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Are Stock Markets Costly Casinos? Disagreement, Market Failure, and Securities Regulation

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ARE STOCK MARKETS COSTLY CASINOS? DISAGREEMENT, MARKET FAILURE, AND SECURITIES REGULATION

*Lynn A. Stout**

INTRODUCTION	613
I. A HETEROGENEOUS EXPECTATIONS MODEL OF STOCK TRADING.....	620
A. <i>The Puzzle of Speculative Stock Trading</i>	622
B. <i>A Simple Model of Heterogeneous Expectations and HE Trading in a World of Imperfect Information</i> ...	625
C. <i>Potential Deterrents to HE Trading: The Roles of Self-Selection and Successive Generations in Fostering Speculative Markets</i>	635
1. <i>Optimistic Self-Selection and the Lake Wobegon Market</i>	636

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2.	<i>A Longitudinal Model of HE Trading: Darwin Meets Barnum</i>	637
D.	<i>The Role of Financial Intermediaries in Encouraging HE Trading</i>	641
1.	<i>The Role of Brokers</i>	641
2.	<i>The Role of Institutional Investment Funds</i>	643
E.	<i>HE Theory and the Relationship Between Stock Prices and Fundamental Values in an Efficient Market</i>	646
1.	<i>The Rise (and Fall?) of Conventional Efficient Markets Theory</i>	646
2.	<i>Modifying Conventional Efficient Markets Theory To Account for Heterogeneous Expectations</i>	651
II.	ARE U.S. STOCK MARKETS HETEROGENEOUS EXPECTATIONS MARKETS?	656
A.	<i>Nonmistaken Reasons for Trading and the Value-Adding Model of Stock Markets</i>	657
B.	<i>The Value-Adding Model Versus the HE Model: Some Evidence on Why Investors Trade</i>	659
1.	<i>The Predominance of Active Institutional Management</i>	661
2.	<i>Trading Volume and Patterns</i>	665
III.	THE POLICY IMPLICATIONS OF THE HETEROGENEOUS EXPECTATIONS MODEL FOR FEDERAL SECURITIES REGULATION	667
A.	<i>The Social Costs of HE Trading</i>	669
1.	<i>Welfare Losses Resulting From HE Traders' Mistaken Investment in Active Portfolio Management</i>	670
2.	<i>Welfare Losses From HE Trading's Distortive Effects on Stock Prices</i>	677
B.	<i>The Social Benefits of HE Trading</i>	682
1.	<i>HE Trading and Market Liquidity</i>	683
2.	<i>HE Trading and The Fundamental Value Efficiency of the Market</i>	688
C.	<i>Reducing Welfare Losses from HE Trading: Some Policy Implications</i>	691

1. Reducing Welfare Losses From HE Trading Through Rules That Reduce the Dispersion of Investor Expectations	693
2. Reducing Welfare Losses From HE Trading Through Rules That Decrease the Costs of Speculative Trading	697
3. Reducing Welfare Losses From HE Trading by Taxing or Prohibiting Trading	699
D. Some Thoughts on the HE Theory's Applicability to Other Speculative Markets, Especially Derivatives Markets	703
IV. CONCLUSION	710

INTRODUCTION

THE U.S. stock market is one of the largest markets in the world. In 1992, over *three trillion dollars* in shares changed hands on the exchanges and in the over-the-counter ("OTC") market,¹ almost twice as much as consumer spending on durable and nondurable goods combined.² Trading on such a gargantuan scale costs investors \$100 billion or more annually.³ Despite these costs, trading volume on the exchanges and in the OTC market has quadrupled over the past decade.⁴ Moreover, investors no longer are content to trade just stocks; they now trade stock "derivatives," complex financial instruments whose values depend on the prices of publicly traded equities.⁵

¹ National Ass'n of Securities Dealers, 1993 Nasdaq Fact Book & Company Directory 7 (1993) (stating that in 1992 \$1.75 trillion traded on New York Stock Exchange and \$1.31 trillion traded on regional exchanges and in OTC market).

² See Bureau of the Census, U.S. Dep't of Commerce, Statistical Abstract of the United States 1993, at 442 tbl. 690 (113th ed. 1993) [hereinafter 1993 Statistical Abstract] (charting the \$480.4 billion and \$1290.7 billion spent on durables and nondurables, respectively, in 1992).

³ See *infra* notes 191-207 and accompanying text (noting that mutual funds' expense ratios suggest investors spend at least \$100 billion annually researching, managing, and trading stock portfolios).

⁴ See National Ass'n of Securities Dealers, *supra* note 1, at 6 (noting that NASDAQ annual dollar volume rose from \$84 billion in 1982 to \$891 billion in 1992); 1993 Statistical Abstract, *supra* note 2, at 522 tbl. 829 (noting that dollar volume on all exchanges rose from \$476 billion in 1980 to \$1612 billion in 1990).

⁵ See *infra* notes 313-25 and accompanying text (describing aspects of derivatives trading).

Why do traders trade? A common assumption is that equities trading serves both buyers' and sellers' self-interest, as well as the interest of the larger society.⁶ In the tradition of classical economics, exchange between rational actors is equated with mutual benefit and a corresponding increase in social welfare.⁷ Thus, scholars and regulators believe that more stock trading is better than less, that increasing opportunities to trade stocks is desirable, and that lowering trading costs, including regulatory costs, is an important policy goal.⁸ Congress and the Securities and Exchange Commis-

⁶ The securities literature often assumes that stock trades are mutually beneficial. See, e.g., Thomas Lee Hazen, *Rational Investments, Speculation, or Gambling?—Derivative Securities and Financial Futures and Their Effect on the Underlying Capital Markets*, 86 Nw. U. L. Rev. 987 (1992) (suggesting that securities regulation is premised on the view that government should not interfere with investment decisions); Donald W. Kiefer, *The Security Transactions Tax: An Overview of the Issues*, 48 Tax Notes 885, 896 (1990) (arguing against tax that discourages trading as cutting against economic assumption that activity is valuable if participants are willing to pay for it); Donald C. Langevoort, *Information Technology and the Structure of Securities Regulation*, 98 Harv. L. Rev. 747, 803 (1985) (noting that information technology that lowers trading costs benefits investors); Robert W. Vishny, *Three Comments on Economic Implications of Alternative Portfolio Policies of Institutional Investors*, in *Institutional Investing: Challenges and Responsibilities of the 21st Century* 159, 165-66 (Arnold W. Sametz ed., 1991) (defending stock trading as activity of "consenting adults"); see also Division of Mkt. Regulation, SEC, *Market 2000: An Examination of Current Equity Market Developments 1* (1994) [hereinafter *Market 2000 Report*] (praising U.S. stock markets for "[r]ecord amounts of trading activity").

In addition to its presumed benefits to trading parties, stock trading also is believed to provide significant social benefits by contributing to the "liquidity" and "efficiency" of the market. See *infra* notes 234-239, 257-258 and accompanying text.

Only a handful of scholars have suggested that stock trading is not socially valuable. See *infra* note 10.

⁷ See Richard A. Posner, *Economic Analysis of Law* 10-11 (4th ed. 1992) (stating that a basic principle of economics is that voluntary exchange is efficient because it helps move resources to those who value them most highly, as measured by willingness to pay). The classic statement of this proposition is, of course, Adam Smith's discussion of the "invisible hand." See Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* 456 (R.H. Campbell & A.S. Skinner eds., 1976) (1776).

⁸ For example, the assumption that stock trading is beneficial has played a large role in recent debates over proposals to reinstate a federal stock transfer tax. See, e.g., G. William Schwert & Paul J. Seguin, *Securities Transaction Taxes: An Overview of Costs, Benefits and Unresolved Questions 1* (1993) (stating that decreasing trading reduces market efficiency and liquidity and drives trading overseas); Kiefer, *supra* note 6, at 896 (arguing against tax aimed at discouraging stock trading); Myron S. Scholes, *Tax Treatment of Short-Term Trading*, in *Institutional Investing: Challenges and Responsibilities of the 21st Century*, *supra* note 6, at 150, 155-56 (arguing that a stock transaction tax is undesirable because it will "reduce demand for trading" and that tax policy should not discourage stock trading but should "be directed at increasing the supply of transaction services").

sion ("SEC") praise stock markets as paragons of efficiency to be protected and promoted.⁹

This Article explores an alternative view of stock trading.¹⁰ Using rational choice analysis and information theory, it presents a

The assumption that trading is beneficial also underlies federal authorities' reluctance to regulate the emerging market for equities derivatives. See, e.g., Division of Mkt. Regulation, SEC, *The Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986*, at 17 (1987) (arguing that trading in stock index options and futures offers "significant benefits to today's capital markets" by adding liquidity and efficiency to equity markets and allowing investors to control the risk of their portfolios); Hazen, *supra* note 6, at 988, 1021 (noting that current regulatory policy, which is based on a model of rational and socially beneficial trading, has sanctioned and encouraged proliferation of derivative investments); see also Henry T.C. Hu, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 *Yale L.J.* 1457, 1513 (1993) (arguing that a prohibition of derivatives trading would be "destructive of social wealth"); Robert Lenzner & William Heuslein, *The Age of Digital Capitalism*, *Forbes*, Mar. 29, 1993, at 62, 64-65 (arguing against regulation of derivatives trading on the grounds that trading serves "powerful demand" and provides benefits to trading parties); Lawrence H. Summers & Victoria P. Summers, *When Financial Markets Work Too Well: A Cautions Case for a Securities Transactions Tax*, 3 *J. Fin. Services Res.* 261, 264 (1989) ("Financial innovators and their academic champions argue that the facilitation of trading necessarily contributes to economic efficiency.").

⁹ See, e.g., H.R. Rep. No. 355, 98th Cong., 1st Sess. 22 (1983) *reprinted in* 1984 U.S.C.C.A.N. 2274, 2294 (noting and adopting SEC's view that U.S. securities markets are "the best . . . the world has ever known" because they are "liquid, efficient, and fair"); U.S. Equity Market Structure Study, 57 *Fed. Reg.* 32,587 (1992) (praising the U.S. for having the "largest, most diverse, and most innovative securities markets in the world," and noting that their continued strength and vitality are "critical to the economic welfare of all Americans"); Market 2000 Report, *supra* note 6, at 1 (describing stock markets as an "important national asset" and praising U.S. markets as "the most efficient and liquid in the world" with "[r]ecord amounts of trading activity"); see also Joseph E. Stiglitz, *Using Tax Policy To Curb Speculative Short-Term Trading*, 3 *J. Fin. Services Res.* 101, 113 (1989) ("No institution in our capitalist society is as venerable as the stock market.").

¹⁰ Stock markets are not without their critics. John Maynard Keynes, who likened stock markets to casinos, once proposed that society might be significantly better off with less stock trading. John M. Keynes, *The General Theory of Employment, Interest, and Money* 159-60 (1st Harbinger ed. 1964). A handful of contemporary scholars have followed Keynes' lead by questioning the social benefits of high-volume stock trading. See Louis Lowenstein, *What's Wrong with Wall Street: Short-term Gain and the Absentee Shareholder* 80-86 (1988) (suggesting social costs of high-volume markets exceed their benefits); Stiglitz, *supra* note 9, at 103 (questioning benefits of stock trading to traders and suggesting that from a social perspective, it may be desirable to discourage excessive trading); Summers & Summers, *supra* note 8, at 262, 271-72 (suggesting that stock market trading is efficient only "[i]n the narrow sense of permitting trade to take place between consenting adults" and that excessive costs may be associated with the zero-sum game of speculation); James Tobin, *On the Efficiency of the Financial System*, *Lloyds Bank Rev.*, July 1984, at 1, 2, 15 (questioning economic benefits of financial markets and their "casino aspect"). Most academic economists, however, have given such suggestions a cool

model of stock trading premised on the observation that, in a world of costly and imperfect information, rational investors are likely to form heterogeneous expectations—that is, to make different forecasts of stocks' likely future performance.¹¹ The heterogeneous expectations ("HE") model predicts that investors' asymmetrical expectations will inspire them to seek short-term profits by speculating¹² on stocks they perceive as mispriced. Thus, John buys

reception. Many are disturbed by the claim that stock markets are "too speculative," believing it implies that stock traders are irrational or that stock markets somehow defy the laws of economics. See, e.g., Donald W. Kiefer, Cong. Res. Serv., *Are Pension Funds Short-Term Investors?* 14-15 (1992) (suggesting that if investors do systematically lose wealth by excessive trading, "inefficient behavior persists on a grand scale in [the stock] market," and as "a serious reconsideration of some of the most basic principles of economic theory may be necessary"); Kiefer, *supra* note 6, at 896 (rejecting suggestion that stock trading leads to social waste of resources as "conjectural" and as "more a statement of personal value judgment than the result of rigorous application of standard principles of economic analysis"); Stephen A. Ross, *Commentary: Using Tax Policy To Curb Speculative Short-Term Trading*, 3 *J. Fin. Services Res.* 117, 117-118 (1989) (decrying argument that stock trading should be discouraged as paternalistic and itself "speculative"); Robert W. Vishny, *supra* note 6, at 165-66 (describing argument that stock trading wastes resources as "dangerous"); see also Stiglitz, *supra* note 9 at 104 (noting that traditional economic texts emphasize importance of mutual gains from exchange and do not question source of stock traders' preferences); Tobin, *supra*, at 2 (noting that skepticism about social value of financial markets runs "against current tides," including a "general enthusiasm for deregulation and unfettered competition" and economists' "intellectual admiration for the efficiency of financial markets"); cf. J. Bradford De Long, Andrei Shleifer, Lawrence H. Summers & Robert J. Waldmann, *Noise Trader Risk in Financial Markets* 98 *J. Pol. Econ.* 703, 731-32 (1990) [hereinafter De Long et al., *Noise Trader Risk*] (noting that arguments considering short-term speculation to be socially destructive have "found little academic sympathy").

¹¹ In another work, I use the phrase "heterogeneous beliefs" in describing why different investors might attach differing subjective values to the same securities. Lynn A. Stout, *Are Takeover Premiums Really Premiums? Market Price, Fair Value, and Corporate Law*, 99 *Yale L.J.* 1235, 1239 (1990). The more specific phrase "heterogeneous expectations" is used here because the phrase "heterogeneous beliefs" could include differences in perfectly informed investors' preferences for risk, liquidity, and so forth. See *infra* notes 136-144 and accompanying text (discussing nonmistaken differences in preferences as reasons for trading).

¹² Financial theorists have yet to agree on a definition of "speculation." Oliver D. Hart & David M. Kreps, *Price Destabilizing Speculation*, 94 *J. Pol. Econ.* 927, 928 (1986). This Article defines speculation as the purchase of an item not for consumption, but in the hope of profiting from resale by predicting future price changes. Cf. Jack Hirshleifer, *Time, Uncertainty, and Information* 186 (1989) (defining speculation as "purchase with the intention of re-sale, . . . where the uncertainty of the future spot price is a source of both risk and gain"); James R. Repetti, *The Use of Tax Law To Stabilize the Stock Market: The Efficacy of Holding Period Requirements*, 8 *Va. Tax Rev.* 591, 596 (1989) (defining speculation as "the purchase of an item with a view to selling it at a higher price within a short period of time").

General Motors expecting that GM's share price will soon rise, whereas Mary sells expecting GM to decline.

The HE model of trading offers important insights into the workings of U.S. equities markets. For example, empirical studies indicating that stock markets do not accurately price securities have sparked much debate among legal and financial scholars over whether modern equities markets conform to the Efficient Capital Markets Hypothesis ("ECMH").¹³ The HE model consequently offers an answer to the controversy by explaining why, when investors disagree, "efficient" markets that rapidly respond to new information can nevertheless produce prices that depart substantially from best estimates of stocks' fundamental values.¹⁴

Perhaps more important, the HE trading model carries profound normative implications for the social value of stock markets. Stock trades motivated by heterogeneous expectations appear mutually beneficial *ex ante* but inevitably disappoint at least one party *ex post*. After all, when John buys GM hoping to profit from a price rise and Mary sells expecting to avoid a decline, both cannot be right. Moreover, trading requires both parties to incur costs,

¹³ The phrase "efficient stock market" generally alludes to a highly specialized notion of efficiency associated with the ECMH. See Richard A. Brealey & Stewart C. Myers, *Principles of Corporate Finance* 290-310 (4th ed. 1991); Edwin J. Elton & Martin J. Gruber, *Modern Portfolio Theory and Investment Analysis* 399-433 (4th ed. 1991); Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 *J. Fin.* 383 (1970); Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 *Va. L. Rev.* 549 (1984); Jeffrey N. Gordon & Lewis A. Kornhauser, *Efficient Markets, Costly Information, and Securities Research*, 60 *N.Y.U. L. Rev.* 761 (1985). In its classic form, the ECMH simply predicts that prices in a well-developed stock market respond so quickly to new information that it is impossible for investors to earn short-run profits by buying on good news or selling on bad news. See Gordon & Kornhauser, *supra*, at 771 n.19 (describing market as efficient with respect to an information set if it is impossible for investors to profit by trading on that information set); see also Gilson & Kraakman, *supra*, at 560 (noting that requirement that prices always reflect new information means that market mechanisms function rapidly enough to foreclose trading opportunities from new information). Many scholars also believe, however, that informationally efficient stock markets produce prices that reflect the best possible estimates of fundamental economic values as measured in terms of likely risk and return. See *infra* notes 95-100 and accompanying text (describing concepts of Capital Asset Pricing Model and fundamental value efficiency); *infra* notes 101-12 and accompanying text (describing controversy surrounding fundamental value efficiency).

¹⁴ HE theory suggests that informationally efficient markets may react quickly to new information, yet still produce prices that depart from fundamental values. See *infra* notes 120-35 (discussing HE model's implications for market efficiency).

including but not limited to broker commissions. The HE model suggests that stock trading may be a form of market failure due to imperfect information.¹⁵ Unless HE trading provides social benefits outweighing its costs, such trading reduces society's wealth along with the wealth of the average HE trader.

That possibility seriously undermines much of the laissez-faire structure of modern securities law. A fundamental premise of the current regulatory scheme is that stock trading is socially beneficial. In the interest of reducing trading costs and increasing opportunities for trading, regulators in recent years have repealed stock transfer taxes,¹⁶ eliminated fixed brokerage commissions,¹⁷ encouraged the development of new trading systems and markets,¹⁸ extended the trading hours of existing markets,¹⁹ and sanctioned trading in securities derivatives, including stock index options and futures.²⁰ If the HE model accurately describes modern stock markets, however, policies that encourage stock trading may, on the margin, *reduce* net social welfare. Far from being engines of efficiency, high-volume stock markets may generate inefficiency and deadweight social loss.

¹⁵ The phrase "market failure" describes instances in which rational, self-interested individuals pursue courses that ultimately reduce their net welfare. In the case of stock trading, imperfect information may be the source of market failure. *Infra* notes 35-45 and accompanying text.

¹⁶ See generally 1 Louis Loss & Joel Seligman, *Securities Regulation* 329 n.18 (3d ed. 1989) (discussing the repeal of federal transfer tax); Kiefer, *supra* note 10, at 23 (noting repeal of federal and New York state transfer taxes).

¹⁷ See generally 6 Loss & Seligman, *supra* note 16, at 2851-80 (laying out the policy debate over elimination of fixed commissions); *infra* notes 59-60 and accompanying text (describing the deregulation of commissions).

¹⁸ See Langevoort, *supra* note 6, at 754 (describing Congress' direction that SEC help develop "national market system" to ensure more efficient and competitive marketplace); see also Brandon Becker, *Global Securities Markets*, 6 *Int'l Tax & Bus. Law.* 242, 249-53 (1988) (describing proposals to develop new trading systems).

¹⁹ See Becker, *supra* note 18, at 250, 253-54 (noting that extending trading hours is consistent with SEC's goal of facilitating international trading); Stephen Labaton, *New Stock Trading Approved*, *N.Y. Times*, Oct. 11, 1991, at D1 (describing SEC's approval of early-morning trading in OTC stocks); see also Laura S. Greenstein, *The Future of Global Securities Transactions: Blocking the Success of Market Links*, 11 *Md. J. Int'l L. & Trade* 283, 286 (1987) (noting that securities professionals are proposing 24-hour market); cf. Aulana L. Peters, *Overview of International Securities Regulation*, 6 *Int'l Tax & Bus. Law.* 229, 230 (1988) (providing argument of SEC commissioner that liberalizing access to securities markets enhances efficiency of those markets).

²⁰ See *infra* notes 320-22 and accompanying text (noting that the benefits of trading are used to defend derivatives).

Part I develops the basic HE model of trading by examining how, when information costs are positive, rational investors form heterogeneous expectations that induce them to hope *ex ante* to profit from speculative transactions that actually reduce their net wealth *ex post*. Part I examines the effect of optimistic self-selection in determining who trades stocks, the importance of generational factors in ensuring that speculative markets persist despite evolutionary pressures that “weed out” unsuccessful traders, and the roles of brokers and institutional investment funds in increasing the incidence of HE trading. Part I also explores the HE model’s controversial implications for the accuracy of stock prices in “efficient” markets.

Part II addresses the empirical validity of the HE model by considering alternative reasons why investors might trade stocks, including liquidity, tax benefit, and portfolio balancing concerns. The available evidence suggests that although such motivations account for a portion of stock trading, investor disagreement inspires the lion’s share of equities transactions.

Part III explores the policy implications of the HE model by examining the social costs and benefits of stock speculation through the lens of HE theory. Investors appear to spend at least \$100 billion annually—approximately twenty percent of the returns from stock ownership—researching, managing, and trading corporate equities.²¹ If most stock trades are HE trades, much of that \$100 billion represents a net loss to investors. Stock speculation also may impose a second, more subtle, form of social cost if speculators’ optimistic hopes of trading profits create “false substitution” and “false valuation” effects that distort investor demand for corporate equity. Nevertheless, from a social perspective, costs associated with HE trading would be worthwhile if HE trading provided even larger social benefits. Two benefits often associated with speculative stock trading are more liquid markets that encourage capital formation and more efficient (*i.e.*, accurate) stock prices. Part III examines the liquidity and efficiency claims and concludes that the marginal social benefits that flow from speculative trading likely are significantly outweighed by the marginal costs. Part III addresses the regulatory implications of this conclu-

²¹ *Infra* notes 191-207 and accompanying text.

sion by examining three basic policy approaches to reducing dead-weight losses from HE trading: (1) reducing investor disagreement, (2) decreasing trading costs, and (3) taxing or prohibiting trading. Part III also discusses the value of each approach in the context of the modern regulatory scheme of mandatory disclosure accompanied by rules against fraud.

The analysis presented below focuses primarily on trading in public markets for corporate equities. That choice of emphasis reflects both the greater availability of data on equities markets and the relative simplicity of modeling equities trading. But lessons learned from stock markets may apply to other markets as well. The HE model of trading is in essence a model of rational—but ultimately self-defeating and socially wasteful—speculation. Part III concludes by briefly considering some of the broader implications of the HE model for other markets and especially for the emerging market for financial derivatives.

I. A HETEROGENEOUS EXPECTATIONS MODEL OF STOCK TRADING

Corporations issue stock in the primary market for corporate equity by selling shares to investors in exchange for additional capital.²² Most companies issue equity only rarely; after “going public,” a firm might never peddle stock to outside investors again.²³ Once issued, however, a firm’s shares will continue to be traded from investor to investor on secondary markets such as the exchanges and the National Association of Securities Dealers Automatic Quotation (“NASDAQ”) over-the-counter system.²⁴

²² See generally Brealey & Myers, *supra* note 13, at 339-43 (discussing venture capital and the public offering); Robert A. Haugen, *Modern Investment Theory* 25-26 (3d ed. 1993) (describing the difference between primary and secondary markets).

²³ See Lynn A. Stout, *The Unimportance of Being Efficient: An Economic Analysis of Stock Market Pricing and Securities Regulation*, 87 *Mich. L. Rev.* 613, 646-47 & 647 n. 185 (1988) (noting that public issuances are rare).

²⁴ Commentators who speak of “the stock market” almost invariably are referring to the secondary markets. Their choice of emphasis reflects the reality that, although secondary market trades provide no additional capital to corporations, they account for the overwhelming majority of all stock transactions. For example, in the five-year period from 1988 through 1992, trading on the secondary markets outweighed corporate issues by a ratio of 50 to one. See Securities Indus. Ass’n, *Securities Industry Yearbook 947* (Rosalie Pepe ed., 1993) (noting that from 1988 through 1992, U.S. firms underwrote annual average of \$40 billion in common stock issues); *id.* at 948, 949 (noting that from 1978

Secondary market investors buy and sell eagerly and often. In 1992, nearly half of the shares listed on the NYSE changed hands.²⁵ In the OTC market, the dollar volume of trading in NASDAQ-listed stocks amounted to 160% of the total value of shares listed, implying an average investor holding period of less than eight months.²⁶

What drives such secondary market turnover? Both scholars and laymen generally assume that disagreement underlies most stock trading.²⁷ John buys General Motors predicting its stock will soon rise, whereas Mary sells, expecting GM to fall. Investors' differing expectations lead them to perceive opportunities to profit by buying stocks they believe are underpriced and selling (or selling short)²⁸ stocks they believe are overpriced. Some individual investors do their own buying and selling. Many more speculate indirectly by putting money into "actively managed" pension or mutual funds that trade on their behalf. In either case, trading is moti-

through 1992, investors traded an average of \$2.061 trillion in stock annually on the NYSE and NASDAQ markets alone).

²⁵ In 1992, investors traded 51.8 billion (45%) of the NYSE's 115.8 billion listed shares. 1993 Statistical Abstract, *supra* note 2, at 524 tbls. 833, 834. In dollar volume terms, NYSE trading in 1992 amounted to 44% of the value of all shares listed, implying an average holding period of less than 28 months. *Id.*; see New York Stock Exchange, Fact Book for the Year 1992, at 11, 32 (1993) (listing \$1.745 trillion trading volume and \$4.035 trillion market value of listed shares).

²⁶ The total dollar volume of trading on NASDAQ was \$891 billion in 1992, whereas the total market value of NASDAQ listed equities was \$556 billion. Nasdaq Fact Book 1993, *supra* note 1, at 7, 11. The Nasdaq Fact Book does not provide the information needed to calculate share turnover.

²⁷ See Donald C. Langevoort, Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited, 140 U. Pa. L. Rev. 851, 895 (1992) (noting the popular assumption that most investors trade because they believe the market misvalues stocks); see also William J. Carney, Shareholder Coordination Costs, Shark Repellents, and Takeout Mergers: The Case Against Fiduciary Duties, 1983 Am. B. Found. Res. J. 341, 385 (describing stock markets as "built . . . on differing expectations"); Gordon & Kornhauser, *supra* note 13, at 781 n.49 (observing that differences in beliefs are occasions for trade); Stiglitz, *supra* note 9, at 102, 104 (stating that stock exchanges are largely motivated by "differences in judgments" concerning stocks' yields).

²⁸ Short selling is akin to selling "borrowed" stock. A short sale is a bet that the market price of the shorted shares will fall before the short seller must purchase the shares on the open market and return them to the "lender." As a practical matter, legal restrictions and market risks ensure that short selling is extremely rare. Stout, *supra* note 11, at 1248 n.68. See generally Jonathan R. Macey, Mark Mitchell & Jeffrey Netter, Restrictious on Short Sales: An Analysis of the Uptick Rule and Its Role in View of the October 1987 Stock Market Crash, 74 Cornell L. Rev. 799 (1989) (analyzing restrictions on short selling).

vated by the desire to achieve returns greater than those available from simply buying and holding a market portfolio. Thus the popular image of stock markets populated by individual and institutional traders trying to “beat the market” by buying and selling based on their predictions for companies, industries, and the market as a whole.

A. *The Puzzle of Speculative Stock Trading*

On closer inspection, however, the idea of investors trying to make money by buying and selling mispriced stocks seems puzzling, for stock trading is a zero-sum game.²⁹ *Owning* stocks is not zero-sum: if stocks tend to appreciate over time, investors generally can increase their wealth by buying, and holding, equities. But *trading* simply transfers the benefits (or costs) of equity ownership from one investor to another. If John buys GM from Mary at \$100 and GM rises to \$105, John is five dollars wealthier, but Mary has lost the opportunity to enjoy that five dollar gain herself. Similarly, if GM falls to ninety-five dollars, Mary avoids a five dollar loss, but only by passing that loss on to John. That stock trading is zero-sum does not imply that no investor can increase her returns from stock ownership by trading. For every talented or lucky trader who earns above-market returns, however, some other trader or traders must be earning below-market returns.

The idea of a market of traders trying to beat the market seems even odder when one considers that investors who trade incur broker fees, research costs, and other expenses. Zero-sum games that involve playing costs become negative-sum games in which the average player loses money. Trading costs ensure that investors who trade earn lower returns on average than investors who do not, just as the “house cut” ensures that gamblers on average exit

²⁹ See William J. Baumol, *Speculation, Profitability, and Stability*, 39 *Rev. of Econ. & Stat.* 263, 264 (1957) (“Whatever one group of traders gains another must lose.”); John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 *Va. L. Rev.* 717, 733 (1984) (explaining that secondary market trading does not create wealth because one party’s gain comes from another’s loss); Summers & Summers, *supra* note 8, at 272 (recognizing that trading is a zero-sum game); Jack L. Treynor, *Types and Motivations of Market Participants*, in *Association for Inv. Management & Research, Execution Techniques, True Trading Costs, and the Microstructure of Markets* 35 (Katrina F. Sherrerd ed., 1993) (noting that trading is a zero-sum game in which every trade has one winner and one loser).

casinos poorer than when they entered. The laws of arithmetic underlie recurrent empirical findings that pension funds and mutual funds trying to outperform the market by trading earn significantly lower mean returns (once trading, research, and management costs are taken into account) than index funds following a buy-and-hold strategy.³⁰

The observation that trading inevitably reduces investors' net wealth does not preclude the possibility that trading may provide other benefits to investors. Some investors, for example, may trade for liquidity reasons, buying stocks when they wish to invest their accumulated savings and selling when they need to raise cash. Others may willingly incur trading costs to "rebalance" their portfolios and to ensure they remain diversified or maintain a certain level of risk. But liquidity needs and portfolio balancing are weak explanations for a secondary market where over half of all shares change hands each year.³¹ Part II examines the substantial evidence suggesting that most trades are, instead, motivated by investors' hopes of trading profits.

If most investors trade to make money, how can their subjective expectations be reconciled with the harsh reality that, on average, trading makes traders poorer? Scholars often puzzle over why even sophisticated institutional investors like pension and mutual funds seem to believe they can earn positive returns from trading

³⁰ See Elton & Gruber, *supra* note 13, at 710 (stating that index funds outperform most active managers); Wayne H. Wagner, *Defining and Measuring Trading Costs*, in Association for Inv. Management & Research, *supra* note 29, at 15, 17 (noting that active management performance falls between 100 and 150 basis points below index fund performance, i.e., active funds annual earnings' average 1% to 1.5% less, due to greater management and trading costs); *infra* notes 152-68 and accompanying text (examining active and passive management); see also Vanguard Index Trust, Annual Report 1990 at 4 (showing that in the decade ending December 1990, average equity fund saw 10.8% annual return, whereas S&P 500 and Wilshire 5000 indexes earned 13.7% and 12.4% annual return, respectively).

³¹ In 1992, the dollar volume of trading in U.S. equities on the exchanges and OTC market amounted to nearly 55% of the market value of all equity holdings. See New York Stock Exchange, *Fact Book for the Year 1993*, at 89 (1994) (showing total market value of U.S. equities in 1992 as \$5.5406 trillion); National Ass'n of Securities Dealers, *supra* note 1, at 7 (showing total dollar volume of trading in U.S. equities in 1992 was \$3.051 trillion). This figure understates actual turnover, as it excludes private sales that take place outside organized markets.

despite transaction costs.³² Some theorists go so far as to suggest that trading evidences investor irrationality.³³ Recently proposed

³² See, e.g., Elton & Gruber, *supra* note 13, at 710 (noting that although most active fund managers underperform market indexes, “investors who hire active managers believe they can spot the manager who will outperform the index”); Kiefer, *supra* note 10, at 14-15 (noting an “uncomfortable inconsistency” between financial theory and investor behavior in that “[i]nvestors and investment managers who try to increase their rate of return by trading more actively to take advantage of perceived opportunities for higher profit would discover that, over the longer term, they earn lower rates of return instead”); William F. Sharpe, *The Arithmetic of Active Management*, *Fin. Analysts J.*, Jan.-Feb. 1991, at 7 (reasoning that the idea that active management allows traders to beat the market “can only be justified by assuming that the laws of arithmetic have been suspended for the convenience of . . . active managers”).

³³ See Hazen, *supra* note 6, at 992, 1002 (explaining that trying to identify securities that will outperform the market is irrational and not “consistent with the actions of ‘economic man’ ”); Kiefer, *supra* note 10, at 14-15 (suggesting that if investors believe in the ability to beat the market, inefficient behavior persists on a grand scale, and “a serious reconsideration of some of the most basic principles of economic theory may be necessary”); Stiglitz, *supra* note 9, at 106 (suggesting that investors’ optimistic belief that they can beat the market is “irrationality”).

A variant of the irrationality argument holds that speculators recognize that they dissipate wealth, but trade anyway because they enjoy it. For example, many people seem to enjoy playing a weekly poker game or watching thoroughbreds race at the track; having a stake in the outcome of the contest increases their pleasure and interest. Similarly, some individuals may seek entertainment and involvement in the pages of the *Wall Street Journal*. Under this theory, both traders and recreational gamblers play negative-sum games because they intrinsically enjoy playing, not because they expect to win.

It is difficult to prove or disprove the claim that investors enjoy squandering their money on trading because that proposition is, in effect, a tautology. It assumes that stock trading must make investors better off despite its apparent wealth-destroying nature, because rational actors only pursue activities that make them better off, and investors are presumed to be rational. As a practical matter, however, recreation seems an unlikely motive for the dull game of investing through the agency of an institution such as a pension or mutual fund (as most investors do). Moreover, casual observation suggests that stock traders who sustain steady losses do not find that process enjoyable. See William Glasgall, *The Market’s Revenge*, *Bus. Wk.*, Apr. 18, 1994, at 32, 33 (quoting trader who sustained large losses as saying, “It’s no fun.”). The notion that investors who speculate willingly accept trading losses as the price one must pay for the joy of “playing the market” is also inconsistent with evidence that traders who sustain losses tend to stop trading. See *infra* notes 70-79 and accompanying text (describing the “weeding out” process). Finally, whereas recreational gambling sometimes is explained by risk-preference, the natural volatility of the stock market ensures that instead of trading, risk-preferring investors can more cheaply satisfy their tastes by buying and holding high-risk stocks. Thus, although it is possible that some investors trade for enjoyment despite their recognition that they are likely to lose money, the “recreational trading” argument seems a weak foundation on which to build a three trillion-dollar-a-year trading market that is heavily dominated by institutions. See also *infra* notes 309-12 and accompanying text (suggesting that some gambling is not recreational but, like stock trading, is a market failure arising from heterogeneous expectations).

“noise trader” models of stock markets, for example, presume that substantial numbers of those who participate in equities markets are irrational.³⁴

Such a radical departure from traditional economic analysis may be unnecessary to explain stock markets. A rational choice model of stock speculation can be developed that reconciles the phenomenon of negative-sum trading with the assumption that investors are self-interested actors who make the best possible use of the resources available to them. This “heterogeneous expectations” model rests on the key premise that investors can rationally differ in their estimates both of stocks’ likely future performance and of their own relative trading abilities. On this plausible foundation can be built a model that offers important insights into who trades stocks, why, and for how long; the relationship between stock prices and best estimates of values; and the manner in which stock markets might be regulated to maximize their social benefits while minimizing their costs.

B. A Simple Model of Heterogeneous Expectations and HE Trading in a World of Imperfect Information

On average, investors who abandon buy-and-hold strategies and try to increase their returns through trading find that their expectations of profits from trading were mistaken. But to say that an investor may be mistaken does not necessarily imply that she is irrational. Even the most sensible actor may make mistakes, if she lacks perfect information.³⁵ Thus, the consumer who does not know at the time of purchase that a used car needs \$200 in repairs

³⁴ See, e.g., Fischer Black, *Noise*, 41 J. Fin. 529, 531, 534 (noting that because “noise” traders trade “even though from an objective point of view they would be better off not trading,” their behavior does not fit “into a world where people do things only to maximize expected utility of wealth, and where people always make the best use of available information”); De Long et al., *Noise Trader Risk*, supra note 10, at 735 (noting that noise theory focuses on irrationality in financial markets); J. Bradford De Long, Andrei Shleifer, Lawrence H. Summers & Robert J. Waldmann, *The Size and Incidence of the Losses from Noise Trading*, 44 J. Fin. 681 (1989) [hereinafter De Long et al., *Losses from Noise Trading*] (concluding that noise trading is irrational); Andrei Shleifer & Lawrence H. Summers, *The Noise Trader Approach to Finance*, J. Econ. Persp., Spring 1990, at 19 (stating that noise traders are “not fully rational”).

³⁵ See generally Alan Schwartz & Louis L. Wilde, *Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis*, 127 U. Pa. L. Rev. 630 (1979) (examining judicial and legislative responses to imperfect information in the market for

might mistakenly pay \$5,000 for a vehicle that she would value at \$4,800 if she had perfect information.

Rational individuals are willing to risk making mistakes by acting on imperfect information because information is costly. It may be cheaper for a consumer to bear the risk of buying a car with a \$200 defect than to pay a mechanic \$300 to inspect the car. Similarly, investors evaluating the likely future performance of particular stocks may consider a wide variety of data, including the firm's annual reports, past price performance, or media accounts of the company or the general economy. But because gathering and digesting data takes time and money, at some point the cost of acquiring additional guidance (by reading another report or hiring a professional analyst, for instance) outweighs the risk of purchasing an overvalued stock.³⁶ Rational investors weigh the potential price of ignorance against the certain expense of further research and make the best decisions they can.

Different investors are likely to face different costs in obtaining and using different subsets of information relevant to stock values. An accountant may find it easiest to gauge a coffee company's prospects according to its financial statements, whereas a gourmand who hates numbers may judge the firm by the taste of its product.³⁷ Investors who rely on different subsets of information are likely to form different opinions of the likely risks and returns

consumer goods); George J. Stigler, *The Economics of Information*, 69 *J. Pol. Econ.* 213 (1961) (discussing economic decisions when information is imperfect and costly).

³⁶ Because stock valuation requires investors to predict an inherently uncertain future, at some point the cost of acquiring all information relevant to stock values becomes infinite.

³⁷ The taste of Dunkin' Donuts coffee allegedly was one of the factors that induced legendary mutual fund manager Peter Lynch to invest in that firm's stock. Carolyn Friday, *A Superstar Bids Farewell*, *Newsweek*, Apr. 9, 1990, at 38.

of particular stocks.³⁸ These heterogeneous expectations can easily motivate the negative-sum game of stock trading.³⁹

Consider the following scenario. A *Wall Street Journal* article praising General Motors' efforts to trim costs convinces John that GM's market price will soon rise from \$100 to \$105 per share. Mary, a GM shareholder, has different information—her newly purchased GM car is a lemon, and she expects GM stock to decline to ninety-five dollars. Even if John and Mary each must pay two dollars per share in broker commissions to trade, each perceives an opportunity to profit from trading. John anticipates a quick net gain of three dollars per share if he buys, whereas Mary expects to avoid a net three dollars per share loss if she sells. Whether GM rises or falls, trading costs ensure that one party's wealth loss outweighs any wealth gain enjoyed by the other. If GM rises to \$105, John earns his expected net three dollars per share profit, but Mary loses a net seven dollars per share. Similarly, if GM falls to ninety-five dollars, Mary saves a net three dollars per share, but John loses seven dollars per share. Although John's and Mary's asymmetrical expectations leads each to perceive an *ex ante* opportunity to gain three dollars per share (six dollars per share total) from trading,

³⁸ See Black, *supra* note 34, at 531 ("Differences in beliefs must derive ultimately from differences in information."). Some commentators have suggested that investors with access to the same information still reach differing conclusions because each individual has unique ways of processing information. E.g., Stephen Figlewski, Market "Efficiency" in a Market with Heterogeneous Information, 86 *J. Pol. Econ.* 581, 584-85 (1978); Milton Harris & Artur Raviv, Differences of Opinion Make a Horse Race, 6 *Rev. Fin. Stud.* 473, 474 (1993) (stating that "disagreements can arise either because speculators have different private information or because they simply interpret commonly known data differently"). Such arguments make a distinction without a difference. Different individuals may disagree in their interpretations of the same information because their differing experiences and training have taught them to extract different meanings. Yet experience and training inevitably are part of the "information" brought to bear on the problem of stock valuation.

³⁹ It is important to distinguish heterogeneous expectations from both heterogeneous preferences and simple uncertainty. If both John and Mary agree that the price of GM stock has a 25% chance of falling by \$1, a 25% chance of rising by \$1, and a 50% chance of remaining the same, then they face uncertainty but share the same expectations. Alternatively, if John and Mary share these expectations about the future performance of GM, but John likes risk whereas Mary is risk-averse, then John may want to buy and Mary to sell, because although they share similar expectations, they have different preferences for risk. See *infra* note 142.

their transaction inevitably reduces their aggregate wealth by four dollars per share *ex post*.⁴⁰

As this example illustrates, a purely speculative market of traders betting on their differing predictions for the future is, in a sense, a mistaken market, for traders on average lose money by trading. Yet such waste is not necessarily due to individual irrationality. John's and Mary's decisions to trade were quite rational, given their differing expectations.⁴¹ Their net loss can be blamed on imperfect information. After all, in a world of perfect information both John and Mary would *know* whether GM were going to rise or fall. No sale would occur because, if GM were going to rise, John would want to buy at market price but Mary would refuse to sell, whereas if GM were going to fall, Mary would be eager to sell but John would balk at buying. In a world of imperfect information, however, John and Mary can disagree on GM's likely future and each perceive an opportunity to gain wealth by trading. At least one will be wrong.⁴²

Economists writing on the economics of information have long observed that heterogeneous expectations can induce rational, wealth-seeking actors to pursue activities with negative expected returns.⁴³ Contemporary securities scholars, however, have largely

⁴⁰ See Stiglitz, *supra* note 9, at 106 (noting that stock trades may appear efficient *ex ante* yet actually reduce trader welfare *ex post*).

⁴¹ A body of work in game theory posits that it is irrational to trade on the basis of heterogeneous expectations. See, e.g., Robert J. Aumann, Agreeing to Disagree, 4 *Annals Stat.* 1236 (1976); John D. Geanakoplos & Heraklis M. Polemarchakis, We Can't Disagree Forever, 28 *J. Econ. Theory* 192 (1982); Paul Milgrom & Nancy Stokey, Information, Trade and Common Knowledge, 26 *J. Econ. Theory* 17 (1982). The no-speculation theorems do not account for the phenomenon of learning, however, and also depend on strong assumptions about common knowledge and investor homogeneity. See Lynn A. Stout, Agreeing to Disagree over Excessive Trading, 81 *Va. L. Rev.* 751 (1995); see also Jeremy C. Stein, Informational Externalities and Welfare-reducing Speculation, 95 *J. Pol. Econ.* 1123, 1125 (1987) (noting that in market with imperfect information, traders who trade on misinformation are still rational).

⁴² Indeed, *both* parties may conclude that their trade was mistaken if prices do not change enough to let at least one profit despite trading costs. Suppose John buys GM expecting it to rise by at least \$3 per share, so that he can earn at least \$1 net after paying \$2 in broker commissions. Mary sells anticipating GM will fall by \$3. If GM rises by only \$1, both will be disappointed.

⁴³ For example, the literature on the economics of research and invention has long recognized the possibility of social waste due to a duplicative "rush to invent" by competing innovators all of whom expect to be the lucky one to win a patent. See, e.g., Hirschleifer, *supra* note 12, at 187-90 (discussing rush to invent and noting that similar

overlooked that literature's obvious implications for securities markets. This may be because orthodox financial theory generally assumes for convenience that investors are perfectly informed and share identical expectations.⁴⁴ In the real world, however, investors labor under conditions of both ignorance and disagreement. A stock trading model that recognizes this reality yields important insights into the behavior of markets and the individuals and entities who participate in them. It also offers a picture of equities markets that in many respects differs strikingly from the one painted by conventional theory, which portrays stock markets as highly efficient capital-allocating machines in which all securities are accurately priced and all trades serve traders' self-interests.⁴⁵

HE theory predicts that when investors hold differing opinions of stock values, some will inevitably disagree with the market price for a firm's shares.⁴⁶ An investor's decision to buy or sell because her personal estimate of a particular stock's value differs from its

problem may exist for stock market research, where social benefits are negligible while private pecuniary returns are substantial); Jack Hirshleifer, *The Private and Social Value of Information and the Reward to Inventive Activity*, 61 *Am. Econ. Rev.* 561 (1971) [hereinafter *Hirshleifer, Value of Information*] (observing that "inhomogeneous beliefs" regarding the effect of information on the value of their respective speculative positions might motivate individuals to "willingly cooperate in making expenditures far in excess of the social value of the information to be acquired"); see also Frank H. Easterbrook & Daniel R. Fischel, *Mandatory Disclosure and the Protection of Investors*, 70 *Va. L. Rev.* 669, 682 n.21 (1984) (noting similar observations in public choice literature on rent-seeking).

⁴⁴ See *infra* note 117 and accompanying text (citing the homogeneity assumption). The homogeneity assumption may explain why financial theorists and securities scholars so often overlook the importance of investor disagreement to understanding secondary stock markets. See, e.g., sources cited *supra* notes 32-33 (noting that economists are puzzled by traders' belief that they can beat the market); *supra* notes 105-112 and accompanying text (citing scholars puzzled by markets' fundamental value inefficiency).

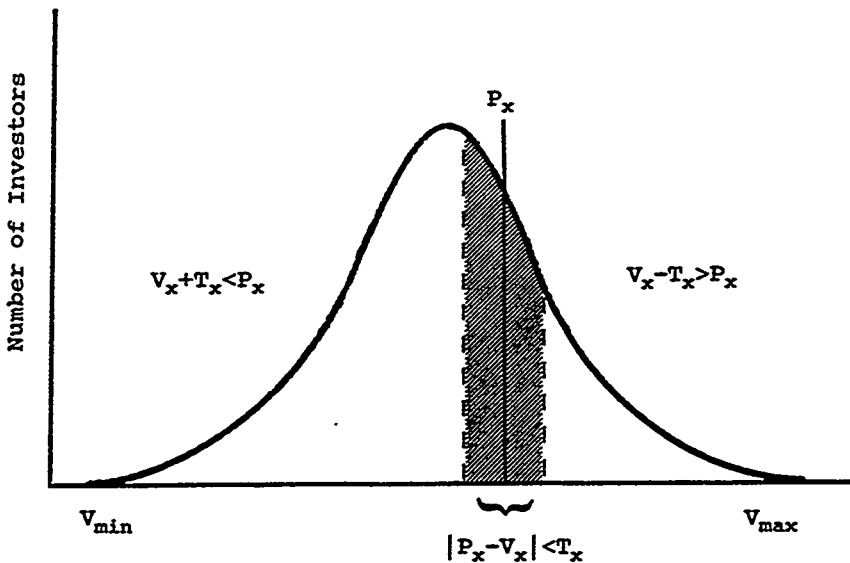
⁴⁵ See Summers & Summers, *supra* note 8, at 263 (contrasting "the Panglossian, theoretical, efficient markets view of the operation of financial markets" with "the way they work in practice").

⁴⁶ When investors hold heterogeneous expectations, a stock's market price is determined by the price demanded by the most pessimistic of the firm's current shareholders, i.e., the shareholder willing to accept the lowest price to part with her shares. See *infra* notes 122-127 and accompanying text.

market price can be modeled by a simple formula.⁴⁷ Suppose

47

FIGURE 1:
DISPERSED INVESTOR EXPECTATIONS AND POSITIVE TRANSACTION COSTS



Subjective Valuation

Investor interest in buying or selling a particular stock also can be depicted graphically. Figure 1 depicts a dispersion of investor opinion regarding a particular stock's value. The horizontal axis represents the range of investors' subjective valuations, ranging from the most pessimistic valuation (V_{\min}) to the most optimistic (V_{\max}). The vertical axis represents the number of investors. On any given day, a few investors will believe that the stock is worth very little, whereas a few will value the stock very highly. The subjective opinion held by most investors, however, converges on some average value. The dispersion of opinion is shown as a normal distribution for illustrative purposes only.

P_x represents the stock's market price. The shaded area ranging to the left and right of P_x represents the transaction costs (T_x) normally associated with selling or buying, respectively. Investors whose subjective valuations fall within the shaded area believe it is unprofitable to trade because any profit they might expect to gain because of a difference between market price and subjective valuation is more than offset by transaction costs ($|P_x - V_x| < T_x$). The shaded area thus can be termed the "nontrading area." On either side of the nontrading area, investors have incentive to trade. To the left of the shaded area, an investor will sell (or sell short) because the market price is greater than her subjective valuation and more than makes up for the transaction costs ($V_x + T_x < P_x$). To the right of the shaded area, an investor will buy because her subjective valuation, less the transaction costs, is greater than the market price ($V_x - T_x > P_x$).

Note that market price and average valuation are not identical. The market price has been placed to the right of the average in recognition of the fact that, for any particular stock, the set of shareholders is smaller than the set of nonshareholders, suggesting that

shares in Firm X are currently trading at market price P_x per share. Based on the limited information reasonably available to her, an investor concludes that P_x does not accurately reflect the value of X's stock, which the investor estimates to be V_x .⁴⁸ The estimated transaction costs of buying or selling one share in X are T_x . The investor will perceive opportunities to profit by buying X whenever $(V_x - T_x) > P_x$, or by selling (or selling short) whenever $(V_x + T_x) < P_x$. More generally, the investor will perceive an opportunity to make money by trading whenever the difference between market price and the investor's estimated value exceeds the estimated cost of trading, so that $|P_x - V_x| > T_x$.

This modest formula permits two important observations. First, the more widely dispersed investors' opinions, the more likely it is that speculative HE trading will occur, other things being equal.⁴⁹

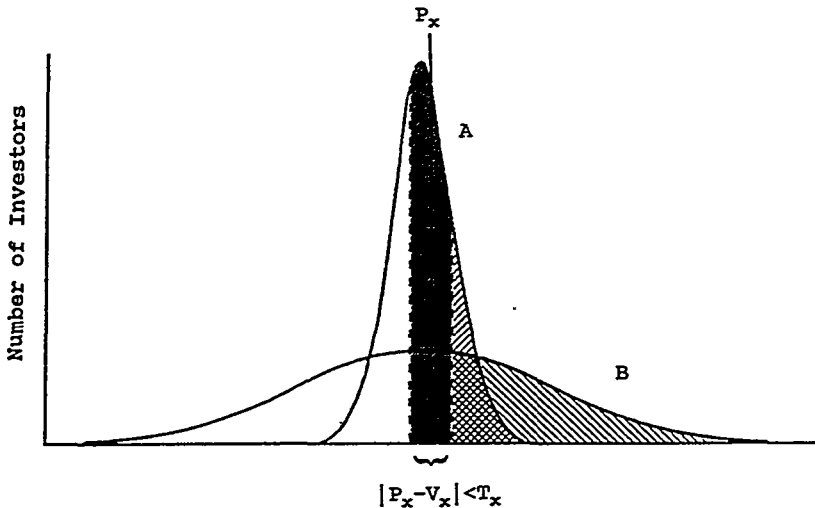
relatively few investors subjectively value any particular stock more than its market price plus transaction costs.

⁴⁸ The market price of a stock is by definition an accurate measure of that stock's value if it has to be sold immediately. If an investor expects that a particular security will, over time, either show less risk or provide greater returns in the form of dividends and capital appreciation than reflected in the current price, however, the investor may be able to profit by buying the stock and holding it for some period.

⁴⁹

FIGURE 2:

INCREASING THE DISPERSION OF INVESTOR EXPECTATIONS



Subjective Valuation

In other words, investors are more likely to perceive opportunities to profit despite trading costs when their subjective valuations of stocks differ greatly from market prices (when $|P_x - V_x|$ is large).⁵⁰ Second, even a modest dispersion in investor valuation creates perceived opportunities to profit from speculation when trading costs (T_x) are low.⁵¹

Figure 2 shows how an increase in the dispersion of investors' subjective estimates will increase trading activity. As in Figure 1, the darkly shaded area depicts the area in which no trading will occur because of prohibitive transaction costs ($|P_x - V_x| < T_x$).

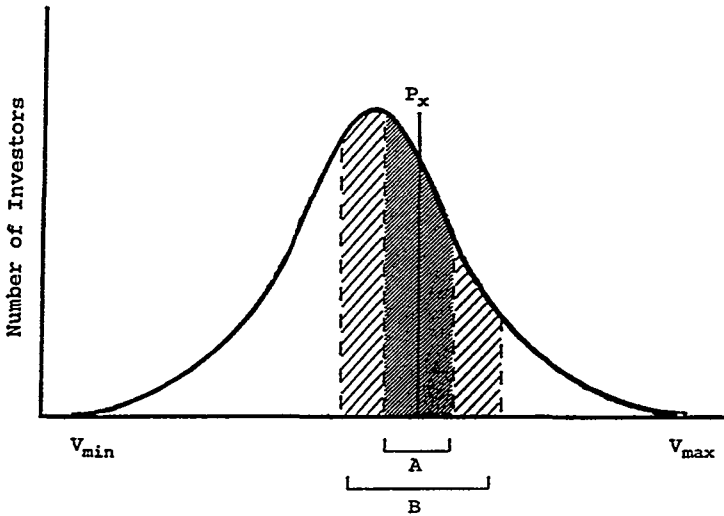
The areas under curves A and B are equal, reflecting a fixed pool of investors. However, curve B represents a pool of investors who exhibit a much wider variation in their subjective valuations than the pool of investors represented by curve A. Again, as in Figure 1, in both curve A and curve B the area to the right of the darkly shaded area represents the area where investors regard the stock as a worthwhile purchase. Note that this trading area is greater under curve B than under curve A; more trading will occur in the pool of investors with more widely dispersed subjective valuations. Similarly, the darkly shaded nontrading area is greater under curve A than under curve B, indicating that transaction costs deter more trades when investors' expectations are relatively homogeneous.

⁵⁰ Professors Milton Harris and Arthur Raviv theorize that when traders start with common beliefs about an asset's expected returns, trading occurs when, and only when, new information changes their minds. As a result, volume and changes in price are positively correlated, as are changes in earnings forecasts and volume. Harris & Raviv, *supra* note 38, at 474-75; see also *id.* at 478 (citing and discussing the "fairly abundant" empirical studies that support these theoretical conclusions).

⁵¹

FIGURE 3:

INCREASING TRANSACTION COSTS



Subjective Valuation

As a practical matter, modern stock markets exhibit both wide dispersion in investors' opinions and low transaction costs. The pages of *Business Week* and the *Wall Street Journal* are replete with anecdotal evidence that people often disagree wildly in their predictions for stocks and the market as a whole.⁵² Empirical studies confirm that investors' subjective estimates of stock values vary greatly. One recent study, for example, found that corporate offers to repurchase shares from shareholders at prices averaging thirteen percent over market price induced shareholders on average to tender only eighteen percent of their outstanding shares,⁵³ suggesting that eighty-two percent of shares were held by investors in whose opinions their stocks' values exceeded the market price by more than thirteen percent.⁵⁴ Such findings should come as no surprise. Because stocks represent claims to future income in the form of either dividend payments or capital appreciation, stock values depend upon an inherently uncertain future.⁵⁵ Any investor

Figure 3 depicts how increasing trading costs will decrease trading. Increasing trading costs from range A to range B will expand the nontrading area within which investors perceive that transaction costs outweigh potential gains from buying or selling a stock they perceive as mispriced. A difference between subjective valuation and market price that would have resulted in a trade given initial trading cost A may now be inadequate to overcome greater trading cost B.

⁵² See, e.g., Fred R. Bleakley, *One Set of Economic Facts, Two Views: Forecasts of Growth and Inflation Vary*, *Wall St. J.*, Apr. 25, 1994, at A2 (describing economists' expectations for growth as "widely divergent"); Jeffrey M. Laderman, *Tiptoeing Through Uncertain Times*, *Bus. Wk.*, Dec. 26, 1988, at 92 ("If you're confused about what to do with your money in 1989, you're in good company. Professional opinion is all over the lot . . ."); Steven E. Levingston, *Adherents of the Dow Theory on Stock Trends Disagree Over When Bull Market Will End*, *Wall St. J.*, Feb. 1, 1993, at C1 (describing investors who subscribe to the Dow Theory as unable to agree on when bull market will end).

⁵³ Laurie S. Bagwell, *Dutch Auction Repurchases: An Analysis of Shareholder Heterogeneity*, 47 *J. Fin.* 71, 76 tbl. 1, 97 (1992) (presenting results and arguing that evidence does not support claim that premium is due to signaling effect of offer but rather that "[s]hareholders' valuations differ dramatically").

⁵⁴ The notion that an investor might value stock in a particular firm at 13% over market price naturally raises the question of why, given reasonably low trading costs, the investor does not purchase more shares until eventually she drives the market price up to match her own subjective valuation. The answer is that any single investor's ability to affect market price is limited by both that investor's wealth and her willingness to tolerate risk from reduced portfolio diversification. See *infra* notes 122-27 and accompanying text (discussing setting market price in market of heterogeneous expectations).

⁵⁵ Investors usually can profit from stocks only through dividends or capital appreciation, both of which depend on future events. An exception arises when an investor seeks to profit by buying a controlling block of shares in an undervalued firm and then liquidating the firm and selling off its assets. See generally Reimier Kraakman, *Taking*

trying to predict that future could consider an almost infinite number of factors, including the quality of a firm's management, its competitors, its products, prevailing interest rates, exchange rates, macroeconomic growth, tax rates, demographic changes, and even the weather. Given the costliness of any single investor's acquiring and assimilating more than a small fraction of the vast data relevant to stock price, "the dark forces of time and ignorance"⁵⁶ ensure that investors' subjective estimates of stock values will vary considerably.

Modern stock markets also offer low transaction costs. For example, stock traders often pay one percent or less of the value of their trades in broker commissions.⁵⁷ In comparison, the homeowner who sells a single-family residence may pay seven percent in real estate agent commissions.⁵⁸ Trading costs in modern stock markets are low compared not only to the costs of trading many other assets but also to historical costs. Before 1968, NYSE-member firms enforced a comprehensive scheme of fixed minimum broker commissions that ensured that investors paid much higher broker fees than they do today.⁵⁹ The fixed commission structure was eliminated gradually between 1968 and 1975.⁶⁰ Congress also

Discounts Seriously: The Implications of "Discounted" Share Prices as an Acquisition Motive, 88 Colum. L. Rev. 891 (1988) (exploring possibility that some corporate acquisitions are motivated by perception that the market price of a firm's equity is less than the value of the firm's assets).

⁵⁶ Keynes, *supra* note 10, at 155.

⁵⁷ See Hans R. Stoll, *Equity Trading Costs* 14 tbl. 4 (1993) (finding from securities firms' revenue data for 1990 that average investor paid commissions amounting to approximately 0.29% of value of trade on exchanges and 0.43% of value on OTC market); cf. Kiefer, *supra* note 10, at 24 (noting that for largest trades by largest institutions, broker commissions estimated to be between 0.05% to 0.18% of value of shares traded).

Broker commissions are, however, just one of the many costs associated with speculative trading. An estimate of the total costs of speculative trading to investors based on mutual funds' expense ratios suggests that in 1992 investors spent \$100 billion researching, managing, and trading equities portfolios, a cost that amounts to approximately three percent of the total of \$3.06 trillion in stocks traded. See *infra* notes 193-207 and accompanying text (discussing the \$100 billion cost); *supra* note 1 and accompanying text (noting \$3.06 trillion traded).

⁵⁸ See Schwert & Seguin, *supra* note 8, at 21 (noting seven percent real estate costs). Not surprisingly, turnover in single-family homes is only a fraction of turnover in stocks. See Tobin, *supra* note 10, at 4 (noting the 4.5% annual turnover in single-family homes).

⁵⁹ See Kiefer, *supra* note 10, at 22. See generally 6 Loss & Seligman, *supra* note 16, at 2831-85 (discussing brokerage commission rate regulations).

⁶⁰ Kiefer, *supra* note 10, at 22.

repealed a modest federal stock transfer tax in 1965,⁶¹ while New York state abolished a similar tax in 1981.⁶² The resulting decline in stock trading costs⁶³ has been accompanied by dramatic increases in trading volume: between 1960 and 1987, the turnover rate of shares on the NYSE increased from about ten percent to approximately fifty percent annually.⁶⁴

C. Potential Deterrents to HE Trading: The Roles of Self-Selection and Successive Generations in Fostering Speculative Markets

The simple HE model presented above suggests that investors lacking perfect information form heterogeneous expectations that make speculative trading a rational, if ultimately self-defeating behavior. Although HE trading only occurs in favorable circumstances—when significant dispersion in investor expectations is combined with low trading costs—modern stock markets provide exactly the conditions necessary for HE trading to flourish.

This simple HE model, however, neglects two influences that should discourage HE trading even when investors hold widely differing views of stocks' merits and face minimal trading costs. The first deterrent to HE trading is the rational investor's recognition that HE trading is, statistically speaking, a loser's game. Investors who disregard that deterrent and attempt to trade profitably will eventually be faced with a second deterrent, the lessons of bitter experience. A persuasive model of stock trading based on heterogeneous expectations consequently must explain how speculative markets can prosper in the face of both speculation's obviously negative-sum nature and investor learning.⁶⁵

⁶¹ 1 Loss & Seligman, *supra* note 16, at 329 n.18.

⁶² Kiefer, *supra* note 10, at 23.

⁶³ As a result of these changes, institutional traders' out-of-pocket trading costs have declined to less than half of their costs in the mid-1960s and 1970s. See *id.* at 24.

⁶⁴ *Id.* at 6 fig. 1; see also Schwert & Seguin, *supra* note 8, at 19 (citing studies estimating that average commission rates fell by 30% from 1975 to 1978, accompanied by 30% increase in trading volume from 1975 to 1981); Stephen A. Berkowitz & Dennis E. Logue, *The Portfolio Turnover Explosion Explored*, *J. Portfolio Mgmt.*, Spring 1987, at 38, 44 (finding historical increase in turnover to be "closely related to the declining trend in trading costs").

⁶⁵ A third deterrent to speculative trading is nearly three decades of financial theoreticians' warnings that "you can't beat the market." According to one version of efficient market theory, stock prices should reflect the best possible estimates of values and

1. *Optimistic Self-Selection and the Lake Wobegon Market*

Because they lack perfect information concerning stock values, investors can rationally disagree with market prices and perceive opportunities to profit from trading in mispriced stocks. Yet rational investors who stop to think about the negative-sum nature of stock trading should also readily recognize that traders, on average, lose wealth by trading. Why would even the most bullish or bearish investor try her hand at trading once she recognizes that the odds are stacked against her?

In fact, many do not trade. Many individual and institutional investors choose a passive buy-and-hold strategy.⁶⁶ But as long as a subset of investors chooses to trade, a speculative market can flourish. An important insight of the HE model is that self-selection can sustain speculative markets even when it is apparent to all participants that speculation is negative-sum.

When some investors hold high opinions of their own abilities to "buy low and sell high" whereas others are more pessimistic about their trading talents, only the optimists trade. Humble John may perceive General Motors shares to be mispriced but may also hesitate to trade on this perception because he recognizes his analysis is based on imperfect information and that trading, on average, erodes investor wealth. In contrast, self-confident Mary may also know that traders on average lose money but believe that she has better-than-average ability to pick stocks. John will hew to a buy-and-hold strategy, whereas Mary will test her stock-picking skills by buying those stocks she perceives as underpriced and selling those she perceives as overpriced.

present no opportunities for arbitrage profits. See *infra* notes 93-100 and accompanying text. The HE model, however, supports market participants' claims that efficient markets can misprice stocks. See *infra* notes 128-32 and accompanying text. Self-selection also helps explain why traders continue to bet on their bullish and bearish beliefs despite theorists' warnings: even if the vast majority of investors believed the vast majority of stocks to be accurately priced, so long as a minority believed that a small portion of the thousands of publicly traded stocks were sufficiently mispriced to justify minimal transaction costs, HE trading would occur.

⁶⁶ For example, nearly 20% of all assets held by pension plans are indexed. See *infra* note 162. Indexed stock mutual funds also are becoming more popular. See generally Elton & Gruber, *supra* note 13, at 705 ("Funds under passive management have grown rapidly and reached significant size.").

Self-selection thus plays a key role in determining who participates in speculative trading. Speculative markets are “Lake Wobegon” markets, where all traders believe their trading skills are above average.⁶⁷ Imperfect information easily reconciles such mistaken beliefs with rationality;⁶⁸ although investors may have perfect information concerning the *average* trader’s negative returns, they remain ignorant of their likely *personal* returns until they try their hands at the trading game. Individuals who have enjoyed success in other personal and professional endeavors may reasonably approach the stock market with an optimistic faith in their own abilities.⁶⁹ They also necessarily enter the market ignorant of their own relative trading talent. Only time and experience will reveal whether they are winners or washouts.

The HE model of trading thus suggests that speculative markets reflect two forms of investor mistake: mistakes about stock values and mistakes about relative trading skills. But as long as investors face positive information costs in evaluating both stocks and their own trading talents, self-selection ensures that a subset of investors—the financially sophisticated, the personally successful, or the merely hopeful—will try the trading game on the rational but statistically mistaken belief that they are better, brighter, or luckier than their fellow traders.

2. *A Longitudinal Model of HE Trading: Darwin Meets Barnum*

Although self-selection explains why a subset of rational investors might elect to play a single round of the negative-sum game of

⁶⁷ Comedian Garrison Keillor described his fictional hometown, Lake Wobegon, as a place where “all the children are above average.” Garrison Keillor, *Leaving Home* xvii (1987); see also Ronald C. Lease, Wilbur G. Lewellen & Gary G. Scharbaum, *The Individual Investor: Attributes and Attitudes*, 29 *J. Fin.* 413, 431 tbl. 7 (1974) (finding that a study group of investors on average believed itself to be “substantially better informed than the average investor”).

⁶⁸ Cf. Stiglitz, *supra* note 9, at 106 (“It is only because each individual believes that he or she is smarter than other speculators—a proposition that cannot be ‘rationally’ held by all—that the market survives at all.”).

⁶⁹ Interestingly, it is the educated and personally successful who most often appear on brokers’ “sucker lists” and who, at least in folklore, are most often the victims of excessive stock trading. See Lowenstein, *supra* note 10, at 16 (discussing “sucker lists”); Stiglitz, *supra* note 9, at 105 (describing dentists and doctors as classic mistaken “noise traders”). Such individuals have in common both relative wealth and the tendency to be “self-made” men and women who may be particularly likely to overestimate their own talents and trading abilities.

stock trading, repeated plays should create selection pressures that lead speculative stock markets eventually to evolve into markets where investors trade only for liquidity or similar non-speculative reasons.⁷⁰ In other words, investor learning should provide a second deterrent to speculative trading.

Imperfect information about relative game-playing skill allows each of the self-selected participants in a negative-sum game like stock trading to believe they are more likely to win than the next player. Over time, however, actors who play a series of games gain additional information about their relative skill in playing. Winners learn that they are winners and presumably will continue to play. But some of those who play negative-sum games learn they were mistaken in thinking they would win. In the face of mounting losses, it is only rational for those who lose at negative-sum games eventually to decide to forgo playing. With whom, then, will the winners play?

One possible answer is that as the initial losers exit the game, the initial winners are left to play with each other. On this model, repeated stock trades should result in smaller and smaller numbers of willing traders who enjoy higher and higher average levels of skill. Taken to its logical extreme, this "survival of the fittest" model predicts that a speculative market should eventually be dominated by a single trader who is so successful no one is willing to bet against her.

This model obviously fails to describe modern stock markets, although Wall Street does have its legendary winners. For example, before his early and lamented retirement, renowned mutual fund manager Peter Lynch parlayed the Magellan Fund from \$20 million in assets into a \$13 billion leviathan that beat the Standard & Poor's 500 index in all but two of Lynch's thirteen years at the

⁷⁰ See *infra* Part II.A (discussing nonmistaken reasons for trading); cf. Figlewski, *supra* note 38, at 596 ("[T]he rationale for strongly efficient markets seems to be some kind of weeding-out process over time by which those with inferior information gradually lose money to those whose information is better . . ."); Keynes, *supra* note 10, at 154 ("It might have been supposed that competition between expert professionals, possessing judgment and knowledge beyond that of the average private investor, would correct the vagaries of the ignorant individual . . ."); De Long, et. al., *Noise Trader Risk*, *supra* note 10, at 704 (noting argument that traders with poor judgments of asset values lose money and eventually disappear from the market); Stiglitz, *supra* note 9, at 106 (discussing argument that noise traders will lose money and eventually be "weeded out" of the market).

helm.⁷¹ Yet Peter Lynch in his heyday controlled only a small portion of the market; millions of other individuals and institutions willingly traded against him. Any theory of HE stock trading must explain how speculative markets persist when repeated trading reveals information that should dissuade at least a portion of traders from continuing to trade. Some process must be inducing individuals to continue to play even against proven winners.

As P.T. Barnum suggested, demographics provides an answer.⁷² Stock markets have existed in one form or another for centuries and have served successive generations of investors. As each generation ages, it accumulates wealth that it eventually seeks to invest. Stocks are attractive investments; even with a buy-and-hold strategy, investors can expect to enjoy greater returns from stocks than from corporate bonds, government bills, or bank deposits.⁷³ Many new stockholders remain cautious and follow a buy-and-hold approach rather than risk losses through trading. But in each new generation, a subset of investors will judge that they are better at picking stocks than their fellow traders. Their optimistic assessments of their own abilities lead them to try their hand at speculative trading. As they play the market, they learn about their relative skill in trading. Most learn they are losers and eventually either exit the market or fall back on a buy-and-hold strategy.

⁷¹ Friday, *supra* note 37, at 38. Another famous winner is George Soros, "the most powerful and successful investor in the world." Gary Weiss & Gail E. Schares, *The Man Who Moves Markets*, *Bus. Wk.*, Aug. 23, 1993, at 50. A Holocaust survivor who once supported himself by working as a waiter, Soros established the Quantum Fund in 1969. *Id.* at 53, 56. From its inception through 1993, Quantum realized an average annual 35% return, with only one down year. *Id.* at 52-53.

It is possible, of course, that both Lynch and Soros were gifted with luck rather than skill. Even if investors cannot identify mispriced stocks, their returns from stock ownership are likely to be randomly distributed, and some lucky investors will strike it big just as others unaccountably lose big.

⁷² P.T. Barnum is credited with the observation that "[t]here's a sucker born every minute." John Bartlett, *Familiar Quotations* 460 (Justin Kaplan ed., 16th ed. 1992). HE theory suggests a less elegant but more accurate and generous version: "there's a rational optimist who is imperfectly informed about her relative trading ability born every minute." Cf. Stiglitz, *supra* note 9, at 106 (noting view that in market of traders irrationally trying to beat the market, losers should eventually be "weeded out," but observing that "[f]or every fool that is weeded out, a new one enters the market").

⁷³ Brealey & Myers, *supra* note 13, at 126 tbl. 7-1 (showing average rates of returns on common stocks, corporate bonds, government bonds, and Treasury bills from 1926 to 1985).

Consistent winners continue to trade and to profit from the mistakes of a new generation of investors.

This longitudinal model of HE trading implies that speculative markets are likely to be composed of a small number of highly successful, wealthy traders who remain in the market over a long period of time and a larger number of recently arrived, smaller traders whose trading time is likely to be short-lived and who will stop trading after losing money. In fact, exactly this pattern of Darwinian attrition is evident among stock mutual fund managers.⁷⁴ Less than fifteen percent of actively managed mutual funds have been under the control of the same individual for ten or more years.⁷⁵ Those funds tend to outperform the market, and they hold average assets of over \$1977 million.⁷⁶ In contrast, mutual funds with managers of less than ten years' tenure are both smaller and less successful; on average, they underperform the market and have assets of only \$822 million.⁷⁷ Similar patterns are found in futures markets, where a small number of large traders obtain positive returns while a large number of smaller traders suffer losses.⁷⁸ Such patterns accord with the prediction that speculators learn

⁷⁴ There is evidence of Darwinian attrition among individual investors as well. Since 1980, about the time that mutual funds became popular alternative investment vehicles, interest in individual stock ownership has tended to be concentrated among relatively young, and presumably inexperienced, investors. See New York Stock Exchange, *supra* note 31, at 86 (noting that in 1985, there were 11.1 million individual shareholders aged 21-34; 11.0 million aged 35-44; 7.9 million aged 45-54; 8.2 million aged 55-64; and 6.6 million aged 65 and over). Because wealth and savings tend to increase with age, see *infra* note 171, one would expect to see individual stock ownership increase rather than decrease with cohort age—unless, as HE theory predicts, there is investor attrition due to learning. If so, individual ownership of stocks might decrease with age because individuals learn over time that they are not successful at stock-picking and shift their investments into mutual funds instead.

⁷⁵ This figure is calculated from a recent survey of 760 equity funds that included information on management tenure, assets, and performance. See Jeffrey M. Laderman, *The Best Mutual Funds*, *Bus. Wk.*, Feb. 14, 1994, at 72, 78-103.

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ Lester G. Telser, *Why There Are Organized Futures Markets*, 24 *J.L. & Econ.* 1, 10 (1981) (citing studies demonstrating that large traders tend to obtain positive returns from futures whereas small traders suffer losses, implying that turnover is greater among small traders because successful traders will become large while unsuccessful traders will leave the market and be replaced by new small traders hoping for success); see also Hazen, *supra* note 6, at 1006 (noting the "consensus" that in derivatives markets "the winners are relatively few in number, and . . . smaller, less sophisticated investors are usually the losers" (citation omitted)).

over time whether they are winners or losers, and losers rationally seek to preserve their wealth by exiting the trading market. But because each generation must begin anew the process of separating winning traders from losers, speculative markets persist in the face of investor learning.⁷⁹

D. *The Role of Financial Intermediaries In Encouraging HE Trading*

The discussion thus far has proceeded as if stock markets consisted largely of individuals trading directly with each other. In reality, investors who trade in modern markets often use the services of a wide variety of financial intermediaries. The HE model suggests that at least two common forms of intermediaries, brokers and institutional investment funds, are likely to increase the incidence of HE trading significantly.

1. *The Role of Brokers*

The simple trading formula presented earlier predicts that, *ceteris paribus*, increasing the dispersion of investor expectations increases the incidence of trading. Given the difficulty of predicting the future, investors' opinions of stocks' relative values will naturally diverge. Yet the dispersion of investor opinion may be increased further by the efforts of a class of intermediaries with substantial incentive to convince investors they can profit through trading. Enter the brokers.

⁷⁹ Noise theorists have hypothesized that irrational noise traders persist in the market because their trading adds variability to prices that occasionally allows noise traders to reap profits rational traders cannot. See generally Black, *supra* note 34, at 532 (arguing that insofar as noise traders distort market prices, they add risk to the market that keeps away enough informed traders to allow imperfect pricing to persist); De Long et al., *Losses from Noise Trading*, *supra* note 33, at 685-86 (developing model in which noise traders can earn better returns than rational investors and so persist in market because noise trading adds risk to existing fundamental risk); Figlewski, *supra* note 38, at 595-597 (arguing that participation of less-informed traders moves prices away from efficient level); see also Keynes, *supra* note 10, at 154, 156-58 (arguing that expert professionals will not necessarily profit and prevail because irrational sentiment's effect on the market leads even professionals to focus on crowds' behavior rather than fundamentals to avoid short run losses).

Such arguments are plausible but hardly necessary to address the "weeding out" issue. Generational demographics suggest a far more direct and simple answer. Cf. De Long et al., *Noise Trader Risk*, *supra* note 10, at 718 ("Under the P.T. Barnum rule . . . a noise trader is born every minute.").

Brokers are paid a commission on every stock transaction they execute, profiting from trades regardless of whether the trading investor profits. They therefore have financial incentives to encourage trading.⁸⁰ One way brokers can persuade investors to trade is by providing them (either knowingly or unknowingly) with imperfect information that suggests that a particular stock or industry sector is significantly underpriced and creates perceived opportunities for speculative profits.

The brokerage industry has developed a variety of means of imparting such biased and limited information to investors, from the crude tactics of boiler rooms, cold calls, and outright misrepresentations,⁸¹ to the more subtle methods of "full service" houses that purport to advise investors on favorable trades.⁸² Federal law prohibits brokers (like other persons) from using fraud in the sale of securities.⁸³ It is extremely difficult, however, to prove that slanted advice was fraudulent, both because of the evidentiary problems involved in proving scienter⁸⁴ and the content of brokers' often-verbal representations, and because the very nature of stock

⁸⁰ See generally Nancy B. Kurland, *The Ethical Implications of the Straight-Commission Compensation System—An Agency Perspective*, 10 *J. Bus. Ethics* 757 (1991) (noting that the commission system creates "blatant conflicts of interest" that invite brokers to encourage trades without regard to clients' needs).

⁸¹ See generally Thomas L. Hazen, *The Law of Securities Regulation* § 10.8, at 429-30 (2d ed. 1990) (describing high pressure sales tactics such as boiler rooms and cold calls).

⁸² Langevoort, *supra* note 6, at 752 (describing the services provided by full service brokers); see also Tom Herman, *Not All Discount Brokers Offer the Same Bargains*, *Wall St. J.*, Mar. 6, 1991 at C1 (comparing full-service firms with discount brokers that do not advise but only execute trades and estimating that discounters handle 20% of individual investors' trades).

Another way to encourage trading is to convince the client not of the merits of a stock, but of the merits of the broker. The client may be persuaded to trade when and what the broker advises, or to give the broker discretionary authority to trade on the client's behalf. Once granted authority, the broker can turn over the investor's account as often as six times annually before discretionary trading is regarded as excessive "churning." See Hazen, *supra* note 81, § 10.10, at 436.

⁸³ See, e.g., 17 C.F.R. § 240.10b-5 (1994) (prohibiting persons from using fraud or misrepresentation in connection with the purchase or sale of securities).

⁸⁴ Apart from the usual evidentiary problems associated with proving state of mind, scienter may be difficult to prove because adverse selection ensures that many brokers who give biased advice are sincere. The modest individual who doubts her own stock-picking ability is unlikely to thrive in the commission-based brokerage profession. Only those who honestly believe they can identify and recommend mispriced securities (or are willing to make that representation dishonestly) are likely to survive in the industry. Thus, the broker who advises a client that a particular stock is a "steal" may be fraudulently trying to

analysis requires observers to consider only a fraction of the vast array of information relevant to stock values.⁸⁵ The rational investor who falls prey to an unscrupulous or overoptimistic broker (and to judge from reported cases, many do) eventually comes to distrust the broker's advice and stops trading with that broker. In the meantime, however, she may have suffered substantial losses from bad trades and brokerage commissions. Once bitten, twice shy; but still once bitten.

2. *The Role of Institutional Investment Funds*

A second common financial intermediary that may promote HE trading is the institutional investment fund. Although over 50 million individuals in the United States own stock directly,⁸⁶ many more own stock indirectly, through mutual funds, pension funds, insurance companies, and the like. Such institutional arrangements sever the individual investor from the trading decision. Trading occurs only at the institutional manager's behest.

Institutional stock ownership has grown steadily over the past few decades, with U.S. institutions' share of outstanding corporate equity increasing from approximately six percent in 1950 to forty-two percent in 1992.⁸⁷ At first glance, institutions' increasing role in securities markets might appear to offer hope of reducing the incidence of HE trading. In theory, institutional entities have potentially infinite lifespans, suggesting that they are not subject to the same demographic influences that lead successive generations of natural persons mistakenly to try their hands at speculative trading. Thus evolutionary pressures might eventually lead institutions to abandon HE-based trading strategies.

But while institutional entities have theoretically infinite lifespans and memories, their human agents do not. The investor who

foment trading, but she may simply be an optimist who believes she has a knack for picking underpriced stocks.

⁸⁵ Financial intermediaries who advise investors necessarily provide them with only a limited subset of the virtually infinite information relevant to stock valuation. Moreover, brokers who advise clients are only required to have an "adequate basis" for their recommendations. See Hazen, *supra* note 81, § 10.6, at 423.

⁸⁶ New York Stock Exchange, *supra* note 31, at 85.

⁸⁷ *Id.* at 89. By 1992, private and government pension funds and mutual funds alone held a total of \$1.846 trillion in stocks, 33% of the \$5.540 trillion value of the market portfolio. *Id.*

relies on a fund manager's trading skills rather than her own is still hoping to profit from what she perceives as her fund manager's superior trading ability. Similarly, a fund manager, like any other individual, begins trading in optimistic ignorance of his own relative abilities, hoping time will prove him to be a canny judge of stocks.⁸⁸ Once again, stock trading's negative-sum nature works remorselessly. Institutional funds that actively manage their portfolios by trying to identify and to trade mispriced stocks on average do worse than the market.⁸⁹ When a fund manager does worse than the market, as most fund managers do, the fund may eventually replace the old manager with a new one, and the learning process will begin anew.⁹⁰ A fund that proves chronically unable to select a winning manager and persistently underperforms the market may lose investors and eventually fail, exiting the trading market just as unsuccessful individual traders do.

But because self-selection ensures that both the average fund manager and the average fund investor believe the fund manager has above-average trading skills, the common practice of institutional investing does not prevent investors from trading in the statistically mistaken belief they can profit by doing so. Indeed, the opportunity to invest through institutional entities may actually

⁸⁸ The evidence suggests that the practice of institutional investing has not reduced HE trading. Pension fund and stock mutual fund portfolio turnover rates somewhat exceed the market turnover rate. Compare *supra* note 31 (noting turnover of over 55% for all equity holdings) with *infra* note 163 and accompanying text (noting 75% turnover rate for stock mutual funds) and *Effects of Short-Term Trading on Long-Term Investments: Hearing on S. 1654 and S. 2160 Before the Senate Comm. on Finance, 101st Cong., 2d Sess. 58 tbl. 2 (1990) [hereinafter 1990 Hearing]* (noting that turnover ratios of pension funds' equity portfolios varied from 51.9% to 63.2% between 1981 and 1986). The vast preponderance of this trading can be traced to active management, whose explicit goal is to beat the market by identifying mispriced stocks. See *infra* Part II.B.1. In the case of stock equity funds, the penchant for trading persists despite tax rules explicitly designed to discourage short-term trading by mutual funds. See Kiefer, *supra* note 10, at 2 (noting tax rules that prohibit mutual funds from deriving more than 30% of their gross income from sales of securities, futures, and options held fewer than three months).

⁸⁹ *Supra* note 30.

⁹⁰ See Employee Benefit Research Institute, EBRI Issue Brief No. 143, *Pension Fund Portfolio Turnover and Performance Evaluation* 25 tbl. 13 (1993) [hereinafter *EBRI Issue Brief*] (noting that average tenure of equity managers at surveyed pension funds varied from 5.7 to 6.3 years between 1986 and 1990); *supra* notes 75-77 and accompanying text (noting that more than 85% of equity mutual funds are headed by managers with less than ten years tenure).

increase the incidence of HE trading by giving investors a perceived second, or even third, "bite at the apple."

Consider the following scenario. Mary, a successful professional, has accumulated enough wealth by her thirties that she decides to invest in the stock market. Because she has a high opinion of her own abilities, she first attempts to trade stocks herself. In time she learns that she is losing money trading her own picks and concludes that she is not a good judge of stocks. She then turns to one or more brokers for advice and endures another round or two of costly trading before concluding that she is no better at picking brokers than she was at picking stocks. In other circumstances, Mary might then decide to avoid further trading costs and fall back on a buy-and-hold strategy. But in a world where individuals can invest through institutions as well as directly, an investor who is no longer optimistic about her ability to pick stocks or brokers may still remain optimistic about her ability to pick fund managers. Mary may shift her savings through a series of mutual funds, each of which underperforms the market, before concluding that she is no better at picking fund managers than she was at picking stocks or brokers.⁹¹

As this example illustrates, increasing the variety of financial intermediaries through which investors can trade increases the number and types of overoptimistic mistakes investors can make.⁹² In a world without financial intermediaries, the investor who attempts to make money by speculating in stocks may need years to discover her relative trading ability (after all, given stocks' natural volatility, how can the unfortunate trader who loses in a particular year conclude with certainty whether she was the victim of overconfidence or simple bad luck?). In a world where investors can choose to rely not only on their own trading skills but also on the skills of a broker or fund manager, however, lessons that used to take years to learn can take a lifetime. Thus financial intermediaries help perpetuate HE markets.

⁹¹ Mary at this point has two options: exit the market or switch to a buy-and-hold strategy, perhaps by investing in an index fund. See *infra* notes 152-56 (discussing index funds).

⁹² The same risk may be posed by increasing the variety of investment vehicles available to investors. Mary may lose money first by trading stocks, then bonds, then stock futures, and so forth. See *infra* notes 313-35 and accompanying text (discussing derivatives markets).

E. HE Theory and The Relationship Between Stock Prices and Fundamental Values in An "Efficient" Market

As the above discussion illustrates, the HE model offers a variety of insights into the nature and behavior of the individuals and institutions who trade on secondary markets. HE theory also offers important insights into the nature of market prices. In particular, the HE model has significant and controversial implications for the relationship between a stock's market price and the best estimate of its intrinsic economic value.

1. The Rise (and Fall?) of Conventional Efficient Markets Theory

One of the most influential concepts in modern financial theory is the Efficient Capital Markets Hypothesis ("ECMH"). According to the ECMH, in an "efficient" market, stock prices respond so quickly to new information relevant to value that it is impossible for investors to earn short-run profits by buying on good news or selling on bad news.⁹³ Thus, the General Motors shareholder who hopes to avoid a loss by selling her GM shares after the company announces an unexpected decline in earnings will find that by the time she calls her broker, it is too late; GM's price has already dropped. Substantial empirical evidence confirms that most stock prices are efficient in this "informational" sense.⁹⁴

⁹³ See generally supra note 13 (discussing the ECMH and listing sources).

⁹⁴ Empirical tests of informational efficiency generally fall into three categories. "Weak form" tests examine whether market prices reflect all information contained in past price movements. Studies confirm the market is weak form efficient; it is impossible (for academics, at least) to predict profitably future movements in stock prices from past price changes. Brealey & Myers, supra note 13, at 287; Elton & Gruber, supra note 13, at 403-18. "Semistrong form" tests examine whether prices reflect all public information, such as earnings announcements or newspaper reports. The evidence suggests that prices respond efficiently to a wide variety of public information. Brealey & Myers, supra note 13, at 287; Elton & Gruber, supra note 13, at 418-25. "Strong form" tests examine whether all public and nonpublic information is incorporated into stock prices. Although strong form tests are difficult to devise because researchers do not, by definition, have access to nonpublic information, some have tried to test strong form efficiency by determining whether traders who are likely to have access to nonpublic information earn better-than-average trading returns. The results are mixed; corporate management and exchange specialists show superior returns, whereas mutual funds do not. Brealey & Myers, supra note 13, at 287; Elton & Gruber, supra note 13, at 425-27; Gilson & Kraakman, supra note 13, at 555-56. But see generally William K.S. Wang, *Some Arguments that the Stock Market Is Not*

Commentators frequently go on to assert, however, that efficient prices are *accurate* prices. In other words, stock markets not only respond to new information quickly, but also respond correctly, so that market prices accurately reflect best estimates of expected risks and returns.⁹⁵ This stronger interpretation of market efficiency, which securities scholars often label “fundamental value efficiency,”⁹⁶ relies not only on the ECMH but also on the Capital Asset Pricing Model (“CAPM”).⁹⁷ The ECMH predicts that market prices respond quickly to new information but says nothing about the quality or rationality of the information itself. General Motors stock may fall quickly after GM announces a decline in earnings; it may also drop quickly after a popular astrologer gives the firm an unfavorable horoscope reading. The CAPM, however, predicts that rational investors measure stock values solely in terms of their likely economic returns and their nondiversifiable (or “beta”) risk,⁹⁸ and that beta risk and return are positively and lin-

Efficient, 19 U.C. Davis L. Rev. 341, 349-59 (1986) (citing studies suggesting markets are not perfectly informationally efficient).

The fact that stock prices are efficient according to the weak, semi-strong, or strong tests does not prove that these prices reflect intrinsic or fundamental values. See *infra* note 134; see generally Bruce N. Lehmann, *Asset Pricing and Intrinsic Values: A Review Essay*, 28 J. Monetary Econ. 485, 491 (1991) (“[U]npredictability of returns is necessary for market efficiency but is not a sufficient condition for price to equal objective intrinsic values.”).

⁹⁵ See Langevoort, *Market Efficiency*, *supra* note 27, at 856 (noting that according to much efficient market literature, prices reflect a rational estimate of value); Summers & Summers, *supra* note 8, at 264 (“[T]he efficient markets view that stock prices will always reflect fundamental values has, until recently, commanded widespread allegiance from academic students of financial markets.”).

⁹⁶ See, e.g., Wang, *supra* note 94, at 344-49 (distinguishing “information-arbitrage” efficiency and “fundamental-valuation” efficiency); see also Kiefer, *supra* note 6, at 888-89 (contrasting fundamental value and informational efficiency).

⁹⁷ See Gordon & Kornhauser, *supra* note 13, at 765 (noting that the argument that an efficient market produces accurate prices relies on CAPM as model underlying tests of ECMH); Stout, *supra* note 11, at 1241-42 (noting that claims of fundamental value efficiency require CAPM as well as ECMH). See generally Brealey & Myers, *supra* note 13, at 136-65 (explaining the Capital Asset Pricing Model).

⁹⁸ Modern portfolio theory predicts that investors valuing financial instruments are concerned only with the expected returns from such instruments, and the expected risk (variation) in those returns. Investors prefer a low-risk investment to a high-risk investment with the same expected return, and so demand a premium in the form of greater expected return to bear risk. Moreover, because much risk can be eliminated by holding a diversified portfolio of many stocks whose “alpha,” or firm-specific, risks counteract, diversified investors care only about nondiversifiable market, or “beta,” risk. See generally Brealey & Myers, *supra* note 13, at 125-65 (explaining the concepts of CAPM and nondiversifiable risk).

early correlated.⁹⁹ Taken together, the ECMH and CAPM predict that efficient markets will quickly and correctly digest all information relevant to economic risks and returns, producing prices equivalent to best rational estimates of stocks' fundamental economic values.¹⁰⁰

During the 1970s and 1980s, the notion that informational efficiency necessarily implies fundamental value efficiency, and that stock market prices consequently provide accurate estimates of stocks' fundamental values, enjoyed great popularity in the legal culture.¹⁰¹ Fundamental market efficiency was described as "an article of doctrinal faith in corporate and securities law"¹⁰² that scholars and regulators "rush[ed] to embrace and apply."¹⁰³ The belief that stock markets accurately price securities influenced the decisions of judges, legislators, and the SEC.¹⁰⁴

Yet even as the legal culture enthusiastically adopted the notion of fundamental value efficiency, financial theorists voiced increasing skepticism.¹⁰⁵ Empirical studies identified a host of market

⁹⁹ The CAPM predicts that beta risk and return bear a direct and linear relationship, because in an efficient market investors can replicate the risks and returns of a high-beta or low-beta portfolio by holding the market portfolio and either lending at the risk-free rate or borrowing at the risk-free rate and using the borrowed funds to buy more stocks. *Id.* at 136-39.

¹⁰⁰ Thus the adage, "[T]rust market prices." *Id.* at 290.

¹⁰¹ See, e.g., Gilson & Kraakman, *supra* note 13, at 550 ("[T]he ECMH is now *the* context in which serious discussion of the regulation of financial markets takes place."); Gordon & Kornhauser, *supra* note 13, at 764 (noting "legal rush to embrace and apply" efficient market theory); Langevoort, *Market Efficiency*, *supra* note 27, at 851 (explaining efficient market theory "has a strong presence in the contemporary culture of securities regulation"); Stout, *supra* note 23, at 621 (recognizing that market efficiency has "captured the hearts and minds of the securities culture").

¹⁰² Langevoort, *Market Efficiency*, *supra* note 27, at 872.

¹⁰³ Gordon & Kornhauser, *supra* note 13, at 764.

¹⁰⁴ See Marcel Kahan, *Securities Laws and the Social Costs of "Inaccurate" Stock Prices*, 41 *Duke L.J.* 977, 982-87 (1992) (surveying doctrines designed to increase markets' ability to produce accurate prices); Stout, *supra* note 11, at 1258-96 (describing how belief that market prices reflect values has influenced policy); Stout, *supra* note 23, at 637-40 (describing how the desire to improve efficiency has influenced policy). But see Langevoort, *Market Efficiency*, *supra* note 27, at 851-52, 900 (acknowledging the general acceptance of the efficient market hypothesis, but suggesting that regulators may cite market efficiency as a rationalization for policies they would adopt in any case).

¹⁰⁵ As Professor Langevoort puts it, a "gulf . . . developed between the current economics literature and the persistent, seemingly static, conception of market efficiency in the legal culture." Langevoort, *Market Efficiency*, *supra* note 27, at 854. See also Gordon

anomalies¹⁰⁶—including “small firm effects,”¹⁰⁷ “overvolatility” results,¹⁰⁸ “mean-reversion effects,”¹⁰⁹ and “closed-end mutual fund puzzles”¹¹⁰—that are impossible to reconcile with the notion that stock prices reflect best estimates of risks and returns. The rising tide of evidence against the CAPM and fundamental value efficiency has led some economists to conclude that orthodox efficient market theory is suffering “a near-death experience.”¹¹¹ One

& Kornhauser, *supra* note 13, at 765 (“It may be only a slight overstatement to say that only in the legal literature is CAPM considered an *accurate* account of market processes.”).

¹⁰⁶ See generally Langevoort, *Market Efficiency*, *supra* note 27, at 863-64 (noting that a substantial body of data from 1970s and 1980s “appear[s] flatly to contradict” ECMH); Peter Fortune, *Stock Market Efficiency: An Autopsy?* *New Eng. Econ. Rev.*, Mar.-Apr. 1991, at 17, 34 (noting that empirical evidence “provides an overwhelming case against the efficient market hypothesis”).

¹⁰⁷ Studies have shown that low-capitalization firms’ stock returns have outpaced average market returns. See William F. Sharpe & Gordon J. Alexander, *Investments* 447 (4th ed. 1990). If markets were efficient, then one should be able to attribute the higher returns of small companies to higher beta risk. The evidence suggests, however, that returns are significantly above what one would expect given small firms’ betas. See Fortune, *supra* note 106, at 22 (describing “small-firm effect”); Elton & Gruber, *supra* note 13, at 429-30 (citing possible explanations for at least part of small firms’ excess returns).

HE theory can explain the small firm effect as a consequence of the fact that small firms are relatively neglected by the larger pool of investors. See Stout, *supra* note 11, at 1257 n.112 (explaining small firm effect given investor heterogeneity).

¹⁰⁸ “Overvolatility” studies have found that stock prices exhibit far more variation over time than is consistent with historic variations in dividends and earnings. See, e.g., Robert J. Shiller, *Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?*, 71 *Am. Econ. Rev.* 421, 433-34 (1981).

¹⁰⁹ “Mean-reversion” studies have found that after large upswings or downswings, stock prices tend to revert towards their original level, a phenomenon inconsistent with the ECMH’s prediction that prices should follow a random walk. See, e.g., Werner F.M. De Bondt & Richard Thaler, *Does the Stock Market Overreact?*, 40 *J. Fin.* 793, 799 (1985) (discussing “overreaction hypothesis”); Werner F.M. De Bondt & Richard H. Thaler, *Further Evidence On Investor Overreaction and Stock Market Seasonality*, 42 *J. Fin.* 557, 579 (1987) (same).

¹¹⁰ The “closed-end mutual fund puzzle” refers to anomalous discounts on closed-end mutual fund shares. The existence of such discounts contradicts the ECMH because, if markets were efficient, the discount would be eliminated by bargain-seeking investors’ buying into the fund. See Fortune, *supra* note 106, at 22-23 (discussing puzzle); Wang, *supra* note 94, at 389-91 (attempting to explain the puzzle and concluding that the market is “not very efficient”).

¹¹¹ Fortune, *supra* note 106, at 35; see also David Dreinan, *An Inefficient Market*, *Forbes*, Mar. 28, 1994, at 146 (claiming that efficient market theory is “in its death throes”); Lehmann, *supra* note 94, at 485 (“It is open season on the efficient markets hypothesis.”). Legal scholars also have begun to voice serious doubts about the wisdom of the legal culture’s infatuation with fundamental value efficiency. See, e.g., Langevoort, *Market Efficiency*, *supra* note 27; Stout, *supra* note 11; Wang, *supra* note 94.

eminent theorist has gone so far as to describe the efficient market as "the most remarkable error in the history of economic theory."¹¹²

Increasing disillusionment with the concept of fundamental value efficiency has spurred financial theorists to propose alternative models of stock markets that in some cases depart radically from the orthodox ECMH/CAPM. One theory that has captured much attention is the so-called "noise trader" theory. According to the noise trader model, stock markets tend to attract two kinds of traders: rational traders with access to information that allows them to accurately assess stocks' true values and irrational traders who trade on the basis of rumors, whims, and fads (i.e., "noise").¹¹³ Noise trader theory hypothesizes that stock markets are not efficient in the fundamental value sense because noise traders distort market prices.¹¹⁴

Noise theorists' willingness to abandon the fundamental economic assumption of individual rationality is strong evidence of economists' frustration with the stock markets' stubborn refusal to behave in accordance with the ECMH/CAPM's prediction of fundamental value efficiency.¹¹⁵ Yet such desperate measures may be unwarranted. Heterogeneous expectations theory offers a rational choice explanation of how informationally efficient stock markets may be demonstrably *inefficient* in the fundamental value sense.¹¹⁶

¹¹² Barbara Donnelly, *Efficient-Market Theorists Are Puzzled By Recent gyrations in Stock Market*, Wall St. J., Oct. 23, 1987, at 7 (quoting Yale economist Robert Shiller). Not surprisingly given its former preeminence, orthodox efficient market theory is dying a long and hard death. See, e.g., Kiefer, *supra* note 6, at 890 (suggesting that new theories of inefficiency "are not yet the accepted paradigms in the finance literature" and "[a]t this point . . . are probably appropriately regarded as interesting new channels of investigation that have some implications which are more consistent with observed market behavior than the standard efficient markets model").

¹¹³ See *supra* note 34. But see Brett Trueman, *A Theory of Noise Trading in Securities Markets*, 43 J. Fin. 83 (1988) (developing a model in which noise trading by institutional managers is a rational means of sending false "signal" that manager has access to private information justifying trading).

¹¹⁴ See, e.g., Black, *supra* note 34, at 532 (arguing that noise traders distort market prices from fundamental values); De Long et al., *Noise Trader Risk*, *supra* note 10, at 705 (same); De Long et al., *Losses from Noise Trading*, *supra* note 33, at 681 (same).

¹¹⁵ See Posner, *supra* note 7, at 3 (describing rationality as a fundamental concept in economic analysis).

¹¹⁶ Some proponents of noise theory have suggested that market anomalies can be explained without resorting to a presumption of investor irrationality by taking account of investors' possibly heterogeneous expectations. See De Long et al., *Noise Trader Risk*,

2. *Modifying Conventional Efficient Markets Theory To Account for Heterogeneous Expectations*

In its traditional form, the CAPM presumes that investors share homogeneous expectations, making identical estimates of the likely risks and returns of various stocks.¹¹⁷ Although unrealistic,¹¹⁸ the assumption of investor homogeneity was a useful device for the pioneering theorists who developed the CAPM to model the relationship between stocks' nondiversifiable risks and their expected returns.¹¹⁹ Nor does the homogeneity assumption's falsity detract much from the CAPM's utility for that purpose. When the CAPM is incorporated into the ECMH to make predictions about the relationship between a particular stock's market price and its intrinsic value, however, the assumption of investor homogeneity leads to the false prediction that stock prices reflect best estimates of stock values.¹²⁰ Modifying the ECMH/CAPM model to take account of investors' heterogeneous expectations produces a model of stock market pricing that preserves the assumption of investor rationality while nevertheless explaining how informationally efficient stock

supra note 10, at 735 (noting that although noise theory focuses on irrationality, many of its results "could perhaps be derived using a fully rational model with differentially informed investors").

¹¹⁷ See Stout, supra note 11, at 1245 n.52 (citing authorities).

¹¹⁸ The artificiality of the homogeneous beliefs assumption was fully recognized by the pioneers who developed the CAPM. See, e.g., William F. Sharpe, *Portfolio Theory and Capital Markets* 104 (1970) (noting that "[e]ven the most casual empiricism suggests" that investor beliefs concerning the values of stocks differ).

¹¹⁹ See Brealey & Myers, supra note 13, at 137 (explaining that the CAPM was developed to help analyze the relationship between degree of risk and expected risk premium).

¹²⁰ At least two of the pioneers who developed the CAPM, John Lintner and William Sharpe, clearly recognized that when investors have differing expectations and either short sales or investor wealth are limited, efficient market prices no longer bear any necessary relationship to best estimates of value. Lintner concluded that in a market where investors make heterogeneous estimations of risks and returns and short sales are restricted, market price will be a weighted aggregate valuation of the optimistic subset of investors who choose to hold stock, investors will hold unique portfolios of those stocks they value most highly, and market price of risk will vary from stock to stock, contrary to predictions of standard CAPM. John Lintner, *The Aggregation of Investor's Diverse Judgments and Preferences in Purely Competitive Security Markets*, 4 *J. Fin. & Quantitative Analysis* 347, 384-97 (1969). In a chapter titled "Disagreement," Sharpe notes that when investors' expectations differ, "[t]he market portfolio will seem inefficient to some, and perhaps to all investors." Sharpe, supra note 118, at 104-13. If short selling or investor wealth is limited, Sharpe predicts, "The demise of the capital market line is followed immediately by that of the security market line. The theory is in a shambles." *Id.* at 112.

markets can produce prices that fail to reflect best estimates of fundamental value.¹²¹

HE theory suggests that when investors disagree about future stock performance, they develop personal preferences for, and aversions to, particular stocks.¹²² John thinks General Motors is a bargain at \$100, whereas Mary thinks GM at \$100 is a sucker's bet. Shares in a particular firm will tend to be held by the investors who are most optimistic about the firm's prospects.¹²³ John buys GM; Mary does not.

Taken to its logical extreme, HE theory would seem to predict that all of a firm's shares will end up in the hands of the one investor who is most optimistic about the company's prospects. If investors enjoyed infinite wealth and were indifferent to risk, each corporation's equity might indeed be held by a single investor.¹²⁴ But investors are risk-averse and have limited wealth; their budgets and their tolerance for diversifiable ("alpha") risk curtail their willingness to invest large amounts in a single firm. Once John has invested a sizeable portion of his finite savings in General Motors, he may prefer to buy shares in another firm he perceives as not quite as good a bargain simply to maintain a diversified portfolio. HE theory thus predicts that a firm's shares will be held by an opti-

¹²¹ See generally Stout, *supra* note 11, at 1244-52, 1284-95 (modifying CAPM to account for investor heterogeneity and considering implications for relationship between stock prices and values).

¹²² See Lintner, *supra* note 120, at 397 (explaining that in a market where investors make heterogeneous estimations and short sales are restricted, investors will not hold market portfolio but unique portfolios of the stocks they value most); Stout, *supra* note 11, at 1246 (stating that investors prefer stocks they subjectively perceive as underpriced and avoid those they subjectively perceive as overpriced).

¹²³ See Lintner, *supra* note 120, at 397 (describing market price as a weighted aggregate valuation of that optimistic subset of investors who choose to hold stock); Stout, *supra* note 11, at 1246 (noting that shares tend to be held by those who attach highest subjective valuation to them). Stocks tend to be held by optimists because legal and practical restrictions on "short sales" limit the ability of pessimists to take a position in a security. See Stout, *supra* note 11, at 1248 & n.68 (discussing short sales restrictions).

¹²⁴ See Harris & Raviv, *supra* note 38, at 481 (suggesting that if short sales were restricted and investors were risk-neutral, each stock would end up being owned entirely by the investor who was most optimistic); Stout, *supra* note 11, at 1246 (same).

Modeling investor heterogeneity in a world where investors are risk-neutral and short sales are not restricted produces the odd prediction that no stable market price exists. See De Long et al., *Noise Trader Risk*, *supra* note 10, at 710 (noting that if investors held "with certainty different beliefs about expected returns[,] they would . . . try to take infinite bets against each other . . . [and an] equilibrium would not exist").

mistic subset of investors, who may perceive the stock to be “underpriced” yet be unwilling to buy more at market price.¹²⁵

Modifying the traditional ECMH/CAPM to account for investor disagreement consequently yields the controversial prediction—nevertheless borne out by much empirical evidence, including several recent studies—that investor demand for particular stocks will be downward-sloping.¹²⁶ Even at a very high price, a corporation may sell a modest number of shares to the “superoptimists” who have the highest opinions of the firm’s prospects. Lowering the price allows the firm to sell more shares, both because the lower price allows a greater number of investors to perceive the stock as a bargain and because it induces the optimists who already own shares to accept the risk of purchasing a bit more. Market price thus will be set by the intersection between a stock’s supply function (fixed in the short run) and the downward-sloping aggregate demand function. Increasing the available supply of stock by issu-

¹²⁵ Stout, *supra* note 11, at 1246-47.

¹²⁶ See Stout, *supra* note 11, at 1247-58 (arguing that HE theory and empirical evidence both support downward-sloping demand). The claim that demand for stocks is downward-sloping is controversial because the orthodox ECMH/CAPM predicts that the demand function for stocks should be horizontal or “perfectly elastic.” In other words, investors should be willing to buy an infinite amount of a stock at below-market prices and be willing to sell an infinite amount at above-market prices. *Id.* at 1236-39. The perfect elasticity prediction flows naturally from the CAPM’s assumption of investor homogeneity because at below-market prices all investors view a stock as a bargain and wish to buy it, whereas at above-market prices all investors see a stock as overpriced and wish to sell. *Id.* at 1245.

Because downward-sloping demand for stocks is inconsistent with orthodox ECMH/CAPM, for many years the suggestion that stock demand might be downward-sloping was regarded as close to heresy in financial circles. Yet financial economists increasingly have come to accept that, as an empirical matter, investor demand for individual stocks is indeed significantly downward-sloping and that investors’ heterogeneous expectations may explain that observation. See *id.* at 1245 n.56, 1252-58 (citing authorities and studies); Gordon B. Pye, *Does the Market Always Know Best?*, *Fm. Analysts J.*, July-Aug. 1989, at 4, 5 (concluding that there is “ample” empirical evidence that the demand curve for shares “may have considerable slope”). Recent studies include Robert W. Holthausen, Richard W. Leftwich & David Mayers, *Large-Block Transactions, the Speed of Response, and Temporary and Permanent Stock-Price Effects*, 26 *J. Fin. Econ.* 71, 73-74, 90 (1990) (noting that if demand for stocks is sloping, large trades will cause permanent price changes directly correlated with size of trade, and finding “strong evidence of a permanent price effect that increases with block size”); Claudio Loderer, John Cooney & Leonard D. Van Drunen, *The Price Elasticity of Demand for Common Stock*, 46 *J. Fin.* 621, 621-22, 648-49 (1991) (presenting study results consistent with inelastic demand); cf. Bagwell, *supra* note 53 (discussing upward-sloping supply curves in the context of Dutch auction stock repurchases).

ing more shares will lower market price, whereas contracting supply (for instance, through a corporate repurchase program) will raise market price.¹²⁷

The possibility that investor demand for stocks is downward-sloping carries important implications for the relationship between a stock's market price and its intrinsic value. According to the

127

FIGURE 4:

EQUILIBRIUM MARKET PRICE WITH DOWNWARD-SLOPING DEMAND

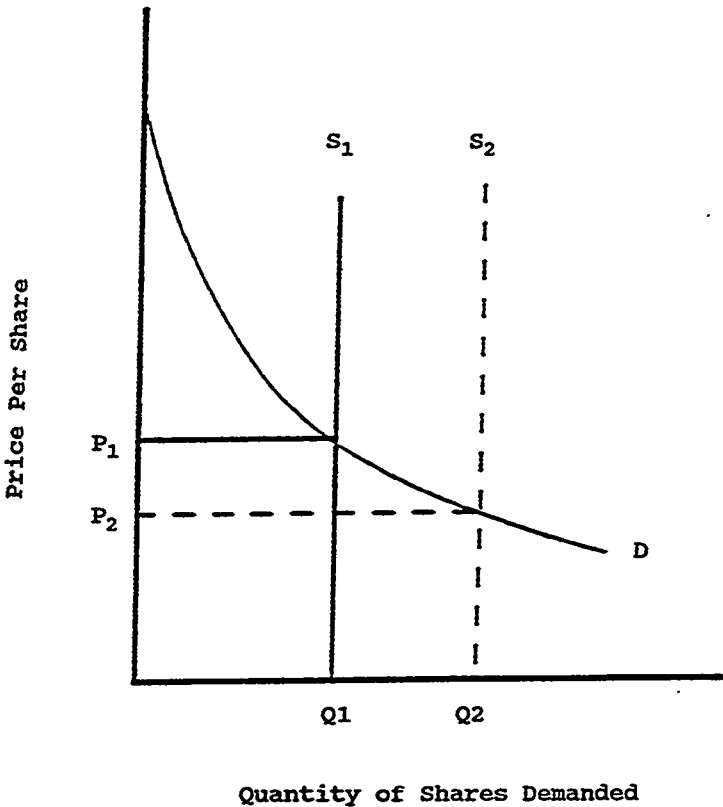


Figure 4 illustrates how market price is set when aggregate demand for stocks is downward-sloping. The supply of any given stock is fixed, in the short run, as illustrated by vertical supply function S_1 . Given a downward-sloping demand function (D) for a stock, equilibrium price P_1 is determined by the intersection of D and S_1 . If the firm issues more shares and increases the supply of stock to S_2 , equilibrium price decreases to P_2 . See Stout, *supra* note 11, at 1249-50 (describing how market price is set under assumption of investor heterogeneity).

orthodox ECMH/CAPM, prices in an efficient market reflect the best possible estimates of stocks' fundamental values.¹²⁸ Under the heterogeneous expectations version of the ECMH/CAPM, however, market price is simply the price at which the least optimistic member of the optimistic subset of investors who hold a particular stock would willingly part with some of her shares.¹²⁹ In other words, *market price is nothing more than the subjective valuation of the marginal investor*. Because there is no reason to presume that the marginal investor's valuation is also the *best*, or most optimal, valuation,¹³⁰ modifying the ECMH/CAPM to allow for investors' heterogeneous expectations destroys any close relationship between a stock's market price and best estimates of its fundamental value.¹³¹

Prices set in a market of investors with heterogeneous expectations may still be informationally efficient. Prices may respond quickly to new information either because fresh information changes the marginal investor's estimate of her stock's value or because it entices new investors into (or drives old investors out of) the market for a particular firm's shares, thus changing the identity of the marginal investor. But even if prices change *quickly* in response to new information, there is no guarantee they change *accurately*. Market prices inevitably reflect the aggregate demand of an amalgam of investors with differing opinions, all acting on limited information and most of whom are mistaken to greater or

¹²⁸ This simple explanation of fundamental value efficiency is close to a tautology. If investors value stocks only according to their expected risk and returns, and if investors all have identical expectations for stocks, a market price that reflects all available information inevitably reflects that "best," unanimous valuation. A more sophisticated defense of fundamental value efficiency recognizes that investors' expectations may differ, but argues that over time stocks' prices should come to approximate fundamental values because investors who are poor judges of stocks' intrinsic values lose money and exit the market. The longitudinal HE model suggests that "weeding out" is ineffective in ensuring that prices equal best estimates of value, due to generational effects. See *supra* Part I.C.2.

¹²⁹ See Stout, *supra* note 11, at 1248.

¹³⁰ In a world of imperfect information, the "best" estimate of a stock's value would be the estimate of that investor who has access to, and has considered, all available information rather than just a subset of information.

¹³¹ Stout, *supra* note 11, at 1248-49; see also Lintner, *supra* note 120, at 384-97, (concluding that when investors make heterogeneous estimations and short sales are restricted, market price of risk varies from stock to stock, contrary to predictions of standard CAPM); Pye, *supra* note 126, at 6 (concluding that because investors disagree about stock values, "[t]he market doesn't always know best.").

lesser degrees. So long as at least a portion of investors in the market are reasonably informed, market prices will not be utterly divorced from reasonable estimates of value. But the connection between price and best estimate of value may be very loose indeed.¹³²

The HE model thus offers an answer to a phenomenon that has long puzzled financial theorists: the steadfast refusal of the sophisticated individuals and institutions who participate in securities markets to heed their warnings that "the market knows best."¹³³ The HE model suggests that at least some of the market participants who claim to be able to detect underpriced or overpriced stocks may be correct in their assessments.¹³⁴ Although HE theory predicts that stock traders who expect to profit from trading are mistaken *on average*, it also, ironically, supports the notion that they may be correct *in individual cases*. Stock trading may indeed be a game of skill in which the talented and canny may profit at the expense of their less able fellows.¹³⁵

II. ARE U.S. STOCK MARKETS HETEROGENEOUS EXPECTATIONS MARKETS?

The HE model of stock trading is logically consistent, its underlying assumptions are plausible, and its predictions accord well with observed market behavior as well as with common perceptions of stock markets. Yet, like any economic model, HE theory simplifies a complex reality. In the real world, traders squander

¹³² As Fischer Black has suggested in the context of noise theory, one "might define an efficient market as one in which price is within a factor of 2 of value, i.e., the price is more than half of value and less than twice value." Black, *supra* note 34, at 533. Although the HE model of stock pricing differs from noise trader theory in several ways—most notably in retaining the assumption of investor rationality, see *supra* notes 33-34 and accompanying text, and in modifying rather than rejecting the ECMH/CAPM framework, see *supra* notes 117-31 and accompanying text—HE theory nevertheless agrees with noise theory's prediction that the market prices of stocks may not reflect their values.

¹³³ See *supra* note 32 and accompanying text (noting that theorists are puzzled by speculative trading).

¹³⁴ Empirical tests of the markets' informational efficiency generally focus on traders' abilities to make profits in the very short run, i.e., hours or days. See authorities cited *supra* note 94 (discussing tests of efficiency). These tests cannot disprove some investors' abilities to identify mispriced stocks and profit from buying them and holding them for longer periods.

¹³⁵ But see *supra* note 71 (discussing possibility that random luck explains persistent winners in the market).

resources trying to beat the market, but they trade for other reasons as well.¹³⁶ Because the policy implications of the HE model depend on determining just how great a role heterogeneous expectations play in the secondary stock markets, this Part examines the available evidence on investors' motives for trading. That evidence suggests that investor disagreement is indeed the modern markets' *raison d'être*.

A. Nonmistaken Reasons for Trading and the Value-Adding Model of Stock Markets

Investors may have a number of reasons for trading other than heterogeneous expectations. For example, some portion of the trading observed in secondary markets almost certainly reflects the changing liquidity needs of investors who desire first to put their savings in stocks and then to liquidate their holdings to raise cash for another purpose. Trading driven by liquidity needs would occur even if all investors shared homogeneous expectations. Suppose John and Mary agreed that GM's market price of \$100 per share exactly reflected its expected future returns. John would still willingly pay broker commissions to buy, and Mary pay commissions to sell, if thrifty John had accumulated savings under his mattress that he wished to invest, whereas Mary needed to liquidate her holdings to purchase a home or pay a child's tuition.

Tax concerns also can trigger transactions by investors who perceive stocks to be accurately priced. If Mary bought GM at \$100 per share and GM's price then declined to ninety dollars, Mary might sell, not because she predicts GM will decline further, but because selling would allow her to realize a ten dollars per share capital loss that would reduce her tax liability by offsetting otherwise-taxable income.¹³⁷

¹³⁶ See Harris & Raviv, *supra* note 38, at 474 (arguing that explanations for trading "include tax-driven trading, liquidity trading, portfolio rebalancing, and speculation"; speculation "stems, presumably, from disagreements among traders"); Stiglitz, *supra* note 9, at 102 (stating that investors trade in order to save or dissave, to change their portfolios, and to beat the market).

¹³⁷ See generally, Marvin A. Chirelstein, *Federal Income Taxation: A Guide to the Leading Cases and Concepts* 299 (7th ed. 1994) (discussing rules for deductibility of capital losses); Josef Lakonishok & Seymour Smidt, *Capital Gain Taxation and Volume of Trading*, 41 *J. Fin.* 951, 953-54 (1986) (describing tax effects of capital losses and limits of tax-induced trading).

“Portfolio balancing” provides a third reason investors might trade absent disagreement over prices. Modern financial theory counsels investors to maximize their returns given a desired level of risk by holding a diversified portfolio of stocks in combination with some riskless asset, such as government bonds.¹³⁸ Occasionally, the nondiversifiable (beta) risk of the equities portion of an investor’s portfolio may shift to the point where the investor must sell off equities and buy bonds (or vice versa) to maintain her desired overall risk level.¹³⁹ Alternatively, a stock might appreciate so greatly that it comes to constitute too large a portion of the investor’s portfolio, and she might sell off some of it to reduce her diversifiable (alpha) risk.¹⁴⁰ Indexed mutual funds and pension funds that buy and hold the stocks comprising a particular stock index also periodically adjust their portfolios when stocks are listed or delisted from the index.¹⁴¹

Because trades motivated by liquidity, tax and portfolio-balancing concerns would occur even if investors enjoyed perfect information and shared homogeneous expectations for stocks’ futures, such “nonmistaken” trades, in addition to appearing mutually beneficial *ex ante*, can, in fact, be mutually beneficial *ex post*.¹⁴² This observation suggests an alternative model of stock trading—call it the “value-adding” model—that carries very different implications for the behavior and the social value of stock markets than those of the HE model. In the economist’s parlance, nonmistaken, mutually beneficial stock trades “add value” because investors who pay trading costs to purchase liquidity, tax benefits, or a balanced port-

¹³⁸ See *supra* notes 98-100 and accompanying text; *supra* text accompanying notes 124-25.

¹³⁹ See *supra* notes 98-100 and accompanying text.

¹⁴⁰ See *supra* note 98 and accompanying text.

¹⁴¹ See *infra* notes 153-56 and accompanying text.

¹⁴² Trades motivated by differing needs for liquidity, diversification, or capital gains or losses reflect differences in investors’ *tastes* rather than in their *expectations*. Thus, even if two investors share identical expectations for the future, one might readily buy stocks that the other sells if the first investor needs to invest the growing pile of cash under her mattress (i.e., has a taste for investing) whereas the second is strapped for cash (i.e., has a taste for liquidity). The transaction costs associated with such trades reduce the two investors’ net wealth by transferring some of that wealth to third parties. Because investors who pay for liquidity or diversification receive something they value in return, however, such trades still increase net investor welfare.

folio receive something they value in return.¹⁴³ Under a value-adding model of stock trading, then, trading improves the average trader's welfare, and costs incurred in trading are well spent.¹⁴⁴

B. The Value-Adding Model versus the HE Model: Some Evidence on Why Investors Trade

As will be discussed further in Part III, the HE model of a stock market primarily composed of speculators betting against each other according to their differing predictions, and the value-adding model of a market comprised mainly of investors trading to satisfy liquidity needs, reap tax benefits, or rebalance their portfolios,¹⁴⁵ carry very different normative connotations. The HE model's relevance for securities policy thus largely depends on determining

¹⁴³ A fourth possible form of value-adding trading is "recreational" trading. See *supra* note 33 and accompanying text (discussing possibility that some investors trade not to profit, but because they intrinsically enjoy the process, and concluding that recreational trading is unlikely to account for more than a small portion of speculative activity).

¹⁴⁴ The value-adding model also raises the possibility that stock markets could sustain a small group of professional traders who systematically outperform the market by trading at favorable prices with investors willing to accept less-advantageous prices to secure liquidity, tax benefits, or balanced portfolios. In effect, investors seeking such benefits "pay" for them by trading with professionals on terms that allow the latter to extract profits.

An equities trading model in which professionals extract profits by trading on favorable terms with nonprofessionals resembles the classic paradigm of futures markets, which are often described as comprised of risk-averse "hedgers" who do business with risk-neutral "speculators" on terms that allow the latter to profit. See *infra* notes 181, 183. This model also bears some resemblance to an efficient markets model proposed by Professors Sanford Grossman and Joseph Stiglitz, who suggest that markets are comprised of informed and uninformed traders, that the latter systematically profit by buying mispriced securities, and that stock prices differ from best estimates of fundamental values just enough to account for the marginal costs of information. Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 *Am. Econ. Rev.* 393 (1980).

The professionals who systematically profit from trading under the value-adding model, however, are more accurately described as "dealers" rather than "speculators." Although they purchase stocks primarily for resale, they are hoping to profit not from "speculating" on (forecasting) future price changes but rather from the spread between the bid price at which they offer to purchase and the ask price at which they offer to buy. The spread compensates dealers for the cost of storing an inventory—negligible in the case of securities—and for bearing the risk of price changes in the inventory they hold for resale. Thus, dealers who provide liquidity can extract profits even in a market of homogeneous expectations.

¹⁴⁵ Served, perhaps, by a modest number of profit-extracting professional dealers. See *supra* note 144.

which model best describes the U.S. secondary markets. As an empirical matter, how much trading in modern stock markets is inspired by investors' statistically futile hopes of profiting from their differing price predictions, and how much by their desires for liquidity, diversified portfolios, or tax advantages?¹⁴⁶

Although there has been little formal study of why investors trade,¹⁴⁷ discovering investors' subjective motivations for trading is not so difficult a task as it may first appear. The HE model's explanatory power in describing the nature of market participants and the relationship between market prices and best estimates of stocks' fundamental values provides indirect evidence that heterogeneous expectations inspire much trading. More direct evidence of why investors trade can be found both in investors' stated descriptions of their trading goals and in the volume and patterns of trading. Both forms of evidence suggest that investor disagreement drives the stock markets.¹⁴⁸

¹⁴⁶ See *infra* notes 299-304 and accompanying text (discussing how optimal regulatory policy depends on whether market is primarily HE or value-adding).

¹⁴⁷ Langevoort, *supra* note 27, at 920, 896 n.153 (“[W]e know surprisingly little about who buys or sells in the stock market (and why).”).

¹⁴⁸ Popular literature may provide a third, albeit indirect, source of information about why investors trade in stock markets. Tales of the market appear in films, books, magazines and on television. See, e.g., *Wall Street* (Twentieth Century Fox Film Corp. 1987) (recounting the rise and fall of a young stockbroker and his inside-trading mentor, the notorious Gordon Gekko); *Quicksilver* (Columbia Pictures Indus. 1985) (describing the story of a former stock trader who returns to the trading floor, discovers he still has “the touch,” and makes enough money to help a friend in need); Michael Lewis, *Liar’s Poker: Rising Through the Wreckage on Wall Street* (1989) (recounting protagonist’s life as Salomon Brothers broker); Alan Rubinfeld, *The Super Traders: Secrets & Successes of Wall Street’s Best & Brightest* (1992) (providing autobiographical anecdotes of successful traders); Thomas D. Saler, *Lies Your Broker Tells You* (1989) (describing the brokerage industry); Tom Wolfe, *The Bonfire of the Vanities* (1987) (describing the travails of a fictional professional bond trader). These tales of the market are not tales of technicians fine-tuning alphas and betas. Rather, they are stories of speculation and intrigue, luck and guile, profitable prediction and mistaken prognostication, and the thrill of winning counterbalanced by the agony of defeat. In the eyes of popular culture, stock markets are indeed casinos, filled with traders placing enormous bets on the future.

Information gleaned from popular culture must, of course, be taken with a grain of salt. Still the tale of the canny (or not so canny) trader is such a staple of Wall Street lore that it is difficult to dismiss the idea that art accurately reflects life. If the popular image of the market bears any resemblance to reality, heterogeneous expectations do indeed provide the foundation on which modern stock markets are built.

1. *The Predominance of Active Institutional Management*

Perhaps the most powerful evidence that investor disagreement fuels modern stock markets is what investors, particularly institutional investors, *say* about why they trade.¹⁴⁹ Institutions such as pension funds and mutual funds own approximately half of all equity and account for half or more of all stock trading.¹⁵⁰ Because institutions disclose their investment philosophies and strategies to comply with federal disclosure requirements¹⁵¹ and to market their wares to individual investors, funds' explicit characterizations of their own investment goals offer great insight into motives for trading.

¹⁴⁹ Economists generally are reluctant to rely on the preferences individuals assert, preferring to infer motive from actual behavior. See David W. Barnes & Lynn A. Stout, *Cases and Materials on Law and Economics* 5 (1992) (discussing the theory of revealed preferences). In the case of institutional trading, however, there is little reason to believe that institutional managers who claim they hope to outperform the market are lying. Self-selection reconciles their optimism with the harsh reality that trading is a loser's game, and lying exposes them to charges of fraud. But see Trueman, *supra* note 113, at 83 (offering a noise trading model where institutional managers trade to create the appearance for their customers that they have nonpublic information, not because they expect to profit). Moreover, even if institutional managers misstate their trading motives, the quixotic hopes of the individual investors who choose to invest in active funds remain the essential impetus for institutional trading. Institutions' statements about why they trade remain highly relevant because individuals who invest in funds surely rely on these statements. Choosing to invest money in an active fund that tries to beat the market through trading, rather than a passive fund with a buy-and-hold strategy, reveals individual investors' preferences for HE trading.

¹⁵⁰ See National Ass'n of Securities Dealers, *supra* note 1, at 36 (stating that institutional block trading accounted for 44.5% of NASDAQ share volume in 1992); New York Stock Exchange, *supra* note 31, at 89 (stating that in 1992, U.S. institutions—primarily public and private pension funds, insurance companies, and mutual funds—owned 42% of market value of all U.S. equity); *id.* at 17 (stating that block trades accounted for 54% of NYSE share volume in 1993). Some commentators believe that institutions account for an even higher proportion of all trading. See, e.g., Lowenstein, *supra* note 10, at 70 (stating that institutions do 75% of trading).

¹⁵¹ Mutual funds are subject to the disclosure and antifraud requirements of the Investment Company Act of 1940, 15 U.S.C. §§ 80a-1 to 80a-64 (1988), and in some cases to the Securities Act of 1933, 15 U.S.C. §§ 77a-77aa (1988), and the Securities Exchange Act of 1934, 15 U.S.C. §§ 78a-78ll (1988). See generally Hazen, *supra* note 81, § 17, at 880-83 (discussing registration and disclosure requirements). Federal law also requires pension plans to disclose some information to employee-investors. See Employee Retirement Income Security Act of 1974 (ERISA), 29 U.S.C. §§ 1021-25 (1988); see also 2 Loss & Seligman, *supra* note 16, at 1031-50 (noting that the SEC views some voluntary contributory pension plans as securities that are subject to federal disclosure requirements).

Institutional managers generally claim to follow one of two basic investment strategies.¹⁵² The first, and less common, is "passive" management, or "indexed investing".¹⁵³ Index funds buy and hold portfolios of stocks designed to replicate a particular stock index such as the Standard & Poor's 500 or Wilshire 5000.¹⁵⁴ They execute trades only when necessary to rebalance portfolios as stocks are listed or delisted from the index or to respond to changing liquidity demands as individual investors in the fund invest or withdraw capital.¹⁵⁵ The typical passive fund turns over only four percent to eighteen percent of its portfolio annually.¹⁵⁶

¹⁵² See Elton & Gruber, *supra* note 13, at 704-05 (distinguishing passive and active management); Sharpe & Alexander, *supra* note 107, at 720-22 (same).

¹⁵³ See Market 2000 Report, *supra* note 6, at II-3 (discussing passive management); Elton & Gruber, *supra* note 13, at 705-08 (same).

¹⁵⁴ The Standard & Poor's 500 is a value-weighted index of 500 large, NYSE-listed, "blue-chip" stocks. The Wilshire 5000 is a broader market index that includes many smaller companies traded on the OTC market. See generally Elton & Gruber, *supra* note 13, at 626, 706.

¹⁵⁵ Kiefer, *supra* note 10, at 19 (discussing rebalancing); Market 2000 Report, *supra* note 6, at II-3.

¹⁵⁶ Although comprehensive data on passive funds' turnover rates is hard to come by, average turnover appears to be quite low. For example, a survey of equity funds listed in Morningstar Mutual Funds' "Growth-Income" category found that five of the 104 funds listed described themselves as passive index funds. See Morningstar, Inc., Morningstar Mutual Funds, Apr. 15, 1994, § 2 at 1, 390, 392, 405-07. Those five funds (the Schwab 1000, SEI Index S&P 500, Vanguard Index 500, Vanguard Index Total Stock Market, and Vanguard Index Value) held net assets of \$7.9 billion and had weighted average four percent portfolio turnover in 1992. *Id.* (1993 data were used for Vanguard Index Total Stock Market, as 1992 data were not available).

Indexed pension funds seem to have similarly low turnover rates. See EBRI Issue Brief, *supra* note 90, at 17 tbl. 7, tbl. 8 (calculating that large pension fund that replicates S&P 500 Index experienced annual turnover ranging from four percent to eight percent in period from 1986-1990, whereas fund that replicates small-capitalization index experienced 13% to 16% turnover). A 1989 survey of 36 pension funds by the Financial Executive Institute ("FEI") found that fund managers asked to estimate turnover in their passive equities accounts estimated that between 1986 and 1989, average turnover varied from 13% to 24%, with an average of 18% turnover for the four years. See 1990 Hearings, *supra* note 88, at 106 (statement of Financial Executives Institute, Committee on Investment of Employee Benefit Assets). These survey results may overestimate true passive fund trading due to the fact that an increasing number of managers of purportedly "passive" funds actually try to outperform the index through arbitrage strategies involving index futures and options. See Elton & Gruber, *supra* note 13, at 707 (noting the rise of such strategies and questioning whether such management is truly passive); New Ways to Play the Indexing Game, Institutional Investor, Nov. 1988, at 93-98; James A. White, Index Funds Start Raising Their Sights, Wall St. J., Oct. 20, 1989, at C1 ("Because index-fund managers are no longer satisfied with merely being average, they developed [active] strategies.").

The second, and far more popular, strategy is "active" investing.¹⁵⁷ Active managers take a position in a particular stock or market "based on a forecast about the future."¹⁵⁸ In other words, active managers are self-described HE traders who buy and sell on the basis of their differing predictions for individual stocks, industry sectors, and the market as a whole.¹⁵⁹ Thus, the prospectus for Vanguard's actively managed Windsor II mutual fund describes the fund's strategy as a search for stocks "undervalued" by the market,¹⁶⁰ whereas the accompanying sales brochure touts "buy low, sell high" as "the classic formula for success in the stock market."¹⁶¹

Although passive investing is becoming more common, less than twenty percent of pension funds' equity holdings and as little as one percent of stock mutual funds' holdings are indexed.¹⁶² Active managers therefore control eighty percent or more of all institutional equity holdings. Not surprisingly, active funds also trade far more often than passive funds do; for example, the average active stock mutual fund turns over more than seventy-five percent of its portfolio annually,¹⁶³ and turnover ratios of 200% or more are not

¹⁵⁷ See *infra* note 162.

¹⁵⁸ Elton & Gruber, *supra* note 13, at 708; see also Sharpe & Alexander, *supra* note 107, at 721 (noting that active managers believe market misprices stocks); Treynor, *supra* note 29, at 35 ("All active investing is motivated by forecasts . . .").

¹⁵⁹ See Elton & Gruber, *supra* note 13, at 708-09 (distinguishing three basic types of active managers: (1) "market timers" who switch between equity and debt depending on their forecasts for interest rates and the stock market as a whole, (2) "sector selectors" who move investments between broad classifications of stocks such as industrials and utilities according to their predictions for each sector's economic health, and (3) "security selectors" who search for individual stocks that have been "undervalued" by the market).

¹⁶⁰ The Vanguard Group of Inv. Cos., Windsor II Prospectus 4 (1994).

¹⁶¹ The Vanguard Group of Inv. Cos., Vanguard Windsor II: For Long-Term Growth Of Capital And Income Using A Time-Tested, Value-Based Investment Approach 1 (1994).

¹⁶² See Kiefer, *supra* note 10, at 8 (stating that 38% of pension funds index some portion of their holdings and that these funds account for 20% of total pension fund equity holdings); Market 2000 Report, *supra* note 6, at II-2 to II-3 (stating that in 1992 only 18.3% of assets in the top 200 pension funds were indexed, whereas "overwhelming majority" of equity mutual fund assets remained actively managed); Vanguard Index Trust, *supra* note 30, at 4 (estimating that less than one percent of equity mutual fund assets are held by passive index funds). Again, these figures may slightly overstate the use of indexing, as many so-called passive funds have begun to adopt "innovations" that amount to active (i.e., forecast-based) investment strategies. See *supra* note 156.

¹⁶³ Morningstar, Inc., Morningstar Mutual Funds, Apr. 15, 1994, § 1, at 7 (stating that average equity mutual fund turns over 75% of portfolio annually). Pension funds experience similar turnover rates. See 1990 Hearing, *supra* note 88, at 58 tbl. 2 (stating that

uncommon.¹⁶⁴ Because active management is so much more common than indexing and because active funds trade so much more frequently, active funds' trades account for the overwhelmingly majority (more than ninety percent) of all institutional trades.¹⁶⁵ Investors' hopes of profiting from their active fund managers' supposed ability to "buy low and sell high" thus underlie the vast preponderance of all institutional trading.¹⁶⁶

As noted earlier, the negative-sum nature of the stock trading game works against institutions just as it works against individuals who trade in hope of profit. Active funds incur much higher trading and management costs than passive funds and on average earn lower returns than either passive funds or the market as a whole.¹⁶⁷ Active management's continued popularity in the face of such a poor track record is cogent evidence of self-selection's power to create a market of optimistic losers.¹⁶⁸

pension funds' average equity turnover ratios varied from 52% to 63% from 1981 through 1986, the last year for which information was available); Stephen A. Berkowitz & Dennis E. Logue, *The Portfolio Turnover Explosion Explored*, *J. Portfolio Mgmt.*, Spring 1987, at 38, 40 tbl. 2 (showing that during the early 1980s, pension funds and mutual funds experienced similar rates of turnover).

¹⁶⁴ See Morningstar, Inc., *Morningstar Mutual Funds*, Apr. 1, 1994, at 6 (noting several funds with turnovers exceeding 500%).

¹⁶⁵ Assuming conservatively that active funds control 80% of institutionally held equity, see *supra* note 162 and accompanying text, and that actively managed funds trade three times as often, see *supra* notes 156, 163 (noting that passive funds' turnover averages 4% to 18%, whereas active funds experience 60-75% turnover), active funds account for at least 92% of all institutional trading.

¹⁶⁶ Liquidity needs, portfolio balancing and tax motives are likely to account for only a very small fraction of active funds' trades. Pension funds are tax-exempt institutions, and mutual funds are taxed only indirectly. See Lakonishok & Smidt, *supra* note 137, at 953 (discussing why institutions are less likely to trade for tax reasons). Both types of funds generally hold portfolios of hundreds of different stocks and so are unlikely to do much trading to retain diversification. See *supra* note 98 (discussing diversification). The law of large numbers similarly ensures that large institutions' liquidity needs will be far less than those of individual investors. See *infra* note 171. Finally, because many stock mutual funds hold only equities, none of those funds' trading can be attributed to any perceived need to maintain a balance between the proportion of their portfolios invested in equity and the proportion in bonds. Actively managed pension funds may do some portfolio balancing, but a survey of active pension fund managers found those managers regarded only about 20% of their trading as attributable to portfolio-balancing needs. EBRI Issue Brief, *supra* note 90, at 16 chart 6.

¹⁶⁷ See *supra* note 30.

¹⁶⁸ See Elton & Gruber, *supra* note 13, at 710 ("Although index funds have outperformed most active managers, most investors who hire active managers believe they

2. *Trading Volume and Patterns*

Additional evidence that modern stock markets are primarily HE markets can be found in both the volume and the patterns of stock trading. U.S. equities markets generally exhibit far higher turnover than would seem reasonable if investors were trading primarily to satisfy liquidity needs or to rebalance their portfolios.¹⁶⁹ In 1992, the dollar volume of trading in U.S. equities on the exchanges and OTC market amounted to over fifty-five percent of the value of all equity holdings, implying an average investor holding period of less than twenty-two months.¹⁷⁰ It seems highly unlikely that investors experience such rapid and dramatic changes in their liquidity needs that they must invest and then sell their entire portfolios every other year or so.¹⁷¹ Similarly, neither the proportions of the stocks held in the average diversified portfolio nor the risk levels associated with those stocks seem likely to shift so rapidly and dramatically that portfolio-balancing investors must completely liquidate and reconstruct their portfolios every twenty-two months.

Evidence that market turnover greatly exceeds what is necessary for liquidity and portfolio-balancing needs can be found by comparing the trading behavior of investors who buy stocks directly

can spot the manager who will outperform the index. This belief persists despite the fact that there is very little evidence that superior performance is predictable.”).

¹⁶⁹ See Black, *supra* note 34, at 530-31 (arguing that if people traded stocks only to respond to changes in market risk or liquidity needs, they would trade in individual stocks only “rarely”); cf. Stiglitz, *supra* note 9, at 102 (noting that some investors trade for liquidity or to change portfolios, but most stock trading is motivated by a desire to beat the market).

¹⁷⁰ See *supra* note 31.

¹⁷¹ Investors tend to accumulate wealth over a lifetime. See Paul A. Samuelson, *Economics* 759 (9th ed. 1973) (describing life-cycle theory of wealth and income). Their savings are likely liquidated only in response to pressing needs, like buying a house, paying for a college education, or retiring. If changing liquidity needs explain most individual stock trades, nineteen years seems a more reasonable holding period than nineteen months. Moreover, the law of large numbers suggests that institutional funds need to trade for liquidity and portfolio-balancing reasons far less often than individuals do. Institutions represent ever-changing pools of individual investors. So long as new investors buy in at roughly the same rate that old investors redeem their interests (or employees contribute to pension funds at the same rate that retirees collect benefits), the fund can meet individuals' liquidity needs without buying or selling assets. Liquidity buying and selling is only necessary for institutions when large numbers of individuals simultaneously either put money into, or draw money out of, the fund.

with the trading behavior of investors who purchase shares in stock mutual funds.¹⁷² Mutual fund investors rely on their fund managers' stock-picking skills rather than on their own. Thus, compared to a direct stock purchase or sale, an investor's decision to put money into or withdraw money out of a stock mutual fund is more likely to reflect her changing liquidity needs or a desire to alter the balance of stocks and bonds in her portfolio, and less likely to reflect a perception that stocks are underpriced or overpriced. Not surprisingly, turnover in mutual fund shares is far lower than turnover in individual equities. In 1992, investors turned over only twenty-six percent of the value of their holdings in equity mutual funds.¹⁷³ But even a twenty-six percent turnover rate significantly overstates the level of trading necessary to satisfy individuals' liquidity and portfolio-balancing needs, because a good portion of fund redemptions are by investors who have become dissatisfied with their original fund's performance and wish to reinvest in another fund.¹⁷⁴ Such trading is HE trading motivated by fund investors' desires to find the superior manager who can beat the market. That mutual funds' twenty-six percent annual turnover probably substantially exceeds what is necessary to satisfy individuals' liquidity and portfolio-balancing needs evinces that the *fifty-five percent* turnover found in the stock markets must be driven primarily by other motives.

The patterns of trading observed in stock markets also suggest that tax-motivated sales account for only a small portion of stock trades. If most investors sold stocks primarily to realize taxable gains or losses, trading should exhibit distinctive seasonal patterns. In particular, trading volume should increase substantially in December, when investors know with certainty what tax benefits

¹⁷² Cf. Black, *supra* note 34, at 530-31 (stating that if people traded stocks only to respond to changes in market risk or liquidity needs, they would have little reason to trade in individual stocks and would instead trade in mutual funds, index derivatives, or money market funds).

¹⁷³ In 1991, when equity mutual funds held \$368 billion in assets, investors bought \$97 billion and sold \$54 billion in equity fund shares. 1993 Statistical Abstract, *supra* note 2, at 525 tbl. 838. Dividing the total market value of equity mutual funds by the larger of either purchases or sales implies annual turnover of 26%.

¹⁷⁴ For example, one survey of investors selling mutual fund shares found that 75% of those who sold their entire interest, and 36% of those who sold part of their interest, reinvested some or all of the proceeds in another mutual fund. See Investment Company Institute, 1993 Mutual Fund Fact Book 86-88 (1994).

selling will bring.¹⁷⁵ Yet empirical studies show December trading volume on the NYSE varies little from normal volume.¹⁷⁶ Researchers accordingly have concluded that although tax incentives have some effect on trading, "non-tax-related motives [are] predominant."¹⁷⁷

In sum, the volume and patterns of trading found in modern secondary markets offer significant indirect evidence of investors' motivations for trading. That evidence indicates that trades driven by investors' desires to meet changing liquidity needs, minimize tax burdens, or maintain diversified and properly balanced portfolios account for only a minority of all stock trades and that disagreement over the future drives the majority of all transactions. If investors shared homogeneous expectations, trading volumes in stock markets would be a fraction of what they are today.

III. THE POLICY IMPLICATIONS OF THE HETEROGENEOUS EXPECTATIONS MODEL FOR FEDERAL SECURITIES REGULATION

Part I introduced the HE model of stock trading and explored some of its implications for the nature and behavior of both stock markets and the investors who participate in them. Part II reviewed the substantial evidence supporting the view that most stock trading is motivated by investors' optimistic hopes of earning above-market returns through speculative strategies. The primary focus of Parts I and II, then, has been the HE model's positive aspect, that is, the model's promise in helping observers understand and describe stock traders and stock markets.

This Part explores the normative consequences of the HE model by examining the social value of stock trading through the lens of HE theory. Modern securities regulation is largely premised on the notion that stock trading is an activity of value both to traders

¹⁷⁵ See Elton & Gruber, *supra* note 13, at 417 (describing the tax consequences of year-end selling); Lakonishok & Smidt, *supra* note 137, at 954-56 (suggesting that there should be an increase in trading volume at year-end).

¹⁷⁶ Lakonishok & Smidt, *supra* note 137, at 958; see also New York Stock Exchange, *supra* note 31, at 13 (showing that NYSE December 1993 share volume of 5.8 billion shares, amounting to approximately 104% of one-twelfth of annual volume of 66.9 billion shares).

¹⁷⁷ Lakonishok & Smidt, *supra* note 137, at 973.

and to society as a whole.¹⁷⁸ Federal law declines to interpose itself between investors and their mistakes, opting instead to protect investors through a relatively unintrusive system of antifraud laws combined with rules that require firms to disclose basic information to shareholders and investors.¹⁷⁹ In short, lawmakers seek to protect and promote stock trading.

The HE model raises serious questions about the wisdom of such a free-market approach. Although economists celebrate stock markets as engines of efficiency and social progress, laymen tend to be more skeptical, viewing stock markets as legalized casinos.¹⁸⁰ HE theory supports lay misgivings by providing a theoretical foundation for the claim that, in at least two distinct senses, stock trading can be wealth-destructive behavior. High-volume stock markets consequently may reflect a form of market failure that leads to substantial and ongoing social losses rather than efficiency gains.

The social losses associated with HE trading might possibly be counterbalanced by some social benefits. In particular, HE trading might contribute to both the liquidity and efficiency (i.e., price accuracy) of modern stock markets. Economic theory counsels, however, that costs and benefits must always be weighed *at the margin*. A marginal analysis of HE trading's liquidity and efficiency contributions reveals that these are likely to be minor and significantly outweighed by their costs.

That observation in turn suggests a need to reexamine present federal policy. Although the problem of reducing welfare losses from HE trading is a difficult one, policymakers have a number of options short of shutting down markets. Part III briefly examines three different possible approaches to reducing the social costs of

¹⁷⁸ See *supra* notes 6-9.

¹⁷⁹ See Hazen, *supra* note 81, at 7 (noting that the federal system eschews regulating merits of securities on theory that investors are adequately protected by antifraud rules and by the disclosure of information relevant to securities being sold); Hazen, *supra* note 6, at 987 (noting that securities regulation based on premises that if investors are provided with relevant information, they will make informed decisions and "there is no need to protect a fool from his or her investment folly so long as no fraud . . . is involved").

¹⁸⁰ See Irwin Friend, *The Economic Consequences of the Stock Market*, 62 *Am. Econ. Rev.* 212, 212 (1972) ("To much of the public, the stock market seems to be a legalized gambling casino. To many economists, the stock market seems endowed with an almost mystical degree of efficiency, even if what is meant by efficiency is not always clear.").

stock speculation, and explores the advantages and disadvantages of each in the context of the present regulatory scheme.

A. *The Social Costs of HE Trading*

The HE model of stock trading is in essence a model of speculation—i.e., trading by rational actors who buy a commodity neither to consume it nor to use it as an input in some productive process, but in the hope of profiting by predicting price changes that permit the speculator to resell at a better price. Economists who study speculation usually assume in the tradition of neoclassical economics that speculative trades, like other voluntary exchanges, benefit both the trading parties and society as a whole.¹⁸¹ Debate over the possible social costs of speculation therefore has focused on whether speculators can destabilize prices.¹⁸² The HE model offers

¹⁸¹ Although lay commentators often condemn speculation, economists generally are enthusiastic about speculative trading, believing it improves the welfare of the trading parties and promotes accurate prices. Compare Posner, *supra* note 7, at 47-48 (stating that speculation “performs a valuable economic function” by helping prices accurately reflect conditions and allowing mutually beneficial trades between speculators and “hedging” consumers) with Hazen, *supra* note 6, at 994 (noting history of “moral disdain” for speculation). Speculative futures markets in commodities, for example, are believed to allow mutually beneficial exchanges between risk-averse consumers who want to hedge against price changes and speculators who are happy to bear that risk in return for trading profits, thus contributing to more accurate commodities prices. See, e.g., Jean-Pierre Danthine, *Information, Futures Prices, and Stabilizing Speculation*, 17 *J. Econ. Theory* 79, 93 (1978) (stating that futures markets may serve insurance function by allowing more risk-averse hedgers to reallocate risks to more risk-neutral speculators and that speculation also has “positive influence” by transmitting information to prices); Sanford J. Grossman, *The Existence of Futures Markets, Noisy Rational Expectations and Informational Externalities*, 44 *Rev. Econ. Stud.* 431, 447 (1977) (noting that in addition to any insurance benefits futures markets provide, speculation in such markets improves accuracy in prices with attendant social gains).

HE theory offers an alternative interpretation of speculation by suggesting that under some conditions—for example, the conditions prevailing in modern equities markets—the supposed economic benefits of speculation are illusory, because speculative trades are neither mutually beneficial nor likely to improve the accuracy of prices. See *supra* notes 29-30 and accompanying text (describing why HE trades do not on average benefit trading parties); *infra* notes 214-19 and accompanying text (describing why HE trading may distort market prices through false substitution and valuation effects).

¹⁸² See, e.g., Baumol, *supra* note 29, at 264 (describing how speculation can be seen as destabilizing); Danthine, *supra* note 181, at 80 (proposing model in which speculators stabilize prices); Hart & Kreps, *supra* note 12, at 928-29 (describing model in which rational speculation increases price volatility); Stein, *supra* note 41, at 1124 (concluding that regulators fear speculation is destabilizing, whereas economists tend to believe it has stabilizing influence). See generally Repetti, *supra* note 12, at 602-03 (noting that

new insight into the theory of speculation by suggesting two other significant negative consequences of speculation. First, speculation may lead to social welfare losses when speculators devote valuable resources to transactions that do not, on average, improve their welfare. Second, the hope of speculative profits may create false substitution and false valuation effects that distort market prices and create the risk of allocative inefficiency.

1. *Welfare Losses Resulting From HE Traders' Mistaken Investment in Active Portfolio Management*

Speculative trading can lead to welfare losses because speculation can be enormously costly *to speculators themselves*.¹⁸³ Invest-

speculation is suspect as contributing to price volatility and that economic literature has focused on that alleged harm). Milton Friedman set the tone for the debate when he argued in defense of currency speculation that “[p]eople who argue that speculation is generally destabilizing seldom realize that this is largely equivalent to saying that speculators lose money, since speculation can be destabilizing in general only if speculators on average sell when the currency is low in price and buy when it is high.” Milton Friedman, *Essays in Positive Economics* 175 (1953). The HE model offers an interesting insight into the debate by predicting that speculators may indeed lose money. See *supra* notes 37-43 and accompanying text (discussing how stock traders can rationally play a negative-sum game).

¹⁸³ At least two factors may explain the economic literature’s general failure to recognize the cost of speculation to speculators. First, economists who model speculative trading (whether in stock markets or elsewhere) tend to assume there are no transaction costs associated with trading. See, e.g., Grossman, *supra* note 181, at 447 (considering normative value of speculative futures while noting that their analysis ignores transaction costs). Second, the speculation literature has tended to ignore the role of heterogeneous expectations in fostering speculation, often by assuming that speculators systematically profit from assuming risks that other market participants (generally known as hedgers) pay them to assume. Stein, *supra* note 41, at 1125 (noting that speculation literature tends “to ignore the issue of heterogeneous information among market participants”); see also Baumol, *supra* note 29, at 264 (noting that traditional economic analysis of profitable speculation neglects possibility that skillful speculators are simply profiting at expense of others). Theorists who do allow for investor heterogeneity rarely recognize the full normative implications. See, e.g., Danthine, *supra* note 181, at 93 (suggesting that if futures markets develop because speculators have differing beliefs, these markets exercise “positive influence” by transmitting more information to prices); Grossman, *supra* note 181, at 447 (adopting model of futures markets in which futures markets develop because traders have differing beliefs about future, while noting that such markets produce social gains by providing “insurance” and price accuracy).

A notable exception can be found in Professor Hirshleifer’s work, which clearly recognizes the possibility of social losses from speculative trading. See generally Hirshleifer, *Value of Information*, *supra* note 43 (developing model in which heterogeneous expectations leads to social losses as speculators trade with each other); Hirshleifer, *supra* note 12, at 240, 255, 288 (discussing and rejecting “insurance” model of

tors who buy and sell in stocks in the statistically mistaken belief that they can beat the market pay a hefty price for their optimism. The most obvious expense associated with stock trading is broker commissions.¹⁸⁴ Investors paid over \$16 billion in broker commissions in 1992 alone.¹⁸⁵

Yet broker commissions account for just a part—and not even the largest part—of the costs of HE trading. Investors who try to beat the market incur a number of more hidden costs as well. For example, investors who trade in the OTC market generally must trade with dealers who act as principals to a trade by selling out of, or adding to, their inventory of a particular stock.¹⁸⁶ Specialists play a similar role on the exchanges, where they do business with customers whose buy and sell orders cannot be matched against another customer's.¹⁸⁷ Dealers and specialists make a living by profiting from the spread between the "bid" price at which they offer to buy and the higher "ask" price they demand from investors wishing to buy out of their inventory. Spreads are more difficult to detect than commissions because they are implicit in the price an investor pays for a stock.¹⁸⁸ Still, spreads are every bit as much a cost of trading.¹⁸⁹

speculation in which speculators are less risk-averse than hedgers and suggesting that there is more support for model in which speculators trade with other speculators due to differing beliefs).

¹⁸⁴ Brokers act as investors' agents by executing buy and sell orders either on an exchange such as the NYSE or with a professional dealer on the OTC market. See Robert A. Haugen, *Modern Investment Theory* 27, 31 (3d ed. 1993) (describing brokerage process).

¹⁸⁵ That figure includes commissions on corporate bonds. See SEC, 1993 Annual Report 134 tbl. 12.

¹⁸⁶ See Haugen, *supra* note 184, at 31 (describing OTC trading).

¹⁸⁷ See *id.* at 27 (describing specialists).

¹⁸⁸ For example, Morningstar Mutual Funds, a private service that provides extensive information on mutual funds' performance and expenses, reports brokers' fees paid by mutual funds in trading but does not attempt to report portfolio value lost to dealer's spreads. See Morningstar, Inc., *User's Guide* 21 (1994).

¹⁸⁹ Another potential trading "cost" from the stock trader's perspective is "market impact cost," the cost of having to make large trades at less-favorable prices because very large sell orders depress market price and large buy orders inflate prices. See Market 2000 Report, *supra* note 6, at 22-23 (describing impact costs); Wagner, *supra* note 30, at 16 (same). Market impact costs reflect in part a downward-sloping demand function for equities. See *supra* notes 126-27 and accompanying text. From a social perspective, because "losses" due to market impact costs benefit one trader at the expense of another, they are wealth transfers rather than net social losses.

Perhaps the most significant cost associated with speculative trading is the cost of speculators' acquisition and analysis of the information on which they base their differing expectations. Investors trying to predict which stocks or markets will do well invest enormous time and effort gathering and digesting the vast quantities of information relevant to the futures of firms, industries, and the market as a whole. Many investors also pay directly for information and analysis by subscribing to newsletters, consulting research analysts, or hiring professional portfolio managers and investment advisors. Although the costs of research and analysis are not, strictly speaking, trading costs, they are a cost of *preparing* to trade.¹⁹⁰

The administrative costs incurred in managing a portfolio of corporate equities are a fourth type of cost associated with stock trading. Even the passive investor who hews to a buy-and-hold strategy must spend some time and effort keeping and updating records of securities owned and transactions executed. But the investor who abandons buy-and-hold and adopts a trading strategy can expect administrative costs to increase with trading.

Any estimate of the aggregate resources investors spend on speculative trading should consider all forms of cost, including commissions, spreads, research and analysis, and portfolio administration. Because individuals rarely have occasion to calculate the value of the time and money they spend actively managing their portfolios, comprehensive statistics on the costs of individuals' speculative activities are unavailable.¹⁹¹ But pension funds and mutual funds

¹⁹⁰ See Langevoort, *supra* note 6, at 751 (“[T]o make an investment, [one] must incur both search costs (including the cost of gathering information and evaluating it) and transaction costs.”); Stiglitz, *supra* note 9, at 109 (noting costs of stock trading include “not only the transactions costs but also much of the costs spent on acquiring information, including . . . getting the information slightly earlier than it would otherwise become available”).

¹⁹¹ One dated but interesting pair of studies examined a sample of individual investors who had maintained accounts over a seven-year period at a brokerage firm. In the first study, individuals held their stocks for a median period of between 4 and 6.5 months, earned 9.9% per annum on portfolios before transaction costs but only 5.5% after, and in aggregate realized few, if any, excess returns from trading relative to a passive investment strategy. See Gary G. Schlarbaum, Wilbur G. Lewellen & Ronald C. Lease, *Realized Returns on Common Stock Investments: The Experience of Individual Investors*, 51 *J. Bus.* 299, 305-07, 321 (1978). In the second study, median investors spent between 3 and 5 hours per month managing portfolios of \$40,000 in equities; the average investor in the sample regarded herself, albeit weakly, as “substantially better informed than the average

keep close track of their business expenses, and equity mutual funds in particular publish extensive information on expenses incurred in trying to beat the market. Because equity funds' turnover rates are roughly similar to overall market turnover rates,¹⁹² their expense reports provide a ballpark estimate of investors' aggregate research and trading costs.

Morningstar Mutual Funds¹⁹³ reports that equity mutual funds spend an average of 0.31% of their assets annually on broker commissions.¹⁹⁴ That figure does not include dealer and specialist spreads, which are difficult to detect because they are incorporated into the prices investors pay for securities.¹⁹⁵ But if spread costs amount to even one-third of commission costs,¹⁹⁶ investors who buy shares in actively managed stock mutual funds are spending more than 0.4% of the value of their portfolios each year on

investor." Lease et al., *supra* note 67, at 428, 430, 431. Unfortunately, because these studies examined trading behavior at a time when trading costs were much higher and trading volume much lower than they are today, their value in explaining modern market behavior is limited.

¹⁹² Compare *supra* note 163 and accompanying text (describing average 75% mutual fund turnover and 52% to 63% annual pension fund turnover) with *supra* note 170 and accompanying text (describing 55% annual market turnover); see also Kiefer, *supra* note 10, at 6-7 (reporting turnover rates of pension funds, mutual funds, life insurance companies and NYSE from 1955 through 1987 and concluding institutions' turnover roughly equals market's).

¹⁹³ Morningstar Mutual Funds is a private advisory service that provides a looseleaf service describing the trading philosophies, patterns, and expenses of over 1,000 mutual funds. See, e.g., Morningstar, Inc., *Morningstar Mutual Funds*, Apr. 15, 1994, (discussing variety of data on funds).

¹⁹⁴ Russ Wiles, *Funds' Trading Costs Are Low*, *The Ariz. Republic*, Sept. 13, 1993, at E2 (citing Morningstar report that average stock mutual fund pays 0.31% annually in brokerage commissions).

¹⁹⁵ See, e.g., Morningstar, Inc., *supra* note 188, at 21 (noting that service does not publish information on losses due to dealer spreads, so true trading costs are understated).

¹⁹⁶ This highly conservative estimate is based on a recent study that found securities firms' revenues from equities spreads are approximately one-third of their earnings from commissions. See Stoll, *supra* note 57, at 9 tbl. 1 (noting that in 1990, securities firms reported \$8.555 billion in commissions and \$2.775 billion in trading gains). The estimate is conservative because the study excluded gains on firms' own investment accounts from the category "trading gains." *Id.* at 7. Because gains on investment accounts support the securities industry and come at the expense of other traders, they may be better categorized as a cost of trading to outside investors. If so, the revenue data suggest that investors lose more money to spreads than they do to commissions. See New York Stock Exchange, *supra* note 31, at 92 (noting that in 1992 NYSE-member firms reported \$11.6 billion in revenues from securities commissions and \$16.8 billion in revenues from all trading and investment gains).

commissions and spreads.¹⁹⁷ Moreover, commissions and spreads account for only a minor portion of the costs institutions suffer trying to beat the market. Actively managed mutual funds invest substantial time and effort in researching and analyzing stocks and markets, as well as in administering their portfolios. Many funds retain extensive staffs of professional analysts and portfolio managers; others hire outside advisors and managers; some do both. According to Morningstar, stock mutual funds spend an average of 1.42% of their assets annually on operating, management, and advisory fees and expenses.¹⁹⁸ That figure excludes (and significantly exceeds) the costs of commissions and spreads.¹⁹⁹ When commissions and spreads are factored in, it appears that investors who buy shares in actively managed stock mutual funds lose more than 1.8% of their assets each year in their quest to outperform the market.²⁰⁰

An annual cost of 1.8% of an investor's portfolio may seem a modest expense. When applied to the entire market portfolio, however, it becomes enormous. The market value of outstanding U.S. equities in 1992 amounted to \$5.541 trillion.²⁰¹ If mutual funds' expenses are typical, investors spent *\$100 billion* on stock

¹⁹⁷ Investors in the aggregate probably lose more to commissions and spreads than do mutual funds. A recent study of securities firm revenues concluded that investors in the aggregate lost at least 0.5% of the value of the market portfolio to commissions and spreads between 1980 and 1990. See Stoll, *supra* note 57, at 7, 10 (describing annual 0.5% loss based on securities firm revenues and noting that estimate conservatively excludes firm profits from trading on investment accounts)

¹⁹⁸ Morningstar, Inc., 22 Morningstar Mutual Funds, Apr. 15, 1994, at 7 (noting 1.42% expense ratio).

¹⁹⁹ See Morningstar, Inc., *supra* note 188, at 27 (noting that expense ratios reflect percentage of assets annually lost to operating expenses, management fees, and administrative fees, but do not include losses from commissions and spreads).

²⁰⁰ See The Vanguard Group of Inv. Cos., Plain Talk About Index Investing 2 (1994) (estimating that the average equity fund has an expense ratio of 1.3% of investor assets and loses another 0.5% to 1.0% annually to trading costs).

Indeed, investors who buy stock through equity mutual funds can lose far more. Many equity funds charge investors up-front "loads" to get into the fund, and back-end "redemption fees" to get out of the fund. Morningstar, Inc., *supra* note 188, at 18. The highly rated Fidelity Magellan fund, for example, demands a three percent "load." Morningstar, Inc., 22 Morningstar Mutual Funds, March 18, 1994, at 154. Such charges can significantly erode returns from investing in mutual funds, especially if shares are held for a short time, and thus are a cost not included in the 1.8% estimate.

²⁰¹ New York Stock Exchange, *supra* note 31, at 89.

trading in 1992 alone.²⁰² One hundred billion dollars annually is an amount that commands respect under any circumstances. The significance of that figure may be better appreciated by comparing investors' annual expenditures on stock trading with their aggregate returns from stock ownership. From 1926 to 1985, the stocks in the Standard & Poor's 500 Index yielded average annual real returns of 8.8%.²⁰³ If investors spent 1.8% of their portfolios on trading each year, stock trading reduced investors' annual returns from stock ownership by twenty percent.²⁰⁴ And compounding magnifies the effects of reduced returns. An individual who began at age twenty-five to invest \$4,000 annually in an actively-managed stock portfolio that produced a seven percent annual compounded return could retire at age sixty-five with a nest egg of \$854,438. If a passive investment strategy increased her annual return to 8.8%, she could retire with \$1,393,864—a nearly sixty percent increase in value.

The notion that investors are losing such huge amounts picking and trading stocks may at first be hard to swallow.²⁰⁵ Nevertheless, the actual cost may be much higher. Institutions are the securities industry's preferred customers and generally pay low commissions on their trades.²⁰⁶ Mutual funds with their vast portfolios also enjoy a relative advantage in researching and analyzing stocks—it

²⁰² 1.8% of a portfolio of \$5.541 trillion is \$99.7 billion.

²⁰³ Brealey & Myers, *supra* note 13, at 129-131.

²⁰⁴ Cf. Lowenstein, *supra* note 10, at 83-84 (estimating that trading costs, measured in terms of commissions and spreads, accounted for 18% of corporate earnings in 1987).

²⁰⁵ Other scholars who have examined trading costs have made similar estimates. See, e.g., Lowenstein, *supra* note 10, at 82 (estimating that in mid-1980s, trading costs from spreads and commissions amounted to one percent of total value of equities market, not including research and portfolio administration costs); Stoll, *supra* note 57, at 10, 12 (finding from revenue data that investors lose 0.5% of value of market portfolio annually to trading costs, and speculating that research and management costs would raise that figure above 1%); Summers & Summers, *supra* note 8, at 271 (estimating \$75 billion in trading costs in 1987).

Data on securities firm revenues also support the idea that investor losses due to speculative trading rise to this order of magnitude. For example, in 1992, NYSE-member firms alone enjoyed \$63 billion in revenues. New York Stock Exchange, *supra* note 31, at 92 (including \$12 billion in commissions, \$17 billion in trading and investments, \$3 billion in interest on customer's debts, \$3 billion on mutual fund sales, and \$18 billion in other income, including fees for investment advice and counsel, service charges, and dividends and interest on investments). Those revenues exclude the earnings of pension funds, mutual funds, non-NYSE firms, investment advisors, and the financial press.

²⁰⁶ See Wiles, *supra* note 194.

takes no more effort to value 100,000 shares of General Motors than it takes to value 100 shares. Similar economies of scale reduce institutions' administrative expenses relative to the values of their portfolios. Mutual funds' expense ratios consequently may provide a conservative estimate of the aggregate costs of stock trading.²⁰⁷

Of course, not all stock trades are based on disagreement. Some portion of stock trading can be attributed to investors who are seeking liquidity, balanced portfolios, or tax benefits, rather than trying to beat the market. Such nonmistaken traders need brokers and dealers just as the HE traders do. They also need to administer their portfolios and to gather information when setting the prices at which they buy and sell. Thus, some portion of aggregate trading costs can be attributed to value-adding trading. The evidence reviewed in Part II suggests, however, that value-adding transactions account for only a fraction of the trading—and a fraction of the costs incurred—in today's markets. Even under the highly conservative assumption that HE trading is responsible for only half of investors' annual trading costs, investors are squandering \$50 billion or so annually on transactions that bring them, on average, no benefit.²⁰⁸

Where does that \$50 billion or more go? Much of it goes to salaries, including the salaries of nearly 500,000 securities and commodities brokerage firm employees,²⁰⁹ over 200,000 investment

²⁰⁷ Compare *supra* note 197 and accompanying text (noting that funds lose 0.4% of portfolio annually to commissions and spreads) with *supra* note 205 (giving conservative estimate that investors in the aggregate pay 0.5% annually in commissions and spreads) and *supra* note 200 (noting 1.8% figure excludes significant investor losses from mutual fund front- and back-end loads and fees).

²⁰⁸ Evidence that eliminating speculative trading would greatly reduce investors' annual losses can be found by comparing the overall performance of stock index funds that do not trade speculatively with the performance of actively managed funds that do. See The Vanguard Group of Inv. Cos., *supra* note 199, at 2 (estimating that average equity fund has expense ratio of 1.3% of investor assets and loses another 0.5% to 1.0% annually to trading costs whereas Vanguard Index Fund loses only 0.3% of assets to such expenses); Wager, *supra* note 30, at 17 (estimating that managed funds underperform index funds by 1.0 to 1.5% annually, presumably due to greater trading costs).

²⁰⁹ 1993 Statistical Abstract, *supra* note 2, at 421 tbl. 662 (estimating that there are 438,000 employed by securities and commodities brokers in 1992, up from 425,000 in 1990 and 227,000 in 1980); see also New York Stock Exchange, *supra* note 31, at 94 (estimating 478,000 employed in securities industry in 1993, up from 447,100 in 1992).

and holding company employees,²¹⁰ and 20,000 registered investment advisors.²¹¹ Investors also pay for the offices, communications equipment, and computer systems used by brokerage houses, pension and mutual fund companies, and exchanges. Another part of traders' money goes to services that analyze and report on companies, industries, and the economy, from private newsletters such as *Value Line* and *Morningstar Mutual Funds* to glossy magazines like *Fortune* and *Forbes*. In short, the money goes to support the industry colloquially known as "Wall Street," as well as the myriad derivative enterprises that follow and feed on it.²¹²

Paying people to act as brokers, dealers, analysts, fund managers, and business reporters does, of course, create jobs, but so does paying people to dig ditches and then fill them in again.²¹³ If no one benefits from digging and refilling ditches, paying someone to perform this task rather than to engage in a more useful activity is a waste of resources. Similarly, if most of the hopeful investors who buy and resell more than half of all outstanding corporate equities each year ultimately fail to meet their objective of beating the market's return, a good portion of the \$100 billion that they spend maintaining an active and thriving secondary market also is wasted.

2. *Welfare Losses from HE Trading's Distortive Effects on Stock Prices*

The discussion thus far has focused on the likelihood that, in a world of imperfect information, investors' rational but mistaken

²¹⁰ 1993 Statistical Abstract, *supra* note 2, at 421 tbl. 662 (estimating 233,000 employed by holding and other investment offices in 1992, up from 222,000 in 1990 and 115,000 in 1980).

²¹¹ SEC, *supra* note 185, at 38 (estimating 20,000 registered investment advisors in 1993, up from 18,000 in 1992).

²¹² Cf. Robert Lenzner & William Heuslein, *The Age of Digital Capitalism*, *Forbes*, Mar. 29, 1993, at 62, 64 (noting that Wall Street has gone from absorbing 0.5% of Gross Domestic Product a decade ago to absorbing 1% today).

²¹³ Nobel laureate James Tobin made this point when he suggested:

[W]e are throwing more and more of our resources, including the cream of our youth, into financial activities remote from the production of goods and services, into activities that generate high private rewards disproportionate to their social productivity. I suspect that the immense power of the computer is being harnessed to this "paper economy," not to do the same transactions more economically but to balloon the quantity and variety of financial exchanges.

Tobin, *supra* note 10, at 14-15.

belief that they can profit by speculating in corporate equities leads them to dissipate substantial wealth researching and trading stocks. HE theory suggests that the mirage of trading profits also may impose a second, hitherto unrecognized, form of social cost. That cost arises from speculation's capacity to *distort* aggregate investor demand for stocks in a fashion that may lead investors to invest too little or too much in corporate equities.

The opportunity to speculate distorts investor demand for stocks because investors who trade hoping to beat the market perceive *ex ante* opportunities for profit that do not, on average, actually exist. The illusion of potential gain can cause investors to purchase less corporate equity than they would otherwise purchase because a "false substitution" effect leads them to choose instead to invest a portion of their assets in research and trading. This effect is dubbed a false substitution effect because it causes investors to regard buy-and-hold and active trading as substitute strategies for making money in stocks, and therefore erroneously to invest resources in trading when they might otherwise use those resources to purchase more shares.²¹⁴ Thus, the investors who spend fifty billion dollars or more annually on researching and trading equities on the secondary markets might instead use that fifty billion dollars to purchase more stocks but for their mistaken belief that they will gain from trading.

The HE model also suggests, however, that the false substitution effect may be countered by a second distortive effect. Investors who believe that they can outperform the market by trading may put *more* money into stocks than they would otherwise, because they mistakenly perceive that they can increase their returns on equity ownership by trading. This contrary effect may be termed a "false valuation" effect, as speculators' erroneous belief that they can earn higher rates of return on their stock portfolios by trading leads them to value stocks more highly. False valuation effects offer an explanation for the puzzling historical phenomenon of speculative "bubbles," where asset prices rose far above reasonable estimates of value before the bubble burst and prices returned to

²¹⁴ Cf. Evan Schulman, *The Revolution in Securities Trading*, in *Association for Inv. Management & Res.*, supra note 29, at 10, 12 (suggesting that trading in stock options "represents business lost to the primary stock markets").

normal ranges.²¹⁵ During the famous seventeenth-century Tulip Bubble, for example, Dutch collectors speculating in tulip bulbs supposedly drove prices up twenty-fold in a single month (followed by an even greater decline in the following month).²¹⁶ HE theory counsels that such peculiar phenomena may be a consequence of adding, and then subtracting, large numbers of optimistic speculators laboring under a false valuation effect to markets previously composed mainly of consumers.²¹⁷

Because the false substitution and false valuation have countervailing effects, it is impossible to judge a priori whether speculative secondary market trading causes investors to invest too little or too much in stocks. But unless the two effects exactly offset each other, HE theory suggests that speculative trading distorts investor demand for corporate equities.²¹⁸ This distortive effect is different from the inevitable fundamental value inefficiencies that arise in a market where prices reflect the aggregate demand of many investors with limited and differing information.²¹⁹ The false substitution and false valuation effects reflect the possibility that rational investors working on imperfect information can make mistakes not only about stocks' fundamental values, but also about the likely returns from trading vis-à-vis a buy-and-hold strategy. The latter error leads the self-selected, optimistic subset of investors who speculate in stocks persistently either to overinvest or underinvest in equities.

²¹⁵ See Burton G. Malkiel, *A Random Walk Down Wall Street* 34-50 (5th ed. 1990) (discussing "bubbles").

²¹⁶ *Id.* at 35-38.

²¹⁷ Although the stock markets have had their share of bullish bubbles, see 1 Loss & Seligman, *supra* note 16, at 3-5, generational effects are likely to ensure that speculators are always present in some proportion in the market, so that false substitution and valuation effects are likely to be chronic. See *supra* notes 72-79 and accompanying text.

²¹⁸ That the false substitution and false valuation effects counteract suggests that HE trading in stock markets may present an example of "the theory of second best"—i.e., an example of two market failures that work against each other so that eliminating one source of failure while allowing the other to persist would actually leave society worse off. See R.G. Lipsey & Kelvin Lancaster, *The General Theory of Second Best*, 24 *Rev. Econ. Stud.* 11 (1956-1957).

²¹⁹ See *supra* notes 116-32 and accompanying text. In particular, although nonmistaken traders and HE traders alike suffer ignorance of stock values, only the latter group suffer false substitution and false valuation effects because only the latter mistakenly perceive opportunities to profit from speculative trading.

From a social perspective, whether the false substitution and false valuation effects are cause for concern depends in large part on the social role stock prices play in allocating real resources. Commentators frequently assert that stock prices that accurately reflect stocks' fundamental economic values are essential to ensure the efficient allocation of investment capital and other resources.²²⁰ Stock markets are described as "mechanism[s] for channeling resources to their most productive uses in the economy"²²¹ and "signaling" devices "important to economy-wide allocational efficiency."²²² Most commonly, stock market prices are believed to determine how investment capital is allocated among firms.²²³ Accurate stock prices are thought to ensure that well-managed, promising corporations can raise capital easily by selling their shares at high prices whereas troubled businesses will find it harder to attract investors' dollars. Similarly, it is sometimes argued that stock prices act as signals of a firm's economic health in the markets for managers and for corporate control.²²⁴

²²⁰ See Barbara A. Banoff, *Regulatory Subsidies, Efficient Markets, and Shelf Registration: An Analysis of Rule 415*, 70 Va. L. Rev. 135, 170 (1984) (stating that stock market prices are "important to economy-wide allocational efficiency and impact[] on all producers"); Kiefer, *supra* note 6, at 889 (asserting that efficient prices are important because they are "signals which provide information that is basic to virtually all aspects of saving and investment"); Stiglitz, *supra* note 9, at 107-08 (describing information signaling function of market); Stout, *supra* note 23, at 615-16 (stating that it is a "fundamental premise" of securities culture that accurate stock prices are desirable because they "influence the production, distribution, and consumption of goods and services in the economy"); cf. Lewis D. Solomon & Howard B. Dicker, *The Crash of 1987: A Legal and Public Policy Analysis*, 57 Fordham L. Rev. 191, 237 (1988) ("[P]rice limits and trading halts may impair the ability of the stock market to allocate capital resources efficiently to those firms who will use them in the most productive fashion.").

²²¹ Kiefer, *supra* note 6, at 896.

²²² Banoff, *supra* note 220, at 170.

²²³ See Stiglitz, *supra* note 9, at 107-09 (noting that commentators frequently argue that stock prices are central to the allocation of investment capital); Stout, *supra* note 23, at 642, 643 n.167 (citing authorities claiming that capital allocation is markets' "most important" function); see also William J. Baumol, *The Stock Market and Economic Efficiency* 4 (1965) (stating that the stock market is the "allocator of capital resources *par excellence*"); Kahan, *supra* note 104, at 1010 ("[I]naccurate stock prices may lead to significant misallocations of capital. Companies whose stock is overvalued may raise too much equity and overinvest. On the other hand, companies whose stock is undervalued may find it costly or impracticable to obtain sufficient capital from alternative sources, and thus underinvest.").

²²⁴ See Kahan, *supra* note 104, at 1028-29, 1035-37 (suggesting that prices influence selection and compensation of managers as well as choice of takeover targets); Stout, *supra* note 23, at 678, 685-86 (same).

If this view is correct, wholesale distortions in stock prices due to false valuation and false substitution effects pose a serious social problem. The notion that stock market prices play a significant role in allocating capital and other resources is, however, controversial.²²⁵ The possible economic irrelevance of stock market prices was dramatically highlighted on October 19, 1987, when the Dow Jones average plunged twenty-three percent in a single day's trading with no noticeable effect on the economy.²²⁶ Assuming some connection, however, stock mispricing seems most likely to lead to allocative inefficiency in two situations: when mispricing persists over large periods of time²²⁷ and when mispricing filters down to the primary market for new corporate issues.²²⁸

Short-lived distortions in stock prices are unlikely to have significant allocative effects because economic decisions influenced by share price, such as a firm's decision to replace its management team, normally are made over periods of months or years.²²⁹ Chronic price distortions, however, can affect such choices. Because the false valuation and false substitution effects of HE trading are persistent,²³⁰ they may pose a significant risk of resource misallocation.

Stock mispricing also may have a direct misallocative effect when mispricing occurs in the primary markets where corporations raise investment capital. This is because, whereas secondary market transactions only redistribute existing wealth among investors, pri-

²²⁵ I have argued elsewhere at length that the securities culture's emphasis on enhancing stock market efficiency, especially in the short run, is misguided because secondary stock prices have only tangential effects on real resource allocation. See Stout, *supra* note 23.

²²⁶ See Paul Farhi, *Dire Forecasts Never Came to Pass*, Wash. Post, Oct. 19, 1988, at F1 (reporting that crash had had little effect on economy); Karen Pennar, *It's Almost as if It Never Happened—Almost*, Bus. Wk., Apr. 18, 1988, at 56 (reporting that six months after October 19, 1987, market crash had little effect on macroeconomy).

²²⁷ See Stout, *supra* note 23, at 656 n.223 (arguing that persistent distortions may lead to mispricing of new issues).

²²⁸ See Stout, *supra* note 23, at 708 (arguing that in contrast to trading market prices, issues prices do affect the allocation of capital).

²²⁹ For example, a firm will not try to finance a project through the sale of "overvalued" stock unless it believes overpricing will continue for some time because preparing an offering can take months, and during that time the issuer faces the risk that the offering price will change. See *id.* at 666 n.272 (asserting that only persistent mispricing will influence decisions to issue stock).

²³⁰ See *supra* note 217 (noting that false substitution and false valuation effects will likely be chronic).

mary market prices can determine which firms receive capital to invest and how much.²³¹ The false substitution and false valuation effects associated with HE trading are likely to have a direct distortive effect on new issues prices. Investors who purchase newly issued shares usually can speculate in those shares in the secondary markets immediately after issuance, leading them to systematically undervalue or overvalue new issues just as they undervalue or overvalue outstanding issues. Thus, to the extent that new issues prices influence the allocation of capital among firms,²³² the false substitution and false valuation effects associated with HE trading pose a further risk of misallocation.

The ambiguous connection between stock prices and real resource allocation makes the magnitude of any welfare losses from false substitution and false valuation effects uncertain. But whatever their magnitude, losses due to HE tradings' distortive effects on prices are just as much a social cost of speculation as the losses arising from investors' mistaken devotion of scarce resources to the negative-sum game of stock-picking and trading.²³³

B. *The Social Benefits of HE Trading*

Speculative stock trading clearly is costly to both stock traders and society as a whole. Yet from an economic perspective, speculative trading may still be desirable if it provides external social benefits exceeding its costs to traders and society. Commentators frequently assert that speculative trading does provide social bene-

²³¹ Kahan, *supra* note 104, at 1008; Stout, *supra* note 23, at 642-44.

²³² Corporations generally satisfy more than 95% of their capital needs with retained earnings or debt financing, neither of which are significantly affected by share price. See Stout, *supra* note 23, at 647 (noting that between 1973 and 1982, net stock issues provided an annual average of only 2.1% of corporate funding). Thus mispricing new issues may affect the allocation of capital only to those firms unable or unwilling to avail themselves of the usual sources of funding. See Kahan, *supra* note 104, at 1009 (suggesting that stock price may influence capital allocation when corporation does not have access to usual sources of funding). The fact that most firms can raise investment capital from other sources thus suggests that stock price inaccuracies, including inaccuracies due to HE trading's false substitution and valuation effects, may not necessarily lead to significant welfare losses from capital misallocation.

²³³ The possibility that speculation can distort asset prices by inflating perceptions of the potential returns from owning and trading an asset also may be of relevance to other markets, such as currency and commodity markets, where asset prices have clearer allocative consequences. See *infra* notes 313-35 and accompanying text (exploring HE theory's implications for other markets).

fits beyond any benefit to trading parties by increasing both the liquidity²³⁴ and the efficiency²³⁵ of modern stock markets. Careful analysis reveals, however, that the marginal liquidity and efficiency contributions of HE trading in today's high-volume markets are likely to be significantly outweighed by their marginal costs.

1. HE Trading and Market Liquidity

"Liquidity" refers to an investor's ability to sell an asset quickly without having to offer a discount from the prevailing market price.²³⁶ High-volume stock markets with large numbers of traders and high levels of trading are said to be liquid because in such markets there is a high likelihood that a seller can find a prospective buyer (and vice versa).²³⁷ Conversely, in a "thin" or "illiquid" market with little turnover, the shareholder who wants to convert her investment into cash may either have to wait for a buyer to appear or sell at a below-market price to a professional dealer who makes a living providing liquidity to those willing to pay her bid-ask spread.²³⁸

Speculative trading can contribute to market liquidity by increasing both the number of traders and the frequency of trading in the market. Liquid secondary markets, in turn, are thought to provide a social benefit by encouraging capital investment. Because investors desire liquidity, they value assets that can be quickly resold more highly than assets that are difficult to convert into cash. The promise of a liquid secondary market is thought to encourage

²³⁴ See, e.g., Hazen, *supra* note 6, at 1005 ("[S]peculators provide additional liquidity in the markets."); see also Schwert & Seguin, *supra* note 8, at 10 (stating that reducing trading volume harms liquidity); Kiefer, *supra* note 6, at 888 (suggesting the same).

²³⁵ See, e.g., Posner, *supra* note 7, at 445 ("[S]peculation serves the salutary purpose of enabling the rapid adjustment of prices to current values."); Repetti, *supra* note 12, at 621 (arguing that investors looking for mispriced securities bid up prices of undervalued stocks and sell overpriced stocks, moving prices toward fundamental value); see also Schwert & Seguin, *supra* note 8, at 8 ("[M]ost economists take as canon the belief that an increase in the efficiency of a financial market is valuable."); Kiefer, *supra* note 6, at 888-89 ("[O]ne of the most basic objectives of the financial markets is determining the 'correct' prices of securities, or, in economic terminology, determining efficient prices.").

²³⁶ See Kiefer, *supra* note 6, at 888.

²³⁷ See *id.* (stating that reducing trading volume harms liquidity); see also Schwert & Seguin, *supra* note 8, at 10 (noting that transfer tax that reduces trading harms liquidity).

²³⁸ See *supra* note 144.

investors to purchase newly issued stocks, lowering firms' cost of capital.²³⁹

Although the liquidity benefits claim has merit, a number of scholars have criticized the prevailing enthusiasm for highly liquid stock markets for ignoring the costs associated with such markets.²⁴⁰ The first and most obvious cost associated with promoting liquidity by encouraging speculative trading is the cost of speculation itself, especially the cost of the resources squandered by investors on researching and trading. The second and more subtle cost arises from the possibility that liquid secondary markets encourage investor "short-termism" that deters shareholders from taking an active role in monitoring their firms' managers.²⁴¹

As noted earlier, investors spend \$100 billion or more annually researching and trading stocks in the secondary markets.²⁴² Any

²³⁹ See Kiefer, *supra* note 6, at 888 (arguing that investors desire liquidity and thus value liquid assets more highly); Stiglitz, *supra* note 9, at 108-10 (describing argument that liquidity encourages investors to buy stocks, including newly issued shares).

This argument implicitly presumes that new issues sales are worth fostering because, unlike mistaken HE trades, such transactions are mutually beneficial *ex post*—corporations get capital for investment, while investors gain a return on savings they might otherwise put under a mattress. Secondary market trades motivated by investors' liquidity, portfolio-balancing, or tax concerns may also be mutually beneficial. See *supra* Part II.A (discussing nonmistaken trading). Thus the liquidity added by speculating HE traders may provide a second social benefit by lowering the costs of nonspeculators' trades. Speculative transactions appear to far outnumber nonspeculative trades, however. See *supra* Part II.B. It would make little sense to pay commissions, spreads, and research costs on 10 speculative trades just to lower costs on one nonspeculative trade.

²⁴⁰ See, e.g., Lowenstein, *supra* note 10, at 81-87; Stiglitz, *supra* note 9; Summers & Summers, *supra* note 8.

²⁴¹ A third cost that some observers associate with highly liquid markets is an increase in stock price volatility that discourages investors from putting their money into stocks, including newly issued shares. See Schwert & Seguin, *supra* note 8, at 10 (noting that some argue that taxes that reduce volatility will increase value of stocks); see also Stiglitz, *supra* note 9, at 108, 110-12 (arguing that less trading will lead to less volatility, making it easier for firms to raise capital). The relationship between trading and volatility is unclear, however. Kiefer, *supra* note 6, at 890 (stating that empirical evidence suggests that transfer tax that reduces trading "would not affect volatility one way or the other"); Repetti, *supra* note 12, at 595 ("[S]tudies are inconclusive as to whether speculating increases or decreases stock market volatility."). Moreover, because new information naturally leads to changes in stock prices, it is unclear why "stable" markets are inherently better than "unstable" markets. See Hart & Kreps, *supra* note 12, at 930 ("[W]hether or not speculation stabilizes prices is in some sense the wrong question. One really ought to be interested in the welfare implications of speculation. One may feel intuitively that price stabilization is 'good', but, if so, one's intuition is faulty." (citation omitted)).

²⁴² *Supra* notes 193-207 and accompanying text.

defense of secondary market trading premised on its supposed liquidity benefits necessarily presumes that liquidity that helps corporations sell new issues is worth at least that amount. The injudiciousness of that presumption, however, is revealed when one considers that the annual costs of secondary market trading likely equal or exceed the total amount of capital that firms raise from new issues in the first place.²⁴³ In the five-year period from 1988 through 1992, U.S. firms underwrote an annual average of only \$40 billion in common stock issues.²⁴⁴ Even 1992, a banner year for new issues, saw only \$72 billion in common and \$29 billion in preferred stock issues.²⁴⁵ Spending \$100 billion to promote an equivalent amount of capital investment makes little sense, especially when most firms can raise investment funds from other sources.²⁴⁶

If the primary purpose of secondary stock markets is to encourage capital investment, society might be just as well off without secondary markets. But we need not choose between a highly speculative secondary market that provides liquidity but costs \$100 billion annually and no secondary market at all. Even if eliminating all HE trading reduced today's \$3 trillion trading market by an order of magnitude, the remaining \$300 billion market surely would be large enough to provide reasonable liquidity for most investors.²⁴⁷

²⁴³ See Lowenstein, *supra* note 10, at 80 (“[T]he value of [new stock] issues is roughly matched by the cost of trading the old ones.”); Stiglitz, *supra* note 9, at 109 (noting that although secondary market is thought to encourage new equity issues, “it seems to do so little of this at such great cost.”).

²⁴⁴ Securities Indus. Ass'n, *supra* note 24, at 947.

²⁴⁵ *Id.*

²⁴⁶ See *supra* note 232 (noting that most corporations prefer to rely on nonequity sources to finance investment, including debt and retained earnings).

²⁴⁷ See Kiefer, *supra* note 6, at 888 (suggesting that U.S. financial markets, including markets for stocks of major corporations, are so highly liquid that a transfer tax that discouraged trading would have inconsequential effect on liquidity); Stiglitz, *supra* note 9, at 109 (suggesting that for widely traded stocks, transfer tax that discourages trading unlikely to have significant effect on liquidity).

Of course, for relatively small and unknown firms, a significant decrease in HE trading might require investors to seek liquidity from professional dealers rather than from other traders, as investors in very small firms do today. Even in such a case, however, the cost of purchasing liquidity from a dealer should be limited to the reasonable costs of storage and risk bearing. See *supra* note 144.

As noted earlier, during the 1960s and early 1970s fixed broker commissions, together with federal and New York state stock transfer taxes, ensured that traders paid far higher costs than they do today.²⁴⁸ Not surprisingly, share turnover on the NYSE during that period was much lower, averaging only about ten to twenty percent annually.²⁴⁹ Yet the new issues markets of the late 1960s and early 1970s were viewed as "hot" markets.²⁵⁰ The liquidity benefits defense of speculative trading suffers from the erroneous assumption that if some liquidity is good, more is better.²⁵¹ Although speculative HE trading adds liquidity to an already liquid market, it adds very little, and at great expense. From an economic perspective, trying to promote liquid markets by encouraging investors to trade on their differing expectations seems a bad bargain.

The social costs of building liquidity by encouraging speculative trading may be even greater if, as some scholars have charged, liquid markets encourage shareholder "short-termism." A fundamental problem of modern corporate life is the separation of ownership (held by the firm's shareholders) and control (held by the board of directors and top management).²⁵² The separation of ownership and control creates opportunities for managers to use their powers to pursue their own interests and feather their own nests at the expense of the company and its shareholders. Shareholders can reduce the likelihood of such inefficient behavior by closely monitoring their managers and replacing those who seem lazy or venal. The critics of highly liquid, high-turnover stock markets charge, however, that even very large shareholders, such as

²⁴⁸ *Supra* notes 59-62 and accompanying text.

²⁴⁹ *Supra* notes 63-64 and accompanying text.

²⁵⁰ See David L. Ratner & Thomas L. Hazen, *Securities Regulation* 875 (4th ed. 1991); David Clurman, *Controlling A Hot Issue Market*, 56 *Cornell L. Rev.* 74 (1970); see also John Brooks, *The Go-Go Years* (1973) (referring to the 1960s as "go-go" years for primary and secondary stock markets).

²⁵¹ As Professor Louis Lowenstein has observed, "Liquidity is a good thing, but we are drowning in it." Lowenstein, *supra* note 10, at 81.

²⁵² See Eugene F. Fama & Michael C. Jensen, *Separation of Ownership and Control*, 26 *J.L. & Econ.* 301 (1983); Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 *J. Fin. Econ.* 305 (1976).

pension funds and mutual funds, are unlikely to ride herd on management if they expect to hold their shares for only a short time.²⁵³

HE theory supports the claim that speculation encourages short-termism by suggesting that short-termism may be another false substitution effect. Investors who regard short-term, speculative trading and long-term, involved ownership as substitute strategies for increasing their returns from stocks may mistakenly select the former approach over the latter.²⁵⁴ The siren song of trading profits may distract shareholders from monitoring shirking managers. As a practical matter, the magnitude of any social losses resulting from investors' mistaken preference for short-term trading over long-term involvement is uncertain. Even in the absence of speculation, freerider effects and a host of other institutional and legal restraints would likely discourage even very large shareholders from becoming too actively involved in their firm's affairs.²⁵⁵ Nevertheless, the lure of speculative profits almost certainly increases investor unwillingness to spend much time or effort policing management.

In sum, the problems of excessive trading costs and investor short-termism caution against an excessive emphasis on the bene-

²⁵³ See, e.g., Lowenstein, *supra* note 10, at 91-92 (suggesting that ability to sell shares quickly discourages investors from monitoring management, thereby harming firms' economic performance); see also Summers & Summers, *supra* note 8, at 273-74 (suggesting that transaction tax might encourage investors to monitor management rather than exit).

Another variant of short-termism addresses the possibility that investors' emphasis on short-run trading profits leads corporate managers to focus myopically on boosting near-term earnings and prospects, while sacrificing investment strategies designed to enhance firms' long-run profitability. See, e.g., Kiefer, *supra* note 6, at 893 (noting short-termism argument). Economists have criticized such claims on the grounds that as long as investors rationally value stocks according to their likely future risks and returns, any management sacrifice of long-run profitability will be recognized and will depress market prices. Schwert & Seguin, *supra* note 8, at 8-9 (criticizing management myopia argument that short investor holding periods induce managers to act myopically because it assumes that long-run strategies are not reflected in market prices and is thus inconsistent with market efficiency); Kiefer, *supra* note 6, at 893-95 ("[T]he 'short-termism' argument depends on the belief that the stock market systematically undervalues companies that pursue long-term investment projects This belief does not seem to be supported by the evidence.").

²⁵⁴ See Summers & Summers, *supra* note 8, at 273-74 (implying that ability to sell quickly in liquid market tempts investors to substitute "exit" strategy over "voice").

²⁵⁵ *Id.* at 274; see Bernard S. Black, *Shareholder Passivity Reexamined*, 89 *Mich. L. Rev.* 520 (1990); John C. Coffee, Jr., *Liquidity Versus Control: The Institutional Investor as Corporate Monitor*, 91 *Colum. L. Rev.* 1277 (1991).

fits of liquid markets without careful assessment of their costs. As John Maynard Keynes observed, scholars of finance have made a “fetish” of liquidity, assuming that more is always better than less and that more liquid secondary markets are desirable no matter what costs may be associated with them.²⁵⁶ Closer analysis suggests that the additional liquidity offered by HE trading carries a higher price than it is worth.

2. *HE Trading and the Fundamental Value Efficiency of the Market*

A second social benefit often attributed to speculative stock trading is an increase in market efficiency, meaning the rapidity and accuracy with which stock prices respond to new information.²⁵⁷ Economists and securities scholars often pay homage to the purported social benefits of efficient stock prices in ensuring the correct allocation of capital and other scarce resources.²⁵⁸ Once again, however, any defense of speculation premised on its benefits for market efficiency must address the question whether those benefits are worth their costs at the margin.

The assumption that speculative trades are important in incorporating new information into stock prices overlooks the likelihood that speculation is unnecessary for such a process to occur. Even if there were no HE trading, investors would still buy and sell stocks for liquidity and portfolio-balancing reasons; presumably, they would still seek out and take into account all reasonably available information when setting prices. An analogy might be drawn to the market for single-family homes. High transaction costs ensure that speculators play little or no part in the market for single-family residences, where turnover is low and owners buy and sell primarily for consumption—i.e., to have a place to live.²⁵⁹ Yet casual observation suggests that home buyers and sellers pay close attention to information relevant to values when setting the prices at

²⁵⁶ Keynes, *supra* note 10, at 155 (“Of the maxims of orthodox finance none, surely, is more anti-social than the fetish of liquidity . . .”).

²⁵⁷ See *supra* notes 13, 235 and accompanying text.

²⁵⁸ See Schwert & Seguin, *supra* note 8, at 8 (“[M]ost economists take as canon the belief that an increase in the efficiency of a financial market is valuable.”); see, e.g., Kiefer, *supra* note 6, at 888-89 (asserting that basic objective of financial markets is determining correct, efficient prices).

²⁵⁹ See *supra* note 58 and accompanying text.

which they buy or sell. Similarly, in a stock market of investors trading primarily for liquidity, tax breaks, or a balanced portfolio, rational investors will choose prices that reflect all reasonably available information relevant to stock values.

Consequently, the argument that speculative trading furthers stock market efficiency must hinge on the notion that speculators greatly improve the efficiency of prices at the margin, both because the hope of trading profits inspires them to seek out new information and because increasing trading volume helps move prices in the direction suggested by new information more quickly. At the margin, however, improvements in market efficiency due to speculative trades are likely to be small. Most information that speculators acquire and incorporate into price (such as news of a takeover bid or a change in earnings) is destined to become widely known in due course anyway. The social benefits of incorporating that news into prices only days or hours earlier seem minimal.²⁶⁰ This is especially true given the likelihood that any resulting improvement in accuracy will likely be confined to secondary market prices, offering only negligible benefits due to improved resource allocation.²⁶¹

²⁶⁰ See Easterbrook & Fischel, *supra* note 43, at 682 (arguing that moving information into stock prices “a day or so quicker is not of much moment for allocative efficiency”); Kiefer, *supra* note 6, at 896 (“According to the argument, the social value of learning news about a company minutes or hours or even days earlier than otherwise is negligible.”).

²⁶¹ See Stiglitz, *supra* note 9, at 107 (suggesting that “prices in the stock market play no basic informational role in the economy”); Stout, *supra* note 23 (questioning extent to which stock prices affect real resource allocation); *supra* notes 227-30 and accompanying text (noting that only secondary market mispricing that is persistent or affects primary market seems likely to trigger resource misallocations). Because trading in the secondary markets does not provide additional capital to corporations, secondary market prices affect the allocation of capital to firms only indirectly, by providing information on what price investors might be willing to pay for newly issued shares. See Kahan, *supra* note 104, at 1012-13; Stout, *supra* note 23, at 653-55. In the case of “seasoned” issues (i.e., issues of shares identical to those already traded in the market), secondary market mispricing may indeed have a direct influence on a firm’s decision whether to issue more shares if mispricing persists long enough for firms to act on it. See Stout, *supra* note 23, at 653-54 (asserting that secondary market prices influence underwriters trying to price seasoned issues by signaling a “ceiling” price below which the issue should be priced). In the case of an initial public offering, however, the signaling value of secondary market prices is quite limited—investors’ varying enthusiasms for established companies say little about the market’s view of a new firm’s prospects. See Stout, *supra* note 23, at 654-56 (arguing that market prices of particular firms in secondary market provide little information to underwriters pricing initial public offerings); see also Stiglitz, *supra* note 9, at 107 (stating more generally that “information revealed by the stock market price is not precise enough to be of much use to most firms”).

Another highly questionable assumption underlying the market efficiency argument is the assumption that efficient market prices are necessarily *accurate* prices.²⁶² As discussed earlier, HE theory predicts that a stock's market price is nothing more than the intersection of a fixed supply curve with a market demand function that aggregates the individual demands of many investors, all of whom are laboring under some degree of ignorance. No amount of speculative trading can produce "accurate" prices in such a market, even if the market is highly informationally efficient, investor disagreement and varying degrees of ignorance will ensure that stock prices bear only the roughest correspondence to their intrinsic values.²⁶³

Close scrutiny of the market efficiency benefits defense of speculative trading consequently reveals that encouraging speculation is unlikely to produce significant social benefits from improved price accuracy. The efficiency benefits claim is undermined still further by the HE trading model's implication that speculative HE trading may actually *decrease* the fundamental value efficiency of market prices. As discussed earlier, false substitution and false valuation effects cause HE traders systematically to undervalue or overvalue corporate equities.²⁶⁴ Because the relatively pessimistic investors who hew to a buy-and-hold strategy and trade only for liquidity or portfolio-balancing reasons are not subject to false substitution and false valuation effects,²⁶⁵ speculators' subjective valuations of stocks are subject to distortions that non-speculating investors' are not. In other words, HE traders may on average be *worse* judges of stock values than other traders.²⁶⁶ If so, adding large numbers of speculating HE traders to a market where investors already trade modest amounts of stock for liquidity or portfolio-balancing rea-

²⁶² See *supra* notes 94-104 and accompanying text (noting that many legal scholars presume fundamental value efficiency follows from informational efficiency).

²⁶³ See *supra* notes 126-31 and accompanying text.

²⁶⁴ See *supra* Part III.A.2.

²⁶⁵ See *supra* note 142 and accompanying text.

²⁶⁶ If investors enjoyed infinite lifespans, speculating HE traders might indeed become superior judges of stock values over time as HE traders who were bad at picking stocks lost money and were "weeded out" of the market. Generational effects ensure, however, that the pool of HE traders includes a large proportion of those whom time will ultimately expose as poor judges of stock values. See *supra* notes 79, 87-90 and accompanying text.

sons actually may *decrease* the already questionable level of fundamental value efficiency found in the market.²⁶⁷

Close examination of the supposed efficiency benefits of speculative trading under the assumption of investor heterogeneity thus suggests that, contrary to conventional wisdom, speculative trading is unlikely to produce more accurate market prices and may even contribute to price inaccuracy. The alleged efficiency benefits of speculative trading are at least exaggerated, and possibly illusory.

C. Reducing Welfare Losses from HE Trading: Some Policy Implications

Scholars and lawmakers alike often sing the praises of modern stock markets, admiring their efficiency, liquidity, and ability to service millions of traders who annually trade trillions of dollars in stocks. Yet a thriving secondary market is enormously expensive to the traders who on average fail in their quest to outperform the market. Speculative trading in corporate equities also may lead to social losses by distorting investors' demand for firms' shares and possibly, the allocation of capital and other resources. In return, speculative trading offers only a modest improvement in the market's liquidity and may actually reduce the market's fundamental value efficiency. Careful analysis of the costs and benefits of speculative trading in the light of HE theory consequently suggests that, at least in the case of stock markets, the common presumption that stock speculation benefits both speculators and society as a whole may be dangerously misleading. Speculation appears to be a form of costly market failure, a rational but ultimately harmful activity that destroys wealth and distorts prices while providing little in compensatory benefits.

That possibility carries a broad range of implications for the regulation of modern equities markets. Federal securities law pursues a number of goals, chief among them the protection of investors and the promotion of efficient markets that accurately price securities. HE theory suggests that policymakers should consider a third

²⁶⁷ Similarly, noise trader theorists have argued that the trading of irrational investors speculating on "noise" moves stock prices away from their values. See, e.g., Black, *supra* note 34, at 532 (maintaining that because "noise trading actually puts noise into the prices . . . prices will be less efficient").

goal as well: reducing the welfare losses that flow from speculative trading.

This Section briefly considers how lawmakers might alleviate welfare losses from HE trading. On the theoretical level, imperfect information, regarding both the true values of stocks, and investors' relative trading talents, is the source of the market failure reflected in HE trading.²⁶⁸ One obvious policy response might be to provide investors with the information they lack.²⁶⁹ In the case of stock speculation, however, the cost of providing the information needed for investors to value perfectly either corporate equities or their own trading talents is virtually infinite. Stock values depend on an obstinately indeterminate future, and only experience can reveal whether a particular investor has a knack for speculation.²⁷⁰ Because the information necessary to prevent speculative trading is no more available to the government (or anyone else) than to investors, individuals who wish to invest in corporate equities necessarily approach the market suffering some degree of ignorance about both stock values and their own prospects in the trading game.²⁷¹

This does not imply, however, that welfare losses from stock speculation cannot be mitigated. At least three possible approaches can potentially reduce social losses due to speculation: (1) reducing the incidence of trading through policies that reduce the dispersion of investor opinion, (2) reducing welfare losses by

²⁶⁸ Uncertainty about stock values leads investors to disagree in their assessments with each other and with market prices. Uncertainty about one's own relative aptitude for trading leads an optimistic subset of investors to attempt to wring profits from their disagreement by trading despite their intellectual recognition that stock trading is a negative-sum game. See *supra* text accompanying notes 35-39, 66-69.

²⁶⁹ This response to imperfect information can be found in other contexts. For instance, prescription drugs are accompanied by labels describing common side effects, and processed foods are labeled with their ingredients.

²⁷⁰ Investors might try to test their trading talent in advance by devising hypothetical trading strategies to observe what their returns would have been had they actually traded. Although some individuals and institutions do use "paper" trading to test the value of a particular strategy, paper trading requires investors to make an investment of time and effort with no risk but also no possibility of return. Moreover, because the success of many trading strategies is best gauged over a period of years, many investors feel that they simply lack the time to test the waters in this fashion.

²⁷¹ The government might, however, require all stocks to carry the following label: "WARNING: Self-Selection Ensures that You Probably Are Not Going To Be as Talented at Trading as You Think You Might Be."

reducing the costs associated with speculative trading, and (3) discouraging speculative trading through deterrent measures such as a tax, or even a prohibition, on speculative transactions.

The discussion below briefly surveys some of the advantages and disadvantages of each approach. The discussion also touches upon the HE model's implications for the present regulatory scheme, a laissez-faire approach that promotes trading while protecting investors primarily through antifraud and mandatory disclosure rules. The intent is not to provide a comprehensive slate of proposed reforms, for any specific question of securities law necessarily implicates complex issues and policy concerns that lie well beyond the scope of this Article. Rather, the following discussion illustrates how the HE model's new perspective offers important, illuminative, and often counterintuitive insights into many old issues.

1. Reducing Welfare Losses from HE Trading Through Rules That Reduce the Dispersion of Investor Expectations

In the simplified model of HE trading presented in Part I, an investor buys (sells) a particular stock when her subjective estimate of that stock's value exceeds (falls below) the market price by an amount sufficient to make up for transaction costs.²⁷² Increasing dispersion in investor expectations—fomenting disagreement—increases trading frequency because more investors will hold subjective assessments that vary enough from market price to justify trading. Conversely, reducing dispersion in expectations—encouraging agreement—decreases speculative trading and thus can reduce welfare losses from speculation.²⁷³

Absent an oracle to predict the future, some investor disagreement over stock values seems inevitable. Nevertheless, policies can be designed to reduce dispersion in investor expectations, and with it, the incidence of HE trading. In fact, two central doctrines in modern securities regulation, antifraud rules and mandatory disclosure rules, may serve just that purpose, albeit inadvertently.

Prohibitions against fraud in the sale of securities are contained in both the Securities Act of 1933 (" '33 Act") and the Securities

²⁷² See *supra* notes 46-51 and accompanying text (modeling trading as function of trading costs and dispersion of investor expectations).

²⁷³ See *supra* notes 49-51 and accompanying text.

Exchange Act of 1934 (" '34 Act").²⁷⁴ These federal antifraud rules are praised for advancing the efficiency of market prices and the fairness of stock markets.²⁷⁵ The HE model intimates that antifraud rules also may reduce the likelihood of negative-sum speculative trading. Misrepresentations regarding securities often are made for the purpose of inducing speculative purchases or sales by convincing investors that stocks are underpriced or overpriced.²⁷⁶ Brokers in particular may be tempted to foster investor disagreement and trading by providing investors with false and misleading information.²⁷⁷ Effective antifraud rules thus not only protect investors and insulate market prices from the distortive

²⁷⁴ See, e.g., 15 U.S.C. § 77q (1988 & Supp. V 1993) (codifying section 17 of the 1933 Act, which prohibits fraud and misrepresentations in the sale of securities); 17 C.F.R. § 240.10b-5 (1994) (providing rule 10b-5 of the 1934 Act, which prohibits fraud and misrepresentations in connection with the purchase or sale of securities).

²⁷⁵ See Easterbrook & Fischel, *supra* note 43, at 673 ("Fraud reduces allocative efficiency."); David J. Schulte, *The Debatable Case for Securities Disclosure Regulation*, 13 *J. Corp. L.* 535, 540 (1988) (same).

²⁷⁶ See, e.g., *Beecher v. Able*, 374 F. Supp. 341 (S.D.N.Y. 1974) (describing action against corporation for misrepresentation in sale of debentures); *Escot v. Barchris Constr. Corp.*, 283 F. Supp. 643 (S.D.N.Y. 1968) (same).

Another common purpose of fraud is to affect the price of a transaction that would occur anyway. See, e.g., *Affiliated Ute Citizens v. United States*, 406 U.S. 128 (1972) (describing claim of fraudulent omission designed to induce plaintiffs to sell at lower price). In such cases, an antifraud prohibition neither furthers nor frustrates the goal of deterring speculative trading.

More rarely, fraud may be used to deter a transaction. In such a case, enforcing the antifraud rules would actually increase the incidence of trading. Interestingly, case law denies standing to investors seeking to enforce the antifraud prohibition in such cases on the grounds that, if the fraud successfully deters the transaction, the plaintiff is neither a "purchaser" nor a "seller" entitled to sue. See *Blue Chip Stamps v. Manor Drug Stores*, 421 U.S. 723 (1975) (dismissing action by offerees of stock who claimed defendants had fraudulently misrepresented offer as unattractive in order to deter them from buying on the ground that only purchasers and sellers have standing to sue under Rule 10b-5).

²⁷⁷ See *supra* Part I.D.1. Unfortunately, the value of present antifraud rules in preventing broker misrepresentation is somewhat limited because, as a practical matter, it is difficult for investors to prove that technically truthful but highly slanted or biased advice that inspires trading is tantamount to a fraud. See *supra* note 84 and accompanying text.

This is not to say there is no hope of reducing brokers' role in fostering disagreement. For example, requiring all communications between broker and client to be in writing would make it more difficult for brokers to avoid fraud claims by disputing the content of their advice. Investors might also be given some protection from sincere but overoptimistic brokers if brokers who gave investment advice were required to disclose their "track record" in advising other clients.

effects of false information, but also reduce welfare losses from speculative trading by reducing the incidence of trading.²⁷⁸

The federal system of mandatory corporate disclosure may provide an even more effective approach to reducing dispersion in investor expectations. The '33 Act requires companies that publicly issue stock to file with the SEC and provide in a prospectus to investors extensive information describing both the firm and the offered security.²⁷⁹ The '34 Act requires firms whose shares are publicly traded to file regularly with the SEC extensive information regarding the firms' business, management, and financial status, and to provide similar information directly to shareholders in the form of an annual report.²⁸⁰ Federal mandatory disclosure rules have been applauded for contributing in a number of ways to both the fairness and the efficiency of the market.²⁸¹ HE theory suggests that mandatory disclosure may serve another important social function by diminishing the investor disagreement that inspires wasteful and distortive speculative trading.

As discussed in Part I, disagreement is inevitable when investors rely on different, limited subsets of information.²⁸² Providing all investors with the same data consequently promotes homogeneous expectations. This insight reinforces the social value of the federal mandatory disclosure scheme against conservative academics' charges (often based on efficient market theory) that required disclosure is either irrelevant or too expensive.²⁸³ HE theory supports

²⁷⁸ In addition to prohibiting misrepresentations, federal antifraud rules also prohibit insider trading and stock price manipulation, both of which are forms of speculative trading. See generally Hazen, *supra* note 81, §§ 6.0.1, 12.1, 13.9 (discussing manipulation and insider trading). The rules against insider trading and manipulation consequently also decrease the incidence of HE trading.

²⁷⁹ See *id.* §§ 3.1-3.8 (stating disclosure requirements under '33 Act).

²⁸⁰ See *id.* §§ 9.2-9.3 (stating disclosure requirements under '34 Act).

²⁸¹ See Coffee, *supra* note 29, at 722, 725-29, 751 (arguing that mandatory disclosure aids informational efficiency because information is underprovided public good); Langevoort, *supra* note 6, at 781-85 (noting a variety of arguments why mandatory disclosure might enhance both efficiency and fairness of market). But see Easterbrook & Fischel, *supra* note 43, at 692-96 (arguing that rationales for mandatory disclosure, including increasing public's confidence in market, protecting unsophisticated investors, and increasing supply of information to efficient market, are "poorly supported").

²⁸² *Supra* notes 46-56 and accompanying text.

²⁸³ See Coffee, *supra* note 29, at 717-18 (describing "revisionist" charges that mandatory disclosure produces few benefits at considerable cost); Langevoort, *supra* note 6, at 778 ("Based on the so-called efficient market hypothesis, . . . a growing number of critics have

the claim that mandatory disclosure rules are needed because it suggests that, before HE traders actually sustain losses from trading, they are unlikely to recognize that they will benefit from uniform and timely disclosures that reduce speculation by encouraging agreement. Indeed, if they think that they might profit from others' ignorance, they might actually oppose such disclosures. As a result, shareholders left to their own devices will not demand optimal disclosure from the firms in which they invest. After sustaining trading losses, HE traders may recognize that ignorance that encouraged disagreement made them worse off, but at that point, the sadder-but-wiser HE trader can avoid losses more cheaply by simply refraining from trading.

HE theory also offers guidance on how disclosure requirements might be structured. For example, the SEC's "integrated disclosure" system excuses large, publicly held firms whose stock is actively traded from providing much information directly to investors on the theory that, as long as the relevant information is filed with the SEC and available to a subset of sophisticated investors, it will be incorporated into an efficient market price.²⁸⁴ The HE model implies, however, that providing information to a small minority of investors promotes informational but not fundamental value efficiency and may even increase welfare losses from HE trading by provoking investor disagreement. Similarly, HE theory offers new insight into the ongoing debate over whether disclosure documents should be "readable" by the average investor.²⁸⁵ If one purpose of mandatory disclosure should be to foster agreement by

argued that the current mandatory disclosure system is unnecessary"); see also Easterbrook & Fischel, *supra* note 43, at 709-14 (discussing critique of mandatory disclosure and concluding that "there is no good evidence that the disclosure rules are beneficial").

²⁸⁴ See Langevoort, *supra* note 6, at 767 & n.83 (describing integrated disclosure and noting that the "practical effect is that investors actually receive very little of the information on file" with the SEC).

²⁸⁵ See Homer Kripke, *The SEC, the Accountants, Some Myths and Some Realities*, 45 N.Y.U. L. Rev. 1151, 1164-65 (1970) (arguing that disclosure documents need not be readable by lay investor); see also Easterbrook & Fischel, *supra* note 43, at 694 (maintaining that view that mandatory disclosure should cater to unsophisticated investors is "as unsophisticated as the investors it is supposed to protect" because informed traders in an efficient market will impound all relevant information into prices, making it unnecessary to provide that information to the remainder of investors).

providing uniform information, disclosures that most investors find incomprehensible do little to further that goal.

2. *Reducing Welfare Losses from HE Trading Through Rules That Decrease the Costs of Speculative Trading*

In addition to discouraging investor disagreement, federal mandatory disclosure rules may play a second role in reducing social losses from speculative trading. The cost of research—that is, the cost of acquiring and analyzing the information needed to make stock forecasts—is a major component of the expense incurred by investors who trade to beat the market. The mandatory disclosure system provides a broad range of information to investors quite cheaply. Thus, mandatory disclosure rules may reduce social losses from HE trading by reducing the costs of speculators' active management of their portfolios.

Legal scholars have occasionally recognized this point by arguing that, in addition to contributing to investor protection and market efficiency, the mandatory disclosure system may also produce a social benefit by reducing investors' need for wasteful and duplicative research.²⁸⁶ This argument, however, fails to take account of the possibility that mandatory disclosure rules that reduce the *marginal* cost of speculation may encourage investors to speculate more often and so lead to an increase in the *total* cost of trading.

Reducing the marginal cost of speculation can increase welfare losses due to speculation because cost and trading are inversely correlated (as the costs of speculating go down, investor interest in speculating goes up).²⁸⁷ As an example, consider the impact on total trading costs of a substantial reduction in marginal costs that triggers an even greater increase in trading. Suppose the elimination of fixed broker commissions in 1975 reduced investors' commission costs by one-half, from approximately 5.0% of the value of

²⁸⁶ See Coffee, *supra* note 29, at 733-34 (arguing that mandatory disclosure system may eliminate much wasteful duplication in research); Stout, *supra* note 23, at 705 ("[M]andatory disclosure can be defended not because it is important for investors to have such information, but because it is important to stop [them from] wasting [their] resources to get it."). But see Easterbrook & Fischel, *supra* note 43, at 682 (noting argument but disagreeing that mandatory disclosure is necessary to reduce waste).

²⁸⁷ See *supra* note 51 and accompanying text; see also Stigler, *supra* note 35, at 223 (explaining that searching for best bargain is part of purchase cost of a good and that consumers purchase less as search costs go up).

a trade to about 2.5%.²⁸⁸ Suppose also that the reduction triggered a threefold increase in trading, so that the annual market turnover rate increased from ten percent to thirty percent.²⁸⁹ Before deregulation, investors were spending approximately 0.5% of the value of their portfolios annually on commissions. Reduced commission rates result in investors spending even more; now they lose 0.75% of their portfolios annually to broker fees.

In economic terms, whether lowering the marginal costs of speculative trading increases or decreases the total costs depends on whether the demand for speculative trading is relatively elastic (small changes in the marginal price of trading trigger large changes in demand for trading) or relatively inelastic (changes in the price of trading have little effect on the demand for trading).²⁹⁰ Although more empirical study is needed, the available evidence suggests that the demand for stock trading is quite elastic, so that decreases in marginal trading costs are likely to trigger disproportionately greater increases in the frequency of trading.²⁹¹ This possibility implies that policies that reduce speculators' marginal costs, such as the deregulation of fixed commissions or mandatory disclosure rules that reduce marginal research costs, may actually have the perverse effect of increasing net welfare losses from speculative trading.²⁹²

The observation that reducing marginal stock research and trading costs can increase welfare losses from speculation should not be taken to imply that the system of mandatory disclosure should be dispensed with, or that securities firms should be encouraged to

²⁸⁸ See *supra* note 63 (noting that deregulation estimated to have halved institutions' out-of-pocket trading costs); *supra* note 57 (noting that net costs of speculation presently approximate three percent of value of trade).

²⁸⁹ See *supra* note 64 and accompanying text (noting that NYSE turnover increased from approximately 10% to 50% following deregulation).

²⁹⁰ See generally Stout, *supra* note 11, at 1239-44 (discussing demand elasticity).

²⁹¹ See Schwert & Seguin, *supra* note 8, at 19-20 (citing studies of foreign exchanges finding highly elastic demand for trading); Kiefer, *supra* note 6, at 886 (estimating that 0.5% transfer tax would cause stock volume to decline by 7.9%); see also *supra* notes 63-64 and accompanying text (noting that deregulation of brokers' commissions between 1968 and 1975 halved institutions' out-of-pocket trading costs and that turnover on NYSE rose from 10% to 50% between 1960 and 1987).

²⁹² Similarly, the development of derivative financial instruments such as stock index futures and index options may increase net welfare losses from stock trading, because the costs associated with trading derivatives are even lower than the costs associated with trading equities. *Infra* notes 330-31 and accompanying text.

engage in monopolistic price-fixing. As noted earlier, federal securities law addresses a number of goals. Although HE theory suggests that reducing social welfare losses from speculative trading certainly is important, it should not be regulators' sole objective. Rather, the point is that the challenge of controlling excess speculation, although not intractable, raises subtle and complex issues.

3. *Reducing Welfare Losses from HE Trading by Taxing or Prohibiting Trading*

Policies that encourage investors to develop homogeneous expectations can reduce the incidence of wasteful speculation. In a world of imperfect information, however, investor disagreement on stock values is unlikely to be entirely eliminated. A second alternative, trying to control welfare losses from speculative trading by reducing marginal research and trading costs, may actually increase total welfare losses if demand for stock trading is highly elastic. This possibility, however, suggests a third (and perhaps more obvious) solution to limiting social losses from speculation: *increasing* the marginal costs of stock speculation either by imposing a tax on such trading or prohibiting it altogether.²⁹³

Both the Bush and the Clinton administrations considered proposals to reinstate a federal stock transfer tax by imposing a fee of no more than 0.5% of value on transactions in corporate equities and other securities.²⁹⁴ Those proposals died in a storm of protest (and lobbying by the securities industry)²⁹⁵ that included debates

²⁹³ Increasing the costs of speculation through a tax or prohibition decreases the incidence of trading without providing any further revenues to the securities industry (as reinstating fixed broker commissions or eliminating mandatory disclosure that substitutes for private research would) and so is effective in reducing welfare losses from speculation whether demand for stock trading is elastic or inelastic.

²⁹⁴ See Schwert & Seguin, *supra* note 8, at 1-3 (describing Bush and Clinton proposals); Kiefer, *supra* note 6, at 885 (describing Bush administration and Congressional Budget Office proposals).

²⁹⁵ See Schwert & Seguin, *supra* note 8, at 23 (asserting that the wisdom of a stock tax is likely to be "hotly debated"); Joseph A. Grundfest & John B. Shoven, *Adverse Implications of a Securities Transactions Excise Tax*, 6 *J. Acct. Auditing & Fin.* 409, 409-10 (1991) (noting that stock tax proposal "encountered a storm of protest from . . . the congressional and academic communities" and that it "was the subject of extensive lobbying by the securities and commodities industries"); see also Joseph A. Grundfest, *The Damning Facts of a New Stocks Tax*, *Wall St. J.*, July 23, 1990, at A10, (asserting that stock tax has "no evident justification" and would likely "destroy part of the U.S. financial

over whether such a tax would raise revenue, its effect on capital formation, its progressivity, its advantages as compared to a capital gains preference, difficulties in implementation, and so forth.²⁹⁶ This Article does not join that passionate and often partisan debate by recommending any particular size or type of tax but rather simply explores the potential value of some tax—including that extreme form of tax, the prohibition—in reducing welfare losses due to speculative trading.²⁹⁷

Taxes are usually implemented to raise revenue. But taxes also can be used to deter undesirable behavior by raising the cost of that behavior.²⁹⁸ A tax to deter behavior resembles a prohibition except that a tax raises the cost of an undesired behavior by a finite amount, whereas a prohibition (assuming perfect enforcement) raises cost infinitely. In the case of stock trading, both forms of regulation pose the similar economic problem of deterring desirable as well as destructive transactions.

In understanding the dilemma posed by a tax or prohibition on securities trading, it is useful to recall the two alternative market models presented in Parts I and II, the HE trading model and the value-adding model.²⁹⁹ The HE trading model describes purely speculative markets in which investors buy and sell stocks in the

market" (quoting Richard Darman)); Michael Kinsley, *Stock Response*, *New Republic*, Aug. 20 & 27, 1990, at 4 (questioning tax that "create[s] friction in the wheels of commerce" and whether "government know[s] better than the free market"); Robert E. Norton, *The Silly Push To Tax Stock Trading*, *Fortune*, Dec. 18, 1989, at 151 (calling the tax "a dumb idea").

²⁹⁶ See sources cited *supra* note 295 (arguing against tax).

²⁹⁷ The transfer tax proposal was supported by a small but esteemed group of economists and policymakers who favored it not only to raise revenue, but also (in the words of Nobel laureate James Tobin) to "throw[] sand in the gears" of financial markets they perceived as exhibiting too much short-term trading and speculation. See Schwert & Seguin, *supra* note 8, at 1 (noting tax supported by Joseph Stiglitz of Council of Economic Advisors and Lawrence Summers of Department of the Treasury); Kinsley, *supra* note 295, at 4 (quoting James Tobin and also noting the support of then-Treasury Secretary Nicholas Brady, "who is obsessed with the idea that American finance is plagued by too much wasteful speculation").

²⁹⁸ The two goals are in tension with one another. A tax that deters substantially raises little revenue, and a tax that deters completely raises no revenue at all. Conversely, if demand for speculative trading proved to be highly inelastic and a stock transfer tax did not significantly deter trading, policymakers would be offered a consolation prize in the form of increased revenue.

²⁹⁹ See *supra* notes 22-64, 137-148 and accompanying text (HE and value-adding trading models).

hope of profiting on resale by successfully forecasting changes in future prices. Disagreement is a prerequisite for such trading because disagreement permits both parties to the trade to expect to increase their wealth *ex ante*, even though trading inevitably reduces the traders' aggregate net wealth *ex post*. Given perfect information and homogeneous expectations, no trading would occur. Trading in the HE market thus reflects a form of welfare-decreasing market failure, implying that a tax or prohibition that discourages trading leaves traders and society better off.

In contrast, according to the value-adding model, investors buy and sell stocks not because of differences in their expectations for the future, but because of differences in their present preferences for liquidity, capital gains or losses, or diversification. Such trades are mutually beneficial *ex post* as well as apparently mutually beneficial *ex ante* and would occur even if investors shared homogeneous expectations. Because trading leaves both parties to the trade better off, the value-adding model implies that trading is a socially desirable activity and that restricting trading leads to welfare losses. The distinction between HE markets and value-adding markets therefore implies that, as a general rule, a tax or prohibition on stock trading may be appropriate if secondary stock markets are purely or primarily speculative. Conversely, a transfer tax or prohibition on trading leads to welfare losses if stock markets reflect primarily value-adding trades inspired by differences in consumers' preferences that would exist even if consumers shared homogeneous expectations.

Markets can reflect a mixture of both value-adding and speculative trading. For example, although markets for physical commodities such as apples normally are dominated by the sort of value-adding transactions that would occur even if all market participants held identical expectations for future prices,³⁰⁰ such markets may

³⁰⁰ That does not imply that consumers cannot make welfare-reducing mistakes as a result of imperfect information in those markets. Consumers may make welfare-reducing trades because they are mistaken about their own preferences. Thus John spends one dollar to purchase a mango ice cream that he discovers, upon tasting, he detests. Consumers with imperfect information may also make mistakes about the quality of the goods they purchase, as when Mary buys a car that proves to be a lemon. It is far more difficult, however, to detect and prevent such mistakes in a largely value-adding market than it is to detect mistakes in an HE trading market, where the laws of arithmetic predict that virtually all transactions are welfare-reducing.

occasionally succumb to speculation (as the Tulip Bulb frenzy confirmed).³⁰¹ Nevertheless, the evidence examined in Part II suggests that the majority of trades in modern stock markets are welfare-reducing trades driven by investor disagreement.³⁰² That evidence supports the notion that regulation that deters speculation by taxing or prohibiting stock trading will produce net welfare gains.

Of the two forms of regulation, a tax seems clearly preferable to a complete prohibition on stock trading. At least some stock trading is value-adding, and secondary markets do provide some social benefits by providing prices that can signal the allocation of capital and liquidity that promotes investor interest in new issues. A tax that significantly diminishes but does not eliminate stock trading might well produce substantial social gains by reducing the incidence of speculative trading while largely preserving the markets' liquidity and signaling functions. Keynes proposed such a tax when he commented:

It is usually agreed that casinos should, in the public interest, be inaccessible and expensive. And perhaps the same is true of Stock Exchanges The introduction of a substantial Government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation [in stock markets].³⁰³

Because a stock transfer tax would necessarily deter a number of value-adding transactions, as well as a larger number of speculative trades, legal rules that mitigate welfare losses due to speculation by either encouraging investors to develop homogeneous expectations or reducing marginal costs (where demand for trading is relatively inelastic) are, in theory, superior to rules taxing or prohibiting trading. But as a practical matter, investors will disagree, and demand for trading does seem to be highly elastic.³⁰⁴ Thus, as Keynes observed, cruder instruments such as a transfer tax may well prove the most "serviceable" reforms available in reducing the welfare losses that flow from speculation.

³⁰¹ See *supra* notes 215-17 and accompanying text.

³⁰² *Supra* Parts II.B.1-II.B.2.

³⁰³ Keynes, *supra* note 10, at 159-60.

³⁰⁴ See *supra* notes 59-64 and accompanying text (describing evidence of highly elastic demand).

D. Some Thoughts on HE Theory's Applicability to Other Speculative Markets, Especially Derivatives Markets

Imperfect information can be a cause of market failure. This basic principle of economic theory has important normative implications for stock markets, where imperfect information tempts investors who disagree over stock values to squander resources playing the negative-sum game of stock trading and distorts their views of the value of corporate equities. The evidence indicates that in modern equities markets, welfare losses from speculative trading are substantial and far outstrip any likely liquidity or efficiency benefits of such trading.

The observation that heterogeneous expectations may lead to market failure in stock markets naturally raises the question of why the HE model should apply only to trading in corporate equities. This Article has focused on equities trading primarily because stock trading is so often presumed beneficial, the stock markets are large and socially important, extensive empirical evidence is available on equities trading, and modeling equities trading is relatively simple. But stocks are not the only securities traded by investors, and securities markets are not the only speculative markets. There are other areas of economic life where the HE model may well be relevant.

The market for litigation, and especially for trials, may reflect a form of market failure due to imperfect information similar to that which inspires speculative stock trading.³⁰⁵ For at least a decade the legal literature has recognized that trials are negative-sum games where the plaintiff's gain necessarily reflects the defendant's loss, and both parties lose wealth to attorney fees and other litigation expenses.³⁰⁶ Some scholars have explained this market failure as a consequence of imperfect information and heterogeneous expectations.³⁰⁷ Thus, when both parties agree on the likely out-

³⁰⁵ See Samuel R. Gross & Kent D. Syverud, *Getting To No: A Study of Settlement Negotiations and the Selection of Cases for Trial*, 90 Mich. L. Rev. 319, 320 (1991) ("A trial is a failure.").

³⁰⁶ *Id.* at 320-22 (reviewing literature).

³⁰⁷ See Robert Cooter, Stephen Marks & Robert Mnookin, *Bargaining In The Shadow of the Law: A Testable Model of Strategic Behavior*, 11 J. Legal Stud. 225, 225 & n.1 (1982) (citing authorities); Gross & Syverud, *supra* note 305, at 321 & n.5 (citing authorities).

An alternative theory is that settlement negotiations fail when parties behave strategically by "holding out." *Id.* at 321 & n.6 (citing authorities).

come of trial, they usually settle. It is only when litigants disagree—specifically, when the plaintiff is more optimistic in her assessment of her chances at trial than the defendant is—that parties insist on the social waste of a trial.³⁰⁸

As Keynes' casino comparison implies, another activity that may reflect market failure due to heterogeneous expectations is the market for certain kinds of gambling games. The HE model predicts that gambling games that involve an element of skill, such as handicapping thoroughbreds or playing blackjack, will attract an optimistic, self-selected subset of gamblers, each of whom believes her knowledge of horses or skill at playing the odds is better than the average gambler's.³⁰⁹ Transaction costs in the form of the house percentage ensure, however, that gamblers leave racetracks and casinos poorer than they arrived. Of course, even if gamblers on average lose wealth, they may find that the excitement and glitter of Churchill Downs or Atlantic City provide recreational value that more than makes up for their losses. Economists frequently hypothesize that gamblers do extract utility from their negative-sum games, and most individuals do seem to find gambling more enjoyable than either poring over stock and mutual fund reports³¹⁰ or being a party to litigation.³¹¹ Nevertheless, the HE model offers an alternative—and less benign—explanation for the popularity of

³⁰⁸ The fact that attorneys are often paid on an hourly basis for trial work suggests that they may face conflicts of interest similar to those faced by brokers and sometimes may play a similar role in fostering litigation by encouraging litigant disagreement. Cf. *supra* Part I.D.1 and accompanying text.

³⁰⁹ That observation raises the interesting question of why rational individuals would play negative-sum gambling games that do not involve an element of skill or forecasting, such as lotteries. See generally Edward J. McCaffery, *Why People Play Lotteries and Why It Matters*, 1994 *Wis. L. Rev.* 71 (arguing that the decision to play lotteries is a rational consumer choice inconsistent with conventional economic theories regarding risk aversion).

³¹⁰ Although the stereotype of the Florida retiree who enjoys "playing the market" raises the possibility that some investors trade for entertainment, closer analysis suggests that recreation is likely to play only a minimal role in equities trading. See *supra* note 33 (discussing and critiquing recreational theory of investing).

³¹¹ See Learned Hand, *The Deficiencies of Trials To Reach The Heart of the Matter*, Address Before the Association of the Bar of the City of New York (Nov. 17, 1921), in *Association of the Bar of the City of N.Y., Lectures on Legal Topics: 1921-1922*, at 89, 105 (1926) ("After now some dozen years of experience I must say that as a litigant I should dread a lawsuit beyond almost anything else short of sickness and death.").

casinos that resonates with the moral condemnation many laymen heap upon gambling.³¹²

A detailed discussion of the markets for litigation and gambling lies beyond the scope of this analysis. More closely related, however, is the possibility that heterogeneous expectations underlie a third, and much larger, market: the vast and growing market for financial derivatives.³¹³ Derivatives are instruments whose value depends on some underlying asset, rate, or index. For example, one common form of derivative is the "stock index future." Index futures are contracts for the future delivery of a group of stocks that comprise a particular stock index, such as the Standard & Poor's 500.³¹⁴ Because index futures generally sell at prices that closely follow the current prices of the stocks that make up the underlying index, a bullish trader might buy index futures, expecting stock prices to rise so that the stocks to be delivered will be worth considerably more than the futures price on the delivery date. Conversely, a bear will sell index futures, expecting she will soon be able to purchase the stocks she has agreed to deliver at a lower price. Other common forms of derivatives include options and futures contracts based on interest rates, commodities prices, and currency exchange rates.³¹⁵

Because derivatives trading is largely unregulated and unreported, reliable information on exactly who is trading what, with whom, and why, is difficult to obtain.³¹⁶ The General Accounting

³¹² See Hazen, *supra* note 6, at 994.

³¹³ See Hu, *supra* note 8, at 1459 ("The OTC derivatives market has enjoyed enormous growth"); Lenzner & Heuslein, *supra* note 8, at 63, 66 (noting that although a few decades ago derivatives markets were an "obscure backwater" of the securities markets, now financial world is "waist-deep in derivatives" to a degree that "few laymen understand"). See generally U.S. General Accounting Office, *Financial Derivatives: Actions Needed To Protect the Financial System* (1994) (discussing derivatives); Hazen, *supra* note 6 (analyzing the effect of derivatives on market efficiency); Hu, *supra* note 8 (discussing banker and regulator informational failure with respect to derivatives).

³¹⁴ See *supra* notes 153-54 and accompanying text (discussing stock indexes).

³¹⁵ See U.S. General Accounting Office, *supra* note 313, at 26-29 (describing basic types of derivatives).

³¹⁶ See Hu, *supra* note 8, at 1463 (noting that regulators know little about derivatives market); U.S. General Accounting Office, *supra* note 313, at 7, 34 (noting that there are "no comprehensive industry or federal regulatory requirements" for derivatives and that "complete information about global derivatives volume" is unavailable).

Office has estimated that in 1992 the notional amount³¹⁷ of interest rate, exchange rate, and equity and commodity price derivatives outstanding globally exceeded \$17 trillion, representing an increase of 145% since 1989.³¹⁸ The sudden appearance and rapid growth of such an enormous and poorly understood market has aroused apprehension among some members of the financial services industry and government policymakers.³¹⁹ Nevertheless, the economic presumption that voluntary transactions are mutually beneficial has armored the practice of derivatives trading against challenges, just as it has protected the derivatives markets' progenitor, the stock market. Scholars and regulators alike justify derivatives markets as beneficial to market participants and society as a whole.³²⁰

And how, exactly, do these arcane instruments further social welfare? Derivatives generally are defended as allowing market participants—including banks, insurance firms, securities firms, institutional investment funds, and corporations—to reduce risk by “hedging” against future changes in the prices of equities, commodities, and interest and exchange rates.³²¹ Thus, for example, an Oklahoma retail store whose clientele consisted largely of oil firm employees might want to protect itself from a decline in business revenues by purchasing an oil-futures derivative that rises in value if oil prices fall, whereas a commercial airline might sell such a derivative to offset the risk of rising fuel prices.³²²

If derivatives are used primarily for hedging (as in the example above), derivatives trades tend to be mutually beneficial. In such a value-adding market, a free-market approach that promotes trading and minimizes regulatory interference may well be wise.³²³

³¹⁷ See Hu, *supra* note 8, at 1459 n.6, 1467 n.44 (illustrating notional amount in interest rate swaps context).

³¹⁸ U.S. General Accounting Office, *supra* note 313, at 35 tbl. 2.1.

³¹⁹ *Id.* at 6.

³²⁰ See *supra* note 8 and accompanying text.

³²¹ See U.S. General Accounting Office, *supra* note 313, at 6 (“Derivatives serve an important function in the global financial marketplace, providing end-users with opportunities to better manage financial risks . . .”); see also Hazen, *supra* note 6, at 1007-09 (noting that futures literature defends futures trading as allowing risk allocation and improving accuracy of prices).

³²² This is a slightly modified version of an example offered by Professor Henry T.C. Hu, *supra* note 8, at 1466.

³²³ Even in such a case, however, the size and riskiness of the derivatives markets have led some regulators to believe that regulation is necessary to reduce systemic risk, i.e., the

Academics and regulators have observed, however, that derivatives can be used not only to hedge against risk, but also to speculate on the future.³²⁴ Thus a corporation might buy an oil derivative that rises in value as oil prices fall not as a hedge, but as a (hopefully profitable) bet on its forecast that oil prices will soon decline.³²⁵

As in the case of stock trading, only empirical inquiry can answer the question of whether most derivatives trades reflect hedging or speculation. Nevertheless, recent events suggest that speculation may play a large, if not a dominant, role in derivatives trading. In April 1994, for example, Procter & Gamble was forced to announce that it had suffered a \$102 million loss on derivatives contracts entered into by Procter & Gamble executives who were "bullish" on interest rates.³²⁶ (The company later announced that the transactions were mistakes "inconsistent" with the company's policy of avoiding financial speculation.)³²⁷ Procter & Gamble may have been lucky; shortly afterwards, Paine Webber Group announced that it would spend \$180 million shoring up a mutual fund that had tried to bolster its profits with derivatives trades,³²⁸ and a few months before, the German conglomerate Metallgesellschaft

possibility that the sudden failure or withdrawal of a large participant in the system could trigger a series of similar failures. U.S. General Accounting Office, *supra* note 313, at 7-8.

³²⁴ See Hazen, *supra* note 6, at 1017-18 (providing example of speculative use of derivative); U.S. General Accounting Office, *supra* note 313, at 25 (noting that speculators use derivatives to try to profit from anticipating price changes).

³²⁵ The derivatives literature also postulates that derivative instruments can be used for "arbitrage," riskless trades that extract profits by exploiting small differences between the market price of a derivative and the market price of an underlying asset, or small differences between exchange rates or interest rates in different capital markets. Hu, *supra* note 8, at 1466 (discussing use of derivatives for arbitrage); U.S. General Accounting Office, *supra* note 313, at 25 (noting use of derivatives to obtain more favorable financing through interest rate arbitrage). From an economic perspective, arbitrage trades, like speculative trades, generally are zero-sum transactions that transfer wealth but do not add to social welfare.

³²⁶ See Susan Antilla, P. & G. Bet on Rates Turns Sour, *N.Y. Times*, Apr. 13, 1994, at D1, D15.

³²⁷ Kelley Holland & Zachary Schiller, Did Procter & Gamble Play with Fire?, *Bus. Wk.*, Apr. 25, 1994, at 38, 38 (quoting Procter & Gamble CEO Edwin L. Artzt); see also Saul Hansell, A Bad Bet for P. & G., *N.Y. Times*, Apr. 14, 1994, at D6, (noting that executive in charge of transactions was put on "special assignment").

³²⁸ Leslie Eaton, Yet Another Round in Greed vs. Prudence, *N.Y. Times*, July 25, 1994, at D1.

schaft AG announced potential losses of nearly \$1 billion from energy derivatives.³²⁹

Such stories hardly sound like the stories of financial technicians negotiating mutually beneficial deals to adjust for market risk. Rather, they resemble the woeful tales of bettors at the racetrack who backed the wrong horse and must now tear up their tickets and go home. Heterogeneous expectations theory supports the idea that the derivatives markets provide fertile ground for speculation. The HE model predicts that, given a particular level of dispersion in investor expectations for future stock returns, speculative trading becomes more likely as transaction costs decrease. The low transaction costs associated with derivatives trading allow market participants who want to gamble on changes in stock prices (or interest rates, or exchange rates) to take a larger position in those markets at far less expense than by trading in the underlying market.³³⁰ Thus, HE theory predicts that derivatives markets are likely to attract a very high portion of those optimists willing to bet they are better than the next trader at forecasting the futures of industries, interest rates and national economies.

If the derivatives market is primarily a speculative market driven by disagreement over the future, what consequences follow? Most obviously, derivatives trading may pose a significant risk of adding to the welfare losses that society already suffers from equities trading because individuals and institutions may be enticed to expend resources researching, managing and trading derivatives, just as they now spend resources researching, managing and trading stock portfolios. To some extent, of course, one loss may simply substitute for the other. In other words, some of the resources expended on derivatives speculation might have been lost in any case to stock speculation. Yet developing a derivatives market seems likely to increase net social losses from financial speculation for at least two reasons.

First, as noted above, if the demand for speculative trading is relatively elastic, the lower transaction costs associated with derivatives trading may tempt market participants to incur larger net

³²⁹ Jeffrey Taylor & Allanna Sullivan, *German Firm Finds Hedges Can Be Thorny*, *Wall St. J.*, Jan. 10, 1994, at C1, C14 (describing losses as result of a "glitch" in the company's attempt to hedge risk).

³³⁰ See Hu, *supra* note 8, at 1466.

costs by greatly increasing their interest in, and the incidence of, speculative trading. Second, and perhaps more significantly, derivatives markets may increase net social losses from speculation because they offer market participants a novel and untried way to bet on their heterogeneous expectations for the future. As discussed in Part I, increasing the number of markets, instruments, and manners in which investors are able to speculate can increase their net losses from speculative trading. Allowing individuals to invest through intermediaries such as mutual funds, for example, can increase speculative losses by allowing individuals to make new and different mistakes.³³¹ The individual investor who has learned from bitter experience that she is no good at picking winning stocks may be tempted to see if she is better at picking winning mutual fund managers. Similarly, Procter & Gamble executives who would not think of hazarding their firm's fortunes on their own stock-picking talents might nevertheless speculate in derivatives, believing they have superior ability to forecast changes in interest rates.³³²

The observation that harsh lessons learned in one market do not necessarily carry over to another suggests that financial "innovations" that lead to new and better financial products may actually lead primarily to new and better ways for individuals and institutions to make expensive speculative mistakes. As Nobel laureate James Tobin has warned: "Every financial market absorbs private resources to operate, and government resources to police. The country cannot afford all the markets that enthusiasts may dream up."³³³ Champions of derivatives trading sometimes describe those who are more cautious as resistant to financial progress.³³⁴ The HE model of trading, however, provides a theoretical foundation

³³¹ See *supra* notes 91-92 and accompanying text.

³³² By introducing a new market in which traders can test their heterogeneous expectations, derivatives have contributed to the significant increase in the size of the U.S. financial industry over the past decade. See Lenzner & Heuslein, *supra* note 8, at 64 (estimating that "what we loosely call Wall Street" has gone from absorbing about one-half of one percent of Gross Domestic Product a decade ago, to one percent today largely because of derivatives).

³³³ Tobin, *supra* note 10, at 10.

³³⁴ See, e.g., Lenzner & Heuslein, *supra* note 8, at 72 (comparing growth of derivatives to invention of internal combustion engine); see also Hu, *supra* note 8, at 1513 (noting that halting derivatives trading would be "Procrustean, unnecessary, and destructive of social wealth").

for those who, like Tobin, fear that the fast-growing market in derivatives may serve Wall Street to the detriment of Main Street and the greater society.³³⁵ Resources lost chasing the illusion of speculative profits are resources that could have been invested in programs that increase social wealth by developing new technologies, improving products, or cutting production costs. Thus, in the regulation of speculative markets, *laissez-faire* can lead to loss.

IV. CONCLUSION

We live in a world of ignorance and uncertainty. Although in some cases economists can reasonably assume away the market effects of imperfect information, in other circumstances economic theories premised on perfect information can be dangerously misleading. As the economist George Stigler observed:

Ignorance is like subzero weather: by a sufficient expenditure its effects upon people can be kept within tolerable or even comfortable bounds, but it would be wholly uneconomic entirely to eliminate all its effects. And, just as an analysis of man's shelter and apparel would be somewhat incomplete if cold weather is ignored, so also our understanding of economic life will be incomplete if we do not systematically take account of the cold winds of ignorance.³³⁶

In the case of stock markets, any analysis that ignores ignorance risks being incomplete indeed. Ignorance about the future breeds disagreement, and disagreement in turn breeds investor trading in the hope of quick gains. Although the conventional economic models most often employed by contemporary financial theorists to describe stock markets are explicitly premised on the assumption that investors hold identical expectations for the future risks and returns of stocks, in reality even experts differ widely in predicting the fates of firms, industries, and the economy as a whole. Such disagreement tempts individual investors and institutional managers alike to abandon conservative buy-and-hold strategies and try their hand at trading in the statistically futile hope of beating the market. Although such trading is self-defeating—research

³³⁵ See Stiglitz, *supra* note 9, at 103 (suggesting that financial innovation may produce more welfare losses than gains such that “[b]arring these innovations . . . could actually make everyone better off”).

³³⁶ Stigler, *supra* note 35, at 224.

and trading costs ensure that investors who churn their portfolios on average *underperform* the market—it is not irrational. Indeed, economic theory explains that in a world of imperfect information where investors necessarily make differing judgments of both stock values and their own relative trading abilities, the wasteful expenditure of valuable resources on the negative-sum game of stock trading is not only rational but inevitable.

Recognizing the importance of disagreement in fostering stock trading allows construction of a model of stock trading and stock markets that offers great promise in describing and predicting the behavior of both equities markets and those who participate in them. This HE trading model offers insights into why investors trade, who is most likely to trade and for how long, the role of self-selection and successive generations in creating and sustaining markets, the role of financial intermediaries, how prices are set, and the uncertain relationship between market prices and best estimates of stock values. In doing so, the HE model paints a portrait of equities markets that departs significantly from models currently in vogue, yet accords well with both the empirical evidence and the perceptions of those who actually participate in stock markets.

In addition to its enormous positive utility, the HE model also carries important normative implications for the appropriate regulation of stock markets. Experts often dismiss the layman's disapproval of speculation. HE theory suggests, however, that the popular condemnation of wealth gained through speculation has a sound basis in economic theory. The HE model implies that speculative stock trading is, in an economic sense, a wasteful mistake. Although investors who trade on their heterogeneous expectations believe they will increase their wealth by doing so, their belief is on average erroneous, and their trading on average leaves them worse off. A conservative estimate of the expenses associated with stock speculation suggests that investors may be spending \$100 billion annually—fully one-fifth of their returns from investing—on researching and trading corporate equities. If most stock transactions are inspired by investor disagreement—and considerable evidence suggests most are—then, at least in the case of stock markets, trading based on heterogeneous expectations leads to substantial net welfare losses for both traders and society as a whole. Investors' optimistically mistaken perceptions that they can

increase their returns from stock ownership by trading also may lead to welfare losses by creating false substitution and false valuation effects that distort demand for corporate equities and may result in the misallocation of investment capital and other resources.

The HE model of trading thus undermines the views of commentators and regulators who perceive stock markets as finely tuned, highly efficient allocative instruments. Rather, the HE model predicts that speculative stock markets reflect a costly form of market failure that erodes social wealth while offering few benefits in return. This possibility has significant consequences for current law, much of which is devoted to promoting stock trading and encouraging the development of new instruments and markets. HE theory suggests that federal securities policy instead should seek to minimize the incidence and costs of speculative trading.

Differences of opinion make a horse race.³³⁷ They also make a thriving stock market because differences of opinion allow both buyer and seller to believe that they can increase their wealth by playing the negative-sum game of stock trading. By recognizing that reality, the HE trading model offers valuable guidance to the academics who study securities markets, the lawmakers who regulate them, and the investors who trade in them.

³³⁷ In Mark Twain's *Pudd'nhead Wilson*, the eponymous hero observes, "It were not best that we should all think alike; it is difference of opinion that makes horse-races." Samuel L. Clemens, *Pudd'nhead Wilson and Those Extraordinary Twins* 92 (Sidney E. Berger ed., W.W. Norton & Co. 1980) (1894).