methods in Law*, 2002 U. ILL. L. REV 791 (2002).

⁷⁰ Ronald Bosman & Frans van Winden, *Global Risk, Effort, and Emotions in an Investment Experiment* (Aug. 2001) (unpublished manuscript, on file with the author) (reporting this finding).

⁷¹ VON NEUMANN & MORGENSTERN, *supra* note 2.

⁷² Kahneman & Tversky, *supra* note 3.

⁷³ David E. Bell, *Disappointment in Decision Making Under Uncertainty*, 33 OPERATIONS RES. 1 (1985).

⁷⁴ Graham Loomes & Robert Sugden, *Regret Theory: An Alternative Theory of Rational Choice under Uncertainty*, 92 ECON. THEORY 805 (1982).

⁷⁵ Jennifer S. Lerner & Dacher Keltner, *Fear, Anger, and Risk*, 81 J. PERSONALITY & SOC. PSYCHOL. 146, 147-51 (2001) (finding that anxious and fearful people made pessimistic risk estimates and favor cautious, risk-averse behavior); Rajagopal Raghunathan & Michel Tuan Pham, *All Negative Moods Are Not Equal: Motivational Influences of Anxiety and Sadness on Decision Making*, 79 ORG. BEHAV. & HUMAN DECISION PROCESSES 56, 63-65 (1999) (finding that anxious individuals are biased towards low risk and low reward gambles because anxiety primes an implicit goal of uncertainty reduction); Larissa Z. Tiedens & Susan Linton, *Judgment Under Emotional Certainty and Uncertainty: The Effects of Specific Emotions on Information Processing*, 81 J. PERSONALITY & SOC. PSYCHOL. 973, 978-81 (2001) (finding that fearful people utilized stereotypes in making social judgments less than disgusted people); Larissa Z. Tiedens & Susan Linton, *Judgment Under Emotional Certainty and Uncertainty: The Effects of Specific Emotions on Information Processing*, 81 J. PERSONALITY & SOC. PSYCHOL. 973 (2001) (providing experimental evidence that emotions associated with certainty promote heuristic processing, while emotions associated with uncertainty promote systematic processing).

significant correlation between electrodermal responses and transient market events, and between changes in cardiovascular variables and market volatility. These data suggest that an important factor in the success of some derivative securities traders is their ability to utilize their emotions to make very rapid trading decisions. In addition, there is anecdotal evidence that even professional traders react emotionally to financial decisions, information, and outcomes.⁷⁷

A number of empirical studies document a statistically significant effect of weather on stock market prices.⁷⁸ For example, local cloud cover in New York City from 1927-89 was significantly correlated with low daily returns on three U.S. stock indices (the Dow Jones Industrial Average, a New York Stock Exchange (NYSE) / American Stock Exchange (AMEX) equal-weighted index, and a NYSE/AMEX value-weighted index).⁷⁹ In fact, there was a strong positive correlation between morning sunshine at a country's leading stock exchange and the market index stock returns that day at twenty-six stock exchanges internationally from 1982-97.⁸⁰ In addition, seasonal variations in biorhythms and disruptions in sleep caused by changing from and to daylight savings affect stock returns internationally.⁸¹ Furthermore, returns on international stock exchanges are correlated with fluctuations in the amount of daylight over the

⁷⁶ Lo & Repin, *supra* note 54.

⁷⁷ 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); LOWENSTEIN, *supra* note 55 at 76-77 (describing the feelings and emotional toll on some principals of the hedge fund, Long-Term Capital Management, during its mounting losses in September 1998).

⁷⁸ Mark Hulbert, *Forget About Efficient Markets, Let the Sun Shine In*, N.Y. TIMES, June 17, 2001 at C7 (reporting on one such study).

⁷⁹ Edward M. Saunders, Jr., *Losing Stock Prices and Wall Street Weather*, 83 AM. ECON. REV. 1337 (1993). See also W. Kramer & R. Runde, *Stocks and the Weather: An Exercise in Data Mining or yet Another Capital Market Anomaly*, 22 EMPIRICAL ECON. 637 (1997) (replicating Saunder's study for Frankfurt, Germany); M. A. Trombley, *Stock Prices and Wall Street Weather: Additional Evidence*, 36 QUART. J. BUS. & ECON. 11 (1997) (reexamining Saunder's study).

⁸⁰ David A. Hirshleifer & Tyler G. Shumway, *Good Day Sunshine: Stock Returns and the Weather*, J. FIN. (forthcoming, 2003).

⁸¹ Mark Jack Kamstra, Lisa A. Kramer, & Maurice D. Levi, *Losing Sleep at the Market: The Daylight Savings Anomaly*, 90 AM. ECON. REV. 1005 (2000); Michael Dowling & Brian M. Lucey, *Weather, Biorhythms and Stock Returns: Some Preliminary Irish Evidence* (Dec. 2002) (unpublished manuscript, on file with the author) (same).

year.⁸² A different approach studies the relationship between stock returns and temperature.⁸³ Another study finds that on average, morning stock returns exceed afternoon returns.⁸⁴ All of these studies imply that the moods of individual investors or professional market-makers affect stock prices.⁸⁵ In addition, there is empirical evidence that unusually high levels of geomagnetic storms (GMS) have a statistically and economically significant negative impact on world and country-specific stock returns, even after controlling for behavioral, environmental, and well-known market seasonal factors.⁸⁶ Finally, other studies speculate that there is a lunar cycle, also known as the circatrigintan cycle, effect in stock prices whereby stock returns are significantly higher on days near a new moon than on days near a full moon.⁸⁷

3. A CASE STUDY OF IRRATIONAL EXUBERANCE: ON-LINE BROKERAGE ADS

A case study of irrational exuberance is provided by emotional on-line investing advertisements that presented visceral and powerful images of on-line investors getting rich quickly. Some individuals exposed to such emotionally appealing on-line brokerage television commercials and billboards are likely to ignore or be insensitive to variations in the probability

⁸² Mark Jack Kamstra, et al., *Winter Blues: A SAD Stock Market Cycle*, AM. ECON. REV. (forthcoming, 2003) (providing international evidence of a link between seasonal depression and seasonal variation in stock returns).

⁸³ Melanie Cao & Jason Wei, *Stock Market Returns: A Temperature Anomaly* (Aug. 2002) (unpublished manuscript, on file with the author) (finding stock prices are negatively correlated with temperature).

⁸⁴ Lisa A. Kramer, *Intraday Stock Returns, Time-varying Risk Premia, and Diurnal Mood Variation* (Apr. 2001) (unpublished manuscript, on file with the author) (finding overall broad support for mood changes affecting risk premia and intraday returns).

⁸⁵ William N. Goetzmann & Ning Zhu, *Rain or Shine: Where is the Weather Effect?* National Bureau Econ. Res. Working Paper No. 9465 (unpublished manuscript, Jan. 2003) (replicating the above weather effect in stock prices, but suggesting that such an effect is due to weather-induced mood changes of NYSE specialists, not of individual investors).

⁸⁶ Anna Krivelyova & Cesare Robotti, *Playing the Field: Where Geomagnetic Storms and International Stock Markets* (unpublished manuscript, Feb. 21, 2003) (documenting such evidence and relating those results to psychological theories of misattribution of mood).

⁸⁷ Iliia D. Dichev & Troy D. James, *Lunar Cycle Effects in Stock Returns* (Aug. 2001) (unpublished manuscript, on file with the author) (finding a pervasive pattern of returns in the 15 days around new moon dates being double the returns in the 15 days around full moon dates, for all major U.S. stock indexes over the last 100 years and for nearly all major stock indexes of 24 other countries over the last 30 years); Kathy Yuan, et al., *Are Investors Moonstruck? Lunar Phases and Stock Returns* (Sept. 5, 2001) (unpublished manuscript, on file with the author) (finding strong

of striking it rich. Some on-line traders will focus instead on the outcome of becoming rich. Television commercials by on-line securities brokerages not only emphasized the personal control, ease, and profitability of such trading, but also were rich in emotional imagery.

Professors Barber, Elsbach, and Odean performed a content analysis of five hundred television commercials from thirteen brokerages.⁸⁸ They found that 28% of all commercials between 1990 and 2000 depicted images and messages likely to induce good or positive moods in viewers and the percentage of such commercials more than doubled from 12.39 percent in 1990-1995 to 32.98 percent in 1996-2000.⁸⁹ This empirical finding is consistent with and understandable in light of recent psychological experiments demonstrating that people in moderately good or positive moods tend to be less thorough and less vigilant decision-makers, are more subject to cognitive biases, and rely more on heuristics than people in moderately negative moods.⁹⁰ On-line brokerages voluntarily ceased the broadcasting of positive emotional commercials due to changes in financial market conditions and moods.

A Discover Brokerage Direct television commercial about on-line trading depicted a conversation between a passenger and a stock-trading tow truck driver, who states, "That's my home. Looks more like an island. Technically, it's a country."⁹¹ Other television commercials

evidence across forty eight countries that stock returns on days near a new moon are higher than on days near a full moon).

⁸⁸ Brad M. Barber, et al., *Investing Advice From Television Commercials*, prepared for the A.A.R.P.-Public Policy Institute (Nov. 24, 2001).

⁸⁹ *Id.* at 16, 25 tbl.1, 27 fig.1b.

⁹⁰ Kimberly D. Elsbach & Pamela S. Barr, *The Effects of Mood on Individuals' Use of Structured Decision Protocols*, 10 *ORG. SCI.* 181, 185-94 (1999); Norman Schwarz et al., *Mood and Persuasion: Affective States Influence the Processing of Persuasive Communications*, 24 *ADVANCES IN EXPERIMENTAL SOC. PSYCHOL.* 161, 187, 189 (1991); Herbert Bliss et al., *Mood and Stereotyping: Affective States and the Use of General Knowledge Structures*, 7 *EUR. REV. SOC. PSYCHOL.* 63, 67- 74 (1996).

⁹¹ *Office of the New York State Attorney General Eliot Spitzer: From Wall Street to Web Street: A Report on the Problems and Promise of the On-line Brokerage Industry Prepared by Investor Protection Internet Bureau and Securities Bureau*, 1189 *PLI/Corp* 355, 395 (1999) [hereinafter *From Wall Street to Web Street*], available at http://www.oag.state.ny.us/investors/1999_on-line_brokers/brokers.html.

included a stock-trading teenager, who owned his own helicopter.⁹² A series of Schwab commercials featured such celebrities as teen-age Russian tennis star Anna Kournikova.⁹³ An E*TRADE advertisement claimed “that on-line investing is ‘A cinch. A snap. A piece of cake.’”⁹⁴

A commentator noted that:

The years prior to 2000 featured a collection of e-trading commercials that could be viewed as hilarious by the seasoned professional and convincing by the novice trader. A typical commercial began by showing a teen-age boy or an elderly woman who appear to be very ordinary, and are treated as such. In the next scene, the other characters, and no doubt the viewers, are surprised to find out that this person is being thanked for bailing out a country, for example. The strong suggestion is that anyone who has a modest savings account can acquire a fortune, and be treated accordingly, if only they start trading on the Internet. For any skeptical viewers having their doubts, a resumption of the news, particularly the business news cable stations, would often turn to factual stories of the day’s new IPO billionaires.⁹⁵

These commercials clearly conjured up mental images of becoming rich quickly and easily. Former SEC Chairman Arthur Levitt said, “Quite frankly, some advertisements more closely resemble commercials for the lottery than anything else. When firms, again and again, tell investors that on-line investing can make them rich, it creates unrealistic expectations. ...

⁹² Joseph Kahn, *On-line Brokerages Use Advertising in a Battle for New Customers*, N.Y. TIMES, Oct. 4, 1999, available at <http://www.nytimes.com/library/tech/99/10/biztech/articles/04trad.html>.

⁹³ *Id.*

⁹⁴ JOHN R. NOFSINGER, INVESTMENT MADNESS: HOW PSYCHOLOGY AFFECTS YOUR INVESTING ... AND WHAT TO DO ABOUT IT 129 (2001).

[M]any investors are susceptible to quixotic euphoria... .”⁹⁶ New York Attorney General Eliot Spitzer observed that on-line brokerage ads “conveys a message of convenience, speed, easy wealth, and the risk of ‘being left behind’ in the on-line era.”⁹⁷

Like much advertising, these advertisements do not provide information for viewers to process cognitively, as much as they appeal to viewers’ emotions.⁹⁸ These commercials were directed at evoking strong positive mental imagery and favorable emotional reactions to on-line investing risks. Such on-line brokerage ads decreased significantly after the bull market ended, further suggesting that the goals of such commercials were primarily to complement an overall mood of irrational exuberance and euphoria that prevailed then in securities markets and to stir up such emotions as hope and greed.⁹⁹ In a Jan. 26, 2001 report about on-line trading, the SEC expressed concerns that certain types of aggressive on-line brokerage ads may cause investors to possess unrealistic expectations over the risks and rewards of investing.¹⁰⁰ In that report, the SEC noted that “[a]dvertising that contains misrepresentations or omissions of material fact may violate the antifraud provisions of the federal securities laws.”¹⁰¹ In 2000 and 2001, the SEC and NASD (National Association of Securities Dealers) formally investigated the advertising practices of E*Trade Group, Inc.¹⁰² But, both lengthy investigations resulted in the SEC

⁹⁵ Gunduz Caginalp, *The Real Year 2000 Problem: Investor Psychology*, 2 J. PSYCHOL. & FIN. MARKETS 2, 3-4 (2001).

⁹⁶ Arthur Levitt, Plain Talk About On-line Investing, Speech at the National Press Club (May 4, 1999); *see also* Report of NASDR Concerning the Advertisement of On-line Brokerages (Sept. 21, 1999).

⁹⁷ *From Wall Street to Web Street*, *supra* note 91, at 4.

⁹⁸ Julie A. Edell & Marian Chapman Burke, *The Power of Feelings in Understanding Advertising Effects*, 14 J. CONSUMER RES. 421, 431 (1987).

⁹⁹ Lisa Singhanian, *Downturn Brings Changes to On-line Brokerage Sector: Firms Cut Back on Pricey Ads, Expand Services*, CHI. TRIB., Feb. 25, 2001.

¹⁰⁰ SEC Office of Compliance Inspections and Examinations, *Examinations of Broker-Dealers Offering On-line Trading: Summary of Findings and Recommendations 1* (Jan. 26, 2001).

¹⁰¹ *Id.* at n.14; NASD Rule 2210(d); NYSE Rules 472.30 and 472.40.

¹⁰² On-line Investor Complaint Center, *U.S. Securities Regulators Criticize, Warn On-line Brokers – Yet Again* (Feb. 26, 2001).

dropping its fair disclosure case and the NASD settling with E*Trade.¹⁰³ The SEC did not publicly state the reasons for its decision to drop the case. Although there is little concern over such types of advertisements in the current anxious securities market environment, similar advertisements may return when an exuberant securities market environment does. In addition, there may be cause for concern over advertisements that exploit investor anxiety in a bear market.¹⁰⁴ Furthermore, SEC releases already express concern over the advertising of such complex financial instruments as collateralized mortgage obligations. For example,

(c)(2) Advertisements concerning collateralized mortgage obligations, advertisements concerning security futures, and advertisements and sales literature concerning registered investment companies (including mutual funds, variable contracts and unit investment trusts) that include or incorporate rankings or comparisons of the investment company with other investment companies where the ranking or comparison category is not generally published or is the creation, either directly or indirectly, of the investment company, its underwriter or an affiliate, shall be filed with the Department for review at least 10 days prior to use (or such shorter period as the Department may allow in particular circumstances) for approval and, if changed by the Association, shall be withheld from publication or circulation until any changes specified by the Association have been made or, if expressly disapproved, until the advertisement has been refiled for, and has received, Association approval. The member must provide

¹⁰³ CNNfn, *E*Trade Ad Probe Near End* (June 27, 2001), available at <http://money.cnn.com/2001/06/27/companies/etrade/>; Michael Schroeder, *NASD to Settle Its Ad Dispute With E*Trade*, WALL ST. J., June 27, 2001 at C1.

¹⁰⁴ Jane L. Levere, *An Online Bank Has A Message for Skittish Investors: Consider A Savings Account*, N.Y. TIMES, Jan. 30, 2003 at C7 (reporting on ING Direct's new \$50 million ad campaign targeting anxious investors). See also, Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420, 1462-66 (1999) (discussing fear-based advertising).

with each filing the actual or anticipated date of first use. Any member filing any investment company advertisement or sales literature pursuant to this paragraph shall include a copy of the data, ranking or comparison on which the ranking or comparison is based.¹⁰⁵

SROs (Self Regulating Organizations), such as the NASD, also have approval and recordkeeping rules related to complex financial instruments. Also, relevant for whether and how the SEC should regulate such advertisements are Federal Trade Commission (FTC) deceptive advertising cases¹⁰⁶ and the FTC's Policy Statement on Deception.¹⁰⁷ Finally, of relevance are the literatures on consumer psychology in general,¹⁰⁸ and the marketing power of emotions in particular.¹⁰⁹

There are many other securities areas where investing is more likely to be driven by emotional reactions to rather than cognitive processing of financial risks and information. The analysis of this chapter applies to such areas for drawing legal policy implications that differ

¹⁰⁵ SEC Release No. 34-46186, 2002 SEC LEXIS 1792, July 11, 2002, *17-19.

¹⁰⁶ See, e.g., *Florence Mfg. Co. v. J.C. Dowd & Co.*, 178 F. 73, 75 (C.A.2 1910) (stating that “[t]he law is not made for experts but to protect the public,— that vast multitude which includes the ignorant, the unthinking and the credulous, who, in making purchases, do not stop to analyze but too often are governed by appearances and general impressions”); *Aronberg v. FTC*, 132 F.2d 165, 167 (7th Cir. 1942) (stating “the buying public does not ordinarily carefully study or weigh each word in an advertisement” and that “[a]dvertisements are intended not ‘to be carefully dissected with a dictionary at hand, but rather to produce an impression upon’ prospective purchasers” (quoting *Newton Tea & Spice Co. v. United States*, 288 F. 475, 479 (6th Cir. 1923))); *Standard Oil Co. of California v. FTC*, 577 F.2d 653, 659 (9th Cir. 1978) (stating “that commercial messages might lead the average viewer, in his anxiety . . . , to overreact even though upon careful reflection he might see for himself the limitations inherent in the advertiser's claim”).

¹⁰⁷ An advertisement is deceptive when there is “a misrepresentation, omission or other practice, that misleads the consumer acting reasonably in the circumstances, to the consumer's detriment.” Policy Statement on Deception, 4 Trade Reg. Rep (CCH) ¶13, 205 at 20, 917 (FTC Oct. 14, 1983). In determining if an advertisement deceives consumers, the FTC asks what does the advertisement say or imply, and does the advertisement have a reasonable basis for its claims?

¹⁰⁸ See, e.g., Hanson & Kysar, *supra* note 104, at 1428-1528 (presenting empirical marketing evidence and consumer behavioral studies of companies manipulating consumer perceptions of risk); Jacob Jacoby, *Is it Rational to Assume Consumer Rationality? Some Consumer Psychological Perspectives on Rational Choice Theory*, 6 ROGER WILLIAMS U. L. REV. 81 n.1 (2000) (citing extensive empirical advertising, consumer behavior, and marketing research about consumer psychology).

¹⁰⁹ See, e.g., generally JOHN O'SHAGHNESSY & NICHOLAS JACKSON O'SHAUGHNESSY, *THE MARKETING POWER OF EMOTIONS* (2003) (providing a systematic account of the significant role that emotions play in marketing and consumer decision-making and shopping experiences).

from those based on unemotional investing. One such area is day trading,¹¹⁰ and emotional advertisements for day trading.¹¹¹ Financial scams by con artists are another such area.¹¹² Examples of such financial scams are so-called “prime bank programs,” which promise incredible returns from investing in “prime bank” securities.¹¹³ Another example of such a financial scam is that of so-called affinity fraud, which is targeted at members of such identifiable groups as ethnic minorities and religious groups.¹¹⁴

B. THEORETICAL MODELS

Neoclassical economic theory already incorporates certain emotions in several ways. First, love or hate can be treated as part of an individual’s tastes or non-monetary utility in the sense of interdependent individual preferences.¹¹⁵ Second, certain emotional reactions function as commitment devices in multi-person decision environments.¹¹⁶ Third, game theory can

¹¹⁰ Rebecca Buckman, *Gambling Man: Stock Losses Roiled A Volatile Personality, And Slaughter Ensued*, WALL ST. J., Aug. 2, 1999 at A1 (reporting on Mark Barton, a day trader who snapped and went on a killing rampage); Evan Thomas & Trent Gregax, *It's a Bad Trading Day ...And It's About to Get Worse*, NEWSWEEK 22 Aug. 9, 1999 (same); Rebecca Buckman & Ruth Simon, *Day Trading Can Breed Perilous Illusions*, WALL ST. J., Aug. 2, 1999 at C1 (reporting on the psychology of day traders and that “[m]ost amateurs can't ‘clinically distance themselves emotionally from the decisions they make in the market.’”).

¹¹¹ Anjali Arora & Jamie Reno, *Rolling the Dice With a Click of the Mouse: Day Trading is a Seductive but Tricky Game, a Subculture in Which Traders Find That Risks are High and Profits Elusive*, NEWSWEEK 30 Aug. 9, 1999 (reporting on affective day trading advertisements and a settlement over deceptive marketing and violations of Massachusetts state securities laws by All-Tech Investment Group, a day-trading firm); Susanne Craig, *Regulators Zap Day-Trading Guru Houtkin and All-Tech*, WALL ST. J., June 14, 2001 at C1 (reporting on an NASD administrative action against All-Tech Direct Inc., one of the nations’ largest day-trading firms, for misleading statements in advertisements in print, on radio, and on the Internet about how easy it is to profit by day trading).

¹¹² CUNNINGHAM, *supra* note 28, at 166-78 (describing how con artists utilize affect in succeeding at financial scams).

¹¹³ SEC, *How Prime Bank Fraud Works*, available at <http://www.sec.gov/divisions/enforce/primebank/howtheywork.shtml>.

¹¹⁴ SEC, *Investor Alert: Affinity Fraud: How To Avoid Investment Scams That Target Groups*, Mar. 16, 2001, available at <http://www.sec.gov/investor/pubs/affinity.htm>.

¹¹⁵ GARY BECKER, *Spouses and Beggars: Love and Sympathy*, in ACCOUNTING FOR TASTES 231-37 (1996) (proposing formal analytical models of emotions in terms of interdependent utility functions).

¹¹⁶ 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) (providing formal analytical models of the strategic value of certain emotions). *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).

accommodate emotions that depend on probability beliefs about strategic behavior.¹¹⁷ Recently, several economists have urged their fellow economists to study emotions more in their models.¹¹⁸ A survey of how economic theory views emotions illustrates this renewed interest.¹¹⁹ That survey, however, criticized the interpretation of emotions as psychic benefits and costs or as merely a source of preferences because such interpretations ignore how emotions affect the ability to make rational choices.¹²⁰ This chapter addresses this criticism by explicitly analyzing irrational exuberance and anxiety in securities investing.

1. PSYCHOLOGICAL EXPECTED UTILITY THEORY AND ANTICIPATORY FEELINGS

A new economic framework introduces a general psychological expected utility model that includes anticipatory feelings prior to the resolution of risk. This model extends the neoclassical expected utility model to incorporate a quite general class of anticipatory feelings, such as anxiety and suspense.¹²¹ This model shows how anticipatory feelings can result in time inconsistency because as time passes, anticipatory feelings and preferences may change. This model has applications to anticipatory pleasure or savoring and implies a resulting preference for commitment devices to facilitate planning and overcome intertemporal inconsistency.¹²² Applying this model to suspense and gambling yields the empirically supported prediction that

¹¹⁷ John D. Geanakoplos et al., *Psychological Games and Sequential Rationality*, 1 GAMES & ECON. BEHAV. 60, 65, 70-74 (1989) (modeling such belief-dependent emotions); Van Kolpin, *Equilibrium Refinement in Psychological Games*, 4 GAMES & ECON. BEHAV. 218, 220-21, 229-31 (1992) (providing an alternative model of such belief-dependent emotions).

¹¹⁸ See, e.g., Richard H. Thaler, *From Homo Economicus to Homo Sapiens*, 14 J. ECON. PERSPECTIVES 133, 139-40 (2000) (predicting that economists will pay more attention to modeling emotions); Romer, *supra* note 116, at 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).

¹¹⁹ See generally Camerer, et al., *supra* note 10 (discussing the important role played by emotions in a theory of economics that builds upon neuroscience); Camerer & Loewenstein, *supra* note 10 (stating that the study of emotion is a promising new direction for the future of behavioral economics); Jon Elster, *Emotions and Economic Theory*, 36 J. ECON. LITERATURE 47 (1998) (surveying the role that emotions play in understanding human behavior).

¹²⁰ *Id.* at 73 (1998) (criticizing a psychic cost benefit model of emotions).

¹²¹ Andrew Caplin & John Leahy, *Psychological Expected Utility Theory and Anticipatory Feelings*, 116 Q. J. ECON. 55, 60-66 (2001) (introducing this model).

people will bet on their emotional favorites in a sporting event.¹²³ This model is also rich enough to analyze preferences over illusions and the dilemma that a doctor faces about whether to give her patient (more than legally required) detailed information concerning an upcoming medically benign, but subjectively threatening diagnostic surgical procedure.¹²⁴ Furthermore, this model has policy implications for the provision to the public of payoff-relevant information by the Federal Reserve and other government agencies.¹²⁵ Finally, this model supports recommendations for “psychologically-appropriate” formats of disseminating medical information to the general population and providing medical advice to specific patients at risk of diabetes or breast cancer.¹²⁶

Applying this model to focus on the portfolio decisions of anxious investors demonstrates that a security producing anxiety on the part of its owners commands a lower price and a higher

¹²² *Id.* at 72-73.

¹²³ *Id.* at 73.

¹²⁴ *Id.* at 76. See also Suzanne M. Miller & Charles E. Mangan, *Interacting Effects of Information and Coping Style in Adapting to Gynecologic Stress: Should the Doctor Tell All?*, 45 J. PERSONALITY & SOC. PSYCHOL. 223, 225-35 (1983) (reporting on a study exploring the interaction between the amount of information provided and personal coping styles of forty gynecologic patients scheduled for colposcopy).

¹²⁵ *Id.* at 76-77.

¹²⁶ *Id.* at 77. See also Laurette Dube, et al., *The Role of Emotions in Health Care Satisfaction*, 16 J. HEALTH CARE MARKETING 45, 47-51 (1996) (reporting on how the emotional experience of hospitalization affects health-related outcomes, including patient satisfaction, in a field study of two hundred and eleven adult patients in an acute care hospital); James F. Fries, *Reducing the Need and Demand for Medical Services*, 40 PSYCHOSOMATIC MED. 140 (1998) (finding that such forms of information-intervention reduces health-care costs and improves outcomes on the order of twenty percent); Barbara E. Kahn & Mary Frances Luce, *Understanding High-Stakes Consumer Decisions: Mammography Adherence Following False Alarm Tests*, MARKETING SCI. (forthcoming, 2003) (finding that patients receiving false positive mammography results experienced more stress, were more likely to delay mammography and less likely to believe that a positive mammography result indicated breast cancer than patients receiving normal results unless those patients were told they may be susceptible to breast cancer in the future); Matthew E. Kahn, *Diabetic Risk Taking: The Role of Information, Education, and Medication*, 18 J. RISK & UNCERTAINTY 147, 155-58 (1999) (studying the role of information in diabetic risk taking); Kathryn M. Kash, et al., *Psychological Distress and Surveillance Behaviors of Women With a Family History of Breast Cancer*, 84 J. NAT'L CANCER INST. 24, (1992) (reporting on a study of two hundred and seventeen women finding that increased cancer anxiety decreased regular clinical breast examinations and reduced adherence to monthly breast self-examination); Lawrence E. Klusman, *Reduction of Pain in Childbirth by the Alleviation of Anxiety During Pregnancy*, 43 J. CONSULTING & CLINICAL PSYCHOL. 162, (1975) (reporting that in a study of forty two primiparas and primigravidas in their last trimester of pregnancy, childbirth information from Childbirth Education Association classes and Red Cross prenatal classes reduced significantly measures of anxiety, fear, and self-reported perceptions of pain in labor and delivery, controlling for the amount of anesthesia).

required rate of return than if that security did not cause its owners to experience anxiety.¹²⁷ This model also formally demonstrates that the price of a riskless security is greater than it would be in a world in which investors do not experience anxiety because riskless securities provide the benefit of anxiety reduction.¹²⁸ This model proves that “anxiety will reduce the price of stocks and increase their return relative to the standard [unemotional] model” and that “stock ownership entails psychic costs [because stockholders have] to live with the anxiety that accompanies the holding of a risky portfolio.”¹²⁹ Finally, this model explains how the desire to avoid the stress and anxiety associated with retirement planning can result in people avoiding thinking about, let alone planning for, their retirement until it is too late to avoid anymore.¹³⁰ Such irrational anxiety has very disturbing implications for the social desirability of recent proposals to privatize social security and retirement investment decisions.

Finally, a recent general equilibrium model provides theoretical support for the proposition that feelings affect securities prices.¹³¹ This model argues that investors’ feelings have an effect on stock prices if three conditions are satisfied.¹³² First, investors do not realize their investment decisions are influenced by fluctuations in their moods. Second, investors’ subjective parameters, such as their judgments of the appropriate discount factor or their levels of relative risk aversion, fluctuate in response to fluctuations in their moods over time. Third, investors uniformly and widely experience the impacts of such fluctuations in their moods on their subjective parameters. This model has closed-form solutions for equilibrium stock

¹²⁷ Caplin & Leahy, *supra* note 121, at 68.

¹²⁸ *Id.* at 68.

¹²⁹ *Id.* at 69.

¹³⁰ *Id.* at 72.

¹³¹ Rajnish Mehra & Raaj Sah, *Mood Fluctuations, Projection Bias, and Volatility of Equity Prices*, 26 J. ECON. DYNAMICS & CONTROL 869 (2002).

¹³² *Id.* at 870.

prices.¹³³ The model predicts that, all by itself, a 0.10 percent fluctuation in the beliefs of investors regarding the discount factor can generate a 3-4 percent standard deviation in stock prices.¹³⁴ The model also finds a similarly important, but smaller effect on the standard deviation of stock prices due to a fluctuation in risk attitudes.¹³⁵

2. THE RISK-AS-FEELINGS HYPOTHESIS

A new theory about decision making under risk, namely the risk-as-feelings hypothesis, focuses on the role of emotions that decision-makers experience leading up to and including the moment of decision making.¹³⁶ The risk-as-feelings hypothesis is based upon four well-supported premises. First, emotions can arise without any cognitive antecedents. Second, there are emotional reactions to cognitive evaluations. Third, emotions inform cognitive evaluations. Fourth, emotions play a crucial role in affecting behavior.

Emotional reactions to and cognitive evaluations of risk and information differ for two reasons. First, emotions respond to probabilities and outcomes in systematically different ways than how cognitive evaluations of risk depend on probabilities and outcomes. A fundamental difference between emotional reactions to risk and cognitive evaluations of risk is that anticipatory emotions are insensitive to changes in probability for a wide range of probability values.¹³⁷ Expected utility depends linearly and symmetrically on the probabilities and utilities of outcomes. Variations in probability generate corresponding variations in expected utility, holding the utility of outcomes constant. Under prospect theory, cognitive evaluations of risk

¹³³ *Id.* at 873-76.

¹³⁴ *Id.* at 878.

¹³⁵ *Id.* at 881.

¹³⁶ Loewenstein et al., *supra* note 9, at 267 (proposing this hypothesis).

¹³⁷ See, e.g., Cass R. Sunstein, *Probability Neglect: Emotions, Worst Cases, and Law*, 112 YALE L.J. 61, 95-97 (2002) (discussing the implications of intense fear causing people to ignore the low probability of worst case scenarios for environmental legal and policy).

depend linearly and symmetrically on the probability weighting functions and subjective valuations of outcomes. Variations in probability generate corresponding variations in probability weighting functions, holding the subjective valuations of outcomes constant. In contrast, probability plays a relatively minor role in such anticipatory emotions as irrational exuberance and anxiety.

If potential outcomes have a lot of emotional resonance, such as (perhaps) kisses from your favorite movie star or electric shocks, then their attractiveness or unattractiveness are incredibly insensitive to changes in the probability of that outcome, even if that probability drops from 99% to 1%.¹³⁸ For positive outcomes, any departure from certainty induces fear, while any deviation from impossibility produces hope. For negative outcomes, any departure from certainty produces hope, while any deviation from impossibility induces fear.

Second, other causal factors besides probabilities and outcomes influence anticipatory emotions. The risk-as-feelings hypothesis focuses on several emotional factors as having a predictable influence on decision-making. These factors include the vividness of the associations that risks evoke; the time-path of the decision process; and how evolutionarily prepared individuals are for certain emotional reactions. For the purposes of understanding irrational exuberance and anxiety in securities investing, there are two such important determinants, namely imagery and misattribution. An analysis of the phenomenon of misattribution is contained in the next section on the related affect heuristic.

Another account of why anticipatory emotions display probability neglect is that anticipatory emotions are primarily due to mental images of the outcome of a decision. Such images are discrete and so are not much affected by probabilities. Thus, anticipatory emotions

¹³⁸ Yuval Rottenstreich & Christopher K. Hsee, *Money, Kisses, and Electric Shocks: On the Affective Psychology of Risk*, 12 PSYCHOL. SCI. 185, 186-88 (2001) (providing experimental evidence of such probability insensitivity).

that arise from such images will be insensitive to changes in probability. An investor's mental image of what it will be like to participate in an IPO of stock is likely to be approximately the same whether the probability of that stock skyrocketing is 1 in 100,000 or 1 in 100,000,000. In contrast, an investor's mental image of what it will be like to participate in a stock IPO that skyrockets will likely be very different from that investor's mental image of what it will be like to participate in a stock IPO that only has a very modest increase.

3. THE "HOW-DO-I-FEEL-ABOUT-IT" HEURISTIC

Experimental results and clinical phenomena demonstrate that emotional reactions are fairly independent of, often impervious to, and precede in time, cognitive judgments.¹³⁹ Evolutionary forces may explain why affect precedes cognition.¹⁴⁰ A recent study found that "affective processes play a critical role in determining choices and that these affective processes may sometimes influence choice without the decision maker's awareness."¹⁴¹ A large body of empirical psychological research finds that affective impressions attach to images and those affective impressions influence judgments and decisions.¹⁴²

A recent theoretical framework emphasizes the importance of an affect or "how-do-I-feel-about-it" heuristic in guiding decisions and judgments.¹⁴³ People utilize this heuristic when

¹³⁹ Robert B. Zajonc, *Feeling and Thinking: Preferences Need No Inferences*, 35 AM. PSYCHOL. 151, 158-65 (1980) (providing and discussing such evidence); Robert B. Zajonc, *On the Primacy of Affect*, 35 AM. PSYCHOL. 117, 118-20 (1984) (providing further evidence); Robert B. Zajonc, *Feeling and Thinking: Closing the Debate Over the Independence of Affect*, in FEELING AND THINKING: THE ROLE OF AFFECT IN SOCIAL COGNITION 31, 25-55 (Joseph P. Forgas ed., 2000) (providing most recent evidence).

¹⁴⁰ Jessica L. Cohen & William T. Dickens, *A Foundation for Behavioral Economics*, 92 AM. ECON. REV. 335, 336-338 (2002) (arguing that evolutionary psychology may partially explain how emotions affect information processing); Robert A. Olsen, *The Instinctive Mind on Wall Street: Evolution and Investment Decision Making*, 9 J. INVESTING 47, 50 (2000) (discussing the importance of affective reactions in framing information search and usage).

¹⁴¹ Ellen Peters & Paul Slovic, *The Springs of Action: Affective and Analytical Information Processing in Choice*, 26 PERSONALITY & SOC. PSYCHOL. BULL. 1465, 1473 (2000).

¹⁴² Finucane, et al., *supra* note 27 (surveying this evidence).

¹⁴³ *Id.* (describing the affect heuristic and its empirical predictions, support, applications, implications, and future research directions); Paul Slovic et al., *The Affect Heuristic*, in HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 397, 400-20 (Thomas L. Gilovich et al. eds., 2002) (defining the affect heuristic, providing

they come to have an emotional, all-things-considered, reaction to make judgments. People utilizing this heuristic essentially ask “how-do-I-feel-about-something” and utilize their answer as the basis for making their judgment about something.¹⁴⁴

The affect or how-do-I-feel-about-it” heuristic is related to the mood-as-information hypothesis. This hypothesis argues that people’s moods informs their decisions, even when the causes of those moods are unrelated to their decisions. This phenomenon is known as misattribution. It explains how and why nominally irrelevant feelings or what the famous macroeconomist, Keynes called “animal spirits” influence securities investing.¹⁴⁵

The “how-do-I-feel-about-it” heuristic explains public concerns about health and environmental risks, high punitive damage awards, and people’s reactions to contested political events.¹⁴⁶ The “how-do-I-feel-about-it” heuristic is related to the dual process theory that people process information via two parallel, interactive modes.¹⁴⁷ The first is a rational, deliberative, and analytical system employing such rules of logic and evidence as probability theory. The second is an experiential system that encodes reality in terms of images, metaphors, and narratives that are imbued with affect and feelings. There is much experimental evidence that a

empirical evidence, and discussing manipulation of affect); Cass R. Sunstein, *Hazardous Heuristics* (Univ. of Chicago Public Law and Legal Theory Working Paper No. 33) (Nov. 2002) (reviewing *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* (Thomas L. Gilovich et al. eds., 2002) (discussing the affect heuristic).

¹⁴⁴ Norbert Schwarz & Gerald L. Clore, *Mood, Misattribution, and Judgments of Well-Being: Informative and Directive Functions of Affective States*, 45 *J. PERSONALITY & SOC. PSYCHOL.* 513 (1983) (proposing that people utilize a “how-do-I-feel-about it” heuristic).

¹⁴⁵ JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY* 161 (1936) (stating that “our decisions ... can only be taken as a result of animal spirits ..., and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.”); Roberto Marchionatti, *On Keynes’ Animal Spirits*, 52 *KYKLOS* 415, 431 (1999) (interpreting Keynes’ animal spirits as psychological and emotional factors).

¹⁴⁶ Cass R. Sunstein, *The Laws of Fear*, 115 *HARV. L. REV.* 1119, 1137-40 (2002) (reviewing PAUL SLOVIC, *THE PERCEPTION OF RISK* (2000))(discussing the prevalence of the affect heuristic in these settings).

¹⁴⁷ Seymour Epstein, *Integration of the Cognitive and the Psychodynamic Unconscious*, 49 *AM. PSYCHOL.* 709, 717-19 (1994) (explaining and offering evidence supporting dual process theory).

person's mood influences which of these two information-processing strategies a person utilizes.¹⁴⁸

The Affect Infusion Model (AIM) argues that the extent to which people rely on their feelings to make decisions depends on how abstract, risky, and uncertain those decisions are.¹⁴⁹ Usually, people who are in rationality utilize high affect infusion strategies (HAIS) in highly complex decisions, such as securities investing. Emotions form a major input of decisions made via HAIS. People usually employ low affect infusion strategies (LAIS) in decisions requiring "little generative constructive processing."¹⁵⁰ So, LAIS are more appropriate for decisions that are familiar and low in complexity than for decisions that are infrequent and high in complexity.

II. MANDATORY SECURITIES DISCLOSURES

"Mandatory disclosure is a – if not the - defining characteristic of U.S. securities regulation."¹⁵¹ The Supreme Court stated that the "fundamental purpose" of federal securities regulations "was to substitute a philosophy of full disclosure for the philosophy of caveat emptor"¹⁵² In another famous case, the Supreme Court stated the Securities Act of 1933 and its mandatory disclosure requirements were designed "to protect investors by promoting full disclosure of information thought necessary to informed investment decisions."¹⁵³ Investor protection is clearly a fundamental goal of U.S. securities regulation. In fact, upon clicking on "What We Do" under the heading "About the SEC" on the SEC's home page, one learns that

¹⁴⁸ Norman Schwarz, *Feelings as Information: Moods Influence Judgments and Processing Strategies*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* 534, 536-47 (Thomas Gilovich et al. eds., 2002) (presenting and reviewing such evidence); Norman Schwarz, *Situated Cognition and the Wisdom of Feelings: Cognitive Tuning*, in *THE WISDOM OF FEELINGS* (L. Feldman Barrett & P. Salovey eds., forthcoming) (same).

¹⁴⁹ Joseph P. Forgas, *Mood and Judgment: The Affect Infusion Model (AIM)*, 117 *PSYCHOL. BULL.* 39 (1995).

¹⁵⁰ *Id.* at 40.

¹⁵¹ Stephen M. Bainbridge, *Mandatory Disclosure: A Behavioral Analysis*, 68 *U. CIN. L. REV.* 1023 (2000).

¹⁵² *SEC v. Capital Gains Research Bureau, Inc.*, 375 U.S. 180, 186 (1963).

“[t]he primary mission of the U.S. Securities and Exchange Commission (SEC) is to protect investors.”¹⁵⁴

There is a long-standing debate over the purpose and effectiveness of mandatory securities disclosure.¹⁵⁵ An often-cited purpose is to improve the informational efficiency of securities prices.¹⁵⁶ Critics of this accuracy enhancement efficiency justification argue that mandatory securities disclosure has not achieved this purpose.¹⁵⁷ Professor Mahoney proposes as an alternative efficiency justification for mandatory securities disclosure reducing the agency costs that arise between investors and promoters and between corporate managers and their shareholders.¹⁵⁸ Both of these justifications of mandatory securities disclosures focus on the cognitive impacts of increased disclosures.

Mandatory disclosures generate not only information, but also such emotions as perhaps anxiety, embarrassment, euphoria, exuberance, feeling stupid, relief, or shame. For example, mandating disclosure of the realistically very low odds of winning a lottery and the present discounted value of the after-tax prize winnings produces no benefits if such disclosures fail to

¹⁵³ *SEC v. Ralston Purina Co.*, 346 U.S. 119, 124 (1953).

¹⁵⁴ The Investor's Advocate: How the SEC Protects Investors and Maintains Market Integrity, available at <http://www.sec.gov/about/whatwedo.shtml> (Dec. 1999).

¹⁵⁵ See, e.g., John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 VA. L. REV. 717 (1984); Frank H. Easterbrook & Daniel R. Fischel, *Mandatory Disclosure and the Protection of Investors*, 70 VA. L. REV. 669 (1984); and Steven L. Schwarcz, *Rethinking the Disclosure Paradigm in a World of Complexity* (Oct. 4, 2002) (unpublished manuscript, on file with the author) (arguing that in the case of structured and other complex transactions, the long-held disclosure paradigm of securities regulations fails to remedy informational asymmetries between investors and originators of securities).

¹⁵⁶ Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 601 (1984); Jeffrey N. Gordon & Lewis A. Kornhauser, *Efficient Markets, Costly Information, and Securities Research*, 60 N.Y.U. L. REV. 761, 802 (1985); Gregg A. Jarrell, *The Economic Effects of Federal Regulation of the Market for New Security Issues*, 24 J.L. & ECON. 613 (1981); Marcel Kahan, *Securities Laws and the Social Costs of "Inaccurate" Stock Prices*, 41 DUKE L.J. 977, 979 (1992); and Edmund W. Kitch, *The Theory and Practice of Securities Disclosures*, 61 BROOK. L. REV. 763, 764-838 (1995).

¹⁵⁷ George J. Benston, *Required Disclosure and the Stock Market: An Evaluation of the Securities Exchange Act of 1934*, 63 AM. ECON. REV. 132 (1973) (providing evidence that suggests mandatory periodic disclosure does not benefit investors); Kitch, *supra* note 156, at 838-74 (arguing that accuracy enhancement cannot be the only goal of securities disclosures and cannot be achieved). See generally HOMER KRIPKE, *THE SEC AND CORPORATE DISCLOSURE: REGULATION IN SEARCH OF A PURPOSE* (1979).

¹⁵⁸ Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047 (1995).

reduce the number of lottery ticket buyers, but cause lottery players to feel dumb or foolish and reduce their pleasure from daydreaming about possible future riches. Such emotional consequences of mandatory disclosure can alter behavior. For example, the display by retailers of detailed facts about food content mandated by food labeling acts may result in the so-called “Snackwell Effect,” named for the fat-free cookie that appears to lead to greater consumption.¹⁵⁹

Emotional reactions to securities risks imply emotional reactions to securities information because information is in essence the negative of risk as information involves the reduction of risk. Analogous to fear in the investment context, evaluating strategies for combating terrorism depends on how much fear involves misperception about risk, whether fear is a hedonic loss that should count as being a cost or harm under a cost-benefit analysis, and to what extent fear is contagious.¹⁶⁰ The fact that people feel emotions and would like to minimize anxiety also has novel implications for health and medical regulatory policy.¹⁶¹

Questions about how much and precisely what disclosures federal securities laws should require are analogous to recent questions about how much and precisely what disclosures the federal government should issue about possible terrorist attacks. While non-specific disclosures provide information, they also produce anxiety, fear, and general uneasiness. There is also the

¹⁵⁹ See Catherine Censor Shemo, *Fake Fats, Real Threat*, VEGETARIAN TIMES, Feb. 1997, at 20 (reporting on the impact on dieters being lulled into a false sense of confidence by misunderstanding food labeling information).

¹⁶⁰ Eric A. Posner, *Fear and the Regulatory Model of Counterterrorism*, HARV. J.L. & PUB. POL’Y 681, 684-89 (2002) (discussing these three aspects of fear and their implications for dealing with terrorist risks).

¹⁶¹ Paul Slovic, *Rational Actors and Rational Fools: The Influence of Affect on Judgment and Decision-Making*, 6 ROGER WILLIAMS U. L. REV. 163, 166-200 (2000) (describing recent empirical and theoretical findings proving the importance of affect and experiential thinking on decisions and judgment and the implications of those studies for legal policy towards cigarette smoking). See also Jay Katz, *Informed Consent -- Must It Remain a Fairy Tale?*, 10 J. CONTEMP. HEALTH L. & POL’Y 69, 87 (1993) (observing that emotions influence patients’ decisions and their autonomy); JAY KATZ, THE SILENT WORLD OF DOCTOR AND PATIENT 142-50 (1984) (analogizing emotional tensions of the physician-patient relationship to those of the analyst-patient relationship); Peter H. Schuck, *Rethinking Informed Consent*, 103 YALE L.J. 899, 903, 926-27, 942 (1994) (discussing an idealistic vision of informed consent focusing on patients’ emotional needs, arguing that physician-patient relationships involve emotional attachment and vulnerability, pointing out how the complex emotional nature of physician-patient relationships can lead to conflicts, and stressing that an important cost of providing information to patients is the emotional stress patients experience in attempting to comprehend such information).

danger that over time people become desensitized to many non-specific disclosures, so that a more specific disclosure may fall on deaf ears. Broad and general disclosures also lack the vividness of more specific and narrowly focused disclosures.

Securities disclosures function not only as information and marketing documents, but also as protection from civil liability for securities fraud. Even though there is no analogous marketing role for disclosures about possible terrorist attacks; after Sept. 11, 2001, the U.S. federal government is concerned with a severe public relations penalty for non-disclosures about possible terrorist attacks that is analogous to liability for fraudulent securities non-disclosures. Another difference between securities disclosures and disclosures about potential terrorist attacks is their actual or intended audience. Some legal scholars believe and argue that the investing public is neither the actual nor intended audience for the disclosures that federal securities laws mandate.¹⁶² Instead, these commentators feel that professional analysts are the audience of much of the accounting and financial disclosures that federal securities regulations mandate. Professional analysts filter that information onto the investing public.¹⁶³ Because analysts are professionals who have repeated experience at interpreting such disclosures, they may seem less likely than inexperienced and unsophisticated individuals to feel irrational exuberance and anxiety as the result of securities disclosures.¹⁶⁴ But, precisely because of their experience with

¹⁶² See Langevoort, *supra* note 18, at 173-75 (discussing the SEC's awkward myth-story of retail investor empowerment). But see *Pinter v. Dahl*, 486 U.S. 622, 637, n.13 (1988) (stating that the provisions of the Securities Act "are concerned with affording the unsophisticated investor information necessary to make a knowledgeable investment decision").

¹⁶³ *Dirks v. SEC*, 463 U.S. 646, 658-59, n.17 (1983) (discussing the importance of market analysts who "ferret out and analyze information"); Stephen J. Choi, *Selective Disclosures in the Public Capital Markets*, 35 U.C. DAVIS L. REV. 533, 540-52 (2002) (discussing the benefits and harms of selective disclosures to analysts); Zohar Goshen & Gideon Parchomovsky, *On Insider Trading, Markets, and "Negative" Property Rights in Information*, 87 VA. L. REV. 1229, 1234, 1246, 1262-67 (2001) (discussing the positive externalities that analysts' research provide all investors); Eric L. Talley & Stephen J. Choi, *Playing Favorites with Shareholders*, 75 S. CAL. L. REV. 271, 310 (2002) (discussing the costs and benefits of selective disclosures to analysts).

¹⁶⁴ Similar arguments have been made concerning the relative cognitive competence of judges versus juries. See W. Kip Viscusi, *Jurors, Judges, and the Mistreatment of Risk by the Courts*, 30 J. LEGAL STUD. 107 (2001) (presenting experimental evidence that jurors deal worse with risk judgments in tort liability cases than judges). But see Hillary

other similar securities in the past, professional analysts may have more vivid reactions to securities disclosures than laypersons lacking any personal or direct knowledge of similar cases. Because of their compensation, there may also be serious conflicts of interests between professional analysts and the investing public that mean analysts could routinely make unjustifiably optimistic or irrationally exuberant securities recommendations.¹⁶⁵

The debate over mandatory disclosure in federal securities regulation ignores the emotional benefits or costs of such disclosures, in particular, irrational exuberance and anxiety that potential and existing investors may feel due to disclosures or their absence. Such emotional benefits or costs affect both individuals in terms of increased or reduced social utility and issuers of securities in terms of a lower or higher cost of capital due to such emotional reactions. The heterogeneity of people's emotional reactions to mandatory securities disclosures complicates if and how securities regulations should take irrational exuberance and anxiety into account. The extent to which different people feel irrational exuberance and anxiety from securities disclosures affects the socially optimal amount of those disclosures. Even holding the content of disclosed information fixed, anxiety has implications for the form or presentation of that information.

Because irrational exuberance and anxiety depends more on the possibility than on the probability of certain outcomes, some people may overreact in their securities investments to disclosures about material events with positive, but small probabilities of occurrence. Irrational

A. Sale, *Judging Heuristics*, 35 U.C. DAVIS L. REV. 903, 905-06 (2002) (discussing the reasons and ways in which federal district judges utilize heuristics in securities fraud cases). See also William Meadow & Cass R. Sunstein, *Statistics, Not Experts*, 51 DUKE L.J. 629, 633-35 (2001) (discussing evidence that medical experts are just as prone to cognitive mistakes and prediction errors as others).

¹⁶⁵ Jill E. Fisch & Hillary A. Sale, *The Securities Analyst as Agent: Rethinking the Regulation of Analysts* (Aug. 2002) (unpublished manuscript, on file with the author) (collecting and reviewing the empirical finance literature about securities analysts); Marcia Vickers & Mike France, *How Corrupt is Wall Street: New Revelations Have Investors Baying for Blood, and the Scandal is Widening*, BUS. WK., May 13, 2002 at 36 (discussing analyst conflicts

exuberance and anxiety may also cause individuals to avoid acquiring or processing material information and to avoid thinking carefully about certain financial outcomes. Even if the apocryphal widows and orphans feel irrational exuberance and anxiety, some financial and legal scholars believe that equilibrium securities market prices may accurately reflect all relevant material information if analysts and institutional investors do not experience irrational exuberance and anxiety.¹⁶⁶ But, even were securities professionals and institutions to be immune from irrational exuberance and anxiety, limited arbitrage prevents them from eliminating the impact of those investors who do feel irrational exuberance and anxiety on securities prices.

On the other hand, just as disclosure of information may trigger irrational exuberance and anxiety, lack of disclosure may also trigger fear of the unknown (or a false sense of contentment from limited knowledge) and fear over imagined worst case scenarios (or joy over imagined best case scenarios). Lack of mandated disclosures does not mean lack of irrational exuberance and anxiety because there are many other sources of information or noise besides mandated disclosures, including security analysts, friends, family members, colleagues, investment clubs, and internet chat rooms.¹⁶⁷ Thus, there is a countervailing emotional benefit from disclosure, namely the prevention of irrational exuberance and anxiety that would result from lack of disclosure.¹⁶⁸

of interests); Mara Der Hovanesian, *How Analysts' Pay Packages Got So Fat*, BUS. WK., May 13, 2002 at 40 (reporting on analysts' compensation).

¹⁶⁶ Burton G. Malkiel, *The Efficient Markets Hypothesis and Its Critics*, 17 J. ECON. PERSPECTIVES 59, 60-72 (2003) (defining financial market efficiency and defending the informational efficiency of stock prices); Mark Rubinstein, *Rational Markets: Yes or No? The Affirmative Case*, 57 FIN. ANALYSTS J. 15 (2001) (arguing that developed financial markets are minimally rational, in the sense that no abnormal profit opportunities exist).

¹⁶⁷ Langevoort, *supra* note 18, at 154-63 (explaining how internet chat room postings can affect security prices).

¹⁶⁸ An analogy is to a patient's fears and behavior in the medical disclosure context. A patient may imagine and fear the worst if a physician does not disclose certain information about medical risks in a timely fashion. In other words, in both financial and medical contexts, people may infer or imagine bad news from silence and experience fear or anxiety from not knowing enough information.

The above observation helps to explain why some people react with irrational anxiety over companies not expensing stock options utilized to compensate and provide incentives for their executives.¹⁶⁹ Not knowing how much those stock options actually cost a company may lead both existing and potential investors to overestimate the cost of granting such executive stock options and experience irrational anxiety from such overestimates or from just not knowing. On the other side of the emotional spectrum from irrational anxiety due to lack of disclosure is possible irrational exuberance or unjustified excitement. In the case of the bull market of the late 1990's, many investors evaluated companies in the so-called "new economy" based more on irrational exuberance and irrational euphoria than on fundamental analysis.

The key legal policy questions are thus what can and should we do about irrational exuberance and anxiety.¹⁷⁰ The Brady Commission formed to examine the 1987 stock market crash advocated circuit breakers to "cushion the impact of market movements, which would otherwise damage market infrastructures."¹⁷¹ In 1988, U.S. securities exchanges adopted trading halts to essentially provide investors a cooling-off period if the Dow Jones Industrial Average index fell too much too fast.¹⁷² Symmetrically, reverse circuit breakers could mandate trading halts for overall securities markets or individual securities if securities price indices or individual securities prices rise too quickly.¹⁷³ But, experimental studies find not only are circuit breakers

¹⁶⁹ Floyd Norris, *Accounting Board Proposes A New Rule on a Hot Topic: Options*, NY TIMES, Aug. 15, 2002 at C5 (reporting on the Financial Accounting Standards Board's proposal to require that stock option valuations be disclosed in quarterly financial statements filed with the SEC); Bill Saporito et al., *Wall Street's Verdict: While Washington Dithers on Reform, Investors are Pushing the Stock Market Down, Down, Down*, TIME MAG., July 29, 2002 at 18, 23-24 (reporting on investor anxiety from uncertainty over the cost of executive stock option grants).

¹⁷⁰ See Frank Partnoy, *Why Markets Crash and What Law Can Do About It*, 61 U. PITT. L. REV. 741, 762-817 (2000) (discussing legal reforms to prevent or mitigate the deleterious effects of securities market crashes).

¹⁷¹ Presidential Task Force on Market Mechanisms, *The Report of the Presidential Task Force on Market Mechanisms (Brady Report)* 66 (1998) (recommending circuit breakers).

¹⁷² CUNNINGHAM, *supra* note 28, at 233-36 (describing and critiquing the experience of U.S. securities markets with trading halts).

¹⁷³ Galbadon, *supra* note 46, at 283; Galbadon, *supra* note 47, at 127.

ineffectual, but also that mandated market closures accelerate trading activity.¹⁷⁴ Another experiment finds that circuit breakers do not work to retard bubbles, but instead they actually somewhat exacerbate bubbles for inexperienced subjects.¹⁷⁵

Instead of circuit breakers, the SEC can require greater firm-specific disclosures that detail how a particular firm's securities differ from the overall securities markets. Section 13(a) of the Securities Exchange Act provides the SEC with authority to require Securities Exchange Act registered companies to file such information and documents as it deems to be in the public interest.¹⁷⁶ Such additional firm-specific disclosures could be provided in the form of "public reports explicitly addressing the relationship between their earnings, dividends, and prevailing stock prices and perhaps containing management commentary upon the wisdom of this relationship and how long it might be expected to be sustained."¹⁷⁷ But, such mandatory disclosures presume that individuals can and will cognitively evaluate such disclosures as opposed to increase noise trading.¹⁷⁸ If one believes that individuals should be holding broadly diversified portfolios instead of engaging in dubious individual stock picking, then individuals do not require firm-specific information. If one believes that irrational exuberance and anxiety dominate securities investing, then mandatory disclosure which is the linchpin of U.S. federal securities regulation may have unexpected emotional, if not little or no, effects upon investing.

Answering the questions of whether, what and how much of mandatory securities disclosures are socially desirable requires comparing the unemotional and emotional

¹⁷⁴ Lucy F. Ackert et al., *An Experimental Study of Circuit Breakers: The Effects of Mandated Market Closures and Temporary Halts on Market Behavior*, Fed. Reserve Bank of Atlanta Working Paper 99-1 (Mar. 1999) (reporting these findings).

¹⁷⁵ Ronald R. King et al., *The Robustness of Bubbles and Crashed in Experimental Stock Markets*, in *NONLINEAR DYNAMICS AND EVOLUTIONARY ECONOMICS* 183, 194-95, 199 (Richard H. Day & Ping Chen eds., 1993) (reporting this finding).

¹⁷⁶ 15 U.S.C. § 78m(a) (2002).

¹⁷⁷ Galbadon, *supra* note 47, at 128.

consequences of such disclosures with the unemotional and emotional consequences of voluntary securities market disclosures. An emotional cost-benefit analysis differs from the unemotional considerations raised in the past and current debate over mandatory securities disclosures. The relative size of the emotional costs and benefits of mandatory securities disclosures versus the emotional costs and benefits of voluntary securities disclosures will vary depending on the precise nature of the specific disclosures involved.

Finally, there is another set of actors in securities regulation who are subject to irrational exuberance and anxiety, namely the securities regulators themselves, be they SEC Commissioners; SEC staff; lawyers and other professionals at SROs, such as the NYSE or the NASD; members of Congress and their Congressional staff; state attorney generals and their staff; private litigants and plaintiffs' attorneys; issuers and their counsel; judges; or juries. Certainly, investors do not have a monopoly on feeling irrational exuberance and anxiety. A central message of this chapter is that emotions are ubiquitous and not always necessarily defects in or flaws of human decision-making. Just as (securities) regulators are no less prone to cognitive biases and heuristics than investors are,¹⁷⁹ so too (securities) regulators are no less prone to irrational exuberance and anxiety than investors are prone to irrational exuberance and anxiety. Just as behavioral explanations of securities regulations complement and enrich public choice accounts,¹⁸⁰ so too for emotional regulatory stories.

It is perhaps no surprise that emotional regulating not only happens, but also systematically differs from unemotional regulating. The social desirability of emotional

¹⁷⁸ Paul G. Mahoney, *Is There a Cure for "Excessive" Trading?*, 81 VA. L. REV. 713, 742 (1995) (pointing out how trend-chasing investors will misinterpret or ignore mandatory disclosures).

¹⁷⁹ Choi & Pritchard, *supra* note 18 (cataloging a series of cognitive biases that may affect SEC officials).

¹⁸⁰ *Id.* at 22; Jonathan R. Macey, *Administrative Agency Obsolescence and Interest Group Formation: A Case Study of the SEC at Sixty*, 15 CARDOZO L. REV. 909 (1994) (providing a public choice approach to the SEC); Paul G. Mahoney, *The Political Economy of the Securities Act of 1933*, 30 J. LEGAL STUD. 1 (2001) (providing a rent-seeking explanation of the Securities Act of 1933).

regulating, including but not limited to zealous advocates, passionate public servants, possibly envious or sympathetic regulators, and ideologically fanatical prosecutors, is a difficult question. But, whether or not emotional regulating is socially desirable, it not only exists, but also is likely to continue. In light of the realities of emotional regulating, the SEC in general and its mandatory disclosure regime in particular might do more harm than good and yet persist due to emotional appeal, rationales, and considerations. The history of U.S. federal securities regulation from its very inception in the aftermath of the Great Depression to its most recent Sarbanes-Oxley Act in the aftermath of Enron, Arthur Anderson, Rite Aid, Worldcom, Tyco, Adelphia, Merck, and Global Crossing is that of (possibly benign) neglect of securities markets interrupted by legislation in response to political and public pressure arising from highly visceral and public episodes of banking, corporate, or securities fraud and scandals.¹⁸¹ Mandatory disclosure might be at best, an impotent, and at worst, a socially harmful regulatory policy if the majority of investors experience cognitive biases and utilize heuristics in the processing of information and/or feel irrational exuberance and anxiety before and during their investing process. But, the SEC's obsession with mandatory disclosure may be due to its emotional resonance with the metaphor of a "level playing field" and the rationale of protecting investors from others and possibly themselves.

III. CONCLUSIONS

This chapter analyzed a still growing, but already large body of empirical and experimental evidence of and theoretical economic and psychological models supporting the

¹⁸¹ See generally JOEL SELIGMAN, *THE TRANSFORMATION OF WALL STREET: A HISTORY OF THE SECURITIES AND EXCHANGE COMMISSION AND MODERN CORPORATE FINANCE* (rev. ed. 1995) (providing an excellent historical account of how securities market crises led to U.S. federal securities laws); see also Joseph A. Grundfest, *Punctuated Equilibria in the Evolution of United States Securities Regulation*, 8 *STAN. J.L. BUS. & FIN.* 1, 1-2 (2002) (using the metaphor of punctuated equilibrium in discussing the history of U.S. federal securities laws).

prevalence of irrational exuberance and anxiety. Because the financial and legal implications of irrational exuberance and anxiety differ significantly and systematically from those of unemotional rational investing, further empirical, psychological, experimental, and theoretical financial economic research concerning the applicability, generality, and robustness of irrational exuberance and anxiety is crucial.

An important question for legal policy is to what extent education or experience mitigates irrational exuberance and anxiety. After all, not only did many individual and novice investors lose money by investing heavily in high-technology and internet stocks during the 1990's, but so did many hedge funds and mutual funds managed by financially sophisticated and experienced investors.¹⁸² To the extent that individuals are more evolutionarily prepared for certain emotions than others, it may be neither easy nor socially desirable to alter irrational exuberance and anxiety in response to securities disclosures.¹⁸³

Whether more paternalistic securities regulation than our current federal system of mandatory disclosure is socially desirable depends on to what extent and how others can improve upon the behavior and performance resulting from irrational exuberance and anxiety.¹⁸⁴ Indeed, if we suspect that most investing is driven by irrational exuberance and anxiety, then securities regulation should focus primarily on emotional reactions to, instead of unemotional processing of, the form and content of mandatory disclosures. If we believe that short of explicit and

¹⁸² Markus K. Brunnermeier & Stefan Nagel, *Arbitrage at its Limits: Hedge Funds and the Technology Bubble* (presenting empirical evidence of limited arbitrage by hedge funds during the NASDAQ technology bubble of 1998-2000) (Aug. 2002) (unpublished manuscript, on file with the author).

¹⁸³ Loewenstein et al., *supra* note 136, at 279 (discussing and citing research about evolutionary preparedness for certain emotional reactions to risk); Cohen & Dickens, *supra* note 140 (suggesting evolutionary foundations of emotions); James A. Henderson, Jr. & Jeffrey J. Rachlinski, *Product-Related Risk and Cognitive Biases: The Shortcomings of Enterprise Liability*, 6 *ROGER WILLIAMS U. L. REV.* 213, 254 (2000) (pointing out evolutionary advantages of emotions that promote overreaction to risks); Olsen, *supra* note 140 (discussing evolutionary reasons for the primacy of affect).

¹⁸⁴ For empirical evidence concerning a similar question about consumption decisions, see Joel Waldfogel, *Does Consumer Irrationality Trump Consumer Sovereignty? Evidence from Gifts and Own Purchases* (May 13, 2002) (unpublished manuscript, on file with the author).

outright cognitive fraud; judges, juries and the SEC are not well-equipped to evaluate the likely emotional reactions to securities disclosures, then perhaps the SEC should not base federal securities regulation upon a philosophy of mandatory disclosure. But, experts can assist both the SEC *ex ante* and courts *ex post* in determining the likely emotional reactions to securities disclosures or marketing hype by conducting empirical surveys of actual people.

An intermediate regulatory strategy is to adopt cautiously paternalistic or asymmetrically paternalistic regulations, namely regulations which greatly benefit people who are prone to mistakes, but only slightly (or not at all) hurt people who are not prone to mistakes.¹⁸⁵ It is important here as elsewhere to not view all emotional investing as being synonymous with making investing errors. A fundamental lesson of recent economic, neurobiological, and psychological research (and hopefully, this chapter) is that emotions sometimes are superior to, and sometimes reinforce, but also sometimes work in the opposite direction of unemotional reasoning.¹⁸⁶ In particular, there are many varieties of emotional investing and some complement, while others substitute for unemotional investing. Determining how much of emotional investing is “rational” or “reasonable” is difficult, both for any particular investor and for others, such as counterparties (of derivative securities), the SEC, and SROs, such as the NASD, NYSE, and AMEX.

A recent argument proposes not protecting so-called “irrational” investors from themselves in order to reap the public good provided by having equilibrium securities market

¹⁸⁵ Colin Camerer, et al., *Regulation for Conservatives: Behavioral Economics and the Case for “Asymmetric Paternalism”*, 151 U. PA. L. REV. (forthcoming 2003) (proposing the approach of asymmetric paternalism); Ted O’Donoghue, & Matthew Rabin, *Procrastination in Preparing for Retirement*, in BEHAVIORAL DIMENSIONS OF RETIREMENT ECONOMICS 125, 150 (proposing cautiously paternalistic policies).

¹⁸⁶ See also, Amitai Etzioni, *Normative-Affective Factors: Toward a New Decision-Making Model*, 9 J. ECON. PSYCHOL. 125, 128-40, 144-47 (1998) (outlining a model of decision making based upon emotions).

prices reflect the private information of those “irrational” investors.¹⁸⁷ But, under a general equilibrium analysis, the price impact and survival of “irrational” investors are two related, yet quite distinct and independent concepts.¹⁸⁸ In other words, in a long-run equilibrium, “irrational” investors can have a significant impact on prices whether or not they survive. Moreover, even if “irrational” investors survive, they may have no price impact. In addition, such a proposal assumes the private information of “irrational” investors have high signal to noise ratios. Although the signal to noise ratio for emotional investing is difficult to determine in general, there are clearly situations where the signal to noise ratio is low. So, for example, emotional investing caused by the on-line brokerage ads described in this chapter is likely to have a low signal to noise ratio and therefore regulating such ads is likely to not have any deleterious effect on the informational efficiency of securities prices.

¹⁸⁷ Gregory La Blanc & Jeffrey J. Rachlinski, *In Praise of Investor Irrationality*, in *THE LAW AND ECONOMICS OF IRRATIONAL BEHAVIOR* (Francesco Parisi & Vernon L. Smith eds., forthcoming 2003) (advocating not protecting irrational investors).

¹⁸⁸ Leonid Kogan, et al., *The Price Impact and Survival of Irrational Traders*, National Bureau Econ. Res. Working Paper No. 9434 (unpublished manuscript, Jan. 2003) (proving this result formally). *See also* Lawrence Blume & David Easley, *If You're So Smart, Why Aren't You Rich? Belief Selection in Complete and Incomplete Markets* (Yale University Cowles Foundation Discussion Paper No. 1319) (unpublished manuscript, June 5, 2001) (showing formally under a general equilibrium analysis that if securities markets are dynamically complete, then “irrational” investors do not survive, but if securities markets are incomplete, then “irrational” investors may survive); Alvaro Sandroni, *Do Markets Favor Agents Able to Make Accurate Predictions?*, 68 *ECONOMETRICA* 1303, 1304, 1306, 1319-21 (2000) (proving mathematically in a general equilibrium model that if securities markets are dynamically complete, then “irrational” investors do not survive in the long-run).