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BEHAVIORAL FINANCE AND INVESTOR GOVERNANCE©

*Lawrence A. Cunningham**

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Introduction

Behavioral economics is emerging as an important new disciplinary adjunct to legal analysis in a wide range of fields from the meta territories of jurisprudence and judicial decision making to the traditional zones of contracts and torts to the specialized areas of tax and health law. It shakes up thought and reorients scholarship laden by its progenitor, law and economics, to revise received wisdom that assumed the bounded but substantial rationality of human actors and prescribed legal rules and social norms according to sterile abstractions that bore little resemblance to actual human beings but which could be modeled in elegant and simple ways. The encrusted models become more realistic accounts of complex human behavior originally mapped in the field of cognitive psychology, adapted by economists, and lately being imported by legal scholars.¹

One corner of this behavioral orientation toward economics and law and the vast social domains those disciplines canvass examines the way stocks are priced in public capital markets and the knowledge being generated from this investigation has significant implications for the field of corporate governance. Corporate law and economics has assumed that prices of publicly traded stocks are formed as the best estimate of the value of the ownership interest in the businesses they represent. Thousands of investors study relevant and reliable information about the cash flows companies are expected to generate and price their stocks based on a risk-adjusted multiple of them. Some investors may act irrationally in the process, but there are enough rational ones to offset (and indeed take advantage of) their mistakes so that the pricing mechanism does work and the stock markets are best described as being efficient.

A set of cultural beliefs accompany this view that stock markets are efficient in the sense of accurately pricing business value.² Chief among these is that the stock market itself operates as a disciplining device on corporate managers. Their company's stock prices are an accurate and transparent report card on their performance—a manager that performs poorly will see his company's stock price fall and be held accountable. Accountability could take the form of an unwanted takeover of the company by a third party through which the manager is ousted. It could come from the impairment of reputation that would diminish a manager's future job prospects. It also could come in the form of a cooled reception by investors to any future plans the manager may have to attract additional financing to run or expand the company's business. The efficient market's discipline extends to put limits on managerial discretion over major capital structure and allocation decisions, such as the mix of debt and equity in the firm, the level of

¹ For a thorough and leading example that considers rational choice theory in its various guises and a series of behavioral realities that contradict it and the effects of these on various legal policies, see Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 Cal. L. Rev. 1051 (2000).

² See Donald C. Langevoort, *Theories, Assumptions and Securities Regulation: Market Efficiency Revisited*, 140 U. Pa. L. Rev. 85 (1992).

dividends, and the timing and extent of stock repurchases.

From these beliefs follows a set of legal principles. The market for corporate control should be unburdened by rules of timing, disclosure, payment or other tilts in the playing field. Fiduciary duties could be relied upon in quite weak forms to police those rare managers who somehow escape the clutches of market discipline to act contrary to the corporation's and shareholders' interests. Broad deference could be given to director decisions on the whole range of capital decisions. Concern over the type and timing of company disclosure, and even the principles of accounting applied in preparing financial statements, could be limited since the activity of the efficient market and its participants will pierce these, getting at the real truth and reflecting it in market price. Investors, on the other side, could be presumed to rely upon misleading managerial statements when they in fact rely solely on market price—when it turns out that what management was saying was false, judges could presume that investors relied on the price as a reflection of what management was saying without the need to ask whether the investor actually did rely on what management was saying.

The efficient market idea, and the set of cultural norms and legal principles that these examples typify, dominated thought and practice in the field of financial economics and corporate law beginning in the 1960s and continuing with undiminished zeal through the late 1980s. Though the zeal abated as the 1990s progressed, and today many more sceptics voice doubt upon the validity of these ideas, the theory of efficient markets and its implications remain widely embraced and the legal culture those ideas spawned remains endowed with its teachings.

A sub-discipline of behavioral economics is blossoming that enervates the 30-year old tenets of the efficient market story. Called behavioral finance, it rests on two foundations. The first is that a substantial amount of stock pricing is performed by investors who do not accurately perceive underlying business values, and hence produce prices that do not equal those values. Investor sentiment, rather than rational economic calculation, contributes significantly to price formation. The second is that even those investors who do accurately perceive underlying business values will not always step in to offset the sentiments of those who do not, for they face risks too great for such an undertaking. This limited arbitrage, when coupled with investor sentiment, yields pricing that does not equate to value and the managerial report card seen in prices turns out often to be inaccurate, even if it remains translucent.

In the world of behavioral finance, no longer can the social or legal culture be content to rely upon market mechanisms for the work of managerial discipline. Neither the market for corporate control nor that for managerial labor is as potent in the behavioral finance story as it was in the world where efficient stock markets ruled. Fiduciary duties, disclosure, and accounting play an important role in holding managerial feet to the fire. Capital structure and allocation decisions are far more flexible and unrestrained—dividend policy, the debt/equity mix, and stock repurchases all matter as substantive decisions and manifestations of managerial probity and intelligence. Investors, on the other side again, may rely upon market prices in allocating their investment capital but that reliance is functionally irrelevant to legal questions concerning whether a management that misleads should be found liable to an investor who does not rely on what was misleading.

The death of the efficient market idea has been coming for a number of years, but it has held onto breath even as research steadily reveals its fatal infirmities. Dozens of law review articles have brought to the legal academy the evidence from economics and finance scholarship showing the demise of the efficient market story, yet scores more proceed with at least tacit acceptance of its force and implications. My contribution to these discussions alerted corporate law scholars to the decay of the efficient market idea wrought by studies as they stood in behavioral finance of the early 1990s, along with the intellectual history of the model that showed it was heading for a dead end.³ This piece is the continuation of that story, with subsequent and stronger evidence that the model is poor grounds for legal policy formulation and a broader account of the implications of that conclusion.

Part I presents behavioral finance as to how prices of stocks are formed—including a theoretical framework, empirical evidence, and psychological explanations. It integrates these materials into a model of market and investor behavior that can be used as a lens through which to analyze a wide variety of legal rules and policies bearing on market regulation and corporate governance.

Part II is a series of prescriptions on the implications of this account relating to investor governance.⁴ It starts with a proposal to promote and expand investor education concerning the cognitive biases behavioral finance exposes. It proceeds to introduce and propose reforms in three critical areas of law and policy that this model impacts: (1) the market regulatory environment in which investors participate, including suitability and churning rules and policies relating to day trading, margin trading, and circuit breakers; (2) the legal duties of boards of directors in making capital allocation decisions such as equity offerings, dividend distributions and stock acquisitions; and (3) issues in corporate and securities litigation, principally the reliance requirement in securities fraud cases and the stock market exception to the appraisal remedy in cash out mergers.

The efficient market idea turns out to be an aspiration worth pursuing, but one never likely to be realized. These proposals and prescriptions therefore operate both to push the reality toward the ideal and to deal with the gap that will persist. The article has a major public policy sub-text too—at stake in the

³ Lawrence A. Cunningham, *From Random Walks to Chaotic Crashes: The Linear Genealogy of the Efficient Capital Market Hypothesis*, 62 *Geo. Wash. L. Rev.* 546 (1994).

⁴ I call this “investor governance” to distinguish it from the literature to date, which has tended to focus on manager actions. *E.g.*, Stephen M. Bainbridge, *Mandatory Disclosure: A Behavioral Analysis*, 68 *U. Cin. L. Rev.* 1023, 1035 n.57 (2000); Donald C. Langevoort, *Organized Illusions: A Behavioral Theory of Why Corporations Mislead Stock Market Investors*, 146 *U. Pa. L. Rev.* 101 (1998); Donald C. Langevoort, *The Human Nature of Corporate Boards: Law, Norms, and the Unintended Consequences of Independence and Accountability*, unpublished manuscript available on the Legal Scholarship Network (2000); Jeffrey Rachlinski, *A Positive Psychological Theory of Judging In Hindsight*, 65 *U. Chi. L. Rev.* 571 (1998). Part I of this piece focuses on investor actions in markets that drive the legal issues in Part II’s discussion of investor education, market regulation, director duties, and the reliance requirement in securities fraud litigation, which I consider to be key components of investor governance.

discussion of how prices are formed is the overarching question of capital allocation. Society is better off in terms of aggregate wealth when its resources are allocated to those best able to deploy them. Investors allocating capital based on rational calculation will produce that result, while those allocating based on sentiment will not.⁵ Attention to this difference is also important to the distributive question, not only since a smaller pie will yield less for certain groups, but because a skewed allocation can widen the gap between the rich and the poor. Proper pricing—or at least an understanding that improper pricing may exist and why—is thus a transcendent social question, not merely a tiny corner of scholarship in law and behavioral economics, though it also certainly is that.⁶

I. Behavioral Finance

The efficient market idea contends that prices of securities in public capital markets always reflect all available information about the underlying businesses they represent. The theory has been described as “dazzling” and as an “enormous theoretical and empirical success.”⁷ The entire field of academic finance was created on its basis, starting in the economics department of the University of Chicago, spreading to every department of every university in the country, and ultimately penetrating trading, board, court and class rooms worldwide. Despite that success, the EMH has always suffered from theoretical and empirical limitations or exceptions, which of late have gone to consume it. In its wake stands behavioral finance as a rival account of capital markets.

⁵ *E.g.*, Marcel Kahan, Securities Laws and the Social Costs of "Inaccurate" Stock Prices, 41 Duke L.J. 977 (1991). Stock markets are a means of allocating capital. Social wealth is greatest when capital is allocated to its most productive uses. Prices that equal underlying values will effect that allocation best. Prices that deviate from values will misallocate to the extent of the difference. The social cost of misallocated capital is a multiple of the foregone opportunities that properly allocated capital would have generated. Additional costs result from the increased risk investors face in misallocations. That increased risk will discourage investment, lead investors to demand a higher rate of return, increase the cost of capital, decrease its supply, and drain overall economic horsepower.

⁶ Proper pricing means prices approximately equal to values, with value defined as the present value of the cash flows a corporation is estimated to generate from the date of calculation to the infinite horizon period. Value in this model is thus determinate as a theoretical and philosophical matter (though the calculation in practice remains fraught with judgments). The term proper pricing thus equates to value but this should not be seen to constitute a conflation of the two in a philosophical sense. *Compare* Kyron Huigens, Law, Economics, and the Skeleton of Value Fallacy, 82 Cal. L. Rev. xxx (2001) (critique of traditional and behavioral law and economics on the philosophical grounds that value is intransitive and incommensurable and, therefore, has an ineluctable “tragic dimension,” the part not accounted for in price, rendering economic analysis of law both impossible and useless).

⁷ Andri Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance* 1 (2000).

A. Foundations and Legal Import of the Efficient Market Hypothesis

The theoretical foundations of the EMH were laid by Paul Samuelson⁸ and Benoit Mandelbrot.⁹ In essence, they supposed that investors act rationally in making the investment decisions that result in stock price changes and levels. The consequences were equivalence between price and value and a random element to the process of price formation that rendered impossible predictions of future price movements and systematically earning higher than normal returns.

Rationality did not have to be complete, however, and the model allowed for the participation of nonrational or irrational persons. Their contributions would have the tendency to push prices away from values but, the theory went on, those deviations would not persist due to arbitrage by the rational participants, whose trading would restore the price-value identity and reinforce the basic conclusions of the model.

Eugene Fama laid the EMH's empirical foundations, starting with the proposition that stale information about a company was of no value to a stock trader.¹⁰ The hypothesis was that an investor cannot use information such as past prices, public disclosures, and maybe even privileged data to make money in the stock market. Such information is instantly absorbed into the price by traders who get the information first and act on it, so knowing it thereafter gives an investor no advantage. There was a sort of noncontroversial and commonsensical appeal to this proposition (except maybe with respect to privileged information), but the harder empirical question was what was meant by advantage to an investor.

Obviously people can make money in the stock market by looking at information, but the key empirical point of the EMH was that they could not use stale information to earn more money than would compensate them for bearing the risk of the investment. Risk was adjusted for in the EMH by a pricing model, most famously the "capital asset pricing model," that specified the risk associated with each stock. The empirical claim was that no investor can use stale information to get returns greater than justified by the associated risk the CAPM defined for the investment.

The theoretical and empirical foundations of the EMH were powerful, constituting a major academic success story, leading to the tenuring of scores of bright young economists and to the awarding of Nobel prizes to about a dozen of their elders. In the triumphant congratulations of one of the pioneers, Michael Jensen announced in the early 1980s that the EMH was the best established fact in all the social

⁸ Paul Samuelson, Proof that Properly Anticipated Prices Fluctuate Randomly, 6 *Indus. Mgmt. Rev.* 41 (1965).

⁹ Benoit Mandelbrot, Forecasts of Future Prices, Unbiased Markets, and Martingale Models, 39 *J. Bus.* 242 (1966).

¹⁰ Eugene Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 *J. Fin.* 383 (1970).

sciences. Not an overly broad claim at the time perhaps, but with the passing of the years and the emergence of newer studies, one continues to wonder whether the claim said more about the social sciences than it did about the EMH.

Among legal scholars, the EMH became so dominant by the mid 1980s that two leading corporate law teachers announced that it was *the* context to discuss markets and their regulation.¹¹ Some legal rules were expressly linked to the theory, especially the stock market exception to the appraisal remedy, the fraud on the market theory, and event study techniques for measuring damages in securities fraud cases.¹² Others were more loosely or rhetorically based on it, such as the SEC's integrated disclosure system initiative and its shelf registration rules.¹³

In between these particularizations and far more broadly, the EMH exemplified the most successful constructs and applications of law and economics generally. The chief reason for this success was that of all the places where theoretical rational actors gather to produce results that look highly rational—whether in contracts, property, or courtrooms—it was in the public capital markets that they did so with greatest plausibility.¹⁴ As a result, discussions of a whole range of topics in corporate and securities law went forward with a backdrop of the EMH if not express articulation of its premises. This privileged position remains a fixture of the culture of business law scholarship, even if its purchase has declined as legal scholars have digested the challenges to the EMH uncovered by behavioral economists and discussed next.

B. Challenges to the Efficient Capital Market Hypothesis

Theoretical challenges to the EMH question the assumed rationality of investors. Drawing on the 1970s pioneering work of cognitive psychologists Amos Tversky and Daniel Kahneman, as early as the mid 1980s economists speculated that many traders act not on information but on hunch and that the market absorbs no more rationality of calculation than it does mere noise.¹⁵ More recent theorizing on investor behavior has considered the nature of investor attitudes towards risk and the way investors make

¹¹ Ronald Gilson & Renier Kraakman, *The Mechanisms of Market Efficiency*, 70 *Va. L. Rev.* 549, 550 (1984).

¹² *See* Langevoort, *Theories, Assumptions and Securities Regulation*, *supra*.

¹³ *Id.*

¹⁴ This plausibility is shown by the unusual degree to which some of the assumptions necessary to sustain the economist's "perfect market" are met in public capital markets: there are a large number of participants such that the actions of any individual participant cannot materially affect the market; participants are fully informed, have equal access to the market, and act rationally; the commodity is homogeneous; and there are no transaction costs. *E.g.*, Paul A. Samuelson, *Economics* 43, 56 (10th ed. 1976).

¹⁵ *E.g.*, Fisher Black, *Noise*, 41 *J. Fin.* 529 (1986).

decisions using attention and memory more than probabilistic analysis (and even how the influences of autonomous brain activity can produce judgments outside of a person's awareness).¹⁶

In terms of assessing risk, investors tend not to look at levels of final wealth attainable but at gains or losses *relative to a reference point*.¹⁷ The path can be more important than the end. In considering the assumption of risk, people display *loss aversion*, a tendency to place an asymmetrically greater value on losses compared to gains.¹⁸ It is epitomized in the reluctance of investors to sell stocks that have suffered substantial losses¹⁹ and in the puzzlingly high premium returns attributable to investments in equity

¹⁶ The first two of these form the basis of the model that follows; the third is not implicated by the model but is taken up as a separate series of phenomena more localized in the part that follows.

¹⁷ Take an example where alternative end states are identical but the ways of getting their differ and people systematically opt for one rather than the other:

Question A: Suppose you are richer by \$20,000 than you are and pick from the following choices: (1) receive \$5,000 or (2) receive a 50% chance of winning \$10,000 (and a 50% chance of winning nothing).

Question B: Suppose you are richer by \$30,000 than you are and pick from the following choices: (1) forfeit \$5,000 or (2) take a 50% chance of losing \$10,000 (and a 50% chance of losing nothing).

In terms of end states, the problems are identical: in each Question the expected value of choice (1) is a position \$25,000 richer than you are (in A, \$20,000 + \$5,000 and in B, \$30,000 - \$5,000) and the expected value of choice (2) is also \$25,000 (you end up with either \$20,000 or \$30,000 with equal probabilities). Most people see these Questions as quite different, and not because of the suppositions about being richer by either amount, but because of the routes to the end. Among those inclined to gamble on either Question, the tendency is to gamble on the downside (picking the gamble that includes possibly losing nothing) and the sure thing on the upside (picking the cash despite the possibility of gaining more). These choices also illustrate the phenomenon of frame dependence, discussed below. See Daniel Kahneman & Mark W. Riepe, *Aspects of Investor Psychology*, 24 *J. Port. Mgmt.* 52, 56-57 (1998).

This description of investor behavior also applies to manager behavior in evaluating potential acquisition transactions discussed below in Part II.B.

¹⁸ For example, people asked how much they would have to stand to gain from the flip of a coin turning up heads in order to take a bet that if it comes up tails they would pay \$100 tend to site a range from \$200 to \$250. Kahneman & Reipe, *supra*. In economic terms they exhibit a loss function steeper than a gain function. See Sheifler, *supra*, at xxx.

¹⁹ Terrance Odean, *Are Investors Reluctant to Realize Their Losses?*, 53 *J. Fin.* 1775 (1998). To illustrate the sort of loss aversion known as the *disposition effect* and how it leads investors to cling to losing stocks consider this hypothetical: Highball and Lowball bought IBM shares at \$200 and \$100, respectively, and today's closing IBM price was \$150, down \$10. Who is more unhappy about today's \$10 decline? Most people concur Highball is unhappier at the \$10 decline for he is suffering further losses

rather than fixed income securities.²⁰

Related to the way reference points are created is how they influence solutions. Different decisions will be made depending on how a problem is framed.²¹ This frame dependence shows itself in the observed

whereas Lowball is still ahead of his purchase price by a substantial amount. For the same reason, it would be harder for Highball than Lowball to sell IBM even given the same fundamental picture of that company's prospects. *Id.*

You can see the sort of loss aversion known as the *endowment effect* by a classic study where one group's members are each given a coffee mug and another group's members given \$6 cash apiece. The mug group are asked to name their sale price for a mug and the cash group are asked to name their buy price. The groups are told that with that information the experimenters would figure out the market clearing price and effect swaps of cash for mugs that satisfied the clearing price. The behavioral surprise is that mug owners put a price on the mugs of about twice what the cash holders did, even after repeat plays of the game were held, contrary to the symmetry of valuation one would expect under rational choice theory. Daniel Kahneman, *et al.*, Experimental Tests of the Endowment Effect and the Coase Theorem, 98 J. Pol. Econ. 1325 (1990).

A different explanation that is more consistent with rational choice theory is simply that this preference differential reflects social norms oriented toward bargaining in which bidding low and selling high are standard. The parties with mugs have differentiated goods while those with cash have the currency of the realm by which everything else in exchange is measured. They are buyers and sellers. Sellers sell high; buyers buy low. Another is that experiments such as these tend to be performed on people with experience as buyers but not as sellers (often the subjects are university students), raising some question as to whether the results generalize to actual market behavior. Richard A. Posner, Rational Choice, Behavioral Economics, and the Law, 50 Stan. L. Rev. 1551, 1556 (1998).

²⁰ The equity risk premium puzzle refers to the observed departure, compared to bonds, of the actual return on stock investments over long period times above that predicted by economic theories and asset pricing models associated with the efficient market hypothesis. The puzzle generated legions of scholarship within the EMH tradition without any satisfactory solution, though adopting a behavioral finance perspective on the puzzle it dissolves—investors hold risk appetites that differ from those postulated by the EMH and its theoretical cognates. See Shlomo Benartzi & Richard H. Thaler, Myopic Loss Aversion and the Equity Risk Premium Puzzle, 110 Q.J. Econ. 75 (1995) (returns on stocks and bonds explainable in terms of risk aversion without any premium “puzzle”). In particular, it is true that stocks are riskier than bonds in terms of repayment of principal and of income generation but not so much riskier to justify the historical difference in actual returns on these two asset classes of about 6%. Rather, that substantial spread is attributed to investor loss aversion that gives greater weight to losses than to gains, a weight in this case greater by about 2.5 times. *Id.*

²¹ Consider the famous Tversky & Kahneman illustration of frame dependence in their theater-goer comparative:

1. You are on your way to see a play for which you do not have a ticket. Tickets cost \$10. You

tendency of experimental subjects to allocate more to stocks when they are shown long-term histories of high returns to stocks than they do when they are shown short-term histories of substantial price volatility.²²

Another aspect of frame dependence concerns how broadly or narrowly a decision is drawn in relation to others. Decisions are often presented in apparent isolation of each other, though they may be about subjects that are related. Rational choice theory prescribes choosing options in particular decisions that produce the best final or aggregate state of affairs (in investing terms, the highest financial value from all investment positions and decisions net). To do so, all components of that final state of affairs must simultaneously be evaluated rather than judged on their own discrete terms. Yet across a whole range of investment decisions, investors tend to isolate and make individual decisions rather than develop an overall and integrated investment policy.²³

realize that you have lost \$10 from your wallet. Will you still buy a ticket for the play?

2. You are on your way to see a play for which you had purchased a ticket for \$10. You realize that you have lost your ticket. Will you buy another?

These situations are analytically, financially, and cost-benefit wise identical, yet subjects distinguish their answers, virtually all saying yes to question 1 but a majority saying no to question 2. *See* Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 *Science* 453 (1981).

A similar sort of frame dependence is exhibited in the pair of choice presented in the illustration of reference point relativity, *supra* note xx (decision to gamble on one but not the other of two identical outcomes influenced by description of one as offering upside potential and the other as posing downside risk).

²² Benartzi & Thaler, *supra* (1995); *see also* Christine Jolls *et al.*, *A Behavioral Approach to Law and Economics*, 50 *Stan. L. Rev.* 1471, 1534 (1998).

²³ Suppose, for example, two goals are to produce an aggregate amount of savings to fund a child's college tuition 10 years from now and to own a brand new car. It is very common for people with these two goals to establish a savings account to meet the educational goal and to take a bank loan to purchase the car. This strategy may impose discipline against invading the child's education savings account. It is an example of a class of techniques colloquially known as making separate mental accounts for different needs. Generations have been reared to think this way, but from a financial viewpoint this narrow framing by separating the goals is not maximizing and not consistent with rational choice theory. The car loan will invariably cost more (say 10%) than the savings account pays (say 5%, minus say 1% allocable to income taxes on the interest). A superior strategy would frame the question in broad terms, combining rather than separating the goals. Use the cash that would be earning 4% to pay for the car (or part of it) and that money will be working to save the 10% cost of the loan (plus income taxes). The savings account won't get funded today but it will get funded tomorrow, with an ultimate balance higher than under the narrow frame strategy.

Attention and memory capabilities are often incorrect, but people rely on them to such a degree as to suggest they believe they are infallible. People thus violate probability theory, including basic principles of Bayesian logic and statistics, all the time.²⁴ One tendency is to predict by projecting a long future pattern based on a short recent history rather than understanding that the short recent history could be due to chance rather than to any emerging pattern. A good example of the late 1990s was the tendency to predict high rates of growth in future earnings of certain high-tech companies for several years in light of earnings growth in the few years just passed.

These tendencies could theoretically exist across all groups of investors, from do-it-yourself individuals to sophisticated hedge fund managers.²⁵ If so, this would undercut claims that non-rational investors get canceled out by the rational. On the contrary, it is even possible that these tendencies of investors are followed by other investors and the biases instantiated.²⁶ This is especially possible when they act as agent rather than principal and therefore worry more about the measure of their performance against their institutional peers. This tends to promote distortion rather than enable them to offset the noise.²⁷ Nor can arbitrageurs be counted on, since not only is arbitrage a risky business but also because

²⁴ Rational choice theory says to pick among uncertain prospects, figure the probability that each will happen, assign a value to each possible outcome, and choose the prospect with the highest product of probability times value. Practical decision making by actual people operating on intuition does not work the way of the theory's prescription. Those that come the closest might be the scrawl of Charles Darwin concerning the pros and cons of choosing to marry versus not to marry, Charles Darwin, *The Autobiography of Charles Darwin, 1809-1882* (N. Barlow, ed., 1969) (first published 1887), and the letter of Ben Franklin to Joseph Priestly describing "moral algebra", the process of recording on a sheet of paper the pros and cons of a decision over a period of several days before choosing. Benjamin Franklin, *Writings* (1987) (first written Sept. 19, 1772). Even so, results of such pragmatic approaches vary from those prescribed by rational choice theory. For example, people will pay more to increase the probability of an uncertain event from say 0% to 1% or from 99% to 100% than they will to increase it from say 41% to 42%. This is so even though in each case all they are getting is a 1% increase in probability, but somehow it looks better to get something over nothing or a sure thing over a (moderately) uncertain thing than it is to boost your odds by an increment to a point not much different from where you were. See Kahneman & Reipe, *supra*, at 56.

²⁵ For a chronicling of cognitive errors displayed by various Nobel prize winning hedge fund managers and their colleagues, see Roger Lowenstein, *When Genius Failed: The Rise and Fall of Long-Term Capital Management* (2000).

²⁶ See Andrei Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance* (2000) (adverse consequences of investor biases are exacerbated when traders "behave socially and follow each other's mistakes by listening to rumors or imitating their neighbors").

²⁷ For example, institutional investors acting as agents for individuals may choose portfolios close to the benchmark of evaluation like the S&P 500 Index. They may herd to avoid falling behind one another

to do effective arbitrage requires there to be close substitutes for the thing being arbitrated and there are not always close (and hardly ever perfect) substitutes for securities.²⁸

The empirical challenges to EMH were pioneered as early as 1981 by Robert Shiller, who showed that there is too much price volatility for the EMH to be true.²⁹ The studies continued, challenging the EMH at its every level. As to its claim that past prices give no profitable trading advantage (called weak form efficiency), evidence comparing the performance of winning and losing portfolios shows that losers do way better and winners way worse than standard risk models (like CAPM) explain.³⁰

As to the EMH's claim about public information (called semi-strong form efficiency), anomalies galore infect it. Stocks of smaller companies tend to outperform those of large; the January effect described how prices tended to rise in January; and the *piece de resistance*, highly priced stocks—measured in accounting ratios such as the market to book ratio—get lower average returns in the future than those with lower prices.³¹ Ratios like those are stale information, yet these observations imply that it is possible to get superior returns by buying the lower priced stocks (and, doesn't this seem like common sense, anyway?).

Concerning the more general EMH claim that there should be no (and aren't any) reactions to noninformation, it is common to note that the stock market crash of 1987 continues to have no discretely

as by picking the same stocks as each other. They can add window dressing right before year end reports are issued by adding stocks that have gained and dumping those that have lagged. Such machinations produce trades that probably have worse effects on price-value relationships than the effects of simple noise trading.

²⁸ They need close substitutes to the things the noise traders trade, such as futures or options at the local level of particular stocks or bonds, and also like all-out market indexes like the S&P 500 at the broadest level. While there may be some functional substitutes in the former case, they are simply absent in the latter. In other words, if the S&P 500 in aggregate is mispriced, there is virtually nothing any trader can do to correct it because there are no substitutes for it. In terms of the uncertainty in forecasting the changing behaviors of noise traders (or their counterparts at big trading houses), Shleifer gives the example of Fed Chairman Alan Greenspan saying one thing just as Goldman Sachs market guru Abby Joseph Cohen is saying the opposite. What is an arb to do? Shleifer, *supra*, at 15.

²⁹ Robert Shiller, *Market Volatility* (1989).

³⁰ *E.g.*, Warner DeBondt & Richard H. Thaler, *Does the Stock Market Overreact*, 40 *J. Fin.* 793 (1985) (comparing cumulative average results for winner and loser portfolios formed based on 3-year prior periods and looking at the next 5 years).

³¹ These categories of stocks are sometimes called, respectively, growth and value stocks, but these labels are essentially meaningless and should be deleted from the lexicon. *See* Lawrence A. Cunningham, *The Essays of Warren Buffett: Lessons for Corporate Lawyers* (1997).

identifiable justifying cause, nor do virtually any other major market moves of dramatic proportions.³² It will become common to note that the huge gyrations in all market indexes in the late 1990s and early 2000s cannot be explained in terms of fundamental changes either. Plenty of evidence shows that all sorts of stock price movements cannot be explained in terms of changes in information about the related businesses.³³ Consider finally that stocks selected for inclusion in a major stock index—such as the Standard & Poor’s 500, for example—tend to enjoy a price increase even though the inclusion alters nothing about their probable future business performance.³⁴

Criticisms of these rebukes to the EMH go forward on a variety of grounds. The chief challenge is in terms of the proper adjustment for risk. Maybe, for example, the observation that low priced stocks outperform high priced stocks is due to the fact that the former are riskier than the latter. However that may be, it seems in tension with common sense. Other critics allege data mining, sample selection biases, not accounting for trading costs, and other potential research defects.³⁵ Fair as these may be, it remains hard to deny the power of the increasing scope and magnitude of this research field.

Recognizing this is particularly important for legal scholars and other chief architects or analysts of public policy. The cautionary bell against the EMH has been rung before and many do seem to be listening.³⁶ Yet the attraction of EMH’s simplicity and elegance remains, not only among scholars but also among courts and regulators.³⁷ One reason for this time lag between the output of economic scholarship and its absorption by lawyers may be the lack to date of a coherent model of market behavior that captures these features. Much of the economics literature for most of the past couple of decades critiquing the EMH demonstrated weaknesses or anomalies in the model rather than developing an integrated alternative view. That hole is now coming to be filled, however, and the next section shows a version of the model that will be useful to corporate and securities law scholars and policymakers in evaluating a range of rules and positions considered in Part II.

³² Shiller, *Market Volatility*, *supra*; Robert Shiller, *Irrational Exuberance* (2000).

³³ Richard Roll first showed that orange juice price changes were not fully explained by changes in weather, Richard Roll, *Orange Juice and Weather*, 74 *Am. Econ. Rev.* 861 (1984), and later adapted that analysis to show that stock price movements are largely unaccounted for either by news about them or changes in the price of potential substitutes. Richard Roll, *R²*, 43 *J. Fin.* 541 (1988).

³⁴ *See* Shleifer, *Inefficient Markets*, *supra*, at 23 (giving the example of America On Line, added to the S&P 500 Index in December 1998, and promptly jumping 18% in price).

³⁵ *Id.*

³⁶ *E.g.*, Langevoort, *Theories, Assumptions and Securities Regulation*, *supra*; Cunningham, *From Random Walks to Chaotic Crashes*, *supra*.

³⁷ *See infra* Part II.

C. *An Alternative General Model*

These theoretical and empirical challenges to the EMH have been combined and deepened in the broader context of well known behavioral phenomenon. These traits can be seen in action in market behavior we observe. When put together, they offer an attractive and general account of a range of typical market activity that even the EMH has a hard time explaining.

1. *Elements*

A thumb nail version of the basic outlines of the model looks like this.³⁸ Investors start by holding some views about the world and markets and particular industries and companies. Some news is released affecting a particular company, say the release of its earnings for a single quarter. The tendency of investors is not to react to this news in reevaluating those prior views as rationality would prescribe but instead to exhibit *conservatism*. This means investors tend to update their views about the company, and the context in which it operates, slowly. They cling, in other words, to the status quo, and are slow to revise the status quo view in the face of single bits of news. The result is under-reaction of prices to earnings news followed by short horizon trends in those prices.³⁹

In contrast, when investors repeatedly receive similar types of news over a period of time, say a series of quarterly earnings surprises for a particular company in the same direction, the tendency is to jettison their prior views quickly in favor of a view that extends that series as the new trajectory. This is called the *representativeness heuristic*, and describes the mental strategy of viewing events as typical or representative of some specific class when statistically they are not. So while a single earnings news flash has modest or no impact, once a whole slew of similar sorts of reports emerges, a backlash comes. This can be true equally of news releases about a single company as about lots of different companies during the same quarter or other reporting period. The result is an overreaction in price changes to the various elements of news.

These under-reactions and overreactions are examples of investors ignoring or at least disobeying the laws of probability. Such phenomena are not limited to investors and markets but rather pervade human decision making. The human mind searches for patterns in all sorts of events including random events. For example, contrary to the beliefs of many basketball fans, just because a player has been shooting lots of 3-pointers from 20 feet, doesn't mean he is more likely to hit the next one (or less likely for that matter). For the non-fan, just because the series of letters AAAABBBB looks less random than the series of letters ABBBAABA each series is equally likely to have been the product of random configuration according to

³⁸ *Shleifer, supra*, at 113-114.

³⁹ *Id.* at 128 (people “tend to underweight useful statistical evidence relative to the less useful evidence used to form their priors”). In investing, this is sometimes called “stock price drift,” and the evidence is similar for other news like share buybacks, dividend changes, stock splits, and seasoned equity offerings. *Id.* at 120.

the tosses of a coin.

Another way of describing the representativeness heuristic is to say that when confronted with a decision that could be solved according to determining probabilities, people tend to take the shortcut of using superficial benchmarks rather than real underlying probability base rates.⁴⁰ One illustration is a mental game where subjects are told only one fact about a person—that she is artistic by nature—and asked to guess whether the person is a sculptor or a secretary. Most people guess sculptor though everyone knows there are more than ten times as many secretaries as sculptors and so the more highly probable answer is secretary.⁴¹

In the case of investing, investors tend to underestimate the likelihood that the past few surprises are the result of chance rather than of a new business reality where more surprises are in store. This pattern of behavior can result not only in overreaction to such news when it arrives in a series, but can also lead to jittery trading decisions. A common example is the selling of one stock deemed “cold” quickly followed by the purchase of another deemed “hot.” Trading losses are the typical result, one study showing that on average investors following that trading policy lost nearly 4% in the process of discard and draw.⁴²

⁴⁰ See Amos Tversky & Daniel Kahneman Judgment Under Uncertainty: Heuristics and Biases, 185 Sci. 1124 (1974). A classic example supposes there are 100 cabs in town, 85 green and 15 blue, and one of these hits a pedestrian and flees. A witness says the wayward cab is blue and we test his ability to recall colors correctly and find he does so 80% of the time. Based on this, what is the probability that he was right in the case of the hit-and-run? Most people choose 80%, a superficially attractive benchmark, but the right answer is 40%, a deeper function of a base rate. Being right 80% of the time means if the witness were shown, for example, 85 green cabs, he'd say 68 were green and 17 were blue; and if shown 15 blue cabs he'd say 12 were blue and the others green, making a total of 29 he says were blue when only 12 of these were in fact blue. So the probability of him being right when he says a cab he saw was blue is 12/29 or about 40%. See Amos Tversky & Daniel Kahneman, Evidential Impact of Base Rates, in Judgment Under Uncertainty: Heuristics and Biases 151, 156-58 (Daniel Kahneman, *et al.*, eds., 1982).

⁴¹ See Shiller, Irrational Exuberance, *supra*, at 144. A more complex variation on this example is the bank teller problem, where a story is told about a woman bank teller suggestive of her being a feminist. Then people were asked is she more likely to be (a) a bank teller or (b) a feminist bank teller. People leap to choose (b) on the strength of the feminist story imagery when this is clearly not the superior choice since (b) is a subset of (a) and, as with the example in the text, there are way more bank tellers in the world than there are feminist bank tellers. See Amos Tversky & Daniel Kahneman, Judgments of and by Representativeness, in Judgment Under Uncertainty: Heuristics and Biases 84, 92-93 (Daniel Kahneman, *et al.*, eds., 1982).

⁴² Odean, *supra*. The interplay of conservatism and representativeness can be seen in a standard experiment using the toss of a coin known to be loaded. The subject is told in advance that the coin is biased, having either a 70% chance of heads or a 70% chance of tails rather than an even chance of either. A rational actor would start off by assigning a 50-50 chance of in which direction—heads or tails—the coin

In between the oscillation from under- and over-reaction to news are periodic price swings that occur due to narrow framing of investment decisions. A narrow framing of risk-related decisions obscures the variability of risk that occurs when a series of related risky decisions are made as a whole than when a series of risky decisions are viewed in isolation. When, as is common, the relative risk of a series of gambles is lower than the sum of the risk of each of them, each particular bet should be made in the context of the whole.⁴³

Yet there is evidence that investors tend to take decisions, say on the stocks in their portfolio, one at a time.⁴⁴ It is a symptom of loss aversion noted earlier. People ask whether they should buy Dell, say, or sell IBM. Even assuming the underlying fundamental values of these stocks are identifiable, the answers may be different for different people, depending on what other investments she holds. They also may be different depending on the degree to which the individuals are loss averse. Failure to integrate these decisions by adopting a broad frame helps to explain the undue amount of both buying and selling of individual securities and hence to explain the substantial excessive price volatility of capital markets.⁴⁵

This model of investor behavior capturing conservative under-reaction and representative overreaction, mixed along with framing volatility and loss aversion, is supplemented by a few other cognitive biases that also seem to play a systematic role in price formation. First, there is a tendency of people who have chosen a voluntary course of action to resist evidence that it was ill-chosen. This *commitment* bias entails an unconscious shift in attitudes and beliefs to preserve consistency with the

is biased. As the coin is flipped and keeps coming up heads flip after flip, a Bayesian updating would call for successively altering the probabilities from 50-50 towards a greater likelihood for heads, but doing so in modulated increasing increments. Subjects in this experiment regularly miss the optimal Bayesian updating, and miss it in an asymmetrical way: at first acting conservatively (not updating the probability of a heads tilt enough, exhibiting under-reaction) but after seeing a few heads in a row acting representatively (updating too much and overestimating the probability of a tilt towards heads, exhibiting overreaction). See Shleifer, *Inefficient Markets*, *supra*, at 129-30.

This is the pattern seen in stock pricing behavior—under-reaction to discrete pieces of information side by side with overreaction to a series of information that looks like a pattern. *See infra*.

⁴³ This point is conceptually similar to that underlying modern portfolio's theory's (MPT) prescription to diversify. But the operational differences are dramatic, including principally that MPT calls for assembling a portfolio by reference to CAPM's measure of risk (a price-based measure which the EMH assumes is equal to value) rather than according to fundamental analysis of the business (a value-based measure which behavioral finance suggests may differ from price).

⁴⁴ Kanheman & Reipe, *supra*, at 61.

⁴⁵ Price volatility has a positive and a negative dimension, the former relating to changes in the underlying fundamentals and the latter to other things. Excessive price volatility refers to the amount of negative price volatility. Shiller, *Market Volatility*, *supra*.

original decision. It reinforces the conservatism or status quo bias in individual investors who have purchased a particular stock. It helps to explain why people cling to stocks whose fundamentals have obviously deteriorated.

Second, people tend to develop *self-serving beliefs*, making inferences from new data that enable them to see what they want to see in it. This bias reinforces both the under-reaction to news associated with conservatism and the overreaction to cumulated recurring news associated with representativeness. In each case, the bias skews results toward seeing small changes as of low relevance and a series of them as having great relevance.

Third, *overconfidence* bias is the pervasive tendency of people to think they know more than they do and otherwise to overrate their own abilities.⁴⁶ Common examples are that 80% of drivers think they are better drivers than average (most of them must be wrong) and despite a divorce rate of 50% newly married couples invariably believe they will not be among them (many of them must be wrong too).⁴⁷ For investors, overconfidence bias is the tendency to construe investing success as confirmation of their own abilities even where the results are not due to any particular research, insight or skill. It includes a tendency to underestimate the role that chance or luck played in the process and is often coupled with *commitment* and *self-serving beliefs* biases just noted.⁴⁸

Reinforcing these same effects is the *availability bias*. This describes the tendency of people to overweight events or circumstances that are at one's fingertips, as it were, including due to their being recent, or well-publicized, or traumatic, or vivid. Thus people think, wrongly, that car accidents and homicides are more common causes of death than diabetes or stomach cancer. In investing, this impressionistic behavior can contribute to trends and "hot stocks." If all the media talk is of the Internet, people start thinking the Internet is the place to be.

2. *Interplay*

The interplay of various cognitive biases shows patterns of price formation that are familiar. One

⁴⁶ Shiller, *Irrational Exuberance*, *supra*, at 142.

⁴⁷ Kahneman & Reipe, *supra*, at 54 (drivers); Lynn A. Baker & Robert E. Emery, *Why Every Relationship Is Above Average: Perceptions and Expectations of Divorce at the Time of Marriage*, 17 *Law & Hum. Behav.* 439 (1993). People also tend to believe that bad things (like ill health or divorce) are more likely to happen to other people than to themselves and good things (like staying healthy and married) are more likely to happen to themselves. *See* Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 *J. Pers. & Soc. Psych.* 806 (1980).

⁴⁸ Notably, these biases are asymmetric: positive events are seen as the product of one's skill and ability while negative ones are seen as due to external forces. This difference is seen less often in people who are more risk-seeking than risk averse. Kahneman & Reipe, *supra*, at 63.

commonly seen phenomenon in market pricing histories is the occurrence of short term trends followed by longer run trend reversals.⁴⁹ The short term trends are a product of under-reaction to individual bits of information not seen as significant, and described by the conservatism bias (the slow updating of beliefs in the face of information). The longer term reversals of those trends are a product of over-reaction to cumulated bits of information perceived as manifesting conspicuous patterns, and described by the representative heuristic.

These trends and reversals pose price-value deviations that are undesirable, even if not cataclysmic, for they distort the capital allocation process. Other combinations of these biases can have devastating effects. Overconfidence plus representativeness, for example, can lead to spectacular feedback loop bubbles in prices. Feedback loops describe a category of observed investment phenomena including instances of price momentum, where prices continue moving persistently in the same direction despite either no or opposite changes in fundamentals.

As prices drive upward, say, investors who recently bought those stocks see their judgment as being vindicated, form beliefs about their expertise and buy more. As the prices move yet higher, a pattern of price increase is detected. Overconfidence confirms what is seen, more buying ensues and other biases—commitment and self-serving beliefs—reinforce each other in an upward spiral, or bubble.

There are separate and external causes to the reinforcing cascades of overconfidence and representativeness. These include investors chasing trends or chasing each other. These loops can be fed by rumor, widespread publicity attendant to new technologies (say biotechnology stocks in the early 1990s or Internet stocks in the late 1990s), or other social forces that trigger the availability bias. They produce cascading chain reactions that reinforce each successive link. They are often accompanied by substantial numbers of new investors to the market, increases in the dollar amount of new funds and borrowed funds invested as well as increases in trading volume and price volatility.

Feedback loops also can result from technical trading strategies adopted by some investors (and sometimes followed by others), including stop-loss orders that automatically prompt selling on price declines and margin calls that result in the involuntary liquidation of all or part of a leveraged portfolio in a declining market. A conspicuous example of a feedback loop cause was the so-called portfolio insurance popular among institutional investors in the 1980s before the crash of 1987. It was a programmed trading directive that, much like a stop-loss order but on a vaster scale, commanded the selling of stocks as their prices fell. Cascade resulted—as the falling prices triggered the “insurance” sale, prices fell further in a downward spiral.

More generally, an entire class of investment phenomena rooted in the cognitive biases just discussed and called *extrapolative expectations* can set in, where price declines (or rises) lead to expectations of further price declines (or rises), which leads precisely to selling declines (or rises). Narrative histories of price bubbles throughout financial history show this pattern repeatedly.

⁴⁹ Shleifer, *Inefficient Markets*, *supra*, at 112 ff.

The price-value discrepancies this behavior creates is not eliminated by sophisticated traders, for several reasons. First, all people suffer from these biases, even sophisticated traders. Second, even those who do not so suffer cannot be sure they will escape the wrath of the biased errors. Third, securities do not have good substitutes that enable the kind of risk arbitrage that perfectly- or even substantially efficient markets require. Fourth, in these patterns it becomes a rational choice for arbitrageurs and other “smart money” to join the crowd rather than try to beat it. Far from stepping in to correct the mistakes of the noise trader, arbs in the ballooning of such bubbles can make more money by participating in the rise by buying on the way up—and hoping to sell before the fall down.⁵⁰ Accordingly, not only does investor sentiment drive the final nail into the EMH’s coffin, this “limited arbitrage” makes the funeral complete.⁵¹

All these phenomenon also point to a more general attribute of investors in public capital markets. They operate in these cognitive biases differently. Some display one more than another. Others can more easily recognize themselves as about to commit one and avoid it. When people operate under the conservatism or representativeness heuristic they do not do so in exactly the same ways. In short, people exhibit different preferences for what is otherwise the same thing, an observation in tension with the usual story of the EMH and the general story of rational choice theory.

The net results of these behavioral phenomena in financial economic thought are theoretical, empirical and psychological accounts showing that prices systematically deviate from values in stock market trading. The story of EMH turns out to be like a fairy tale in the sense that it would be wonderful if it were true. Wonderful because the equation of price and value promotes optimal asset allocation—the capital market resources of society are deployed in their most effective capacities.

Policies that tend to align the reality with the ideal are desirable. Recognizing justifiable skepticism that the ideal ever will be realized, a two part program is implied by behavioral finance—a part that promotes the aspirational tale, and a part that responds to the distance that remains between the reality and that goal.

⁵⁰ Shleifer, *Inefficient Markets*, *supra*, at xx. Both these aspects of the theory are necessary to negate the EMH, for if investor sentiment were not true then no price/value distortions would occur and if complete and unlimited arbitrage were possible then any distortions they created would be corrected and eliminated. Economic theorists at present exhibit a deeper and broader understanding of investor sentiment than they do of limited arbitrage though both are adequately theorized and documented to justify treating the EMH as overthrown. Nevertheless, these researchers caution that their modeling capability remains somewhat incomplete and subject to further refinement. *E.g.*, Shliefer, *Inefficient Markets*, *supra*.

⁵¹ On top of all this, the argument that the increase of institutional investors (smart money) will make the biases less rather than more significant is certainly misleading and possibly dangerous. The only clear primary consequence of such concentration is that decisions are made by a smaller number of people. The only clear secondary consequence is that their mistakes will be magnified. *See* Paul Gompers & Andrew Metrick, *How Are Large Institutions Different from Other Investors? Why Do These Differences Matter?*, Working paper, Harvard Business School and National Bureau of Economic Research.

II. Investor Governance

The ultimate quest of research in cognitive psychology of which behavioral finance is a part is a theory of decision making and a model of judgment. It follows the research methods and programs of psychological work in perception theory (concerned with optical illusions) and memory theory (concerned with mnemonic failure).⁵² That quest is facilitated by the discovery and documentation of cognitive biases, an understanding of how and why they are used, and consideration of when if at all they may be overcome. The resulting general theories can then be adapted for application in particular settings, such as the model of investor behavior presented in Part I for stock markets.

Concerning overcoming the biases, research considers first whether actors in particular settings or the social organizations of which they are part have already adapted to them in systematic ways. It is possible, for example, that law has implicitly identified and corrected for various cognitive biases in the judicial evolution of doctrine or the creation of regulatory frameworks.⁵³ In business firms, maybe the substantial reliance upon systems of internal control are designed to fight an intuitively perceived risk of self-serving bias or other cognitive errors.⁵⁴ While these are open subjects in broader inquiries and debates, in the case of stock markets the evidence shows that cognitive biases affect them and the effects persist uncorrected by other systemic adaptations (such as, say, smart money traders correcting the errors of the noise traders).⁵⁵

The open question at the top of the social science research agenda is whether it is even possible

⁵² See Jeffrey J. Rachlinski, The “New” Law and Psychology: A Reply to Critics, Skeptics, and Cautious Supporters, 85 Cornell L. Rev. 739, 751-52 (2000).

⁵³ See, e.g., Langevoort, Organized Illusions, *supra* (due diligence defense of third party professionals in securities fraud context justified as response to self-serving biases associated with officers and directors of SEC registrants); Rachlinski, Judging in Hindsight, *supra* (business judgment rule in corporate law justified as response to hindsight bias, discussed *infra*).

⁵⁴ See Melvin A. Eisenberg, The Board of Directors and Internal Control, 19 Cardozo L. Rev. 237 (1997).

⁵⁵ It might be nice if these biases would disappear on their own through a quasi-Darwinian process of weeding out the investors who suffer from them. But not only is there no guarantee that they will disappear, there isn't much reason to believe that they will. First, those who tend to lose money on investment under these biases continue to generate income, some of which could continue to be invested. Second, operating under these biases does not necessarily mean an investor will lose money in investing. Even an irrational or nonrational investment policy can sometimes turn out to generate profits in the end, though it could not have been rationally predicted that it would. The consequence remains the same, however, for price formation—prices and values separate except by sheer coincidence, and it is that separation that entails social costs.

to overcome these biases. Preliminary indications suggest that it is possible, at least to some extent.⁵⁶ The open question at the top of the legal scholarship agenda is whether it is desirable to employ law in the effort to overcome them. There are good reasons to be hesitant.

All these cognitive biases are heuristic strategies that operate at a subconscious level and carry some obviously powerful benefits. Conservatism performs the motivational role of stress reduction, enabling one to sift through avalanches of information with the comfort of relatively easily separating the important from the trivial or meaningless. The strategies are often accurate. After all, constancy is more common than change. Some biases enable the embrace of attitudes that spell success in life—the traits associated with overconfidence such as high self esteem, optimism, confidence, and perseverance, characterize highly successful people.⁵⁷

So maybe an investor is better off using these biases.⁵⁸ If investing is both a financial and an emotional enterprise, then as much attention should be given to selections that produce the desired financial results as to the selection that enables better emotional states. These objectives can entail trade offs,

⁵⁶ See Kahneman & Riepe, *supra*, at 52-53 (presenting strategies to overcome biases and heuristics but noting that they are often correctly called cognitive illusions for their similarity to optical illusions which also can be very difficult to overcome even after they are pointed out to you); Shiller, *Irrational Exuberance*, *supra*, at 142 (“People can sometimes be trained out of their overconfidence”); Jennifer Arlen, *The Future of Behavioral Economic Analysis of Law*, 51 *Vand. L. Rev.* 1765, 1768-69 (1998); Donald C. Langevoort, *Behavioral Theories of Judgment and Decision Making in Legal Scholarship: A Literature Review*, 51 *Vand. L. Rev.* 1499, 1521 (1998); Korobkin & Ulen, *supra* note xxx, at [21 of draft].

⁵⁷ *E.g.*, Lionel Tiger, *Optimism: The Biology of Hope* 203-05 (1979).

⁵⁸ With tongue only the slightest bit in cheek, devotees of behavioral finance developed an experiment to evaluate the exploit-ability of the recognition bias. It is a heuristic that enables a person to make a decision based on relative familiarity with the alternatives. In the case of the stock market, for example, it is a stock selection strategy based on the degree to which one recognizes a corporate name. The researchers asked finance/economics graduate students at the Universities of Chicago and Munich as well as randomly selected pedestrian nonprofessionals in those cities to indicate which companies they recognized from those listed on the New York and several German stock exchanges. The eight portfolios that could be assembled by arraying this information were tracked over a succeeding 6-month period (*e.g.*, foreign stocks most recognized by domestic professionals; domestic stocks least recognized by foreign professionals and so on). The result: German stocks most recognized by US nonprofessionals outperformed the market and all others. The intuition has a certain appeal: those companies with the greatest penetration in the random mind or consciousness of the untutored are most likely to enjoy that penetration carried over to their product, supply, labor and stock markets as well. See Bernhard Borges, *et al.*, *Can Ignorance Beat the Stock Market?*, in Gerd Gigerenzer & Peter M. Todd, *Simple Heuristics That Make Us Smart* (1999) 59.

exposing a tension between efficiency and happiness.⁵⁹ The optimal financial strategy defined in terms of rational choice theory may leave a person feeling uncomfortable. An optimal choice at the outset of a particular investment prospect can become sub-optimal if it produces emotions that lead to upsetting the original choice at the wrong time.

This does not necessarily mean that it would be wrong for investors to think about their cognitive biases nor that public policy should ignore them. All this proves is that any public policies that are intended to influence these behaviors should be highly conscious of their possible benefits and the associated costs of training people out of them. Accordingly, an obvious implication is that policies designed to educate investors about these phenomena are superior to building into legal rules incentives or disincentives towards behavior that exhibits less rather than greater cognitive bias.⁶⁰ It also means that such investor education must include not only tutelage in the principles of finance and their use as well as insights from behavioral finance, but also how these axioms may collide and what to do about that.

These points also lead to a broader preliminary conclusion. The insights of behavioral finance will be useful as a tool in evaluating a whole range of existing and potential future legal and policy positions in corporate and securities law. These would include rules governing investor-broker relationships, the timing and content of corporate disclosure, the manner of deciding issues of corporate finance, the proof a shareholder should be put to in alleging securities fraud, and so on, really the whole field of corporate and securities law. Examples of how the behavioral approach applies to such topics, and the limits of current doctrine that perspective uncovers, are given in the next sections in this Part, after consideration is given to the prior topic of investor education about behavioral finance.

A. Investor Education

Two questions are taken up in this section: the key lessons and possible remedial strategies that investor education programs should teach and how the lessons should be delivered. It starts with the question of delivery.

1. Delivery

A vast industry has emerged dedicated to investor education. It is composed of both private enterprises such as mutual funds, investment banking firms, and Internet investment sites as well as public

⁵⁹ See Rachlinski, The “New” Law and Psychology, *supra* note xx, at 751-52.

⁶⁰ These behaviors are unusual to law in the sense that they are not readily amenable to traditional legal tools such as prohibition or even deterrence. Enacting laws that require a certain response to the release of earnings announcements is silly. It may be possible, of course, to identify certain systemic symptoms of these behavioral biases, however, and enact laws to deter or even prohibit these. Examples include margin requirements and capital gains tax rates lower than ordinary rates. See *infra* text accompanying notes xx-yy for additional reasons why these devices are not highly desirable.

agencies such as the Securities and Exchange Commission (the SEC) and the Department of Labor (the DOL). These organizations all offer a wide variety of publications, seminars, and other materials that seek to educate investors about investment philosophy and strategies, types and risks of various investment products, and the environment of investing, including risks associated with financial fraud. The SEC has gathered much of this material together in what is presented as an integrated investor education program called the “Alliance for Investor Education.”⁶¹

This blossoming commitment to investor education arose in the past two decades in response to important historical and cultural forces. These include the Baby Boom generation’s maturation that will put pressure on Social Security programs to meet their retirement needs. It includes steadily expanding availability and flexibility of private self-directed retirement vehicles such as IRAs and 401(k) plans. Cultural factors include the characteristic sense in the US of individual responsibility and the market’s willingness to meet demands from consumers as well as public policy needs to address questions of resource allocation and savings rates necessary for collective prosperity and economic efficiency.

Despite the importance of these phenomena, legal scholars have paid only scant attention to the content or vehicles of investor education. In one of the few pieces to consider the subject at length, Professor Fanto⁶² calls on the private market—including families, schools and firms—to lead the way in the areas of savings and investing and recommends that regulators such as the SEC stick to lessons concerning financial fraud. He calls for the SEC therefore to redirect its educational efforts toward fraud education but away from its historical saving and investing education programs, which he claims simply do not measure up to those offered in the private sector.⁶³

There is no doubt that the private and public sectors have generated substantial educational capital for investors and that both have a role to play.⁶⁴ It is not so clear the best division of labor is as Fanto

⁶¹ Partners in this mission range from governmental engines such as the Departments of Labor and Justice and the Federal Trade Commission and Social Security Administration, to trade groups such as the Securities Industry Association, the American Association of Retired Persons (AARP) and the National Association of Securities Dealers and quasi-public bodies such as the New York Stock Exchange. See <<http://www.investoreducation.org>>.

⁶² James A. Fanto, *We’re All Capitalists Now: The Importance, Nature, Provision and Regulation of Investor Education*, 49 Case Wes. Res. L. Rev. 105 (1998).

⁶³ Fanto allows that the SEC could remain focused on encouraging saving and investing and encouraging the private market to promote investor education but otherwise calls for the SEC to create a conceptual framework project to provide a “sustained reflection on” the SEC’s role in the field. Fanto, *supra*.

⁶⁴ Part of the private sector that also has a role are corporate issuers of securities. This group too seldom believes it has such a role. They could easily do this on their Web sites, though registrants seem

prescribes. First, none of these delivery systems deals in any systematic way with behavioral finance.⁶⁵ It may be that the private sector simply lacks the interest in this kind of investor education. It is sophisticated. It is difficult. It is relatively newly developed. Most of all, these providers may prefer an investor that succumbs to many of these biases, for they lead to substantial trading activity (and therefore commissions), margin lending (and interest income), and even greater volumes of corporate deal making (and associated fees), all as discussed in Part II below.⁶⁶

Even were the private marketplace to be an effective provider of these lessons, there remains a public policy dimension to their delivery. Educated and psychologically astute investors will produce superior allocations of capital. This carries substantial social advantages. It is therefore a matter of important public policy concerning both savings and regulation of securities markets. Accordingly, some role for governmental engines remains, whether the SEC or other body.

Congress prescribed just such a role for the Department of Labor. In light of evidence of a declining national savings rate (it actually was negative in the latter part of 2000), Congress enacted the “SAVER Act” which imposed an express educational mandate on the DOL.⁶⁷ Its purpose was to advance

more often to use these vehicles as a public relations device to encourage demand for their securities. One of the rare companies that recognizes this role is Berkshire Hathaway and its Chairman, Warren E. Buffett. *See* Lawrence A. Cunningham, *The Essays of Warren Buffett: Lessons for Corporate America* (1997) [hereinafter, Cunningham, *Buffett Essays*] (including in documents Berkshire sent to shareholders an “Owner’s Manual” designed to educate Berkshire shareholders about management’s business and investment philosophy so that only those who share it would become Berkshire investors).

⁶⁵ Nor, for that matter, does Fanto, who endorses as a desirable component of an investor education curriculum the idea of developing separate mental and actual accounts for different financial purposes, such as placing funds to be saved in a savings account, calling these “behavioral ‘tricks’”, Fanto, *supra* at 129, when it is precisely these sorts of strategies that behavioral psychologists have identified as operating at the subconscious level and that sometimes impair rational choice making (though admittedly they also may sometimes help, *see supra* note xxx).

⁶⁶ An extreme but instructive example of the pitfalls of leaving investor education to the private sector is the proliferation of day trading firms in the late 1990s and early 2000s. These companies teach people how to trade electronically using tactics that purport to exploit minute-to-minute price changes during the course of a trading day. Advertising materials for these firms fraudulently touted the high profits and low risk associated with this absurd strategy. Regulators cracked down but not until after about 5% of aggregate market trading was being performed by these amateurs trained by unscrupulous hawkers. *See* U.S. Senate, *Day Trading: An Overview* (Hearing Before the Permanent Subcommittee on Governmental Affairs, 106th Cong., 1st Sess., Sept. 16, 1999).

⁶⁷ Savings Are Vital to Everyone’s Retirement Act of 1997, 29 U.S.C. §§ 1146-47 (Supp. 1997) (SAVERs Act).

the public's knowledge of savings and investment by requiring the DOL to gather and disseminate this knowledge, including by means of a permanent Web site and by requiring the President to hold periodic summits on the subject. This is what the SEC has been doing in more narrowly focused ways for some time.

Some of what Congress requires of the DOL was so mundane that it is easy to defend. For example, it requires the teaching of compound interest and the virtue of early savings to take advantage of it. But other topics are controversial and when mandated by Congress or the DOL, parochial. For example, the legislation compelled teaching the "importance" of "diversification" and "timing" in investing,⁶⁸ lessons also taught by the SEC, even though neither idea is free from controversy in the investment community.⁶⁹

Even if Congress was mistaken in over-specifying the content of investor education, it was certainly correct in allocating a public policy responsibility to the executive branch of the Federal government. By no means, however, should that cylinder be the only one hitting in the engine of investor education. A role remains for all the myriad sources of investor education—from family, to formal schooling, to industry professionals, as well as governmental leaders. All these sources must know, moreover, that while the traditional key topics need to be covered (the time value of money, risk and return, liquidity, diversification, indexing, specialized funds, tax matters, and asset allocation),⁷⁰ they also must include a component on investor psychology.

In designing such a component (as well as in thinking about the content and presentation of existing topics), consideration should also be given to developing a deeper philosophy of the educational program. At present, the SEC's Alliance for Investor Education is a hodgepodge of material culled from disparate sources lacking coherence and the panoply of products on the market evince no coordinated pedagogical philosophy or educational theory. Successful educational programs tend to be characterized by three attributes in the execution of their mission.⁷¹ The first and most obvious is the intrinsic function, learning for its own sake. This is the core of enlightenment, involving the transmission of knowledge and the skills to use it as edifying sensibilities. Its quintessence may be the vaunted notion of a good liberal arts undergraduate education. In the case of investor education, it is the complete picture—the traditional

⁶⁸ SAVERs Act, § 1146(c)(2)(E)-(F).

⁶⁹ See Cunningham, Buffett Essays, *supra* (identifying criticism by Warren Buffett and others of practice of both timing the market and portfolio diversification for its own sake). In the case of emphasizing "timing," moreover, the lesson can be downright counterproductive by encouraging pernicious practices such as day trading. See *supra* note xx; *infra* text accompanying notes xx-xx.

⁷⁰ *Id.*

⁷¹ For a wide ranging series of discussions of issues related to sound education policy, see *Improving the Environment for Learning: Academic Leaders Talk About What Works* (Janet Gail Donald & G. Erlandson, eds., 1997).

principles of finance already widely taught bolstered by the principles of behavioral finance.⁷²

The second function is the symbolic, the conferring of tangible recognition of the rewards of learning, as in granting diplomas, degrees and certificates, often accompanied by formal ceremony such as graduation or commencement exercises. The symbolic function creates both incentives and rewards for learning. In the case of investors, at present only those motivated by an independent desire to learn tend to participate, a problem of self selection. Tangible manifestations of achievement may be necessary to broaden the class. A starting point would include a certification component to the programs. Many of the private programs confer tangible evidence of completion, including the programs of several on-line investor education firms. Neither the SEC nor the DOL have done so, however, but they should.⁷³

The third characteristic of successful educational programs is the instrumental, entailing a distinctly functional value to the lessons in practical application. Examples are qualifications to enter the professions, such as law and medicine, to advance in the job market, and so on. The instrumental dimension of a sound investor education program would also be enhanced by such a certification program. At present, one theoretical instrumental advantage to investors of taking these programs is superior investing results and another is superior investor protection. Empirical evidence is lacking about whether these results occur. They are certainly desirable and could be enriched not only by a certification program, but by the following proposed expansion of the content of investor education programs.⁷⁴

2. Content

The content of investor training in behavioral finance should consist of exposition of the main biases associated with investing and some suggestions and strategies for evaluating their influence to enable a determination of their usefulness in particular settings. The precise shape of the program will vary according to the organization sponsoring it, the size of the audience, their demographic characteristics and other factors. Subject to that kind of detailing and refinement, the broad general outlines illustrating the highlights

⁷² On this dimension of education, see Mary Michael Spangler, *Aristotle on Teaching* (2000).

⁷³ In all cases of investor education, certification could follow the model embraced by such specialized human endeavors as scuba diving, aviation or even automobile driving. Each of these requires training to do well, though in no case is a mandatory course imposed on those who would pursue the activity. Yet in these and other skilled but amateur-filled fields, formal certification is given that carries not only educational satisfaction to the student but tangible advantages such as discounts on car insurance in the case of driver training and access to superior sites and swifter service in the case of scuba and aviation.

Investing is as specialized as these fields and yet except for the professional, there is no or limited formal training that leads to recognized certification.

⁷⁴ These could have instrumental benefits beyond improving investor behavior and performance, including enhancing the proprietor's own ability to evaluate its programming and improve its philosophical shape and substantive integrity.

of topics and approach follows.

The list of cognitive biases is long and seems only to get longer.⁷⁵ Not all these biases are relevant to the model of investor sentiment being discussed, nor are they all relevant in the same degree. As noted, some may even be desirable for other reasons. While all may be of some interest to investors and of benefit to at least some, a comprehensive and general program of investor education would stick to those that are most relevant to the model, contribute most to market inefficiencies, and do not otherwise offer their users substantial offsetting benefits.

Defined this way, the key cognitive biases that should be addressed by investor education programs boil down to three basic categories: (1) reference point related issues (including conservatism, excessive loss aversion and frame dependence); (2) probabilistic analysis issues (including representativeness and overconfidence); and (3) mental errors (brain functioning outside of one's awareness, principally anchoring, regret and addiction).⁷⁶ In each category, the lessons would consist of identifying and describing the set of biases and introducing steps that can be taken to reduce any adverse effects that adopting them may have.

Reference Point Related Issues. At the most general level, neutralizing the errors of cognitive bias relating to reference point issues calls for recognizing them. This requires first a simple introduction to them and how they can operate. To correct for them then requires some mechanism to spot them when they come up. Some are easier to recognize than others of course. Conservatism bias is probably easier to recognize in general terms than are problems of excessive loss aversion or framing dependence for example. Once investors are alert to watch for the conservatism bias—impaired or delayed responses to new information—they can begin to develop a habit of reflection and consideration upon receiving new information.

Excessive loss aversion in connection with holding the losers (the disposition effect) can best be addressed by combining three separate lessons. The first is to recognize that risk of loss is a major variable and factor in investment selection but that the relevant loss varies by reference point, only one of which is the price paid (others include year end price, losses that would have been realized on alternative opportunities and so on). Making a habit of noting the loss reference point is valuable.⁷⁷ Second, to counteract the disposition effect in particular, investors should be trained to think hard about non-investment examples where the clearly superior strategy was to “cut one's losses.”

Third, and more generally, investors should specify for themselves when they buy a security the

⁷⁵ Rachlinksy, *The “New” Law and Psychology*, *supra*, at 760 (organizing the seemingly bewildering array of cognitive biases that are relevant to law into these three categories).

⁷⁶ *Id.*

⁷⁷ *See* Kahneman & Riepe, *supra*, at 52-53.

circumstances under which they would sell it. These circumstances should relate principally to the fundamental characteristics of the business rather than to its stock price but could also include price. In any event, they should be clearly articulated to avoid inadvertently identifying a chance event (say the entire market breaks one day, sending the subject stock to nadir low prices).⁷⁸

The way to deal with frame dependence problems is to notice that decisions can be described in broader terms or narrower terms. A choice between two problems posed in terms of total wealth or in terms of gains or losses from the particular decisions that were to be made produces different selections despite having identical economics.⁷⁹ When the framing is done more narrowly, as in terms of gains or losses, the tendency is to select choices that can produce weaker (less profitable) positions. Accordingly, decisions and other questions concerning investment that can be put in broader frames should be—usually total wealth or the annual amount of income available from an annuity investment, say, rather than gains or losses.⁸⁰

Probabilistic Analysis Issues. The whole range of biases that are a function of limited cognition of probability (such as the representativeness heuristic and overconfidence) can best be addressed, obviously, by enhancing one's ability to judge probabilities accurately. Decision analysts prescribe doing so by thinking of uncertain variables in terms of confidence intervals. Take an example from Kahneman and Riepe:

What is your best estimate of the level of the Dow Jones one month from today? Next pick a high level, such that you are 99% sure (but not absolutely sure) that the Dow Jones a month from today will be lower than that. Now pick a low level, such that you are 99% sure (but no more) that the

⁷⁸ This was a common error of portfolio insurance strategies adopted by many major institutional investors in the late 1980s that contributed to accelerating the market crash of October 1987. See Cunningham, *From Random Walks to Chaotic Crashes*, *supra* note xx.

⁷⁹ An example is provided, *supra* note xx.

⁸⁰ Kahneman & Riepe, *supra*, at 57. Superior framing can also help to avoid excessive loss aversion. Emphasis should be given to the benefits of statistical aggregation—that is, betting less on the big risky chances and betting more on the smaller so-so risky deals and knowing that throughout the long series of decisions one will make over an investment life time, you will win some and you will lose some and what matters is not so much each one but all of them together.

A limiting point to consider in evaluating frame breadth, however, is what disciplinary value different people exact from narrow rather than broad frames. If a separate mental account for a child's collegiate savings enables a parent to allocate more to the account and leave it untouched than would be possible if those amounts were first applied to consumption (say buying a car), there may be reason to stick with that heuristic—better to have something for college than nothing all. But if a sufficient level of discipline can be used with a broader lens to allocate the same amount to that account in future periods, then more money will be available.

Dow Jones a month from today will be higher than that.⁸¹

Following the instructions, you state as having a 1% probability each that the Dow will exceed your high guess and fall short of your low guess. In statistical terms, you have set a 98% confidence interval of where the Dow will be. You may turn out to be correct (the actual Dow is within your confidence interval) or it may be higher (called a high surprise) or lower (called a low surprise).

People who are well calibrated in judgments of probability have a success rate of at least 98% (it is okay to be off 1% in each direction) but most people's success rate is more like 75-80%.⁸² Evidence shows that calibration rates can be improved by those who face similar problems daily, make explicitly probabilistic predictions in terms of confidence intervals, and get quick and accurate feedback on outcomes.⁸³ Including these lessons, and developing the prescribed habits, would be a prudent addition to investor education programs.

Mental Errors. Another general way people can be sensitized to their cognitive biases is through receiving feedback from decisions that reveal their presence. The good news in the case of stock market investors is this feedback is pervasive; the bad is that the feedback itself is not always easy to identify (is poor portfolio performance due to investor's misstatement of probability or just the plain unlucky happenstance of the improbable occurring?). Recognition of the most common and costly mental errors investors are prone to would go a long way to help investors avoid repeating them. A valuable component of a behavioral finance investor education would concentrate on introducing just a few of these.

First, one of the most powerful cognitive errors of judgment is the *hindsight bias*, a "tendency to think that one would have known actual events were coming before they happened, had one been present them or had reason to pay attention."⁸⁴ In terms of financial markets, the most persuasive, daily and multiplying evidence of the hindsight bias is in "market-wraps," financial news shows about the market after

⁸¹ Kahneman & Riepe, *supra*, at 53.

⁸² This is why when someone tells you "I am 99% sure," you should translate that as "75-80% sure."

⁸³ Kahneman & Riepe, *supra*.

⁸⁴ *Id.* A wonderful study described to a group a set of circumstances existing in an obscure battle between Britain and the Gurkas in Nepal in the 19th century. Four possible outcomes of the next stage in the battle were then noted as possible. Five sub-groups were created, four of which were each told that one of the four outcomes in fact happened and the fifth was not told which happened. Respondents were asked to gauge how likely they had thought each outcome was. The four informed groups responded disproportionately that the outcome they were told happened was most likely to happen. See Baruch Fishhoff, *Hindsight is Not Equal to Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. Exp. Psych. Hum. Perception & Perf. 288, 289-90 (1975).

it closes, and the daily press, all reporting on why the market moved the way it did earlier in the day or the day before. Such commentary as the “market moved sideways because investors were skittish about third quarter earnings reports of technology companies” suggests not only that it was possible for the speaker to gather such information but also that the market action was so reasonable that it could have been predicted before hand. But if the market could have been predicted in that way, then lots of people would have acted differently, and the actual market behavior that day would have differed too.⁸⁵ Investors consuming this daily diet should be forearmed with knowledge that it is an illusion.

Second, as the examples in Part I suggested, there is a substantial emotional aspect to investing, a conclusion made even clearer when you turn your attention away from the moments of decision and towards living with those decisions. The most striking emotion associated with the consequences of investment decisions is regret. Regret produced by uncertainty differs depending on whether a decision resulted in an affirmative action (“commission”) or a choice of not taking some action one considered (“omission”). Most people experience and understand regret to be greater over commissions more than over omissions.⁸⁶ Training to acquaint investors with this distinction would go a long way towards avoiding regret. Training to overcome such regret generally requires attention to its link to loss aversion. It calls for learning about one’s own loss averseness, gauging the slope of one’s value function (comparing the gain function to the loss function) and sticking with investments that meet one’s willingness to bear losses and

⁸⁵ See Kahneman & Reipe, *supra*, at 55.

⁸⁶ To see this, suppose that on January 1, 2000 Holder owns 1000 shares of Procter & Gamble (P&G) and Trader owns 1000 shares of Gillette. In January 2002, Trader decides to sell her Gillette and buy P&G and Holder considers selling his P&G and buying Gillette but ultimately decides not to. By January 2004, Gillette has performed very well compared to P&G so that if Trader had not made the switch she’d be better off by \$10,000 and if Holder had made the switch he’d be better off by \$10,000. In effect, these two are in the same position as each other, yet most people say Trader is likely to feel more regret.

There are two reasons. The broader one is that Trader made a stronger form of what looks like a mistake—a commission, consisting of a decision and an affirmative action. Holder made the weaker sin of omission, consisting of a decision, to be sure, but not any other affirmative action. The second reason is the difference between outright losses and mere opportunity cost. Outright losses are felt more acutely than missed opportunities. Kahneman & Reipe, *supra*, at 63.

Regret is also amplified by some of the cognitive errors catalogued above. The hindsight bias, for example, that leads an investor to believe he could have avoided a loss, exacerbates feelings of regret. Investors feel for not having seen the writing on the wall and acted to protect a bad result later on.

Also noteworthy is that of the minority of people who express greater regret over their omissions rather than commissions, a disproportionate percentage of them were also more risk seeking than average and among this group a disproportionate percentage assigned virtually no role at all to chance in the outcomes of their decisions, exhibiting an “illusion of control” that itself is a cognitive bias. *Id.*

thereby to minimize regret.⁸⁷

Third, the folk wisdom caution against the power of suggestion is called by social psychologists the problem of *anchoring*. This comes up in finance and related negotiations all the time and can be seen in a simple experiment. Two groups of accountants are asked about the relative incidence of fraud among major companies, one group whether they thought more than 10 of every 2000 companies had the problem and the other whether more than 200 of every 2000 had it. Not surprisingly, but certainly induced by the anchors contained in the question, when thereafter asked to estimate the number of companies having fraud problems the latter group responded with significantly higher guesses than the former.⁸⁸ For investors, anchoring can orient analysis towards the present or recent price of stocks and away from underlying values. Even among those who exercise independent judgment in estimating value using fundamental methods of analysis may be led toward a particular end of their range in light of present price data or price data recently examined.

Fourth and finally, a couple of more obviously dysfunctional limits are bad habits and addictions. Some trading decisions or activities are performed simply because one is used to doing it a particular way as a matter of repetition. In many contexts, such performance habits can be cost savers, as in taking the same route to work at the same hour of the morning, and thus amount to good habits. Rarely is this so in investing, with the possible exception of dividend reinvestment plans and except for the good habits of reflection and attention being discussed

Worse, however, are addictions, actions taken not simply as a product of ordinary repetition but as a product of powerful compulsions that coerce an action against an opposing rational sense that it is undesirable. Excessive drinking and eating fall into this category, as does any amount of smoking, and at least some forms and amounts of gambling, including all such activity that bears on the price formation process in public capital markets.

In the case of each of these phenomena, investor education would be substantially improved simply by covering the topics—pretty much as described here—as part of the course. More advanced courses or materials could amplify them further. Even this level of awareness of these mental shortcuts should enable an investor to evaluate intelligently whether using one or taking the long route is better when facing a particular decision.

Promoting the identify of stock prices and business values is socially desirable and may be aided through superior investor education programs that emphasize not just the basic principles of investing that

⁸⁷ See *infra* text accompanying notes xx-xx (considering this problem in the context of the broker-investor suitability rule).

⁸⁸ Edward E. Joyce & Gary C. Biddle, *Anchoring and Adjustment in Probabilistic Inference in Auditing*, 19 J. Acct. Res. 120, 122-23 (1981).

have been accepted for decades but also the role and significance of psychology that has been neglected until recently. This education will not eliminate all errors or their effects, however, so attention also must be paid to potential reforms in fields that most directly relate to investors and their behavior. Those fields are potentially very numerous, but let's start by tackling three of the most dramatic in terms of importance and immediacy: market regulation, corporate finance, and shareholder litigation.

B. Market Regulation

Investor education rather than investor regulation is probably the best way to respond to the increasing recognition of the substantial role that cognitive biases play in investor behavior. Nevertheless, the insights from behavioral finance do suggest a couple of areas where existing legal rules should be changed.

1. Local Educational Subvention: Suitability and Churning Rules

Brokers owe a general duty of fair dealing to their clients and a special duty of suitability in recommendations on investment decisions. These duties are defined principally by regulation of the NASD and other SROs,⁸⁹ as well as administrative and judicial interpretations.⁹⁰ The regulations and the interpretations all tend to define fair dealing and suitability solely in financial rather than psychological terms.⁹¹ Behavioral finance suggests, however, that while financial aspects of investing are obviously of

⁸⁹ The New York Stock Exchange has its own version of the suitability rule called a “know the customer rule”, NYSE Rule 405, *reprinted in* NYSE Guide (CCH) ¶2405 (1999), understood to impose a duty on the broker to insure that recommendations reasonably relate to the investor’s particular needs and situation. *See* Richard W. Jennings & Harold Marsh, Jr., *Securities Regulation* 643 (6th ed. 1987).

⁹⁰ Some states also have adopted fair dealing and suitability rules for brokers, but along lines substantially similar to those discussed in the text. *See* Joseph C. Long, *Blue Sky Law* § 7.07 (1998); Jerry W. Markham & Thomas Lee Hazen, *Broker-Dealer Operations Under Securities and Commodities Law* (1999). Liability for failure to comply with the principles underlying such rules has also been found under Section 10b(5) of the Exchange Act. *E.g.*, *Cruse v Equitable Securities of New York, Inc.*, 678 F Supp 1023, 1031-32 (S.D.N.Y. 1987); *Brown v E.F. Hutton Group, Inc.*, 991 F2d 1020, 1031 (2d Cir. 1993); *O'Connor v R.F. Lafferty & Co.*, 965 F2d 893, 897 (10th Cir.1992); *Miley v. Oppenheimer & Co.*, 637 F.2d 318 (5th Cir. 1981); *Clark v. John Lamula Investors, Inc.*, 583 F.2d 594 (2d Cir. 1978).

⁹¹ For example, NASD Rule 2310(a), the main suitability rule, provides: “In recommending to a customer the purchase, sale or exchange of any security, a member shall have reasonable grounds for believing that the recommendation is suitable for such customer upon the basis of the facts, if any, disclosed by such customer as to his *other security holdings and as to his financial situation and needs.*” NASD Rules of Fair Practice, Rule 2310(a), NASD Manual NASD (emphasis added). Most interpretations emphasize financial aspects. *E.g.*, *In re Application of Rangen*, 64 SEC Docket 628, Release No. 34-

great importance, there is a substantial place for psychological aspects that may differ. Accordingly, consideration should be given to broadening the concepts underlying the fair dealing and suitability requirements to include a psychological component.⁹²

As a practical matter, such a step would not differ all that much from what happens in most cases already. When an investor opens a brokerage account the broker is required to take reasonable steps to obtain information about the customer's financial and tax status and investment objectives, as well as other information that could be useful in making recommendations.⁹³ Brokers implement this requirement in part by including on new account forms lines to indicate data such as income and net worth and boxes to indicate investment objectives by categories such as income or growth.⁹⁴ The broker typically reviews this data with the customer in a conversation.

38486 (Apr. 8, 1997) (whether recommendation was consistent with "financial situation and needs"). Though psychological variables have not been a factor, sometimes among the financial aspects factors such as experience and complexity have been considered. *E.g.*, *In re David Allen*, NYSE Hearing Panel Decision 96-147 (Dec. 19, 1996) (suitability in terms of investment objectives, financial resources, and experience); *In re Application of Clyde J. Bruff*, 52 SEC Docket 1266, Release No. 34-31141, Fed. Sec. L. Rep. (CCH) ¶85,029 (Sept. 3, 1992) ("high degree of financial risk and complexity").

⁹² Legal scholarship concerning the suitability rule proliferated in relation to derivative securities and sophisticated investors during the 1990s but was otherwise not a richly plowed field, with a few notable exceptions: Robert N. Rapp *Rethinking Risky Investments for that Little Old Lady: A Realistic Role for Modern Portfolio Theory in Assessing Suitability Obligations of Stockbrokers*, 24 Ohio N.U.L. (1998); Donald C. Langevoort, *Selling Hope, Selling Risk: Some Lessons for Law from Behavioral Economics About Stockbrokers and Sophisticated Customers*, 84 Calif. L. Rev. 627 (1996); Seth C. Anderson & Donald Arthur Winslow, *Defining Suitability*, 81 Ky. L. J. 105 (1993). None of this work deals with the psychological portion of the suitability equation.

⁹³ NASD Rule 2310(b) provides that "Prior to the execution of a transaction recommended to a non-institutional customer, other than transactions with customers where investments are limited to money market mutual funds, a member shall make reasonable efforts to obtain information concerning: (1) the customer's financial status; (2) the customer's tax status; (3) the customer's investment objectives; and (4) such other information used or considered to be reasonable by such member or registered representative in making recommendations to the customer." NASD Rules of Fair Practice, Rule 2310(b), NASD Manual.

⁹⁴ The forms vary by firm, sometimes widely. *See* Anderson & Winslow, *supra* note xx, at 119 (reporting their survey of four firms calling, respectively, for: (1) prioritizing income, growth and speculation as "objectives" and reporting investment experience as none, low, moderate or high; (2) selecting appreciation with risk, speculation and income with safety, income with risk or tax reduction; (3) income, growth or total return as goals and aggressive, moderate or conservative in risk; and (4) prioritizing income, investment grade, capital gains, and speculative).

It would not be hard in such a meeting, or on the account form, to call attention to aspects of investor psychology in addition to investor financial condition. An applicant would check boxes according to investment objectives and also according to psychological profile. As with investment objectives, firms could choose which of various psychological factors seem most relevant to their understanding of what investments would be suitable for a particular client. Of all the biases and factors that one could possibly ask about, however, one's degree of loss aversion is striking for its relevance, reliability, and accessibility. Loss aversion relates directly to problems of regret (a universal characteristic of claimants in non-suitability cases), it is a good indicator of the sorts of securities that would or would not make the investor comfortable, and it is relatively easy to elicit by reflection or brief interview. It can be expressed in terms of one's value function, the degree to which the person differs in her weighting of gains versus losses.⁹⁵

These profiles would then be considered in relation to otherwise stated investment objectives. In some cases the two may have to be reconciled according to some trade offs. For example, an investor checking "speculation" as her objective and also indicating a steep gain:loss value function would clearly need to reconsider at least one of her choices. This could be done by the client at the outset or could be amended in the course of investment selection. In any event, the suitability of investment would be measured in terms of both financial objectives and psychological profile.⁹⁶

This is, after all, what people are usually worried about in thinking about the uncertainties of investment and is a major part of what they complain about afterwards when things don't turn out the way

⁹⁵ For example, behavioral finance explanations of the equity risk premium indicate that on average investors weight losses more heavily than gains by a factor of about 2.5, a good proxy for the normal value function. *See supra* text accompanying notes xx-xx. More loss averse investors would have higher value functions.

If this sounds at all fanciful, it should be noted that it is no more peculiar to ask an investor what her emotional orientation towards gain versus loss is than it is to ask her to specify her investment objectives in terms of categories such as income, investment grade, growth, or speculation. Indeed, these labels may have far less meaning than labels defined in terms of emotional states.

In principle and to avoid creating substantial administrative costs or burdens, it would not be necessary for the client to undergo any extensive diagnosis. It should be possible for a client to form her own judgments of her psychological profile based on the kind of training discussed above in connection with an investor education program. However, it is equally possible and certainly within the range of passing a cost-benefit test to call for the firm to evaluate a client using the kinds of behavioral testing and experimentation researchers in behavioral finance have used in developing the theories discussed in Part I.

⁹⁶ If EMH were true, suitability could be defined according to the linear relationship of risk specified by investor goals on the one hand and expected return from particular investment or type defined by CAPM on the other. *See Anderson & Winslow, Suitability, supra*, at 110-111. Such a linear relationship becomes irrelevant, however, once it is clear that EMH is not true, and particularly when a major reason it is not true is due to loss aversion and asymmetric value functions.

they had expected. The approach, therefore, would certainly change the sorts of investment recommendations that are made and decisions that result. The outcome, however, would reduce the frequency of good faith, after-the-fact, objections to broker advice and the incidence of formal disputes alleging violation of the suitability rules. From that point of view, this device should have the effect of protecting both the investor and the broker and at the same time promoting optimal capital allocations.

Defining suitability rules in both financial and psychological terms bears on the related set of broker-investor regulations concerning churning, excessive trading done in an account.⁹⁷ Brokers are not permitted to trade excessively in accounts in a manner that appears intended more to generate trading fees and commissions than to meet investment objectives of the client.

The commonest means of assessing whether trading is so excessive as to constitute churning is calculating the annual turnover rate for the account.⁹⁸ The rate is then compared to general baseline indicators of trading levels on a continuum between light, moderate, and excessive trading. The commonest metric is the so-called *2-4-6 rule*, that a rate over 2 indicates the possibility of churning; over 4 indicates a presumption of churning; and over 6 conclusively establishes churning.⁹⁹ Whether applying this rule or taking a less formulaic and more contextual approach, it is also common to evaluate the observed turnover rate in relation to the investment objectives. An account intended to engage in short-term price arbitrage would ordinarily have a much higher turnover rate than one intended to preserve capital and accumulate income.¹⁰⁰

⁹⁷ Exchange Act Rule 15c1-7, 17 C.F.R. § 240.15c1-7. Churning rules apply only to accounts over which a broker has control. A violation of the anti-churning rules may also be a violation of a broker's standards of conduct under Section 15(c)(1), 15 U.S.C. § 78e(c)(1), as well as Exchange Act Rule 10b(5). *E.g., Hecht v. Harris, Upham Co.*, 430 F.2d 1201 (9th Cir. 1970).

⁹⁸ The simplest computation divides the total dollar amount of purchases by the average monthly ending balance invested in securities.

⁹⁹ Some sophisticated techniques have been urged that apply portfolio theory to churning, an approach rooted in the EMH. *See Donald Arthur Winslow & Seth C. Anderson, A Model for Determining the Excessive Trading Element in Churning Claims*, 68 N.C. L. Rev. 327 (1990). These obviously do not work when EMH is false, particularly where the reasons it is false include psychological factors.

¹⁰⁰ Yet another approach is to compare the observed turnover ratio to the observed turnover rate of mutual funds pursuing comparable investment objectives. Winslow & Anderson, *supra*. Suppose the subject account's turnover rate is 4. You then compare this rate to the mean turnover rate of mutual funds adopting similar objectives (such as "growth and income") as their investment objective during a comparable period. Suppose this is 53 with a standard deviation of .55. This means that the subject account turnover rate exceeds the norm by 5.8 standard deviations. The likelihood that the actual rate exceeds that norm purely as a random matter is exceedingly slight, and that accounts operated in accordance with the investment objectives would exhibit that high level of turnover. Accordingly, a strong

But if we also recognize that substantial psychological forces are at work in the market in aggregate and in the case of individual investors, it may be most useful to compare particular levels of trading in an account not with market benchmarks but against the psychological profile of the investor developed during the suitability review. In other words, questions of churning would be related directly to questions of suitability, which in turn are keyed off not only investment objectives but also by psychological factors.¹⁰¹

Rules of thumb might still be useful, and could draw on the 2-4-6 rule, for example. The intuition behind that rule is sound in the sense that it furnishes a channeling directive for the inquiry ranging from dismissing a case at levels under 2 to granting summary judgment for the plaintiff at levels over 6 and a degree of evaluation in between. Once a psychological profile is included, the intuition would still hold though the calibration would differ.

Trading is risky but for an investor who identifies arbitrage as his investment “objective” and discloses a flat gain-loss value function, it would not seem unreasonable to raise the 2-4-6 scale up to as much as 5-8-11. At the opposite end of the scale, an investor seeking preservation of capital and disclosing an acutely steep gain-loss value function might be better served by a churning framework of 1-2-3. In short, courts otherwise content with adopting and applying the 2-4-6 rule or similar abstract formula, could vastly improve the accuracy of their analysis by adjusting the general standards for the particular suitability defined by each investor’s combined financial and psychological profile.

2. *Systemic Manifestations and Public Policy: Day Trading, Margin Trading and Panic*

These proposals to broaden the rules relating to suitability and churning to include psychological profiles can themselves be seen as an element of an investor education program, for the investor would be called upon to pause upon opening a new brokerage account to consider her emotional orientation towards investing. Neither sort of investor education program is likely to eliminate cognitive biases or their effects and it would probably not be desirable to do so in any event.

What may be tempting, then, is to consider stronger action to address systemic manifestations of the consequences of collective cognitive biases. These general manifestations include such episodes as the explosion of day trading in the late 1990s and early 2000s, obviously a product at least in part of overconfidence and representativeness biases on a mass scale. Day trading is the practice of buying and selling stocks during a single trading day with the goal and result of holding no stocks overnight. It is an

claim can be made on these numbers that this activity constituted churning. In evaluating churning claims by incorporating psychological profiles, comparisons to the mutual fund industry would not be workable except to the extent the psychological profile of the fund were known.

¹⁰¹ That nexus also appears in some of the cases, for some courts have held that a showing of non-suitability is an element of a churning case. See *Jennings & Marsh*, *supra* note xx, at 639-41. Other courts distinguish the offenses. *E.g.*, *Nesbit v. McNeil*, 896 F.2d 380 (9th Cir. 1990).

extraordinarily risky activity that became quite popular during the latter 1990s and early 2000s, suggesting that thousands of people (and maybe more) suffered from an inability to calculate probabilities accurately and other cognitive biases.

The mass appeal of this activity compelled at least the asking of the question whether public policy could do anything to stem it. The epidemic caught the attention of regulators, including the SEC which warned against it and the Senate which published a report about its hazards, along with statistical evidence showing how unlikely it is for a person to make money in the process. Neither the Congress nor the SEC took any additional formal action to ban day trading or even to discourage it. Nor could they.

There is no practical way for a regulation to forbid the actual practice of day trading. After all, at the level of practice it consists solely of effecting trades in an open market. What the regulators throughout the country could and did do is enforce existing laws against touters of day trading who engaged in false advertising and other deceptive trade practices to promote the activity.¹⁰² Indeed, it was precisely this kind of force in the market place that investor education programs emphasizing biases such as overconfidence would be intended to counteract. But outright banning of day trading was not seriously on the agenda.¹⁰³

This policy of persuasion may reduce the incidence of day trading, but educating people about the pitfalls of short-termism has always been a tough public policy battle concerning investment. Indeed the proliferation of day trading is an example of this commonly lamented characteristic of limited rationality in American equity markets. There has always seemed to be a relatively greater emphasis on the near term compared to the long term. This is so even though in stocks, the near term (today through the next couple of years) is riskier than the far term (five years and beyond) in that there is greater variability of returns to individual stocks, the percentage of losing time periods compared to winning time periods in the major indexes is greater, the volatility is greater, and so on.

Yet most (maybe almost all) people check and recheck their purchases and sales and rebalance their portfolios over the near term. This habit has only gotten worse over the past two decades, with the advent of the Quotron in the early 1980s that enabled people to stop by any branch brokerage office to check their quotes at lunchtime to the ubiquity of the Yahoo! Finance Internet site on people's desk tops in the late 1990s to check them every five minutes. Apart from costing substantial sums of money in transaction fees and taxes, this preference for the short term view both makes people see greater risks than there really are (which can translate into missing opportunities within their tolerance for risk, called *myopic*

¹⁰² See North American Securities Administrators Association, Report of the Day Trading Project Group: Findings and Recommendations (Aug. 9, 1999) (on file with author) (cataloguing enforcement examples).

¹⁰³ See Senate Report: Day Trading, *supra* note xx (testimony of SEC Chairman Arthur Levitt as well as remarks of Senator Collins expressly disclaim any intension to forbid day trading while also expressly condemning the practices of many of its promoters and characterizing the practice as a foolish high risk strategy).

loss aversion) and, shockingly, compound those risks by active trading over that shorter and riskier period (in effect, converting risks to reality!)¹⁰⁴ Yet proselytizing, and possibly some incremental tax policy, are about the only available public policy avenues to seek reorientation of this attitude and this is no less true of problems such as day trading.¹⁰⁵

Another symptom of the short term view that reveals additional plagues of many American traders is margin trading. It is the practice of borrowing funds from a broker with whom one holds an account in order to buy securities with the proceeds. It purports to exploit the leverage of lending but can have financially dire consequences when securities market prices turn downward.¹⁰⁶ In behavioral terms, excessive margin trading seems to be a product of overconfidence, at least when levels of debt compared to investment reached the proportions they did in the United States in the late 1990s and early 2000s.¹⁰⁷

¹⁰⁴ Kanheman & Riepe, *supra* note xx, at 62 (citing Benartzi & Thaler, *Myopic Loss Aversion*).

¹⁰⁵ Apart from tax policies such as lower capital gains taxes, a broader possible prescription would impose differential transaction taxes on purchases and sales of securities that occur in a single day. After all, it would be the rare day on which it is rational for an investor who decides in the morning that buying a share of IBM is a good idea in the afternoon to decide that it is not. Most underlying fundamentals do not change that quickly, nor do most news reports of such alteration disseminate in that short time period. Apart from ignoring that rare case that admittedly maybe should not be ignored, however, the larger problem with such a regulation is its inability to discriminate between day traders acting noisily and under cognitive biases from smart money traders such as arbitrageurs who notice price/value differentials that should be corrected. Discouraging such trades in one market may also exacerbate problems of mispricing on others, for it reduces the range of opportunities an arb has to hedge risks he takes in one market by offsetting positions in another.

¹⁰⁶ Suppose two brokerage clients. Mr. Conservative opens a regular account depositing \$5,000 and buys X Company's securities with that amount and Ms. Aggressive opens a margin account depositing \$5,000 cash and borrowing an additional \$5,000 to buy \$10,000 of X Company's securities on day one. A year later X Company's stock has doubled in price and both Conservative and Aggressive sell their shares. Conservative has yielded a 100% return while Aggressive yielded a 200% return (less interest on the margin loan). Suppose instead a year later X Company's stock has dropped in price by half and both our clients sell anyway. Conservative has lost 50% while Aggressive has lost 100% (plus interest on the margin loan). In light of the exploding volume of margin debt outstanding in the late 1990s and early 2000s, it seems doubtful that all investors who use margin accounts are aware of the downside potential.

¹⁰⁷ From 1996 to 1999, margin debt at on-line brokerage firms rose nearly five-fold and doubled among New York Stock Exchange member firms. During the decade of the 1990s, margin debt as a percentage of total consumer debt quadrupled from 4% to 16%. Yet many do not understand that margin loans are not like other consumer loans. Gretchen Morgenson, *Buying on Margin Becomes a Habit*, *The New York Times*, March 24, 2000. *See also* Gretchen Morgenson, *Stock-Trading Cheerleader Now Faces \$45 Million Debt*, *The New York Times*, April 19, 2000 (chronicling travail of promoter of margin and day trading when crash in high tech sectors of market led to margin calls against him).

That can help to foster market bubbles that not only push prices above values but also pose substantial risks of uncontrollable financial fall out and devastation once the bubble bursts.

This seems an easy context in which to justify regulatory intervention, not so much because of its effect on the stock market as such or investors individually, but because of the broader macroeconomic context of which it is a part. The volume of margin debt relates directly to the aggregate supply and cost of credit in the economy, and therefore has an important bearing on the level of domestic production and on price inflation. It was for this reason that Congress allocated the power to regulate margin lending not to the SEC, say, but to the Federal Reserve Board.¹⁰⁸

Indeed it was the Federal Reserve that first publicized concerns in the late 1990s about the effect of increasing levels of margin debt on the overall supply of credit in the economy. While individuals did not seem collectively to get the initial messages, the private market responded with some brokerage firms beginning to prohibit credit extensions for certain customers or for certain types of securities. Fed proselytizing and even regulatory tightening of its margin credit rules are apt responses to the problems of excessive margin borrowing.¹⁰⁹

Yet it remains true that no amount of proselytizing or Fed policymaking is going to change everyone to eliminate the systemic manifestations of cognitive biases. Nor would this necessarily be desirable, not only because of the ways that these biases may be beneficial to those exercising them but also because financial history and economic theory both strongly suggest that governmental efforts to control market

¹⁰⁸ The Federal Reserve's general regulatory powers relate to the money supply and interest rate (supply and cost of credit) in the economy with responsibility for monitoring whether and to what extent credit is being used for "the speculative carrying of or trading in securities, real estate, or commodities" and has power to regulate to minimize such speculative use of credit. The Fed exercises that power by limiting the amount holders of securities may borrow upon securities, set as a percentage of their current market value, a figure that has range from 45-60% and is currently at 50%. This regulation is an exercise in serving as a "stabilizing and corrective influence" against speculation for the broader economy. These limits apply only to the initial loan, and do not require adding collateral or reducing the loan amount (these limits are imposed by brokerage firms [and SROs?]). The rationale of the Fed's involvement is that while the broker is the nominal lender to the customer, the broker obtains the funds in turn from banks and changes in bank funds directly affect the bank's reserve position. Substantial increases in demand for margin credit can produce the same for bank debt and thus affect money rates. The Fed is thus able to restrict the use of bank funds for stock market speculation without restricting the volume of credit available for commercial and industrial needs or raising its cost.

¹⁰⁹ Regulation T governs credit extensions by securities brokers and dealers, including all members of national securities exchanges. Regulation T, Margin Credit Extended by Brokers and Dealers, CFR. These parties cannot extend credit to their customers except by loans secured by publically traded securities, mutual funds or certain foreign stock. At inception, the amount of the loan may not exceed the percentage of current market value permitted by the Fed from time to time.

activity through policies of price control or stabilization are doomed to fail. Alas, some lessons can only be learned the hard way: by experience.

That raises a final question in this section concerning manifestations of collective cognitive biases: market crashes and what, if anything, regulators should do about them. Market crashes are described quite well by the behavioral model outlined in Part I. They are preceded by a market bubble, driven by psychological forces such as overconfidence and reinforced by those such as representativeness. They are sparked by biases such as overreaction, which are reinforced by those such as hindsight bias and regret. In short, people get carried away on the way up and carried away on the way down.¹¹⁰

Should government step in on the way down?¹¹¹ Through the 1987 crash, the regulatory posture had mostly been to let the cards fall where they may. In October of that year, stocks steadily declined manifold and on a single day dropped by nearly 1/4. No regulatory mechanisms were triggered to halt the hemorrhaging. In the wake of the crash, the major national securities exchanges instituted circuit breakers to prevent panics. They trigger when specified price-level changes are reached and then impose a trading halt for a specified period of time—a cooling off period.¹¹²

¹¹⁰ See generally Frank Partnoy, *Why Markets Crash and What Law Can Do About It*, 61 U. Pitt. L. Rev. 741, 755-57 (2000) (summarizing this “cognitive error” theory of market crashes as proceeding differently in the details of various crashes but generally following a structure or pattern moving from an exogenous catalyst creating new profit opportunities, the expansion of credit to exploit those opportunities, euphoria at the resulting rise in financial asset prices and a consequent mania, a panic that things have gotten out of hand, and a crash that proves the point). Partnoy notes two weaker alternatives to the cognitive error theory of market crashes: (1) moral hazard problem created by financial guarantees in the economy ranging from deposit or securities insurance to probable governmental bailouts (weaker because the presence of these devices has reduced the incidence of crashes in the US) and (2) information asymmetry under which price-value discrepancies are caused by investors lacking sufficient information about value and can lead to market spirals by creating incentives for issuers and existing shareholders to keep negative information quiet (weaker because it draws on the theory of investor cognitive error). *Id.* at 757-62.

¹¹¹ Apart from the specific question posed in the text concerning whether law should step in when markets begin to crash, legal rules and social norms do play important roles in averting the bubbles that precede crashes and keeping the number of bubble-crash patterns to a minimum. Among the operative forces having this effect are legal rules that reinforce a culture of trust in markets, corporate governance rules that reduce the costs of the separation of ownership from control, rules that permit free markets to operate according to their own economic laws of supply and demand, and laws creating and governing the operation of lenders of last resort. These can all fail of course. The question is when they do, should law do anything more?

¹¹² Circuit breakers have triggered on various financial markets on many occasions since enacted.

The apparent concern of the circuit breakers is an absence of liquidity. They are, however, designed to bring buyers back to restore it. A major behavioral problem with circuit breakers is they can heighten fears and operate as a magnet to pull the market to the trigger level. They also draw in arbs and speculators who bet on whether the trigger will be hit, which can also become a self-fulfilling prophecy. Moreover, many forces other than relative liquidity affect trading volume and patterns, and therefore any market or regulatory mechanism addressing market crashes must be evaluated in the larger context of such other forces.¹¹³

These complexities are not well understood, the influence of psychological factors indeterminate, and the effects of the regulation themselves highly uncertain. Indeed, the architects of the trading halts did not see fit to draft rules that limit prices on their way up amid the speculative phase of the cycle, and rightly so. But if there is an insufficient economic policy basis to call for governmental control of the pricing during the speculative phase of the cycle, there remains an insufficient economic basis for doing so on the way down. Trading halts do not, in short, seem defensible as ways to deal with market inefficiencies. Better, again, to work with the indirect tools of proselytization and education rather than with the direct tools of price control and regulation.¹¹⁴

Prices should fall. If they have been driven to heights above values then a correction should follow. Any interfering with the fall is artificial. It replaces irrational fantasy for the heuristics and other cognitive limits that created the bubble. It is a form of price controls that are disproved repeatedly every time they are used. Prices are driven, constantly, to equilibrium, the point where supply meets demand, where

¹¹³ Another approach would be to respecify the circuit breakers according to structural market complexities described by chaos theory. See Cunningham, *From Random Walks, supra*, at 602.

¹¹⁴ Frank Partnoy has proposed eliminating circuit breakers and replacing them with a Federal Reserve as the stock buyer of last resort. Partnoy, *supra* note xx, at 802-03. His idea is if the market declined by a certain percentage the Fed would begin offering to buy S&P 500 contracts at 20% below the opening market price. He believes this would pose no moral hazard problem and the main behavior it would encourage is the diversification of portfolios and, on the brink of a panic, restore confidence, with investors safe in the knowledge that they stand to lose at most 20%. What if this does not calm people and selling pressure continues? Or it calms them today but they all come back again next, losing another 20%? It would only take a few episodes to wipe a lot of people out. And then the Federal government is a major shareholder of corporate America. Partnoy notes that in the event of a crash without this policy the Fed would nevertheless provide liquidity by purchasing government bonds on the open market. He argues that his proposal just enables the Fed to do directly what it would now do indirectly.

There is a big difference, however, between buying stock directly and repurchasing debt securities the Fed itself had functionally issued. US taxpayers would be funding this insurance program, Partnoy argues in its favor. But why should all taxpayers pay for the bail out of investors? Investors should know they are getting into a risky business; part of that risk is they join a giddy parade of excess; part of that experience should be to learn the lessons from such risk taking. Those opting not to participate in that game of risk should not be forced to shoulder the burden—or at least not pursuant to this automatic device.

marginal cost equals marginal benefit. It is bad enough when that equilibrium is forestalled by cognitive error. When the consequence of the error is a price level bubbling higher than the value base, it is compounding the error to stand in the way of its correction. And that goes not only for the abrupt arrest of the correction but also, though more weakly, for the gradual deflation of the bubble over time. Either way, artificial rather than merely natural forces are installed. Hard as it may be to correct or forfend the natural errors of cognitive bias, it is simply Frankensteinian tinkering to try to correct or forfend those natural errors with artificial devices.

C. Corporate Finance

Apart from better equipping investors to deal with behavioral realities through investor education, a substantial range of legal implications of market inefficiency remain. Lawyers and policy makers need not only to be aware of these, but also must recognize the extent to which the existing legal framework fails to deal with the issues they pose. These laws in the area of corporate finance relate to situations that fall into the three categories of raising, deploying, and distributing funds.

Most legal scholarship in these three areas considers cases where a transaction is made at a price different from value due to an issuer failing to disclose information that explains the difference.¹¹⁵ This scholarship seeks solutions that limit the ability of insiders to exploit such circumstances for personal profit.¹¹⁶ Left out of this literature are transactions effected at prices that differ from value simply because the market is not digesting disclosed information properly and without any motive of the insiders other than for the corporation to take advantage of an inefficient market for cheap financing. The following discussion centers on that situation in the three financing contexts.¹¹⁷

¹¹⁵ This can occur both when the information is material and unlawfully withheld or when it is not. *E.g.*, Donald C. Langevoort, *Rereading Cady, Roberts: The Ideology and Practice of Insider Trading Regulation*, 99 *Colum. L. Rev.* 1319, 1335 (1999).

¹¹⁶ *E.g.*, Mitu Gulati, *When Corporate Managers Fear a Good Thing Is Coming to an End: The Case of Interim Nondisclosure*, 46 *UCLA L. Rev.* 675 (1999); Jesse M. Fried, *Reducing the Profitability of Corporate Insider Trading Through Pretrading Disclosure*, 71 *S. Cal. L. Rev.* 303 (1998); Jesse M. Fried, *Insider Signaling and Insider Trading with Repurchase Tender Offers*, 67 *U. Chi. L. Rev.* 421 (2000).

¹¹⁷ Obviously when the context for discussion is the EMH and its limits these finance decisions relate only to corporations whose shares trade in public capital markets and does not generally address closely held and other non-public business organizations except to the extent that doctrines in one field inform those in the other and except to the extent that the issues discussed concerning raising funds bear on the transitional firm in the process of preparing for and consummating an initial public offering (IPO).

1. Raising Funds

If a stock market is not efficient, then a company's stock may be over- or under-priced compared to its intrinsic value. For a company with an existing class of public stock outstanding, a good time to issue new shares to raise funds is when the market is over-pricing that stock compared to value. If the stock is trading at \$5 but is only worth \$4, a company can "make" \$1 per share by selling new shares. Secondary securities offerings are often timed in precisely this way.¹¹⁸ A nice legal question arises: are directors who make such a decision to offer discharging their legal duties? (Note that this legal question does not arise in efficient markets, where the offering price is the correct value.)

Directors are discharging their state law fiduciary duties in such an over-priced offering to the extent that both the corporation is making money on the deal and this benefits at least the existing shareholder group. But for buyers in the offering, this is a bad bargain. While the directors at the time of the offering don't owe that group any fiduciary duty, they do owe them disclosure duties under Federal securities laws. Those laws require disclosure of all material facts. If it is known that the company is exploiting a market inefficiency and this is not disclosed, then this would constitute a violation.¹¹⁹

Directors thus face a conflict between duties owed to existing holders and duties owed to the buyers.¹²⁰ One way out of this conflict would be to observe that directors have no duty to effect the offering at all. Under the business judgment rule, a board would not be legally required by fiduciary duties to effect an offering.¹²¹ But there will be times when boards in such a circumstance nevertheless find it necessary or desirable to effect an offering. Once a decision to effect an offering were made, the price

¹¹⁸ Shleifer, *supra*, at, 187 (citing A. Brav, C. Geczy and Paul Gompers, Is the Abnormal Return Following Equity Issuances Anomalous, mimeo, Duke University (1999)); Tim Loughran and Jay R. Ritter, The Operating Performance of Firms Conducting Seasoned Equity Offerings, 52 J. Fin. 1823 (1997).

¹¹⁹ Securities Act of 1933, § 11; Securities Exchange Act of 1934, § 10b(5).

¹²⁰ This conundrum of clashing duties is not unique to corporate financing through public equity offerings. As others have noted, directors engaged in merger negotiations sometimes face a disclosure duty under Federal securities that would be inconsistent with fiduciary duties they owe their stockholders under state law. *E.g.*, Ian Ayres, Back to Basics: Regulating How Corporations Speak to the Market, 77 Va. L. Rev. 945 (1991); Marcel Kahan, Games, Lies and Securities Fraud, 67 N.Y.U. L. Rev. 750 (1992); Jonathan R. Macey & Geoffrey P. Miller, Good Finance, Bad Economics: An Analysis of the Fraud-on-the-Market Theory, 42 Stan. L. Rev. 1059 (1990). What is important is that whether the duties in this context are indeed in tension varies depending on whether the markets are efficient.

¹²¹ A credible argument *could* be made that the failure to exploit such pricing inefficiency is a dereliction of duty if not an actual breach. *See generally* Edward Adams & David Runkle, The Easy Case for Derivatives: Advocating a Corporate Fiduciary Duty to Use Derivatives, 41 Wm. & Mary L. Rev. 595 (2000).

would to some degree be subject to judicial scrutiny under state fiduciary law. On the low end, the price could not be set so low as to constitute waste of the corporation's assets.¹²² At the higher end, there is at least a credible theoretical argument that the board is required to get the highest price it can—including a price above value if the market is offering to pay it.

That theoretical argument recognizes that a decision to effect a secondary offering of securities is a decision to sell part of the company to the buyers. Decisions to sell the entire company require a board as a matter of fiduciary duty to get the highest value for shareholders reasonably available and subject a board to enhanced judicial scrutiny of their decisionmaking process.¹²³ The predicate of this enhanced scrutiny of director action in selling a company is some degree of self interest facing a director (his job is in some sense at stake when the company is on the block). But an analogous and maybe even more acute conflict faces directors in this situation: failure to disclose poses the risk of violating the Federal securities laws and, in extreme cases, being sent to jail.¹²⁴ As a result, the conflict between Federal and state law is particularly sharp, with the Federal consequences reinforcing their conflict with the state law.

Empirical evidence about how the conflict plays out in practice suggests that managers make these kinds of high-priced offerings all the time, exploiting the market inefficiency and in effect privileging state law fiduciary duties to get the best deal they can for their holders over disclosure duties suggesting they should disclose their views of market pricing.¹²⁵ That compliance with both duties is the rare case is

¹²² This also means, of course, that wholly apart from business reasons to avoid effecting offerings at prices lower than values, legal rules deter it too. In any event, though, waste is a difficult claim for a shareholder to sustain doctrinally, usually requiring meeting a burden not much different from the business judgment rule. *E.g.*, Franklin A. Gevurtz, *Corporation Law* (2000) 346. But even while a judicial presumption might exist in favor of upholding a transaction, the doctrine encompasses and justifies rescinding transactions in which the corporation did not receive “the equivalent to what it gave in the deal.” *Id.*

¹²³ *Revlon v. McAndrews & Forbes Holding Co.*, 506 A.2d 173 (Del. 1986); *Paramount Communications, Inc. v. QVC Network, Inc.*, 637 A.2d 345 (1994).

¹²⁴ It is a crime for any person to “willfully” violate any provision of the Federal securities law statutes or the rules and regulations promulgated thereunder and is also a crime for any person to “willfully” (and in the case of the Exchange Act, “knowingly”) make a false statement in a filing submitted to the SEC. *See Cox, Hillman, & Langevoort, Securities Regulation*, at 952.

¹²⁵ The evidence includes something even worse: that firms planning equity offerings, both secondary and initial, often massage their earnings to indicate growth trends that are mere figments of accounting imagination in violation of securities laws. S. W. Teoh, *et al.*, *Earnings Management and the Long Run Market Performance of Initial Public Offerings*, 53 *J. Fin.* 1935 (1998); S. W. Teoh, *et al.*, *Earnings Management and the Long Run Market Performance of Seasoned Equity Offerings*, 50 *J. Fin. Econ.* 63 (1998). Evidence shows such earnings smoothing in connection with stock options as well. *E.g.*,

suggested by the excitement and applause given to the managers of Berkshire Hathaway when they effected an offering of a new class of stock in a recapitalization of the company by saying, in effect, they were taking advantage of market mis-pricing. A conspicuous legend on page one of the prospectus for the offering included the following:

Warren Buffett, as Berkshire's Chairman, and Charles Munger, as Berkshire's Vice Chairman, want you to know the following (and urge you to ignore anyone telling you that these statements are "boilerplate" or unimportant):

1. Mr. Buffett and Mr. Munger believe that *Berkshire's Class A Common Stock is not undervalued at the market price stated above. Neither Mr. Buffett nor Mr. Munger would currently buy Berkshire shares at that price, nor would they recommend that their families or friends do so.*¹²⁶

Robert W. Holthausen, *et al.*, Annual Bonus Scheme and the Manipulation of Earnings, 19 J. Acct. & Econ. 29 (1995).

Evidence also shows that managers actively manage disclosure timing to maximize the value of their options, as by issuing negative news ahead of option grants and hence exercise price setting and positive news ahead of option exercise and hence values. *E.g.*, David Aboody & Ron Kasznick, CEO Stock Option Awards and Corporate Voluntary Disclosures (unpublished manuscript available on SSRN, Nov.1998). Notably, these disclosure management techniques are not likely to constitute violations of either the letter or the spirit of Federal securities or state fiduciary law. *See* Charles M. Yablon & Jennifer Hill, Timing Corporate Disclosures To Maximize Performance-Based Remuneration: A Case of Misaligned Incentives?, 35 Wake Forest L. Rev. 83 (2000). Instead, this practice constitutes a new variation on the old problem of agency costs, so that amelioration lies in ordinary tools of corporate governance such as board oversight and, especially, structuring option packages to avoid the enhanced risks posed by options paid at a single time (the "one big payday"). *Id.*

¹²⁶ Berkshire Hathaway Inc., Prospectus: Class B Common Stock (1996) (emphasis added). It continued as follows:

2. Berkshire's historical rate of growth in per-share book value is NOT indicative of possible future growth. Because of the large size of Berkshire's capital base (approximately \$17 billion at December 31, 1995), Berkshire's book value per share cannot increase in the future at a rate even close to its past rate.

3. In recent years the market price of Berkshire shares has increased at a rate exceeding the growth in per-share intrinsic value. Market overperformance of that kind cannot persist indefinitely. Inevitably, there will also occur periods of underperformance, perhaps substantial in degree.

4. Berkshire has attempted to assess the current demand for Class B shares and has tailored the size of this offering to fully satisfy that demand. Therefore, buyers hoping to capture quick profits

Berkshires's managers seemed to be discharging both duties—to get the highest price reasonably available for this partial sale of the company and to disclose to the buyers that this price was likely to be greater than the value they are getting. Experts and practitioners of corporate law and finance alike marveled at the candor in this step, suggesting at least anecdotally that the practice is not widely followed in corporate America and that, if markets really are inefficient, then there are real tensions being ignored between state corporate and Federal securities law.¹²⁷

If the conflict is real and the doctrine and practice suggest a privileging of state fiduciary duties over federal disclosure duties, the question is whether that is the correct hierarchy or should it be inverted (or, more extremely, should both duties simply be abolished). The source of the problem, as well as its cost, are price-value deviations. Accordingly, the rule of resolution should be the choice that most tends to close rather than to widen or ignore the gap.

Abolishing both duties risks sustaining the deviations, enabling management to take unbridled advantage of continuing deviations. Retaining or privileging the fiduciary rule would tend to produce buying pressure on the stock and thus to widen or sustain the gap, with price above value. Retaining or privileging the disclosure rule would tend to produce selling pressure and thus to widen or sustain the gap, with price below value. Retaining both should benefit from the tension in these cross-pressures and therefore tend to produce a price closer to value.

There can be no assurances, on the other hand, that disclosure or non-disclosure will induce such pressure, because of cognitive biases or otherwise. Indeed, compliance with both rules is also possible and

are almost certain to be disappointed. Shares should be purchased only by investors who expect to remain holders for many years

¹²⁷ See Robert W. Hamilton, *Reflections on the Pricing of Shares*, 19 *Cardozo L. Rev.* 493, 500-502 (1997). This paper was delivered at a live conference of several hundred experts, including Buffett and Munger. The latter commented after this paper as follows:

It is an interesting story. You can argue that it demonstrates an important principle of law: you don't want the judges running the prisons or the detailed operations of the corporations of America or whatnot, and yet you want certain standards of behavior that are so awful that you want judges or legislatures to intervene. Between that intervention point and the best possible behavior should be a big area, and you want a big area where it isn't illegal in the sense that courts will intervene, but where you allow room for a lot of behavior that's a lot better than the minimum standards. And I would argue that this prospectus was just an example of behavior that was better than the minimum standards of the civilization, and to the extent that anybody wants to make it an example for law students or anybody else, I encourage it.

Lawrence A. Cunningham, *Conversations from the Warren Buffett Symposium*, 19 *Cardozo L. Rev.* 719, 784-85 (1997).

at least in the case of the Berkshire Hathaway offering just mentioned investors fully subscribed the caution-accompanied issuance in any event. Thus management discharged both these duties, it generated all it sought from the financing, and there was no reason to believe that it had any immediate effect on the proper pricing of the shares. Even so, the evaluation of which of these two duties should be privileged when the two conflict—as well as evaluation of all other legal rules that bear on the regulation of such offerings—should be undertaken by considering the effects of those rules on the price-value relationship.¹²⁸

2. *Distributing Funds*

A corporation can distribute funds to equity holders either through the declaration and payment of dividends or by share repurchases. Both these decisions can be strongly influenced by the presence of market inefficiencies.¹²⁹

In the case of share buy backs, things are just the other way around when compared with stock offerings. That is, repurchases are desirable from the corporation's standpoint when the company's shares are priced in the market at levels below their values.

If a company's stock is trading at \$4 but it is really worth \$5, the company can at least close the gap between price and value and thus generate some improvement in real returns to investors by funds spent buying back stock.¹³⁰ But not all shareholders will be treated equally by such a move. First, the gain

¹²⁸ See Jonathan A. Shayne & Larry D. Soderquist, Inefficiency in the Market for Initial Public Offerings, 48 Vand. L. Rev. 965 (1995) (in the case of IPOs, securities law prescriptions to discourage or eliminate practices including stabilization, issuance of unduly positive research reports on recent IPOs, the syndicate penalty bid, and refusal to lend shares for short sales.).

¹²⁹ So can related decisions concerning stock splits.

¹³⁰ Note that determining the return of paying \$4 to repurchase stock worth \$5 is not as simple as determining the return of paying \$4 to expand a warehouse that will generate a return valued at \$5. The latter would generate a return of 25% (\$5 of value is created through the outlay of \$4, so \$4 of outlay landed \$1 of additional value and $1/4 = 25\%$). In the case of repurchasing one's own equity securities, however, no real investment is being made and the funds used to effect the repurchase are no longer in the corporation or working for the corporation. What will happen is the number of shares outstanding will fall and thus the remaining shares outstanding rise in value. Due to inefficient markets we cannot say that they will rise in price by a proportional amount, though share repurchases do seem to be taken by the market as signals that a share is underpriced and the result is usually a rise in price (though perhaps not proportionally and hence all that can be said is the price-value gap should narrow rather than disappear). Evidence shows that corporations do take advantage of these inefficiencies in precisely this manner and these effects. David Ikenberry *et al.*, Market Underreaction to Open Market Share Repurchases, 39 J. Fin. Econ. 181 (1995). It is unlawful for a corporation to raise the price of its shares through buy backs for the purpose of inducing new purchases. Exchange Act, §§ 9(a)(2), 10b(5). (None of this would be

in value from closing the price-value gap will accrue only to shareholders who continue to be shareholders after the repurchase. Those who sell in connection with the repurchase are selling at the price below value and not enjoying any of the benefit of the higher price that more closely reflects the higher value. Second, clear losers will be any shareholders who purchased that same stock within a short time earlier at a price above \$4.

Directors effecting a share repurchase in these price-below-value circumstances thus may discharge a duty to the corporation but in the process impair the interests of a shareholder or entire groups of shareholders.¹³¹ (Again, in efficient markets, this problem simply does not arise because price and value are the same and all are paying or receiving the same.)

This perspective exposes a major and usually hidden ambiguity in corporate law. Fiduciary duties are routinely said by courts and commentators to be owed by directors and officers to the “corporation.”¹³² That description is usually altered when the context requires it to the “corporation and its shareholders,” as when directors are negotiating a sale of the corporation.¹³³ While the splicing goes on to consider what comprises “the corporation”—employees, creditors, suppliers, communities and so on—no further distinction between the corporation on the one hand and the shareholders on the other is typically pursued.¹³⁴

There are cases where corporate law must choose between shareholder groups, such as between preferred and common holders or between majority and minority common holders.¹³⁵ But there are few

possible in efficient markets. In efficient markets, a corporate buy back may appear to increase demand and hence the price of its shares but it also reduces the corporation’s assets and earnings per share, creating downward price pressure that should offset the upward pressure exactly.)

¹³¹ In a corporate buy back from shareholders, a director’s duties under state corporate law and Federal securities law are not in conflict in the way they are in an offering to new shareholders, for a disclosure that says we are repurchasing shares we believe are undervalued is consistent with a corporate interest of allocating capital in ways that generate value to the corporation (*i.e.*, purchasing things at prices lower than values), though this does not mean a disappointed shareholder will not sue claiming breach of both these duties. See *Rochez Bros., Inc. v. Rhoades*, 491 F.2d 402 (3d Cir. 1973); *Staffin v. Greenberg*, 672 F.2d 1196 (3d Cir. 1982); *American Gen. Ins. Co. v. Equitable Gen. Corp.*, 493 F. Supp. 721 (E.D. Va. 1980).

¹³² *E.g.*, MBCA 8.30(a).

¹³³ *E.g.*, *Smith v. Van Gorkum*, et al.

¹³⁴ *E.g.*, Franklin A. Gevurtz, *Corporations* 304-305 (2000).

¹³⁵ In the context of freeze-out merger pricing, some have distinguished between shareholders who purchased at prices that theoretically reflected a discount for the risk of being frozen out (*e.g.*, at a time when a majority block existed) from those who purchased at price that did not reflect that discount (*e.g.*,

doctrinal areas where corporate law has managed to identify much less resolve the problem of shareholders—or, more precisely, one group of shareholders—versus the corporation. One answer would be to return to the standard statements and conclude that the corporation’s overall interests are privileged compared to the interests of any particular group, and there is some support for this in the special context of the selective defensive self-tender offer.¹³⁶ If so, then directors could choose to effect a buyback at a price lower than value without regard to whether some shareholders are hurt in the process.

But should this be corporate law’s response? A more precise response would be to call on managers to consider the impact of corporate decisions on particular shareholder groups. Most broadly, in capital allocation decisions such an approach would call for directors to make decisions based on shareholder-specific factors such as particular liquidity needs and tax brackets. Such an approach would be unwieldy to say the least, and is sufficient reason for the law’s unwillingness to impose such an arduous burden.

Yet there is a commonsensical appeal to affording the shareholders some protection of their idiosyncratic positions. In the context of repurchases this appeal could be satisfied by a device far simpler and efficacious than requiring directors to consider their infinite particularity. The device is to give each shareholder the direct voice in choosing whether or not to accept the repurchase. This is not far fetched.

At present there are two common and straightforward ways to effect share repurchases: in the open market or through formal tender offer. The chief substantive difference is that the tender offer route leaves it up to each shareholder whether to sell shares back to the company whereas in the open market route this decision rests entirely with the company’s board. A policy that promotes the use of the self-tender rather than the open market would promote the objective of lodging the power to decide in existing shareholders.

Oddly, the law does not presently do this. The chief regulatory difference between open market purchases and self tenders is the latter must comply with Section 13(e) of the Securities Exchange Act (as amended by the Williams Act) and Rule 13e-4 thereunder, including disclosure requirements. The regulatory scheme may have the intuitive appeal of imposing disclosure rules on offers where shareholders actually make a decision. Yet it is backwards as it imposes greater costs on adopting the approach that is superior for shareholders and that eliminates the problems inefficient markets create for this way of allocating corporate capital.

The current defense of this menu for managers is that there is also an implicit private ordering

at a time when no majority block existed). *Gevurtz, supra*, at 737.

Shareholders whose cashing out contributed value in the form of tax benefits to the corporation are entitled to no greater share of the value than are shareholders of the same class whose cashing out did not make such a contribution. *In the Matter of Cawley v. SCM Corp.*, 72 N.Y.2d 465 (1988).

¹³⁶ *E.g., Unocal, et al.*

solution to the surface dilemma that makes the problem dissolve. Managers sympathetic to the individual and tailored needs of shareholders can signal their sympathy by disclosing and following clear principles that guide their capital allocation decisions. A no dividend policy, for example, could be justified for a company with tremendous growth and investment opportunities available to it and could seek to attract investors in high tax brackets with no liquidity needs.

Even so, the practice and the results remain imperfect. The menu is prone to change and must adapt to meet new circumstances. An approach that avoids those problems of the *ex ante* perspective would simply be to lodge the particularized decisions impacting these holder-specific matters to the holders themselves. In the case of share repurchases, that simply means requiring that the directors adopt the form of the self-tender, where each holder decides to sell or not, rather than permitting open market purchases in a company's own stock.¹³⁷

As for managers actually signaling to shareholders certain traits and creating, in effect, a mall for them to shop in, there is no question that such managers exist and that many managers actually follow this sort of practice. Why they do so would be a mystery, were the EMH true, but obvious policy when it is not. The point can be drawn by turning attention to the other way managers can distribute funds to shareholders—dividends.

Dividend theory and policy have been a particular specialty of the EMH, mainly by virtue of some features of the so-called irrelevance hypothesis propounded by Modigliani and Miller.¹³⁸ It essentially says

¹³⁷ A special case concerns “greenmail,” share repurchases that leave some stockholders out while paying a price greater than either the prevailing market price or the actual value to a third party posing threats to the corporation such as unwanted acquisition overtures. The special case is omitted from this discussion, other than to say that cases reviewing director's discharge of fiduciary duty in paying greenmail that focus on the difference between the payment amount and the price are myopic. *E.g.*, *Heckmann v. Ahmanson*, 168 Cal. App. 3d 119, 214 Cal. Rptr. 177 (1985) (upholding injunction against shareholder alleged to have aided and abetted corporate directors' breach of fiduciary duty in greenmail transaction in part on grounds that shareholder “knew it was reselling its stock at a price considerably above market value”). The important inquiry is the difference between the payment amount and value.

¹³⁸ Modigliani and Miller make two major claims, one mentioned in the text and one other. The irrelevance thesis holds that the market value of a company is independent of capital structure. That is, when securities are correctly valued, based on cash flows, then the total market value of all a firm's securities will equal the present value of all its future profits. This means that any attempts by a company to use varying mixes of debt and equity to increase its market value would fail and are a waste of time. If the assumption of market efficiency is removed because markets are observed to be inefficient, then the thesis crumbles. The debt/equity mix becomes a potentially significant factor in market pricing because it can be used to create different sorts of cash flow streams that different sorts of investors may have stronger or weaker preferences for with resulting variations on market pricing. The Modigliani-Miller irrelevance thesis has been embraced routinely by legal academics but has not escaped criticism either. *E.g.*, William

that a firm's dividend policy (as to the timing or amount of payments) does not matter for the pricing or valuation of the company. The thesis depends on the accuracy of the assumption of efficient markets in the sense of prices constituting accurate valuations.

But under behavioral finance where this is not true, dividend policy starts to matter very much for pricing. That is, preferences for a particular design of cash flows may attract different sorts of investors to different securities that are otherwise identical in terms of intrinsic value (the present value of future cash flows). This means that dividends become a discretionary managerial tool that can be deployed to market the company's securities.¹³⁹

Stock differentiation by dividend design is also evidently widely practiced, as companies routinely maintain dividend payouts that are steady and tend to rise or if they are cut they are cut only gradually (even though underlying business conditions are far from steady, don't always grow, and often fall).¹⁴⁰ So it turns out that dividends do matter and can be used for a wide range of purposes.

This behavioral story of dividend policy does not necessarily mean that corporate law should begin to regulate them in any particular way.¹⁴¹ The theory of the second best still applies and there remain good reasons for judicial deference to directors concerning dividend policy, such as not having courts make decisions for businesses about whether to expand and to what extent. The behavioral story can even defend bolstering judicial deference, for when different shareholders place differing utilities on various income streams or their timing, it will be impossible for a board to please all shareholders, and just as impossible for a judge to do so.

W. Bratton, *Corporate Finance, Dividends, Noncontractability and Corporate Law*, 19 *Cardozo L. Rev.* 409 (1997); David G. Carlson, *Secured Lending as a Zero-Sum Game*, 19 *Cardozo L. Rev.* 1635 (1997).

¹³⁹ See J. Linter, *Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes*, 46 *Am. Econ. Rev.* 97 (1956).

¹⁴⁰ Plenty of companies whose earnings turn negative continue to pay out dividends according to historic rates. *E.g.*, Mattell after the fiasco of buying the Learning Channel led to substantial and sustained losses, the quarterly dividend checks kept being cut.

¹⁴¹ Beyond formal, manipulable and archaic legal capital rules, there are pretty much no legal restrictions on dividends or dividend policy. Hardly any judicial opinions ever have upheld a shareholder challenge to a corporate dividend policy, either in general or in particular circumstances, even where there was undoubted and objective grounds to show that the board's policy was simply stupid and economically irrational from the perspectives of both the company and the shareholders. *E.g.*, *Kamin v. American Express*, 383 N.Y.S.2d 807 (Sup. Ct.), *aff'd*, 387 N.Y.S.2d 993 App. Div. 1976); see also Elliott J. Weiss, *Teaching Accounting and Valuation in the Basic Course*, 19 *Cardozo L. Rev.* 679, 691 (1997) (calling board's decision "demonstrably foolish").

But to the extent judicial deference has rested on the implied view that market discipline was adequate to police directorial machinations in dividend policy, behavioral finance undermines it. It raises the possibility that corporate law's highly *laissez faire* view of director dividend decisions should be revisited. Doctrinally, this could mean as simple a thing as there being more ways that a particular dividend policy amount to bad faith under the standards set forth in cases such as *Dodge v. Ford Motor Co.*¹⁴² and *Smith v. Atlantic Properties, Inc.*¹⁴³ Though these close-corporation cases remain non-generalizable to the public corporation case with respect to the differing preferences of discrete shareholders, their rules about mixed motives or bad faith could be generalized and broadened to police director failure to consider these trade offs.¹⁴⁴

3. Deploying Funds

Funds not distributed to investors are available for deployment in investment. It is useful to distinguish between the general form of investment and investment effected by the acquisition of other existing businesses. In the case of such acquisitions, those chiefly affected by market inefficiencies involve acquisitions paid for in stock.

Take an example, supposing at the outset an efficient market.¹⁴⁵ Company A is selling at \$100 a share and Company B at \$80 a share, but putting them together as Company AB creates enough synergy to yield a trading price of \$102. Contrast two merger dynamics.¹⁴⁶

First: assume Company A offers an even one-for-one share-for-share exchange of A for B. B's

¹⁴² 170 N.W. 668 (Mich. 1919).

¹⁴³ 422 N.E.2d 798 (Mass. App. 1981).

¹⁴⁴ The logic of limiting share buybacks to self-tenders does not follow in considering dividend decisions for the latter are simply distributions with no offsetting reduction in outstanding shares. A functionally equivalent limitation on the discretion ordinarily given to director decisions would consider the extent to which consideration has been given to disparate interests and effects of board decisions on discrete shareholder groups.

¹⁴⁵ This example is drawn from an interchange that took place at a symposium featuring Warren Buffett's letters to Berkshire Hathaway shareholders. See Cunningham, *Conversations, supra*, at 749-753.

¹⁴⁶ By statute, stock swap statutory mergers always require board approval by each constituent corporation as well as shareholder approval of each, e.g., Del. Gen. Corp. L. § 251(c), except in the case of small-scale mergers, upstream or downstream mergers, and holding company mergers. See Dale A. Oesterle, *The Law of Mergers and Acquisitions*, 23-27 (1999). In some states (not including Delaware), the swap can be effected by a share exchange agreement under which the acquiring company's shareholders do not get to vote, but only so long as it is not issuing substantially dilutive new stock, e.g., MBCA §§ 11.04, 6.21(f), which is the minority of cases.

holders and its board are likely to respond favorably, on the grounds they are getting a share priced at \$100 for a share priced at \$80. A court under current law would scrutinize the B board's conduct and decision in this case but would almost certainly find it met its fiduciary duties.¹⁴⁷ No such enhanced scrutiny would apply under current law to A's board, even though it is paying such a premium or, more precisely, selling part of itself to combine B with A, at a \$2 per share profit.¹⁴⁸

Second: assume Company B offers the same one-for-one share-for-share exchange of B for A. A's holders and board are more likely to respond unfavorably, on the grounds they are giving up a share priced at \$100 for a share priced at \$80. A's board is now subject to enhanced judicial scrutiny of its actions, and may be found to have violated its duties if it accepts such a lower price. B's board this time has no such judicial scrutiny to fear.

The economics of the transactions are identical in terms of what the shareholders had versus what they end up with. Either way: A holders had A stock at \$100 and they end up with AB stock at \$102; B holders had B stock at \$80 and end up with AB stock at \$102. The forms of the transactions are quite different in terms of who is buyer and who seller and who is paying a premium or getting a discount. Why do the forms end up more important than the economics, as both a business matter in terms of the A board's response and as a legal matter in terms of which board is subject to enhanced judicial scrutiny?

If markets were purely efficient and the numbers in this hypothetical reflected actual values then the form should be subordinated to the economics. The boards should respond the same way and courts should apply the same level of review to each board's actions in both cases. Yet this is not so. Boards do respond differently and judges review them differently.

So suppose that markets are not efficient. If those numbers are not values but prices, then the different behavior and review starts to make sense. For example, it is possible that A's board believes its stock is overpriced at \$100 and that it is really worth only \$80. If so, the transactions end up being quite different. In case 1, A is not really paying a premium at all to get its shareholders stock worth \$102; in case 2, it is not receiving any premium for its contribution to the increase in value of AB.¹⁴⁹

¹⁴⁷ This would constitute a "sale" of the corporation calling for enhanced judicial scrutiny of the board's actions under the leading takeover cases noted above in discussing share offerings. *Revlon v. McAndrews & Forbes Holding Co.*, 506 A.2d 173 (Del. 1986); *Paramount Communications, Inc. v. QVC Network, Inc.*, 637 A.2d 345 (1994).

¹⁴⁸ This would not constitute a "sale" of the corporation triggering such scrutiny.

¹⁴⁹ These examples show difficulties that extend well beyond now-standard non-EMH critiques of particular legal practices. These critiques theorize that price formation is driven by the marginal buyer of shares (*i.e.*, those with the least optimistic expectations of the future). Other shareholders may value the shares at levels substantially higher than the prevailing price. This view of pricing leads to a series of critiques of typical legal responses to takeovers, such as that a bid exceeding market price constitutes a premium to the target's shareholders when all it really amounts to is a premium for the target's marginal

This story even suggests that the reasons for market inefficiency include those identified by behavioral finance. A's board may have different assessments of the price-value relationship of its stock depending on whether it is acting as the proposer or proposee in the exchange. And boards and judges evince greater concern about shareholders receiving too little than about their corporations paying too much.¹⁵⁰ These responses echo the endowment effect—shares being given up are seen as carrying greater value relative to shares being used as currency to acquire something else. More broadly, the contrast in these cases admit behavioral explanations of frame dependence combined with loss aversion.¹⁵¹

Whether one is the buyer or the seller does matter. Form matters. Markets do not produce divine answers to business and social problems. A role for courts remains. Courts should examine these situations differently because different perceptions and risks are at stake. Even if in theory the economics of the transactions are identical, in practice they are not.¹⁵²

The judicial response could ignore the cognitive differences and examine only the economics. The standard of director behavior would be identical in both cases. Or it could recognize, along with the directors, that characterizing or positioning one party as buyer and one as seller does make a difference, even if not as a matter of economics.

But under this approach judges would approach the review differently. Prevailing law suggests judges evaluate the economics of the transaction. This view suggests that economics alone is not the point, but perception and cognitive bias are also. A real conundrum opens up. Judges embrace the business judgment rule and other deferential standards based on what reasonable people do or would have done. In this setting, there is an admission that reason is muted, suffused with heuristics. The rhetoric of

shareholders. *See generally* Lynn A. Stout, Are Stock Markets Costly Casinos? Disagreement, Market Failure, and Securities Regulation, 81 Va. L. Rev. 611 (1995).

¹⁵⁰ This description is itself revealing—shareholders receive payment upon a takeover whereas corporations make the payment.

Buying other companies with stock when your stock is overpriced seems potentially value enhancing. One risk is that even if you use scrip trading at 5 that is worth 4, you may still be tempted to use it to buy something that is worth 3. Indeed, the problem of buyer overpayment, sometimes called the winner's curse, is exacerbated by overpriced stock with which to pay. The seller faces the opposite picture in a symmetrical way.

¹⁵¹ The example given above concerning the choice between two alternatives with identical financial outcomes but presented as requiring traversing two quite different paths is an example of the same phenomenon. *Supra* note xx.

¹⁵² The apt but blasphemous quip is the apocryphal academic lament that “It may work in practice, but it will never work in theory.” Which in turn brings to mind a (useful) theory of theories, which is that good theories have some practical applications.

reasonableness is discordant with the reality of the deference. It is deference to the cognitively biased, not to the reasonable prudent man. Or are these, after all, the same people?¹⁵³

The deployment of funds other than through corporate acquisition is less clearly affected by stock market inefficiencies. That is, the exploitation of timing and mispricing on the financing side doesn't imply anything about use of proceeds on the non-acquisition investment side. For example, a company could exploit an overpricing situation by effecting a secondary offering but then simply hoard the cash or it could exploit underpricing by effecting a share buyback but simultaneously cut its dividend level to keep net investable funds the same.

Important legal and policy questions nevertheless arise. First, should firms be required or encouraged to exploit market inefficiencies in these ways? But if so, what about any conflicting duties, such as disclosure obligations, they may impinge upon in doing these things? Second, even if firms should be allowed (let alone encouraged or required) to do these things, what effect should their doing so have on the real investment side of the equation? That is, should these financing tactics be exploited only so long as they have no effect on the substantive capital allocation decisions or should it be recognized that there will necessarily be such an effect.¹⁵⁴ Questions such as these extend far beyond the particularized relationship between directors/managers and shareholders. Solutions are only now being sought by economists who have been discarding EMH assumptions and trying to grapple with inefficiencies that drive corporate financing and possibly investment decisions. Much remains unclear in these pursuits.

One thing that is clear is that these decisions can have a bearing on the periodic booms and busts financial markets experience and that these in turn impact the markets for real assets from real estate to franchises.¹⁵⁵ Outstanding research issues include the precise shape and magnitude of the bearing and the desirability of the boom/bust cycle in both financial-asset and real-asset markets. In financial markets, for

¹⁵³ If courts pierced the form to get at the substance they would be overcoming framing and loss aversion biases. If directors and judges have acted according to those biases in the past, it is reasonable to suppose shareholders would too. If that is correct, then perhaps judges should simply reflect the biases that shareholders and directors share and permit director conduct that comports with that stand (even if it is a product of cognitive biases that do not comport with rational choice theory). On the other hand, if we recognize that these biases produce error judgements in terms of maximizing end states, judges when capable of doing so should penetrate them and prescribe results that comport with rational choice theory rather than behavior decision theory.

¹⁵⁴ See Shleifer, *Inefficient Markets*, *supra*.

¹⁵⁵ For example, a firm that constantly seeks to exploit market inefficiency by issuing overpriced securities may have to use some proceeds to invest in sub-optimal projects and this can create bubbles in real investment markets, as happened in various Florida land rushes and railroad development enterprises. See Shleifer, *Inefficient Markets*, *supra*, at 188-89.

example, though busts that follow booms can have devastating effects on people, businesses, and communities, the boom that preceded it often generates vastly greater wealth than is taken away even amidst the devastation.¹⁵⁶ Even so, distributive questions are unanswered and policy touchstones remain elusive for these macro social questions.¹⁵⁷

At present, therefore, all law and legal policy can do is focus on the relationship between management and shareholder (existing or prospective). Sticking to that legal knitting calls for keeping in force fiduciary and disclosure duties regulating share issuances that seem in tension; heightening judicial willingness to superintend director decisions concerning corporate distributions; and recognizing that cognition and perception, in addition to pure economics, play an important role in director decisions approving stock-for-stock mergers and acquisitions and judicial scrutiny thereof.

D. Litigation

This piece finishes up by considering two of the most striking areas where the EMH was expressly used in corporate and securities law, both relating to litigation. The first concerns the fraud on the market theory in stock-price drop securities fraud action lawsuits; the second concerns the stock market exception to the appraisal remedy otherwise available in cash out mergers and other cases.

1. Fraud on the Market

The fraud on the market theory is a legal doctrine that permits plaintiffs to maintain securities fraud class actions without the need to prove the reliance element of individual claimants essential to ordinary common law fraud claims.¹⁵⁸ The reliance element is presumed to be satisfied for claims about securities that trade in public capital markets on the theory that the alleged fraud was reflected in the price at which plaintiffs traded securities. In other words, fraud on the market theory assumes that certain types of markets are efficient in the sense described by the EMH.

The fraud on the market theory emerged in the Federal district and circuit courts in the late 1970s and early 1980s and was endorsed by a divided Supreme Court in *Basic v. Levinson*.¹⁵⁹ Thereafter,

¹⁵⁶ Bubbles can thus be socially desirable when they enable funding otherwise unfundable projects. That can produce substantial wealth, as Keynes suggested was the case in the 1920s market boom and as many say is the case in the 1990s-2000s market boom. *Id.*

¹⁵⁷ *See supra* text accompany notes xx-xx (end of Part I.C.2 on model of hazards interplay).

¹⁵⁸ This judicial innovation renders the 1934 Act's anti-fraud provisions more like those under the 1933 Act, Sections 11 and 12(a)(2) of which are strict liability statutes that dispense with the reliance requirement (as well as the scienter requirement).

¹⁵⁹ 485 U.S. 224 (1988).

hundreds of Federal cases regularly applied the doctrine as a matter of routine. The flow of securities fraud cases to Federal courts was interrupted for a few years, however, after the US Congress passed legislation in 1995 seeking to limit or eliminate class action strike suits in stock price drop cases where the fraud on the market theory had been used. This legislation put numerous restrictions on these suits, though it did not address the fraud on the market theory at all.¹⁶⁰

The new Congressional barriers seemed to have outweighed the benefits of the fraud on the market theory, however, for increasing numbers of these cases were afterwards brought in state courts but no state high court had embraced the fraud on the market theory.¹⁶¹ That unintended effect was stemmed with the passage, in 1998, of additional Federal legislation requiring that any securities fraud action brought on behalf of a class of more than 50 individual investors had to be brought in Federal rather than state court.¹⁶² Back the cases went to Federal court, and roaring back to vibrancy with them was the fraud on the market theory, on which this legislation again was silent.

In efficient markets, the fraud on the market theory is an obvious triumph of logic, law and policy. The price reflects everything, including fraudulent statements. Investors look to the price in making decisions and use it when they actually trade. So they rely on the statements when they trade, paying a fraudulently-inflated price when they buy and receiving a fraudulently-deflated price when they sell. But with inefficient markets, the theory crumbles. Investors may look at, even rely on, the price, but the price has no necessary connection to the statements at all. To continue to embrace the fraud on the market theory in the face of evidence of market inefficiencies is then to indulge in a fiction.

There is nothing inherently wrong with relying on a fiction but it is useful to be aware that is what is being done. Yet the tenacity with which Federal courts have held onto the fraud on the market theory without admitting that it is fiction does not reflect so much a devotion to the EMH as such but rather a recognition that the fraud on the market theory is a useful tool to solve administrative problems of securities fraud class actions. The main appeal of the fraud on the market theory is that in the securities fraud class action context, presuming reliance is virtually always necessary to enable a lawsuit to be certified as a class action. Without the presumption, factual issues open up that require intensive discovery and plaintiff-by-plaintiff inquiries concerning individual reliance that would often be punishing if not prohibitively

¹⁶⁰ Called the Private Securities Litigation Reform Act of 1995 (the PSLRA), the restrictions include staying discovery while any motion to dismiss is pending, raising the specificity in pleading fraud to allege a “strong inference” of fraud, and limiting damages to the difference between the plaintiff’s trading price and the securities’ mean trading price during the 90-days after the fraudulent statements were cured. *See generally* 15 U.S.C. §§ 78u-4 ff.

¹⁶¹ *See, e.g.*, Kaufman v. i-Stat Corp., 2000 N.J. LEXIS 993 (NJ 2000).

¹⁶² Securities Litigation Uniform Standards Act of 1998, Pub. L. No. 105-353, 112 Stat. 3227 (codified in scattered sections of 15 USC §§ 77-80).

expensive.¹⁶³

Even if the fraud on the market theory is a pragmatic solution to a real problem, however, when the firmaments of a legal theory are unsound as in the case of the EMH underlying the fraud-on-the-market theory, then it should either be recognized as a fictional tool rather than rearticulated as social science gospel or another tool more accurately rooted in fact should be developed to solve the problem without falsely championing bad social science. After all, evidence shows that the EMH is false, that prices do not always or even often reflect the material false statements or omissions registrants make. It also shows that investors do not always or even often respond to such information in rational ways but according to a whole set of cognitive biases that make presumptions of reliance on the statements through reliance on price farfetched.

Even the doctrinal bases of the theory are a bit farfetched. For example, a chief legal basis of the theory is its functional equivalence to the indirect reliance doctrine. The indirect reliance doctrine permits satisfaction of the reliance requirement in ordinary fraud cases by pointing to statements made not by the defendant directly but by his agent or others acting at its direction with the intention that the plaintiff should hear it and rely.¹⁶⁴ If the market functions as such as an agent or other person, then the fraud on the market theory is functionally equivalent to the indirect reliance doctrine.¹⁶⁵ Strange or strained as this analogy may at first seem, it carries some purchase if the markets are in fact efficient. If they are not efficient, however, then the unpaid fictitious agent of the defendant is acting outside the scope of its authority. The indirect reliance doctrine analogy breaks down.

The theory itself can be understood in ways that distance itself from the truth of the EMH, but these strategies do not fully succeed either. For example, one doctrinal strategy for defending the fraud on the market theory without indulging too much faith in the EMH recognizes that the theory does not excuse reliance but rather furnishes a rebuttable presumption of reliance. This works to permit defendants to show that plaintiffs did not rely on the statements, as by showing that the plaintiff would have traded the way he did even if he knew the statement was false or that the statements did not affect the price. It makes a place, in effect, to recognize non-efficient markets and even the insights of behavioral finance. This stance thus shifts the burden from the plaintiff to prove reliance to the defendant to prove its absence. Trouble is, if the rationale of excusing the former is the administrative difficulty of individual proof in a class action, the theory

¹⁶³ An innovative economic argument favoring fraud on the market theory's dispensing with the reliance requirement holds that risks of misrepresentation in securities fraud are greater than in transactions involving real goods and therefore securities fraud actions should create greater deterrence than the common law deceit action and reducing the reliance requirement is a reasonable way to do so. *See* Nicholas L. Georgakopoulos, *Frauds, Markets, and Fraud-on-the-Market: The Tortured Transition of Justifiable Reliance from Deceit to Securities Fraud*, 49 U. Miami L. Rev. 671 (1995).

¹⁶⁴ *See Kaufman v. i-Stat Corp.*, 2000 N.J. LEXIS 993 (NJ 2000).

¹⁶⁵ *See Basic v. Levinson*, 485 U.S. at 244 (calling the market the defendant's "unpaid agent").

does not eliminate this problem but merely puts it on the other party, making the doctrine suffer from the very problem it seeks to escape.

Beyond these doctrinal and theoretical problems, a better way to solve the administrative challenge would be to create or identify easily proven indicia of reliance. The SEC certification program mentioned earlier could be put to work in this effort. It would be reasonable to presume that those investors having taken the SEC investor program and earned its certification have been trained to think properly about the fundamentals of investing and of behavioral finance. That is, this group would reasonably be expected to listen to statements management makes and to act on it in ways that approach accordance with principles of rational choice theory (admitting that plenty of cognitive biases would persist).¹⁶⁶ This could be a superior basis for judicial presumptions of reliance by members of a putative class than the EMH.

Presuming reliance by investors who possess an SEC investor education certificate would entail a bit more administrative work by class action trial judges than at present, but not much more and certainly less than in a full blown reliance inquiry individual-by-individual.¹⁶⁷ It would formally suffer from under-inclusion and over-inclusion. Some without the certificate may have relied and some with it may not have. The under-inclusion problem can be cured by permitting uncertified claimants to prove reliance by traditional means. The over-inclusion problem cannot be cured, but there would be far fewer claimants in certified classes that did not rely than is the case under the fraud on the market theory as it stands. A substantial fiction may remain in this mechanism, but also far less than under the fraud on the market theory and at least we could start off admitting this indulgence.

2. *The Stock Market Exception to the Appraisal Remedy*

In certain corporate transactions, such as majority freeze-out mergers, a shareholder can dissent and require the corporation to pay her the fair value of her shares as determined by a judge in an appraisal proceeding. Appraisal proceedings are time-consuming and expensive and depend on judicial ability to appraise value reasonably competently. When the shares at issue trade on a reasonably well developed capital market, therefore, it may be tempting to turn to the market for a measure of valuation rather than to a judge. As a result of that view, many states have chosen to limit the availability of the appraisal remedy

¹⁶⁶ Of course, some who learn behavioral finance and the theory of cognitive biases may not follow such a path of fundamental analysis but instead seek to exploit such strategies as the recognition heuristic as short-cut. *See supra* note xxx.

¹⁶⁷ Assuming that class certification of a claim is desirable, the practical limitation on this device or any other is to avoid triggering administrative, discovery or other protracting steps concerning reliance issues. Thus neither putative class members nor defense counsel would be involved in this step. Rather, plaintiff lead counsel would simply generate the clearly eligible class list by comparing the broader potential class with a computerized record of SEC certified investors. That group would enjoy presumed reliance.

to situations in which there is no such reliable alternative market measure.¹⁶⁸

This legislative preference for the market over the courthouse is far from compelling.¹⁶⁹ Suppose a majority shareholder seeks to cash out a minority whose shares trade on an open market. Some minority shareholders object that the price is too low. They are told, if there is a liquid market for their shares, tough luck. Take the price offered or leave it. But why has the majority structured this cash out deal rather than simply buying the shares on the open market at the market price?

The majority could go on the open market and purchase shares and may have done so. Some members of the minority might be sellers and the majority could buy their shares. This pushes the market price up and that may even induce some more members of the minority to sell. But there may be hold outs among the minority unprepared to sell at the price to which the majority's purchases drive the market. Still the majority may wish to cash them out, but they don't want to go.

At this point, the only reason the majority is going to structure a cash out merger is it values the shares at a level higher than the market price and higher than the price at which it proposes the deal. Any minority shareholders who continue to refuse to sell at that price and hence seek to perfect appraisal rights are saying they value the shares at a level still higher than the price the majority is offering.¹⁷⁰ The minority may well be holding out for more on the grounds that they honestly and reasonably value their shares at more than the last willing minority seller did (even if this belief is a product of biases). The majority may also honestly and reasonably value them at more than that last seller too (hence the deal) but not as much as the minority (even if this belief is a product of opposite biases).

When this is the case, remitting a minority to the market price on squeeze-out day interferes with

¹⁶⁸ *E.g.*, New York Business Corporation Law § 910; Revised Model Business Corporation Act § 13.01 (1999). The RMBCA version of the stock market exception to the appraisal remedy applies when there is a liquid market for the target's shares and where the consideration being paid is either cash or shares that are also liquid. Nor does the exception apply to transactions in which managers of the target are part of the acquisition group.

¹⁶⁹ For one thing, the appraisal statutes typically do not simply call for valuing a company at fair market value, but rather "in its entirety as a going concern and then determining the fair value of the minority shares as a pro rata percentage of that value." *M.G. Bancorporation v. Le Beau*, 737 A.2d 513 (Del. 1999) (citing *Nebel v. Southwest Bancorp, Inc.*, 1995 Del. Ch. 80 (1995), which held that a banking firm's valuation opinion rendered to set the price in a short-firm merger was not legally proper because it had determined only the "fair market value" of the minority shares).

¹⁷⁰ The difference between price and value can be explained in part on the grounds that the marginal buyer is the one that sets the price in the market, *see supra* note xx, and in part on the grounds that the majority and minority, as well as other holders, exhibit different degrees of bias in their valuations, whether from overreaction, representativeness, overconfidence, or what have you.

capital allocations the parties would readily agree to. Instead of the majority buying in the open market at prices that increase as it buys, it enables the majority to use a single prevailing market price below both its and the minority's private valuations. It is of course possible that the minority could claim an inflated valuation, leading the majority to pay substantially more than a fair private valuation. But that is what appraisal proceedings are supposed to uncover that the market cannot, and an important judicial function remains even where subject shares trade in liquid markets.

As with the fraud on the market theory, the stock market exception to the appraisal remedy may be seen as a device intended not so much as a celebration of the EMH but as a pragmatic tool to solve a difficult problem in litigation. The typical appraisal proceeding involves a protracted dual between financial valuation experts who oppose one another not only in result but also in the proper model to use in even thinking about the case. The stock market exception may reflect legislative pragmatism to relieve judges from being at the center of the dual. If so, however, also as with the fraud on the market theory, there is a better way to go.

The judiciary could simply develop a rule for appraisal proceedings under which it will refrain from evaluating the internal details of each expert's model and refuse to develop an integrated model from the parts of the competing models that seem to make the most sense. Instead, the judge would simply choose one expert's model and valuation over the other's, period.¹⁷¹ This would have the effect of substantially contracting the litigation, contracting the range of valuations that the experts propose, and probably yield a valuation that more accurately reflects the subjective but honest valuations of both the majority and minority.¹⁷² Not only that, this kind of judicial horse sense would solve the administrative problem for all

¹⁷¹ Courts have the power and discretion to select one of the party's valuation models as its general framework or fashion its own. *M.G. Bancorporation v. Le Beau*, 737 A.2d 513 (1999).

¹⁷² This was the ingenious insight revealed by Chancellor Allen in *Cede & Co. v. Technicolor, Inc.*, C.A. No. 7129, slip op., 1990 WL 161084, *7-8 (Del. Ch. 1990) n.17, who put it far better:

“[In some appraisal proceedings, it is possible to develop] either a completely independent judicially created [discounted cash flow (DCF) valuation] or a pastiche composed of bits of one model and piece of the other. For good reasons aside from technical competence, one might be disinclined to do so. Simply to accept one experts' view or the other would have a significant institutional or precedential advantage. The DCF model typically can generate a wide range of estimates. In the world of real transactions (capital budgeting decisions for example) the hypothetical, future-oriented, nature of the model is not thought fatal to the DCF technique because those employing it typically have an intense personal interest in having the best estimates and assumptions used as inputs. In the litigation context use of the model does not have that built-in protection. On the contrary, particularly if the court will ultimately reject both parties DCF analysis and do its own, the incentive of the contending parties is to arrive at estimates of value that are at the outer margins of plausibility—that essentially define a bargaining range. If it is understood that the court will or is likely to accept the whole of one witnesses [sic] testimony or the other,

appraisal proceedings, not just those concerning shares that trade in liquid markets.

Conclusion

The efficient market hypothesis is a special case in finance. It explains only tiny fractions of observed phenomena. Perhaps its major contribution is a formal definition of an ideal market world, to which policy formulations may be directed and against which they can be measured. Indeed, it seems unlikely that the infirmities of market action ever will be so minuscule as to render the EMH more than a special case, though it may explain more in the future than it does now. However things evolve, during the evolutionary course the shackles of the EMH should be unloosed from corporate and investing culture.

Apart from that substantive conclusion, a word of methodological conclusion is in order on the particular place the foregoing analysis fits in the burgeoning legal literature drawing on behavioral social science. The genealogy of behavioral finance traces itself to branches of psychology and economics. Its great-grandparents on the psychology side were the behaviorists such as B. F. Skinner and on the economics side the financial economists such as Paul Samuelson. Its grandparents were both revolutionaries against those traditions: the cognitive revolution in psychology during the 1960s and the discovery of extensive anomalies in efficient market theory in the 1980s, both of which are concerned with human thought processes in a way their forebears were not. Behavioral decision theory emerged from cognitive psychology's study of human thought processes that raised substantial doubts about rational choice theory while noise theory emerged from financial economists who applied those insights to capital market phenomena. The result is behavioral finance, a marriage of cognitive psychology and the financial economics of market inefficiency.

Throughout this intellectual history legal scholars with a social science inclination have drawn on various strands of thought pioneered in these fields. At a general level, principles of psychology played a substantial role in theory and practice concerning the institution of the jury and the tools of economics were deployed in all aspects of law with such a distinctive style of analysis that the whole field was given its own name and so sweeping in scope that the name was "law and economics." As with many other intellectual endeavors borne in the social studies departments, legal scholars in a wide variety of fields are importing the work of the cognitive psychologists, principally behavioral decision theory (which they call BDT).

As with such large-scale importation that has taken place in the past, the leaders of this development have sought to ease the fears of the critics and skeptics (and implicitly guide the direction of its users). The present concerns of the lead importers center on the usefulness of BDT to legal scholarship and policymaking generally. A key concern is whether all it will do is furnish criticism of law and economics and fail to offer its own positive theories of law or normative prescriptions. If that is all it did, these lament,

incentives will be modified. While the incentives of the real world applications of the DCF model will not be replicated, at least the parties will have incentives to make their estimate of value appear most reasonable. This would tend to narrow the range of estimates, which would unquestionably be a benefit to the process.

“BDT risks devolving into a degenerate research agenda with no positive theories, as has been the fate of critical legal studies.”¹⁷³ Whatever power BDT has for legal scholarship in general and whatever its fate may be in a battle with principles of law and economics, this Article should leave no doubt that it furnishes a positive theory of market behavior quite different than that of efficiency (imported and promoted by some law and economics devotees) and that this theory carries with it substantial normative implications for law and legal policy in the fields of securities and corporate law.

¹⁷³ Rachlinski, The “New” Law and Psychology, *supra*, at 741.